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O'Rielly Seeks to Knock Down Barriers

Commissioner speaks up for economic freedom, licensed incumbents and the rule of law

Michael O'Rielly keeps on his wall a framed picture of Ronald Reagan and on his desk a memento with the word "Freedom" — both suggestive of his regulatory philosophy. A picture of his two-year-old daughter and a Father's Day card signed "Daddy's Grilling Partner" attest to the role of family.

With more than four years at the Federal Communications Commission including one in the political majority, O'Rielly is no longer the new guy. Radio World Managing Director of Content Paul McLane and Content Manager Emily Reigart sat down with him in February ahead of his appearance at the spring NAB Show. Text is edited for length and clarity.



Radio World: On the idea of a 5G nationalization proposal, you said, "I've seen lead balloons tried in D.C., but this is like a lead balloon made out of a Ford Pinto." Regarding the possibility that then-Chairman Wheeler would circulate a draft item, you said,

"Forgive me being pessimistic after having the rug pulled out from beneath the feet of rationality so many times." And more recently, you told an audience that Chairman Pai couldn't make a scheduled appearance so instead they were going to get "a shorter, less attractive version of an FCC Republican." Do

you write your own material?

O'Rielly: I have a good staff. But they tend to let me write the colorful stuff. I try to make things lighthearted but also make a point.

RW: Would you say that you have a tart tongue and a quick wit?

O'Rielly: That seems too complimentary. I do like to joke around. I think wit's part of the job.

RW: Since you've come into the major-


ity, what's your big-picture assessment of the FCC's performance? Is there a signature accomplishment to date?

O'Rielly: Chairman Pai has done a wonderful job, and I hope I've been a good partner to him. He and I have a great relationship. I've been very impressed with his leadership and excited to see where we go in the next couple of years.

The chairman would say his top priority is the digital divide, closing that. It's something I've spent a ton of time on myself. There are many items that go into that; we just did one on terms of the Connect America Fund Phase Two

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Jim Wood Preaches Simplicity in Design

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Jim Wood Focuses on the Basics

Inovonics founder has been pushing for "better radio since 1972"

NEWSMAKER

BY TOM VERNON

For the past 45 years, the equipment design philosophy of Inovonics has been "Simplicity in design, consistent with performance objectives."

It's a suitable mantra for a broadcast manufacturer whose corporate personality reflects that of its founder: quiet, dignified and widely respected. It's a policy that has produced a lifetime of close personal relationships for Jim Wood with employees, fellow designers and manufacturers, radio engineers and station owners.

Wood, a recent recipient of NewBay's Industry Innovator Award, spoke with RW about his earliest interests in electronics, his career and some milestones in the history of his company.

VIDAR AND GRT

Wood, 76, recalls that his interest in electronics began when he was about five years old.

"My dad had been a ham radio operator in the 1920s. He had a box with old equipment that I used to play with. That's what fostered the initial interest. When I was around 10, I started building crystal sets, and got interested in pirate broadcasting and sound recording."

He initially hadn't considered electronics as a career, earning an undergraduate degree in theater arts with a minor in industrial arts from San Jose State University.

"I was informed by a professor in the Theater Arts Department that my portrayal of Willy Loman in Arthur Miller's 'Death of a Salesman' was the most 'unique' one he'd ever seen in his life," he recalls. "I took this as a hint that a career on the stage, movies or TV was probably not in the cards, so I followed my lifelong hobby-related interest in radio and electronics."

His education in the business really began after graduation in 1964, when he went to work as a test technician for Vidar Corp. in Mountain View, Calif. It made instrumentation equipment, temperature gauges, strain gauges and similar equipment.

"The circuitry was analog, but they were beginning to transition to digital. The company was staffed by a lot of Stanford graduates. From them I learned how to make transistors do interesting things."

After Vidar, Wood was a production engineering tech for General Recorded Tape, which in addition to producing tape



The Inovonics crew at the company's second location in Campbell, Calif., circa 1977-78. From left: Joan Pellizzari, office manager; Norm Nelson (kneeling), test tech/product Development; Jim Wood, CEO/chief engineer; Richard Gill (kneeling), purchasing/production; Linda Gonzalez, production; Sue Tahovsky, bookkeeper; Tony Quinsay (kneeling), production; Brian Fogerty, test tech/sales; and Stephen Chrisco, production.

product for about 30 record labels developed high-speed duplicators for 8-track tape and cassettes. Following efforts to diversify into unrelated industries, it went out of business in the late 1960s.

It was in 1972 that Wood partnered with Mark Drake to found Inovonics in Campbell, Calif. The two saw a market for replacement electronics for professional tape recorders, in particular those made by Ampex and Scully. The electronics for many of these machines used first-generation transistor circuits or, in the case of the Ampex 350 series, vacuum tubes. The original manufacturers had no interest in providing updated electronics.

Wood handled electronic design, Drake did the packaging. In what has turned out to be an ongoing practice, Inovonics talked to potential customers — in this case, recording engineers — to learn more about their needs and expectations. Wood said he found a great deal of room for improvement in recorder electronics, in both features and performance.

By the early 1970s, even basic opamp circuits could run circles around those early transistor and mature tube designs, and the smaller size of components meant that Inovonics could offer replacement electronics in a package the same size as the original, but with more features.

Enhancements offered by Inovonics included the ability to remotely switch all monitor and equalization functions, the use of solid-state switching to elimi-

nate contact issues and harmonic and phase distortion nulling circuits.

The original market for Inovonics' tape recorder electronics was not broadcasters but recording studios. The premiere Model 355 was developed as a feature-packed stereo chassis. The marketing plan soon had to be changed.

"The studios turned out to be an unstable market in many ways," he said. "I thought that radio might be a more solid market base, and it was."

For radio customers, a mono chassis was needed, and the Model 360 was introduced. The sales pitch was difficult to argue with: Spend \$690 for Inovonics 360 replacement electronics, install it in your Ampex 350, and come away with a machine having performance equal to or better than most modern recorders.

SUPER TAPES

Over several years, Inovonics focused on refining recorder electronics and adding to the product line. A new 380 series was an upgrade from an earlier 375. It

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JIM WOOD

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included advanced features such as circuitry to reduce the effects of tape compression and phase distortion, expanded signal and bias headroom to accommodate high-coercivity tapes and extra bias and EQ settings to work with "super tapes."

In 1989, Inovonics introduced its final product for magnetic recording, the 390 series film recorder electronics package. It was designed to replace obsolete sound electronics in motion picture recording and playback equipment.

By the late '80s, digital audio was gaining a foothold, and it was clear that the days of analog tape recorders were numbered. Wood had built compressors and limiters for his garage studio, and began to explore the market for commercial audio processors.

"The market was dominated by the CBS Audimax/Volumax and Gates Sta Levels at the time. We had built the Model 200 and 201 for recording studios, and took one to KFWB Los Angeles. The engineers talked about their requirements, and we listened. The result was the Model 220, a mono audio processor for AM that could be paired with a second unit for FM stereo."

A less-familiar Inovonics products was the Model 210 Frequency Selective Limiter. "It was originally developed while I was working at GRT, and patented there. However, we purchased the patent for \$1 when GRT went under. The unit was repackaged, still mainly for tape duplicators, but with plug-in cards for different protection characteristics in anticipation of use for the unit in FM broadcasting."

Eventually there were four audio processors in the

product line. The new units sold well, and by 1980, Wood recalls, about half of Inovonics sales were audio processors, the other half replacement recorder electronics.

Mark Drake left the company years ago to pursue other interests but Wood has been its face and mainstay. Over ensuing years, Inovonics branched out into AM and FM modulation monitors, RDS encoders and rebroadcast receivers. As new products were released, others seemed to suggest themselves. When web streaming became more popular, an internet radio monitor was introduced.

PROUDLY AMERICAN

Wood is proud that Inovonics manufactures all its equipment in the United States. "It's very important for us to support the local and U.S. economy."

At one time, all assembly took place in the factory, but with advances in technology, some adjustments were necessary.

"When circuit boards had through-hole components, we could fabricate our own boards and then stuff them in-house. Surface-mount technology requires some very expensive equipment for assembly, so the board fabrication part of the process is now outsourced."

Final assembly and quality control checks are completed at the Inovonics factory in Felton, Calif., where 14 people are employed.

In addition to the shift to surface-mount technology, another big change in equipment design and manufacturing is the dependence on software. Very little of the traditional circuit design takes place any more. Most of the magic of the latest generation of broadcast equipment lies in the use of digital signal processing (DSP) and other software.



The Inovonics booth at the NAB Show in 1981 featured the Gordon Headroom Meter, a design by Canadian broadcast engineer Jack Gordon that "bridged the gap" between the traditional VU meter and the European PPM. Employee Glen Closson is shown with Ted Tripp of Taber Manufacturing and Engineering.

"We saw this change coming, and wanted to keep all the development work in-house. We hired people with training in software engineering, and set out to build our first product."

The Inovonics TVU was the first device that used CMOS logic and an EPROM. It displayed stereo audio level metering on the screen of a video monitor. When connected in-line with the monitor's video signal, it inserted into the picture a boxed audio level bargraph that could be positioned anywhere on the screen.

HISTORY'S LESSONS

Wood's role at Inovonics has changed over four-and-a-half decades.

EVERY SECOND COUNTS

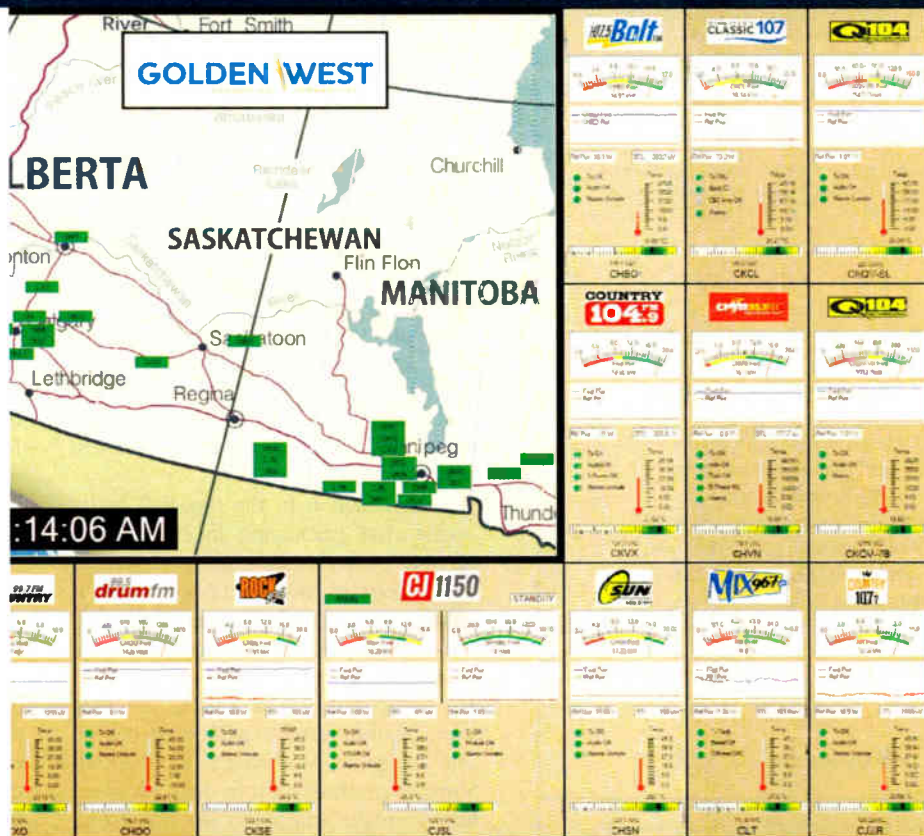
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NEWS

"I used to design all the equipment, but my input in that end is about 10 percent now. I understand the concepts, stay focused on the big picture, and make sure the demand for new products is being met by the technology." In addition, Wood writes the Inovonics tech manuals. "It's something I enjoy, and I come away with a better understanding of our new products."

Ben Barber joined the company as a test and R&D tech and engineer in 1988 and was named president/CEO in 2012. Wood today remains chairman of the board.

From the beginning, Inovonics sold into a global marketplace. In the early years, the biggest international consumers were in the United Kingdom and France. Wood adds that over the years, exports have ranged from 10 percent to 80 percent of Inovonics' sales.

He noted differences in doing business abroad and in the U.S. "The cost of manufacture is usually less overseas, and we see some real innovation in products, particularly from the Czech Republic. They have great success selling to pirate broadcasters and smaller operations."

Despite the price differential, Wood said Inovonics has a strong market position abroad, particularly with government broadcasters.

"Much of the equipment built by these smaller companies does not have the same quality of manufacture as gear from U.S. companies, and might not hold up well in 24/7 operations. Government broadcasters want the good stuff, and can be very demanding customers. They can have unrealistic demands, such as signal-to-noise ratios

in excess of 100 dB."

Inovonics is a company that likes to emphasize "the basics." As expressed on its website, this means emphasizing service, ease of use, fair prices and "respect for our customer's time, money and trust." The company is also one of the few in broadcast with a section on its site devoted to its own history. For Wood, that is important.

"History can teach us some vital lessons, and it's good to occasionally reflect on some of our milestones. You can't dwell on it too much though, because you need to keep up with the times. If we hadn't gotten ahead of the curve when digital was coming and hired new people, Inovonics would be part of history now."

Part of being ready for the future involves taking risks. Not all of them pay off.

"We got involved with Motorola AM stereo and CBS Lab's FMX, which just weren't going to fly, so it's just as important to know when to cut your losses and move on." On the brighter side, Inovonics was an early promoter of RDS, an investment that has certainly paid off.

A testament to the quality of Inovonics equipment lies in the fact that so many of the original recorder electronics remain in service, some 45 years after they were built. "There are still quite a few channels in use for archiving and to play 'legacy' tapes from the archives. There are also many channels of film record/play and play-only electronics in use, as Hollywood has so much material still on full-coat 35 mm film stock."

Looking ahead, the company will introduce a new RDS/RBDS encoder



Jim Wood at a National Radio Broadcasters Association show in 1979, where Inovonics introduced the MAP-II eight-band airchain processor for AM.

at the NAB Show this year, Model 732, which Wood says will make setup and programming much easier and include a true web interface.

Reflecting on his career, Wood said the best choices aren't always about making a lot of money.

"There are easier and more lucrative ways to make a living. But something very special about radio appeals to so many of us. We're here because we love it and want to be a part of it."

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auction rules. There are pieces people can't see on a day-to-day basis that set the stage to bring broadband to those who don't have it.

RW: How would you grade yourself in regard to radio issues so far?

O'Rielly: I don't look upon it as one particular segment or another. But in terms of radio, I've spent a great deal of time getting to know the industry, understanding what the concerns are, what's happening in the marketplace and addressing them from our vantage point. From my perspective it's been about removing barriers that no longer make any sense and addressing the issues the chairman has led — AM revitalization, the main studio rule. A number of burdens have been there so long and not a lot of people have paid attention to them.

RW: What did we learn from the Hawaii false missile alert situation?

O'Rielly: We're still in the investigative stage, so we've got more work to do on our end to get a complete picture. The preliminary report and presentation were made at our [January] meeting. We learned a couple of things that I can't extrapolate anywhere else yet; in Hawaii there are some management issues and serious staffing capability issues that are really troubling.

Our role at the FCC is the back end — after the notice and the warning have been prepared, making sure providers get it out. That side of the equation worked very well. The wireless companies getting out the message worked very well. The broadcasting industry did an exceptional job getting out the message — and getting the correction out.

The front end — people don't like to hear it — is not necessarily the FCC's responsibility. It doesn't mean I don't think it's important. Congress decides our lines of who should do certain things; and that is a FEMA job. ... People talk about best practices and corrective measures. That's on the FEMA side, given the industry side worked very well.

RW: You mentioned the broadcasters' response in distributing —

O'Rielly: Thank goodness for the broadcasters! It's not just Hawaii, it's everywhere. A massive snowstorm happened in Buffalo a couple of years ago and you have like seven feet in a weekend. How amazing it was that they were able to get the information out. Thank goodness we have broadcasters that educate consumers, especially during time of trouble.

RW: Do you think broadcasters have an additional role to play in some sort of mechanism for calling alerts off?



Michael O'Rielly, center, with Paul Rotella of the New Jersey Broadcasters Association and Francisco Montero of Fletcher Heald & Hildreth at an NJBA event in 2016.

O'Rielly: I think that's one thing that's being worked on in Hawaii. I don't know if it needs to be done elsewhere. That's something FEMA is going to have to look at closely.

Broadcasters did a wonderful job. I'm not interested in posing new burdens on them. I want to congratulate the work that they did.

RW: Our industry's tech leaders feel the decision to close FCC field offices led to the retirement of some very talented people. And there was the promise of Tiger teams. Do you see an opportunity to restore field offices?

O'Rielly: I think it might be a heavy lift to reopen field offices, given the budgetary situation that we face.

The decision on the field offices was made by former Chairman Wheeler. I didn't necessarily agree with the decision. He had said, "This a path we need to go along," and it had the Tiger teams. Since then, I've been asking the Enforcement Bureau, "Where are the Tiger teams? What's the status of them?" They seem to be quite lacking. They aren't able to do what was envisioned. People have called them basically a roving field office; that's not what was anticipated when it was sold to us. It was supposed to be this "strike team" that would hit a particular area because something happened. I'm a little disturbed on where that is, and just getting operational. Last I knew, they were still looking to fill slots. They have personnel openings to try and find the right personnel.

I visited a number of our field offices in my time here, and I really appreciate the work that they do. ... I didn't sign up for Chairman Wheeler's plan; I think undoing it is probably pretty problematic.

RW: How did illegal broadcasts come to be one of your major issues?

O'Rielly: To me, it's a rule of law issue. It impacts listeners and it impacts the companies.

Companies themselves have had financial issues; the radio industry is going through some turmoil. AM radio has had some issues. On the financial side, the impact of pirate radio is problematic.

On the listeners' side I think it's equally problematic in terms of what they may miss out on by having these pirate stations — whether they're stealing advertisers and making the other stations less vibrant, or missing requirements like EAS, the warning systems, the good work that broadcasters do.

"I want to get the FCC to remove the barriers to allowing broadcasters, particularly radio, to serve their local communities."

With Chairman Pai focused on it too, it's been great. He's been such a good leader on it. I don't agree with someone just determining that they can set up their own station at any time. There are rules and obligations that come with getting a license. Our obligation is to shut them down. If for some reason the market is able to handle a licensed station, then we should look at that closely.

RW: Where are you on your push to get more statutory power to act against landlords, seizure of gear, increased penalties.

O'Rielly: I continue to have my conversations with friends on Capitol Hill. I don't want to get ahead of myself. It's not my job. They get to determine when they may or may not act on something. But I get the impression from talking with folks that they're getting closer to looking at the issues that are important to me, increasing the fines, addressing those who are aiding and abetting.

RW: Many who watch the pirate radio debate scoff at the FCC fines. They perceive that unless the Justice Department picks the matter up, nothing's going to happen, so who cares. So what do you do about that? Even if you increase the fines?

O'Rielly: Increasing the fines actually does trigger the thresholds at the Department of Justice and their ability to enforce them. If they're at paltry levels, they tend to focus on bigger cases; increasing the fines does have an impact on that side.

Two, we can have a telephone scammer or someone sending a fax — hundreds of million dollars may be the proposed fine against them, and then you see \$14,000 against a pirate radio station; that's never going to be collected. You can throw multiple fines on somebody and it has no impact. It's demoralizing to the field staff to know that their work is not being as fruitful as it should be. We're working through that and hopefully we're going to see some stuff done in the very near future.

RW: Okay. ...

O'Rielly: I don't want to get ahead of myself.

RW: Okay. I see you smiling about that. There's something going on there.

Let me ask you about AM revitalization. That has included modification of FM translators and expansion of cross-service translators. These are popular with a lot of AM owners; but some folks say this is only a short-term solution, or actually detrimental because we're actually moving people over to the FM band more than we are focusing on AM. How do you view the success of AM revitalization so far?

O'Rielly: To me it's about giving AM stations an opportunity to reach the marketplace.

To the second part of your question, it was very important for me to have conversations with those stations that are not on AM. I talked to a number of [FM stations] and said, "Does this cause you problems if we were to do this?" And they said, "No. We actually work in cooperation. We don't have difficulty with their becoming an FM broadcaster." That was helpful for me. I had a number of conversations to make

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sure that wasn't going to be problematic.

In terms of the first part of your question, it really does give an AM broadcaster an opportunity. But the marketplace is what's going to decide whether they succeed. Does AM have a long-term future? That's what consumers are going to decide. The technology is only one component of it. Do they serve the local consumers? Does it attract enough listeners? Is it a long-term medium? That's for the marketplace to decide, in my opinion.

RW: One then might say, "Why have an AM revitalization procedure at all?"

O'Rielly: There are technical limitations that could be addressed with the [translators] that full-power FM stations don't have a difficulty with. To give them that opportunity to me is just like removing a number of barriers on rules. Remove those things, give them the opportunity and see where the market takes it.

RW: Do you think we'll see the FCC change protected contours and give less protection to those big Class A stations that they've always enjoyed?

On C Band proposals: "We're going to take care of incumbents. I'm not interested in disrupting incumbents."

O'Rielly: Those are harder cases to say. I can't tell you right now where we're going to come out on that issue. It's been something debated for quite a while. There's [also] a proposal to create a new class on the FM side.

To see where the path is, you've got to see what's the opposition. Many of these have opposition, and it makes it's harder and probably more unlikely. But we'll just have to see.

RW: The historic structure of the AM band, with big signals that covered so much of the country — the historical justification for that, one might argue, is long since gone.

O'Rielly: Don't disagree with that, but I'd also say people bought those stations

A CAREER ON THE HILL

Michael O'Rielly was nominated by President Barack Obama and confirmed unanimously by the Senate in 2013. In 2015, he was sworn in for a new term.

O'Rielly received his B.A. from the University of Rochester and began his career as a legislative assistant to Rep. Tom Bliley in the mid-1990s. He also served as telecommunications policy analyst and then a professional staff member on the Committee on Energy and Commerce in the House of Representatives.

Moving to the Senate, he worked in the office of Sen. John Sununu as senior legislative assistant and later legislative director, and for the Republican Policy Committee as a policy analyst for banking, technology, transportation, trade and commerce issues. He later served as a policy advisor in the Office of the Senate Republican Whip, led by U.S. Sen. John Cornyn. He worked in the Whip's Office since 2010, as an advisor from 2010 to 2012 and deputy chief of staff and policy director from 2012 to 2013 for Sen. Jon Kyl.

with the understanding of the rules that were in place. They've put finances based on those. If they had known, you would have different purchasing prices. There are expectations that we can't just mightily wipe off without serious consideration.

RW: Broadband. You wrote an op-ed with Sen. Ted Cruz about net neutrality and made a comment that it was "imperative to establish a strong deregulatory federal framework." You've also

been quoted as saying, "People do a disservice to overstating the internet's relevance." Given its critical role in society, shouldn't the internet be a utility?

O'Rielly: The internet is very important. It can be incredibly beneficial to consumers.

I disagree that it's a necessity. There are individuals who do not have the internet today and are quite successful in the marketplace. I don't think it's an absolute necessity. Necessity is a term that gets denigrated when we go down this path. A necessity, if you look at circumstances, you need food, shelter, water, power. If you look at what the needs are in areas such as Puerto Rico, it's power, it's clean water.

Communication is very important. It doesn't rise to that exact level, in my opinion.

RW: Isn't it getting there?

O'Rielly: I think it's increasingly important; but even at the time of [peak] telephone penetration we only had 95 percent of reach of telephone. No matter what we did, we couldn't get the last 5 percent; and people still were able to function.

If it's a necessity, then you have a right to it. Therefore, you can't be denied it. So you don't pay your bill, you can't be — there are consequences to declaring it certain things.

We have utilities for water and sewer; that's not where broadband is today. These are private sector companies that offer service. We haven't nationalized them; localities are not declaring them the local property in the community. That's the wrong direction to even contemplate. It is a private-sector service being offered to consumers. They are incredibly increasing investment to try and meet consumer demands. It's exciting for consumers. It's a race to provide service and meet all the different technologies and what you can do on the net. It's incredibly valuable to individuals.

I'm a full-bore supporter of the internet and what it can be. I just don't declare it a necessity.

RW: How serious is the FCC about sharing the C Band with wireless carriers for broadband? We hear there's a proposal for a market-based approach that would split up the spectrum and share it with satellite and wireless broadband. There's also disagreement about just how many stations broadcasters are using. How serious is that proposal?

O'Rielly: It's a very serious proposal. I think it's very likely to move forward. Radio broadcasters and broadcasters in general should not be concerned. As someone who's leading the effort on the 3.7 to 4.2 band, and the 6 gigahertz bands, which are the C Band up and down links, we're going to take care of incumbents. I'm not interested in disrupting incumbents.

A market-based mechanism may be the best way to go. Intelsat and Intel have a proposal. I really appreciate the work that they've done on that; but I haven't endorsed that mechanism yet.

I'm looking at how we would best go about the 3.7 to 4.2, how would we make that happen without disrupting service to local broadcasters.



Photo by Emily M. Reigart

You also raised the point: We don't know exactly who's operating today. You get interference protection if you're registered; you don't if you aren't. We're trying to figure out how we protect those we don't know about. "Tell us if you exist." It's hard to protect people we don't know about.

C Band, itself, may not be the way to offer service. Maybe it could be done through fiber. It can be other bands, satellite. I'm open to looking at different ways to make sure that broadcasters — or whomever is operating in the band, there are multiple players — aren't disrupted and are not harmed in the process.

RW: Related to that is general concern about noise and interference across the dial. Can't the FCC do something to protect over-the-air incumbents more aggressively?

O'Rielly: The noise floor is a huge problem. It's not just the radio band. It's a lot of different bands.

Consumers want more technology, more wireless technology. It does have an impact. Our job is to protect from harmful interference those licensees that have them, and we will continue to do so.

The noise floor, in general, we are trying to figure out how you would deal with and what does it mean. Each band is a little different. It's not an easy answer though.

RW: The FCC's Technology Advisory Council has taken this on and asked for comment on spectrum management proposals. It seems, in general, there's a need for better understanding of that environment — quantifying it. There was a proposal to conduct such a study; I don't believe that's been happening.

O'Rielly: I can't speak to it off the top. There had been a proposal to establish a noise floor, and we weren't ready to do that at the time. We were trying to figure out, how do you quantify it? What does it look like? What does it mean for this band, how does it differ from over there? It wasn't ready at the time.

(continued on page 10)



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O'RIELLY

(continued from page 8)

It doesn't mean that the TAC recommendations don't lead to something along those lines. We just weren't ready at the time. I think it was premature.

RW: What priority do you see next that will affect radio licensees and people in the industry?

O'Rielly: I don't want to point to any specific item; the chairman gets to dictate the schedule. But what you have seen so far will continue, and I'm excited about that. We have a media modernization effort; every month we're taking something up along these lines. If there are burdens on the industry that no longer make any sense or are unnecessary given the marketplace competition, for multiple reasons we want to get rid of those.

You're going to see more of the same, in a good way.

RW: It was a big change to see the main studio rule go away. How can stations really be local without a studio?

O'Rielly: I don't believe the elimination of the requirement is going to have a tremendous impact. In radio, like the television side, stations are committed to the community. They have to be. They know that's how you make money. That's how you stay profitable.

"I don't agree with someone just determining that they can set up their own station at any time. There are rules and obligations that come with getting a license."

I don't believe their ties to the community are driven by the fact that they had a particular site, on this street, in this community. I don't see a tremendous change in how radio operates. We're not going to see tremendous closure of studios in the near future. There may be some efficiencies to be had. It shouldn't be something though where people make decisions based on FCC rules. We want to make sure that radio is allowed to have efficiencies to address what's happening in the marketplace. I don't think for a minute that they're going to change their behavior in staying incredibly local. It's the only way to succeed, in my opinion.

RW: Should the FCC raise radio's ownership caps — local station numbers?

O'Rielly: I'm open to exploring that. We will look at that as part of our quadrennial [review].

I have suggested that we need to eliminate the AM/FM sub-caps. I don't think the downsides that people have suggested actually will occur. I got a promise from the chairman that we're going to look at that as part of the quadrennial. We're going to start the quadrennial sometime this year, I'm hoping this summer.

Whatever is decided here is going to go into court. We're still stuck with so many rules because the court hasn't approved anything — on either side of the ledger, either from Republicans or Democrats or conservatives or liberals. We've been basically stuck for so long with no changes, it's been incredibly problematic.

RW: You're not a lawyer, working in a town and an organization of lawyers. How does that play out in your job?

O'Rielly: I spent 20 years on Capitol Hill as a staffer. I've writ-



Photo by Emily M. Reigart

ten, probably, more provisions than a lot of lawyers have. My fingerprints are all over the statute. I don't pretend in any situation to be a lawyer. I have a wonderful staff who are all layers and they do incredible work. I rely on their expertise on those points. But I don't think you have to have a law degree to serve in my role; you want varied backgrounds and personalities for commissioners.

RW: Do you think there should be a requirement that at least one commissioner be an engineer, as has been posited over the years?

O'Rielly: No. I don't think an artificial requirement is the way to go. If that were a requirement, I might not have made the commission. Hopefully I've brought some benefit to my time here so far.

RW: You've worked for and around Republican lawmakers for two decades. What did you learn from people like Senators Sununu, Cornyn and Kyl?

O'Rielly: I did nine years in the House, 11 in the Senate; it wasn't intentional necessarily but I found that those I was interested in working for were strong family people. They would rather spend time with their family than trying to get the most publicity for whatever item they're working on.

That has been something I've tried to do in my job here. I try to make it home. I try to go home for dinner, whether I'm cooking dinner or my wife is cooking dinner.

I've also learned that there are incredibly dedicated people with different backgrounds. You may not agree with them on every instance. I worked a ton with Democrats and I have a lot of Democratic friends on the Hill. You may not agree with everything that they do; but you have to respect that they're dedicated to the job. We kind of lost that some in the last couple of years; hopefully, we'll get back to that. You can have a disagreement of positions, disagree at one moment and then try to find something else.

That's what I strive to do here at the commission. I might argue with my Democratic colleagues, or even Republicans in the past, not that often; but if there are instances, disagree; and the next day try to work on something different.

I disagreed with Commissioner Clyburn on something in

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O'RIELLY

(continued from page 10)

a recent meeting, and this week we did a blog together on an issue. You try to find those partnerships when they can happen.

Telecommunications policy was not partisan for the longest part of my career. A couple issues would spike up. Public broadcasting was one that would spike up and cause some partisanship; more recently net neutrality has gone along those lines and made it seem like Republicans and Democrats can't agree on communications policy. That's something the Congress needs to address. If they do, we can go back to doing our job and getting along again.

RW: I do wonder what it's like working on and around the Hill in an environment like it's been for the last year or two. You clearly are a fan of Ronald Reagan; and I can't think of a less Reaganesque president than we have right now.

O'Rielly: I haven't been there for four years but I do keep up. In my time period, 20 years, I lived through some very extraordinary times. There were government shutdowns. We had an impeachment process of the president of the United States. My old office building,

kind of nondescript, is where they kept the information regarding impeachment, the Starr report. I've seen a lot of things.

This doesn't surprise me too much or jar me too much. You go with the flow. We've dealt with wars. We've dealt with domestic attacks. You grow used to the dynamics of things shifting very quickly.

I'm excited to see what the next couple of years have for the new administration. They have a track record so far in a year. They've got a lot of problems for the United States to work on, and a lot of success so far. So we'll just see where it goes.

RW: Spectrum, at least on the FM band, remains very much in demand. To some people, the band is full. Is there anything the FCC should be doing differently about FM band management?

O'Rielly: Just like I'm not a lawyer, I'm not an engineer. That's why we have some really good folks in the Audio Division in the Media Bureau and in OET [Office of Engineering and Technology] to give some inclination of what the story is.

But I don't think your estimate is too far off. We have thrown a lot of stuff at the FM band. That's why the noise floor is of deep concern to a lot of individuals. We have to have a better analysis of that. I think that's a fair role



for the commission.

RW: Does the FCC have a role to play in getting Apple to activate the FM chip in phones?

O'Rielly: We don't have a statutory role over Apple. The chairman has done a wonderful job in trying to convince them of the benefits. I'm of the same mind — that you can't do it through a mandate. We don't have the statutory requirement. I also don't think that's the best way to go. But that seems to be the biggest sticking point: how to convince the one company, given that the providers themselves are willing to do so, as they have on other platforms.

RW: I'm curious to your perspectives on whether we might see a time soon when the FCC would allow broadcasters to turn off their analog and go all-digital — whether it's AM or FM.

O'Rielly: It still seems like the story is mixed in terms of where the industry is on digital radio. It goes back to that point: Is there a general agreement that it should go one way or the other? Right now it doesn't seem to be the case. I certainly don't want to mandate we go that direction. ...

Whatever side of broadcasting, we want to make sure whatever we do doesn't cause harm to the listeners or viewers who enjoy their product today.

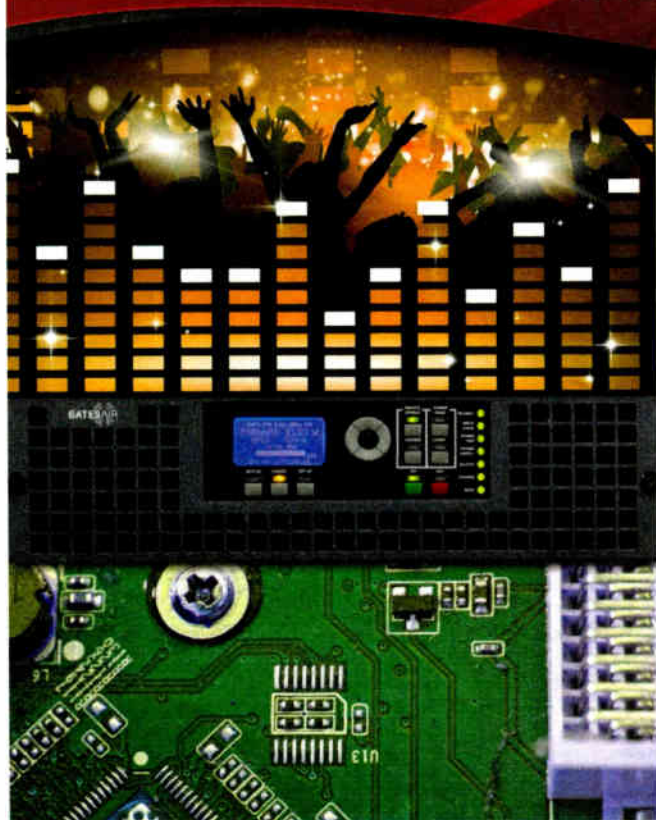
RW: There have been broadcasters who've said, "We'll never in our lifetime turn off our analog." Given the television experience, it seems it could be more of a possibility.

O'Rielly: I think that's a fair analysis. It's more likely today than in the past. But that doesn't mean it will happen.

RW: The commission seems to have more of a collegial environment than over the last 10 years.

O'Rielly: It is this year. Under Chairman Pai it's more collegial than it was. Tom Wheeler is a friend, a former colleague; but everyone walked around

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holding their breath; it was almost like dancing on the head of a pin. He was a very dominating personality. I think Chairman Pai is a little bit more open. It's a breath of fresh air.

RW: What role does the FCC play in the dashboard and the broader world of the autonomous vehicle?

O'Rielly: Very interesting question. We are still limited by our statute. Our role in terms of autonomous vehicle is not extensive. We have some spectrum issues; one that's been important to me is the 5.9 DSRC. [5.9 GHz Dedicated Short-Range Communications is a range of spectrum set aside by the FCC in 1999 for use in intelligent transportation systems]. The system proposed would have interaction with other cars and infrastructure and everything else in their path; I've had some concerns about that. But that's one of our roles, the spectrum around autonomous vehicles. Other safety agencies deal with how the autonomous vehicles work.

The dashboard itself, we don't have a great role in. I'm just of the mind that radio is so important to consumers, their interests and meeting what they do on a daily basis, that no matter what the car looks like — or maybe we won't even call it a car, whatever the vehicle is going forward — radio is going to be a part of that equation.

RW: You have a desk ornament with the word "Freedom" front and center on your desk. Why?

O'Rielly: A gift from a former staff person. It complements my overall message. I stated in my first speech that I was going to look upon issues of the commission through what I call an economic freedom lens. There's a number of criteria that I still abide by — like cost-benefit analysis; does the solution actually bring about what it is supposed to. [solving] the problem that we're trying to solve; does it have negative consequences?

It also was a mantra that I had on Capitol Hill: Stay strong for freedom. ... I think freedom is incredibly important. It's what makes our country unique — we provide a beacon of light to the rest of the world, what they want to be.

RW: Final thoughts?

O'Rielly: I want to get the FCC to remove the barriers to allowing broadcasters, particularly radio, to serve their local communities. And I thank them for the benefits that they bring. There's no better participant or active aid during emergency circumstances; there's no better fundraiser than the broadcaster when the chips are down in the community; there's no one who cares about their community more than a broadcaster.

IN CASE YOU MISSED IT

A sampling of recent headlines delivered to Radio World readers in their free daily NewsBytes e-newsletter.

► House Approves Money for FMs Hit by TV Repack

Legislation that includes funding for radio stations suffering operational harm from TV repack activities advanced on the Hill.

► Tom Jones to Receive NAB Radio Engineering Achievement Award

He's president of Carl T. Jones Corp. Also at the spring show, Clay Freinwald will be honored with the Service to Broadcast Engineering Achievement Award.

► NAB Has Concerns About C4 FMs

The association said the creation of a new class of FM stations will bring interference challenges, so perhaps the FCC would be better off addressing more pressing issues first, like finding better ways to expedite the settlement of interference complaints against FM translators.

► FCC Won't Give MMTC More Time to Comment on Diversity Incubator

Cites court decision, need to get program up and running.

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A Timer Takes People Out of the Equation

Also here's another way to learn about station coverage and details

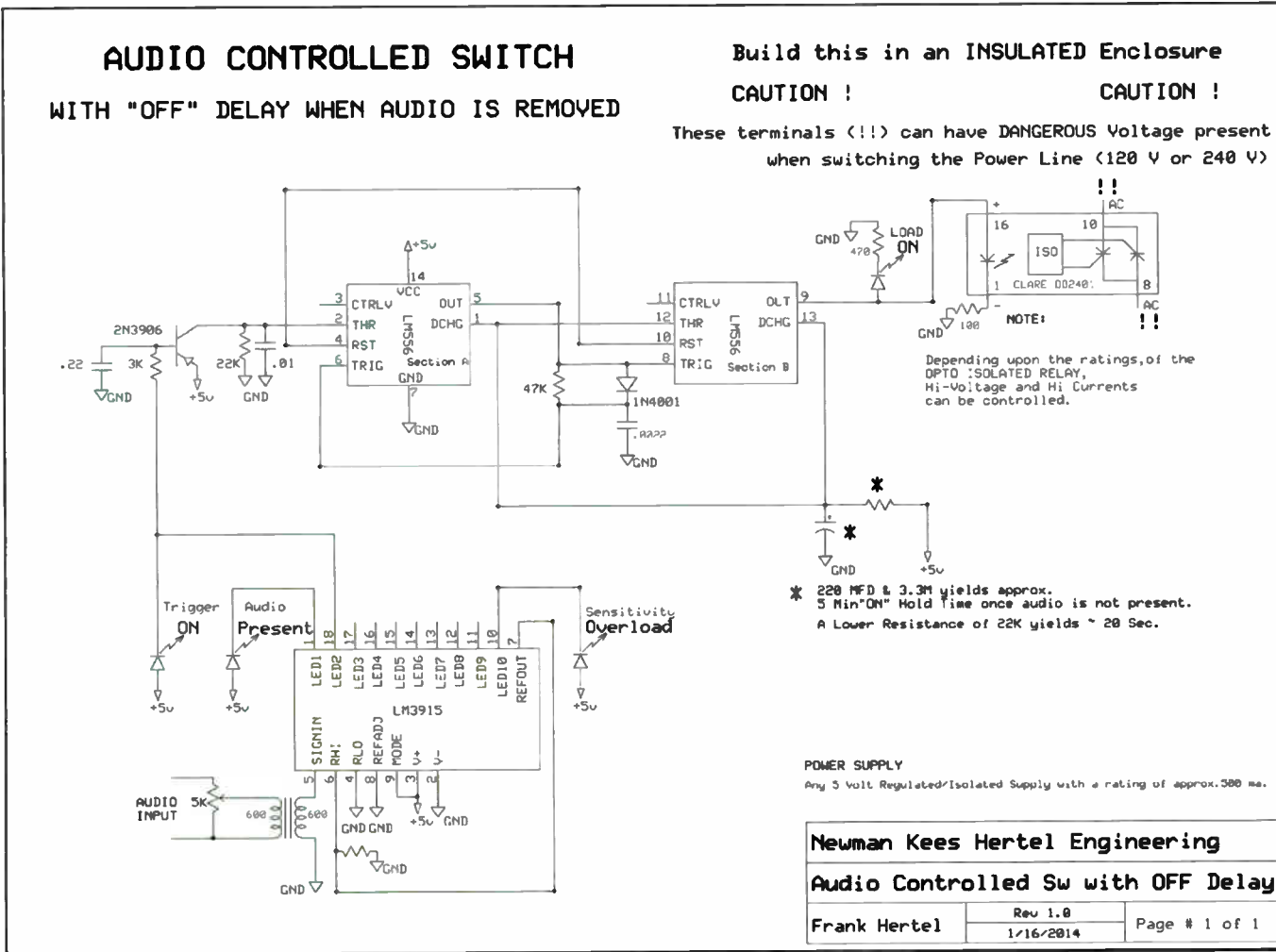


Fig. 1: The schematic for Frank Hertel's delay relay switch. Its parts list is not complicated but is not reproduced here for space reasons; to obtain the list, just email radioworld@nbmedia.com with "Relay Parts" in the subject line.

Stuck with using the RPU transmitter as the link from the church, Frank decided to take the "people" out of the equation.

With the help of Walter Jung's "IC Timer Cookbook," a few adaptations to the LM556 Dual Timer coupled with the LM3913 Dot/Bar Meter IC along with a few other parts, Frank built a switch. The switch, upon sensing audio from the church's PA system, will turn the RPU transmitter on. After the service, when the PA is no longer providing audio, the "switch" will keep power applied to the RPU transmitter for 5 minutes, then turn the transmitter off. The 5-minute delay was to ensure that silent portions of the service — such as silent prayer — would not inadvertently turn the transmitter off.

The result is no dead air on Sunday mornings! There are likely other applications where the presence of audio immediately triggers the relay "on" but the removal of audio will not cause the triggered device to become inactive — it will wait 5 minutes.

Construction is simple. Frank cautions to build the circuit in an insulated "plastic" case, since there's switched 120VAC inside.

Fig. 1 shows the circuit schematic. Fig. 2 shows the finished product, along with the IC Timer Cookbook (used copies are available on Amazon for under \$10). Fig. 3 shows Frank's internal construction of the project.

Bible Broadcasting Network Engineer Steve Tuzeneu writes that many engineers visit Radio Locator to look up details about a radio station and view a coverage map. It's a great site but unless

(continued on page 18)

WORKBENCH

by John Bisset

Email Workbench tips to johnpbisset@gmail.com

Frank Hertel writes, "It's Sunday morning, and the local church — way out in the boonies — is scheduled to broadcast their live morning worship service at 10 a.m. They have no internet connection; and when you couple that problem with the fact that various non-technical personnel are responsible for delivering the program via RPU radio transmission, you get a sense of the issue at hand."

You can guess what happened — they forgot to turn the RPU transmitter on! When 10 a.m. rolls around, the station's automation switches to the RPU audio port, and there is no audio. Since the station is unmanned at that time, silence is broadcast. Sometimes the station manager hears the problem and drives to the church to turn the RPU transmitter on.

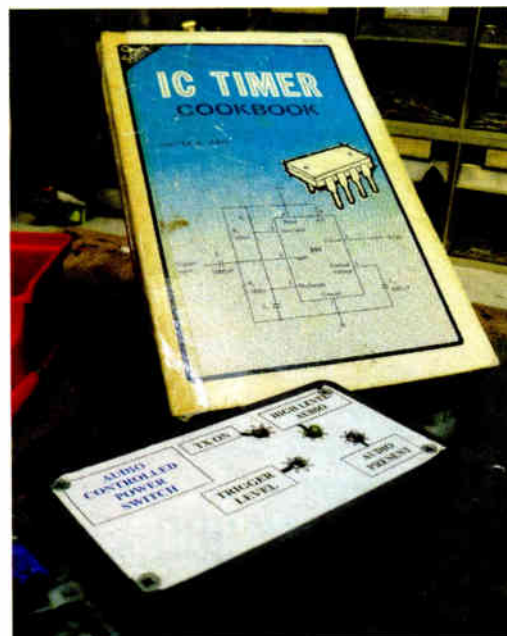


Fig. 2: The finished relay project uses a timer described in Walter Jung's "IC Timer Cookbook."

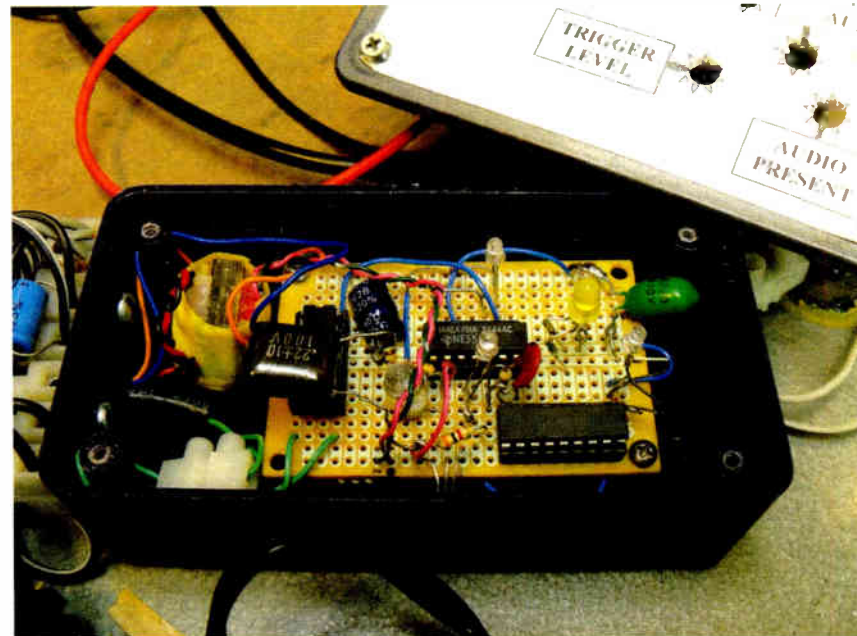


Fig. 3: An internal view of the construction.

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Hands On: Replacing a Tower at North Pole

It would be a challenging project under the best of circumstances



FIRSTPERSON

We had TJ's Landclearing clear the brush that had grown up at the edge of the tower field over 50 years. They took the edge back 10 to 30 feet depending on the area.

BY REGINALD SWEDBERG

The author and his wife live in a log cabin on the grounds of KJNP(AM) in North Pole, Alaska, near Fairbanks. This is the first in a series about the process of replacing the station's tower.

KJNP Radio has just finished celebrating 50 years of broadcasting from the city of North Pole. Founded by Don and Gen Nelson to broadcast the Gospel to Alaska and the Arctic, it went on the air in October 1967. Don Nelson later wrote a book "Shadows on the Arctic Snow" that details the start of KJNP Radio; the station has even been recognized as a historic part of Alaska by the state Office of History and Archaeology. Today we also have two FM signals, a TV station and translators.

Over the years the operation has changed from having DJs to operating with an automation system ... from getting programs in by 16-inch LP, to cassettes, then CDs and now the internet. But with all the technical and operation changes, there are a couple of people who have been there from its beginning; Dick Olson and Bonnie "Yvonne" Carriker are still involved on a daily basis. And the purpose of the station has not changed; it is still broadcasting the Gospel to Alaska and the Arctic. Having begun at 10,000 watts, the AM is now a 50,000 kW signal that gets listener reports from as far as Sweden, Finland, eastern Russia and New Zealand.

Recently, after some other towers in the area had problems and needed to be replaced, we decided to have ours inspected for structural integrity.

The Nolan Brothers tower crew from Soldotna did an inspection and found that the legs were no longer within the acceptable tolerance for wall thickness; they had corroded from the inside. The outer paint and guy wires were OK, but internally the metal had been oxidizing. They found the problem throughout, not in just one area.

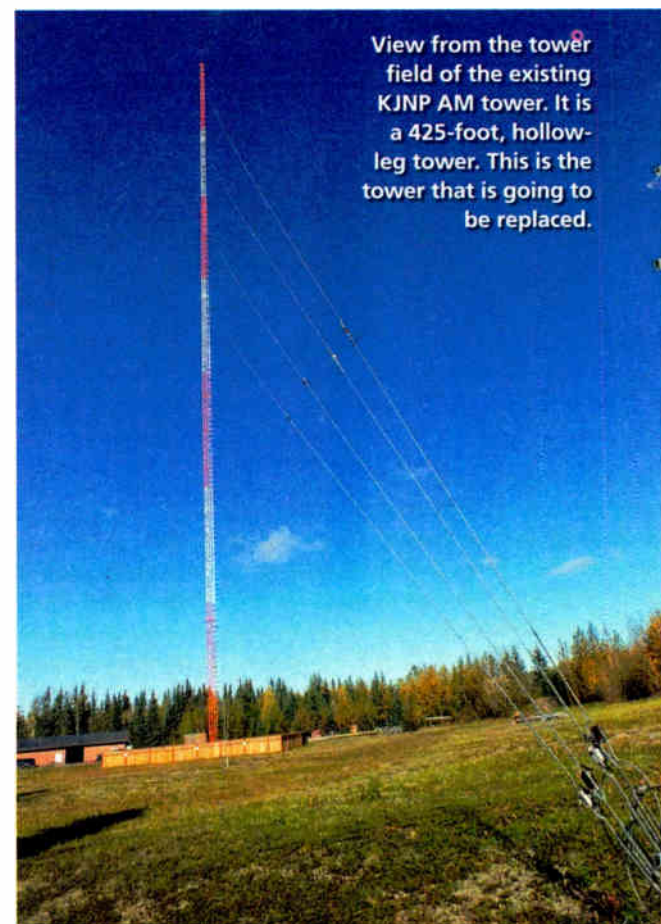
The 425-foot hollow-leg tower has been in use for 50 years. This is a 5/8-wave tower, taller than a lot of AM structures because we make use of skywave to cover the Arctic.



Homestead Drilling took soil samples down to 40 feet to determine the foundation needs for the replacement tower.

We also have temperatures that range from above 80 degrees Fahrenheit in the summer to below minus-60 in the winter. This is a temperature change of over 140 degrees, which can cause stress on junctions and connections, especially when various metals are used. Copper and steel have different amounts of thermal expansion and contraction, which needs to be planned for in the construction. It can also affect the tuning of the tower and ATU at different seasons.

With this information in mind, we are going to be



View from the tower field of the existing KJNP AM tower. It is a 425-foot, hollow-leg tower. This is the tower that is going to be replaced.



Alaska Groundworks went over the cleared area with a rake to remove the roots, then leveled it so it is ready for new radials next summer.

replacing the tower this summer. The tower will be in the same location, same height and face, same feed type. We want to reuse as many things as we can, like the ATU and coax. The replacement will be a solid-leg model from Magnum Towers.

GROUND WORK

When we started planning the replacement, we realized that we would also need to replace the ground system. It would be damaged during the tower work; and it had been in the ground for 50 years.

We started with the project last fall so that everything would be ready for tower work in the spring.

Part of the job was clearing the area of the tower field. Over time, the edges had grown in, even though the center was being mowed. We had a brush clearing company, TJ's Landclearing, and a dirt work company, Alaska

(continued on page 18)

Worry-Free Transmission

Because Radio Matters



KJNP*(continued from page 16)*

Groundworks, come do that.

After we picked up everything that had been stored on the edges of the tower field, they got things ready for the ground radicals that will go in come summer. The tower field is now cleared and leveled to the original size; the guy anchor points are again in the field instead of among brush on the edges.

We are going to go with a pile foundation for the replacement tower. To plan for the foundation, we had soil samples taken down to 40 feet at two locations. Homestead Drilling did these in one day. They were analyzed by an engineering company that then designed the pile foundation. The piles were driven by Alaska Groundworks, two for the tower and one for each guy anchor. With those steps done last fall, we won't need to wait for frost to be melted before starting things in the spring.

GEARING UP

We are in the process of getting everything ordered and purchased so that when we start the actual work, all is ready. Shipping



One of the completed pilings by the base of the existing tower. It will be used as part of the foundation for the replacement tower.

to Alaska can take time and is expensive. Fairbanks and North Pole are more than 300 miles from any other large city, and going to town to get supplies usually is not an option.

Previously, for large items, instead of commercial shipping we have done the shipping ourselves, getting the tower loaded on a large trailer and driving it up. We are looking at doing this again for this project.

Reginald "Redgy" Swedberg is the engineer for KJNP. He has been with the station since 1991. Share your own project experiences. Write to radioworld@nbmedia.com.

WORKBENCH*(continued from page 14)*

you have a paid subscription, you only can look up a limited number of stations.

A free alternative to Radio Locator is found at <https://recnet.com>, offered by REC Networks. Here, you can look up as many radio stations at a time as you like. There is a coverage map and detailed information about each station. Another great resource.

You can make reliable wire connections without soldering, using NTE Electronics Self-Solder Butt Splice Connectors, available from DX Engineering. These connectors have a solder ring with flux inside a transparent, adhesive-lined heat shrink sleeve. Simply insert the wires in each end of the butt splice connector, then heat the sleeve with an ordinary heat shrink gun to make a permanent, waterproof connection — no soldering iron is required.

These connectors are suitable for making connections on equipment in the field or in your shop. The connector's heat shrink sleeve has greater pull strength compared to vinyl or nylon insulated connectors, since the wires are actually soldered together.

And since the sleeves are transparent, you can visually inspect them to make sure the wires are fully connected — no guesswork or finger-crossing — just a good, solid connection.

NTE Electronics Self-Solder Butt Splice Connectors are available for 10 to 26 AWG gauge wire and are color-coded to industry-standard wire gauges. They come in packs of 50 or 100.

For more information head to the DX Engineering site, www.dxe-engineering.com. In the search box enter "NTE Electronics Heat Shrink Self-Solder Butt Splice Connectors."

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What Big Data Means for Radio

Spring show explores the question of what the future measurement marketplace might look like

MEDIA MEASUREMENT

BY SUSAN ASHWORTH

There's been plenty of discussion on what big data can do — tracking public health threats like the flu or improving the performance of an elite sports athlete.

But what might it mean for radio?

At the NAB Show, the issue of big data and radio measurement will be part of sessions like “What's the Big Data Deal for Radio,” where the concept of analytics and their power in determining listener preferences and impacting purchases will be up for debate.

Every aspect of the content business increasingly will be affected by data and the analytics and insights built on it, said Rick Ducey, managing director of the research firm BIA/Kelsey.

“Audience data, advertising data, content metadata, marketing data — all tied to developing smarter product roadmaps, smarter business models and

smarter executions — will be tied to future success,” he said.

DEEPER INSIGHT

At its simplest, big data is a way to give broadcasters a more complete understanding of a radio audience across various platforms, including online and OTA.

“Our industry is at a point when big data needs to be considered as a possible opportunity to improve stability, reliability and validity of our current measurement,” said Buzz Knight, vice president of programming for the Beasley Media Group, which owns more than 60 radio stations.

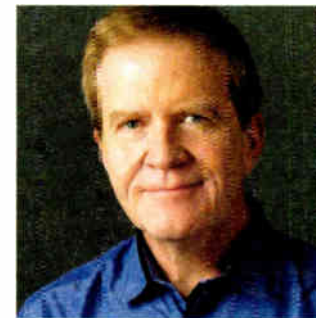
Knight will serve as moderator of the “Big Data Deal” panel in Las Vegas. “The marketplace is clamoring for this discussion both from a measurement front and certainly from a business standpoint.”

With big data analysis techniques, radio stations can, for example, use archived media information to create a more complete picture of the effectiveness of an advertising campaign.

Consider the media monitoring firm Critical Mention, which captures and indexes 40 hours of broadcast content every 60 seconds from 2,000 unique broadcast sources, giving users a look at a database of millions of searchable segments.

Radio stations might use the data from media measurement to show advertisers how often their brand aired in any geographically or age-segmented market and why that ad run should continue based on the use of additional data such as smart device ownership, drive time peaks or radio vs. app listenership.

For radio, the techniques gleaned from analytics can give stations the ability to better determine patterns of con-



Buzz Knight, vice president of programming for the Beasley Media Group, said the company is using big data to get a relevant picture of the changing radio industry.

evolve, radio remains the top way to reach consumers across all media platforms — and in particular, radio in the car. According to the most recent Nielsen Comparable Metrics Report, each week, more Americans tune into AM/FM radio (93 percent) than watch television, use smartphones, use tablets or use computers. And that listening is primarily in the car.

On a typical week-day, radio's share of in-car listening is 64 percent, following distantly by other means like satellite radio and personal media libraries, according to a recent Jacobs Media report.

What broadcasters now need is a more efficient means of gathering data on that in-car radio listening, and how



Connected car technology is part of the big data discussion. Shown is a 7-inch iLX-107 screen with CarPlay connectivity from Alpine.

sumption, offer more detailed insights into a specific marketplace and allow radio station ad sales staff to set new strategies and goals.

In today's marketplace where consumers have so many platforms competing for their attention, big data metrics becomes even more relevant. “It's important as a way to evaluate what footprint some of these new platforms have and what opportunities they open up for the future of measurement,” Knight said.

ON THE ROAD

This is particularly relevant, Knight said, as it relates to in-car measurements.

As the audio landscape continues to

stations can best target those listeners. “One thing for certain is that some of the new big data offerings offer a view of in-car measurement that paint a [clearer] picture of consumer behavior,” Knight said.

What's missing in today's current measurement options is the next step in the evolution of audience measurement.

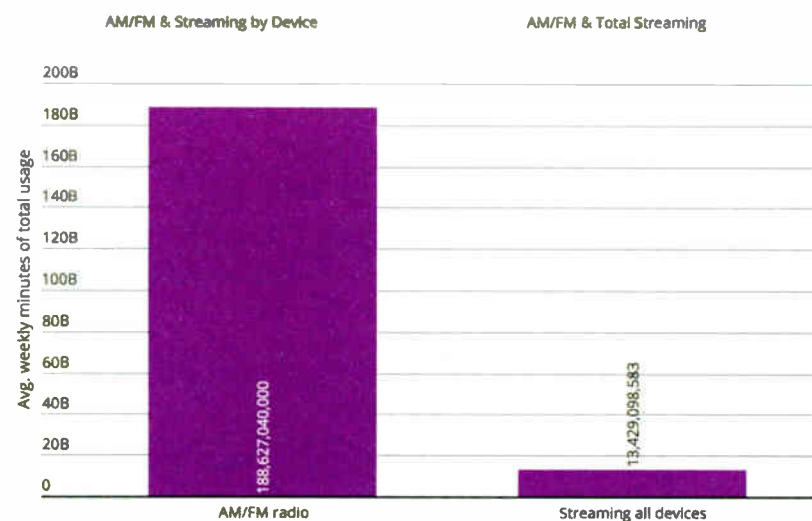
“Measurement [now] needs to evolve and innovate to give a more complete picture of the consumer,” Knight said. Big data metrics offer an opportunity to provide some type of hybrid measurement of data that will give stations a more complete picture, he said.

Broadcasters are finding that impor-

(continued on page 24)

U.S. AUDIO LISTENING

Persons 18+



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When it comes to how listeners consume audio, AM/FM radio represents 93 percent of the total weekly minutes that listeners tune in, compared with roughly 7 percent for streaming audio — a combined 202 billion minutes per week, according to a Nielsen survey.

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How to Get the Most From Smart Speakers

As with mobile apps, experts say, radio can't afford not to be there

BY JAMES CARELESS

Smart speakers like the Amazon Alexa-enabled Echo, Apple HomePod and Google Home are certainly cool. The user simply tells it what to do — “Hey Google, play me some Pink Floyd” — and presto, the speaker pulls up Floyd music from the web.

But what's cool for listeners isn't necessarily cool for radio. In fact, some broadcasters might see smart speakers as another way to lose listeners to the web, an argument sometimes heard when discussing mobile listening apps.

How can radio use these tools to grow audiences rather than lose them? At NAB Show, the Wednesday session “Maximizing Smart Devices and Mobile Apps for Radio” will feature three innovators exploring the topic: Steven Meyers, EVP of digital at Beasley Media Group; Brian Savoie, NAB's senior director of technology education and outreach; and Jeremy Sinon, VP digital strategy with Hubbard Radio. The session is moderated by Radio World Content Editor Emily Reigart.



An Amazon Echo promotional image. “At a foundational level, these devices serve as a beachhead to build at-home listening,” said NAB's Brian Savoie.



The topic will be explored by Beasley's Steven Meyers, NAB's Brian Savoie, Hubbard's Jeremy Sinon and moderator Emily Reigart of Radio World.

To be sure, all three of the panelists see both smart devices and mobile apps as useful channels to bring radio content to more listeners.

OPPORTUNITY

“Let's focus on the smart speaker,” said Brian Savoie. “At a foundational level, these devices serve as a beachhead to build at-home listening. This is extending the value of that program stream that broadcasters have been pushing out for years to their mobile and web audiences.”

Jeremy Sinon similarly is bullish about mobile listening apps as audience-builders.

“Having a great, scalable mobile app allows us to create experiences that never before were possible for radio,” he said. “Whether it's bringing in podcasts, video, social media and other consumable assets, or creating secondary experiences along with listening to the radio stream like listening rewards, the mobile app gives us a platform where we can experiment and explore all of these possibilities.”

Sinon added that the interactive nature of such apps allows stations to really engage their listeners in ways that conventional broadcasting cannot, even with the help of listener-initiated emails, texts and telephone calls.

For instance, he said, “Push notifications have also given us a great way to connect with our listeners in a way that feels very personal and special to the app user. We offer them exclusive chances at prizes and ‘can't buy it’ type experiences, we give them reminders about ‘must hear’ moments happening on the air, we send them breaking news and more; and the best part is that it's all entirely customizable for the listener.”

Smart speakers and mobile apps are part of listener-driven reality; so broadcasters, it seems, must continue to adapt.

“More and more our audiences are building their own personal multi-

(continued on page 24)

NAUTEL GATHERS USERS AT SHOW

Anyone interested in Nautel transmitters is welcome to attend the company's annual Nautel Users Group at the NAB Show.

Radio World Editor in Chief Paul McLane is among the speakers, providing an overview of technology and business themes for radio at the convention under the theme “What I'm Watching for at NAB.”

Jeff Keith, Wheatstone's senior product design engineer, will explain how a single AES-EBU cable between the Wheatstone processor and the Nautel transmitter carries the baseband signal, bypassing the need for multiplexing in the exciter and eliminating the resulting signal overshoot and associated loudness tradeoff.

Among the speakers from Nautel itself, Research Engineer Philipp Schmid will address the “HD Multiplex Trial — KKLZ Experience,” and Sales Manager Central USA Jeff Welton will again offer his popular “Tips and Tricks.”

Last year's event drew more than 300 registrants. NUG@NAB 2018 takes place Sunday April 8 from 9 a.m. to 1 p.m. at the Flamingo Las Vegas, with a hot buffet lunch and optional AUI session following.

Register at www.nautel.com/nab.





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SMART DEVICES

(continued from page 22)

media ecosystems to suit their lifestyle and preferences," said Meyers. "It's important that our brands are not only available across each of the new media channels available, but that they also take advantage of each channels' unique benefits and context."

ASSESSING RISKS

Adapting to change is never easy for an established medium; and there are financial risks associated with investing in new technologies, some of which won't pan out. "Are the business models ready?" Savoie cited as a common question. "Will there be a tangible ROI?"

But consensus estimates are that more than 75 percent of households will have some type of smart speaker in their home by 2020, he said. "That sounds like an opportunity that audio content providers including radio broadcasters need to fully explore."

For his part, Sinon said the risk to broadcasters is one-sided. "I have not heard any arguments claiming there are dangers into getting into the smart speaker space. I'd be very curious to hear what the nay-sayers have to say," he said. "I will say this, though: We don't have a choice."

Meyers echoed the point. "I would argue that the danger is in not pursuing the smart speaker market. It's still early days, especially with exploring revenue models, but I believe our brands should be well represented not only with live streams, but more fully within the conversational context of what makes these smart speaker platforms so attractive."

MAKING MONEY

Beasley Media Group and Hubbard Radio are among companies walking the talk.

"As of last fall, Beasley's brands are now fully represented on the Amazon Alexa service," said Meyers. "Today we offer live streaming and a special selection of on-demand content for each brand. This year our focus is on adding personalization and cross-platform synchronization to our web, mobile app, smart speaker and smart dashboard offerings."

Sinon said, "Hubbard has produced our own skills for Alexa. The skills are very basic right now, simply starting and stopping the stream. However we are working on many enhancements including bringing in our podcasts, ability to access or music data — 'Alexa, ask KS95 what song this is' — user authentication and tie-ins to our listening rewards platform."

Are these broadcasters making money by investing in these forms of media?

"Sure, we absolutely are," said Sinon. "Our streaming players and mobile apps have opened up opportunities for advertisers to participate and offer prizes in our rewards platform. The right campaign can generate tremendous results for our clients."

At Beasley, said Meyers, "We have seen traction with large national brands who are interested in being 'first in' on new technology initiatives and sponsorships. The revenue model is still evolving, however, and we believe there is room for new opportunity growth."

A big picture view is provided by NAB's Brian Savoie. "It's really early days in the area of monetization. These are rapidly evolving and scaling platforms where content producers are still trying to figure out what their audiences want."

Nevertheless, "Groups who have been working in this area for some time have seen exponential growth in listening via the smart speaker," Savoie said. "That's exciting: Strong listenership is a foundation to build around."

A SHOW SAMPLER FOR MANAGERS

This issue of Radio World previews business and management themes of the NAB Show; below is a sampling of relevant sessions. See show website for full program. Next issue we'll dig into technical content of the show.

NAB Show Opening — Monday morning, at the new NAB Show Mainstage in the North Hall of the Las Vegas Convention Center. Distinguished Service Award to Robin Roberts; Opening Keynote and State of the Industry address by NAB President/CEO Gordon Smith.



Photo by Jim Peck

"DFXtra: Digital Leaders Take Charge" — Part of the Digital Futures Exchange, this Monday panel brings together "digital managers-turned-senior corporate leaders from top broadcast companies," to discuss the shift in corporate executive progression from digital professional to CEO. Moderated by NAB Executive Vice President of Technology and Chief Technology Officer Sam Matheny, it will feature Capitol Broadcasting Co. President/COO Jimmy Goodman; Raycom Media CEO Pat LaPlatney; ABC Owned Television Stations Group President Wendy McMahon; and The E.W. Scripps Company CEO Adam Symson.



Taja Graham

"A Monumental Partnership: How AAA Insurance Monumental Music Jam Came to Be a BIG Win for the Client, the Consumer and the Station" — Monday morning. Taja Graham, vice president, director of sales for Emmis Indianapolis talks about how to "get client buy-in from the very beginning, demonstrate deliverables across multiple channels and work in tandem to endure success."

NAB Achievement in Broadcasting Dinner — Convention organizers rethought longstanding events this year (among other changes, replacing the Television, Radio and Technology Luncheons), and this event is one of the results. It is a ticketed dinner and reception held Monday evening, April 9 at the Encore Las Vegas; it will feature presentation of the NAB Radio and Television Hall of Fame Awards and the NAB Digital Leadership Award. Tickets are sold through the NAB Show registration portal.

Elvis Duran enters NAB Broadcasting Hall of Fame — The nationally-syndicated radio personality and philanthropist will be inducted during the Achievement in Broadcasting Dinner (above). "Elvis Duran and the Morning Show," distributed by Premiere Radio Networks, is broadcast from New York's Z100. His three-decade radio career includes host and program director duties at iHeartMedia's WIOQ(FM) Philadelphia and KBest Media's KBTS(FM) Austin, as well as stints at Entercom's WZGC(FM) Atlanta and Cumulus' KRBE(FM) Houston.



Elvis Duran

"Law and Policy Q&A With the FCC and Capitol Hill" (Invitation Only) — Senior congressional staff and FCC bureau chiefs answer questions. "This exclusive member benefit and one-of-a-kind session happens only at NAB Show," the website states. "If you would like to attend but have not received an invitation, please contact membership@nab.org for more information." Among panelists is the new head of the FCC Audio Division Al Shuldiner.

"Crisis on the Strip: Reporting in an Unfolding Emergency" (Business of Broadcast Conference) — Tuesday afternoon. A panel will focus on the role broadcasters served in providing information to the public during the tragic shooting in Las Vegas.

We Are Broadcasters Celebration — Another new event, this will be held Tuesday from 3 to 4:15 p.m., followed by a networking reception, at the new Mainstage in the North Hall, and it is open to all attendees. It will include presentation of the NAB Crystal Radio Awards and the NAB Crystal Heritage Award, in addition to the Radio and Television Engineering Achievement Awards and the Television Chairman's Award.



NAB Crystal Radio Awards — Fifty finalists have been named, 10 winners will be recognized during the new We Are Broadcasters Celebration Tuesday afternoon (see above). The awards recognize radio stations for outstanding year-round commitment to community service. WTOP(FM) in Washington will receive the NAB Crystal Heritage Award, which recognizes stations that have won a total of five Crystal Radio Awards. WTOP is the seventh station so honored.

"Content Strategies for Podcasting" — An all-day track of four sessions on Wednesday including discussion of the "anatomy of a podcast hit."

BIG DATA

(continued from page 20)

tant data is coming from innovative new places. Megan Lazovick from Edison Research will talk during the session about consumer data emerging from virtual assistants like Alexa and Google Home.

"We conducted multiple studies within the past year to learn about how consumers are behaving with the smart speaker," she said. "We saw that these devices in the home gradually become more and more adopted, and actually change and create new behaviors that had not existed." Today,

42 percent of smart speaker owners now say that their smart devices are essential to their everyday lives.

The "Big Data Deal" session also will include panelists from the Katz Media Group and Connected Travel.

Other relevant sessions at the show include "Don't Let Big Data Become a Massive Liability" in the Broadcast Engineering and Information Technology Conference; "Big Data and Big Brother: News, Privacy & Piracy" at the Destination: NXT Theater (North); and "CM | IP Debate: Understanding Big Data and the Role of Analytics in TV" in the Connected Media | IP Pavilion.

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ruby's powerful visual interface is designed for fast-paced radio, with fingertip access to source, bus, and mix-minus assignments, as well as EQ and dynamics processing — freeing your talent to perform instead of searching for settings. You can even use ruby's GUI-building app to centralize control of studio software and peripherals. With intelligent AutoMix hands-free

mixing and one-touch AutoGain mic calibration, your operators will tackle the most complex shows with ease. Even voice-tracking while on the air takes only the push of a button. Be prepared: your talent may actually thank you! And because ruby is engineered and built in Germany, it might just be the last console you'll ever need to buy.

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Efficiency, quality, ease of maintenance seal the deal for NRG

USERREPORT

BY GEORGE NICHOLAS
Director of Engineering
NRG Media

CEDAR RAPIDS, IOWA — Serving a mid-sized broadcaster with 40 radio stations in four states, the NRG Media engineering team has operational savings on the mind. Every dollar counts, especially when it comes to labor and equipment costs. Therefore, there are three key traits we look for with technology: longevity, reliability and, increasingly, efficiency.

We have long counted on GatesAir for a large percentage of our transmission systems. Their proximity to our Midwest location has been a benefit for service, including quick access to spare parts and occasional training sessions at their Quincy, Ill., facility. In the rare instance we need to call support, we know to whom we are speaking with on a first-name basis.

The quality of their transmitters, however, is what keeps our stations competitive and profitable. We have many GatesAir tube and solid-state transmitters that have been in reliable service for many years. However, as solid-state technology continues to grow more efficient, thanks to advances in LDMOS transistors, we gradually have retired or moved our tube transmitters into backup service.



Our recent transmitter purchases favor GatesAir's Flexiva FAX air-cooled transmitter line. Many of these have low-power systems, but we recently installed a FAX30 (30 kW) transmitter at KOKZ(FM) in Waterloo, Iowa. The FAX30 replaces a GatesAir FM-25K tube model that had been in service since 1985; that transmitter now operates in standby mode, as it remains in excellent condition.

As with most such facilities, we had limited space to accommodate a new transmitter. An advantage of modern LDMOS technology is that the transmitter footprint is reduced significantly. Since we signed up for GatesAir's white-glove service, the service team slid the FAX30 into the designated space we provided. The modular build of the transmitters removes the need for forklifts and just makes the move-in process painless.

A remarkable benefit of Flexiva transmitters is how quickly they are ready for air. In most cases, we have a new Flexiva on the air within two hours, and it was no different for KOKZ. Once the frame was in place, we plugged in the modules, wired three or four connections, and plugged in a few ribbon and coaxial cables. The rigid RF pipe provided with the transmitter is precut, and simple to line up and tighten to our combiner and other RF accessories. The Flexiva manuals are straightforward, and our electrician was clear on proper cable size and voltage handling for the final steps. It's literally the easiest transmitter model we have installed.

Speaking of modules, the limited number of power amplifiers and other

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Nautel Brings FM Translators to AM Stations

Quality and features of VS Series please Twin Cities broadcaster

USERREPORT

BY GREG BORGEN
President
WDGY/WREY

ST. PAUL, MINN. — WDGY(AM), “The Original Rock n Roll station,” or “Wee Gee,” is an institution in Minneapolis-St. Paul, and serves the Twin Cities area with “All the Hits of the ‘60s and ‘70s.” Our AM 740 station is daytime-only but we keep the rock and roll going through the night thanks to some well-placed FM translators on 103.7 and 92.1 MHz. Also in our group is WREY(AM), a Spanish-language station with 3 kW daytime and 2.4 kW nighttime operation. WREY is also served by an FM translator on 94.9 MHz.

Market No. 16, this meant that there was nothing to be had within the budget of an AM-only group. However, in October 2015, when the move-in rules were released, we saw the opportunity to bring some additional energy to our stations with the January 2016 filing window. Applications were submitted

capabilities including IP audio, USB backup audio, SNMP support and so on. We aren’t using all of the features, but it’s nice to know they are there.

One feature that is outstanding is built-in Orban Optimod audio processing, which allows us to achieve the perfect sound for our audiences on

monitor all three of the translators, but so far we haven’t encountered any deviations that we need to adjust. In the event that there is a situation at the transmitter site, due to ice or AC power, usually logging into one of the transmitters and looking at the stored logs is enough to give us an idea as to what most likely happened.

Nautel transmitters are bulletproof.



This report concerns the translators, purchased and placed on the air in 2016. All three came from one of my favorite companies, Nautel. I’ve been doing business with them since the early 1990s, and with only one exception (I’m calling that exception a mistake) I have only purchased Nautel equipment during that time.

In 2009, the FCC issued a Report and Order formally allowing AM stations to run FM translators. However, they only allowed use of existing translators and were subject to the rules at the time regarding moving translators. In

and we got our opportunity to match FM translators with our AM stations.

We elected to use the Nautel VS Series FM transmitters for our translator sites. For WDGY, we put a Nautel VS1 (1 kW) on 103.7 FM and a VS300 (300 W) on 92.1 FM; and we installed a VS1 on 94.9 FM for WREY. These VS Series transmitters have some great

these transmitters. We sound every bit as good as — if not better than — the big corporate facilities in our market. We’ve even had “audio geeks” call us to rave about the great sound. Setting up the processing was easy, thanks to some presets that we were able to select.

Control is easy, too. We use the Advanced User Interface — AUI — to

Set them and forget them. They operate without a glitch or hitch. Maintenance is simple too, with easily accessed, washable air filters. It is also nice to have the ability to update software — frequently Nautel will release an update that adds features. Their continuous improvement philosophy and attention to their customers’ input serves all of us well.

If you’re looking to expand your listening area with translators, my advice to you is “Don’t cut corners: Buy the highest quality equipment that you can.” You know it will work and serve you well.

For information, contact Wendell Lonergan at Nautel in Nova Scotia at 1-902-823-5131 or visit www.nautel.com.

GATESAIR

(continued from page 26)

parts inside the transmitter offer several benefits. For one, there is ample space to work inside the transmitter; modules are easy to reach and hot-swap as needed, and typical maintenance is limited to blowing dust out of the filters. More important is the high-efficiency design that ties to the limited modules and LDMOS transistors. Both play significant roles in reducing power consumption and cooling loads; our air conditioning units run far less than before. In fact, the FAX3 and FAX5 transmitters run so cool at other facilities that we have had to occasionally pump in heat during the winter months.

The FAX30 air-cooled design draws air from the front, and exhausts it through the rear of the building. The design provides options for perforated or solid doors depending on whether you want to channel the air straight up into a hot air return, or just dissipate the air within a closed air conditioning system. These options are important as it doesn’t force

the broadcaster into an air-cooling pattern that might require other expensive and time-consuming design changes inside the building.

The audio quality coming is second to none, and much of this is due to the design of the Flexiva FAX exciter. NRG sizes our future transmitters with HD Radio in mind. We like that this exciter, and by default the transmitter, are HD Radio-ready without expensive reconfiguration. Once we are ready to move forward, we will work with our regional GatesAir representative to determine equipment configurations.

GatesAir helps our stations remain competitive and profitable. They clearly are the most economical transmitters from a price-to-performance ratio, typically costing about 10 percent less than the closest competitor. We have small- and medium-sized markets, and everything in between. Regardless of market size, it’s paramount to have a reliable transmitter that produces excellent sound and coverage to optimize ratings and revenue. GatesAir fits that bill for us across our station group.

For information, contact Keith Adams at GatesAir in Ohio at 1-513-459-3447 or visit www.gatesair.com.

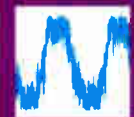
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NABSHOW
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R&S THR9 Is CatCountry's Transmitter of Choice

Pensacola station chooses Rohde & Schwarz for its new HD Radio installation

USERREPORT

BY NATHAN "BRITON" SMITH, CBT
Chief Engineer
WYCT(FM)/ADX Communications

PENSACOLA, FLA. — It took over 10 years but HD Radio is now on CatCountry 98.7 in Pensacola, Fla., at full power.

Some history. In 2003 WYCT (CatCountry 98.7) acquired an Armstrong tube-based test rig directly from iBiquity and drove it with Broadcast Electronics' FS1-10/FXi-250 exciter. This was connected to a new Shively IAD 8/3 interleaved antenna, and so WYCT became the first Florida FM to broadcast in HD Radio.

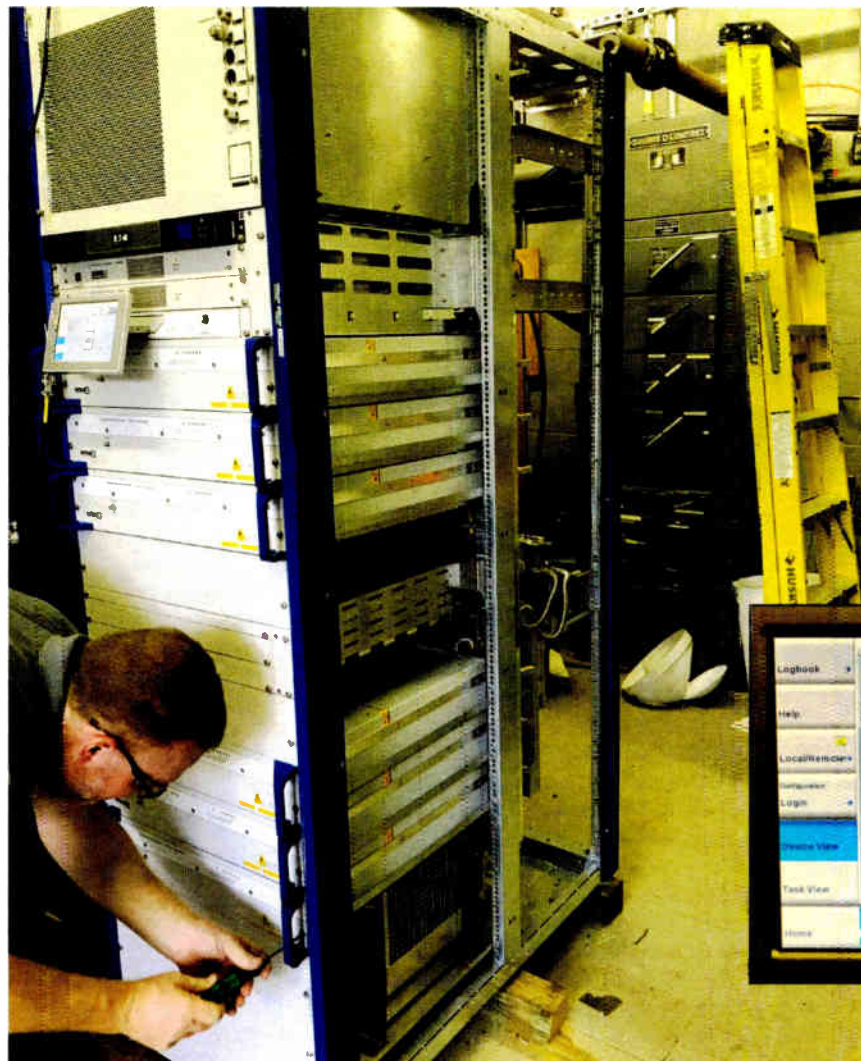
With northwest Florida being basically flat, the -20 dB injection covered our area well for vehicles and station staff was impressed. However, management decided that HD Radio receiver penetration was not yet high enough, so we returned to analog-only broadcast.

The times and technology have changed. Going to NAB Shows over the past few years made it easy to see that FM transmitter technology is providing higher value and more reliability. HD Radio is a standard option in more vehicles, which made a full-power HD transmitter a must-buy.

So when I received the budget for a new transmitter, I got excited and started talking. I talked with manufacturers, with other broadcasters and with Xperi.

GEN 4

Our priorities: The system had to be running the latest Generation 4 HD software, have asymmetrical sideband implementation, utilize low-level combining, have a high level of built-in redundancy and require no air conditioning.



Rohde & Schwarz is committed to the HD Radio roadmap and it shows in their hardware, so the R&S THR9 became the transmitter of choice for us. The importer, exporter and Engine are all running Generation 4 software on an embedded platform, providing a highly reliable system. This configuration allows use

of the extended partition for a fourth audio channel and for the importer and exporter to reside on the same hardware, which reduces cost and complexity.

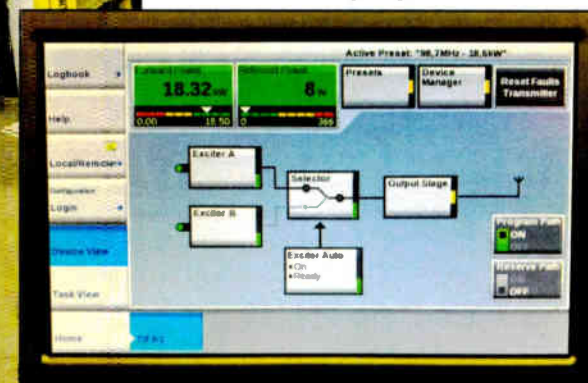
Other important features of the R&S THR9 are its ability to broadcast asymmetrical sidebands, and its liquid-cooled RF amps and power supplies.

In fact, the R&S THR9 is nearly silent while operating as it "sends the heat out the hose" to a heat exchanger.

For those renting by the square foot, the R&S THR9 fits in the space of a single deep rack, even when fully populated at 40 kW.

Moving away from WYCT's old Collins 831-G2 transmitter meant we no longer had to use air conditioning to cool the transmitter. Air-cooled transmitters typically require significant added air conditioning to be installed, a big expense for a block building in Florida with little insulation. Calculations showed that using a liquid-cooled Rohde & Schwarz transmitter had a lower overall system cost than installing and running an external air-cooled system. And for those wondering: No leaks!

The physical installation is simple and should be fine for those knowledgeable in installing large transmitters.



The built-in redundancy is great. We have dual exciters (so no downtime for software updates), dual Engines, dual pumps for the cooling system, dual fans in the heat exchanger and even dual breaker switches. Electric feeds were run from separate breakers; this allows for the exciter, Engine, and half the RF amps to stay on if one breaker trips. The exciters and Engines can be set to automatically fail-over on alarm. I also opted for a 1U built-in UPS that the R&S THR9 controller communicates with.

Our biggest fear buying a new design transmitter was ready support and parts availability. While virtually 100 percent of the spare parts are now stocked at the Rohde & Schwarz headquarters in Columbia, Md. (near Baltimore-Washington International airport), the station bought a bunch of spare parts to keep on hand. Rohde & Schwarz radio field support is growing and is responsive. When I had issues with a new configuration the team was prompt in addressing it. If you aren't utilizing the R&S team for the install, the configuration of initial settings may be a little confusing, but the documentation is very good.

(continued on page 32)



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Ecreso Transmitters Pull Double Duty at Manning Media

FM translators and HD Radio broadcasting come easily to E750

USERREPORT

BY **BILL MCCARREY**
Chief Engineer
Manning Media Inc.

HAGERSTOWN, Md. — When cross-service translator use exploded a few years ago, Manning Media decided to expand the service of our Hagerstown, Md., AM station 1490 WARK.

The CP for W255CP, conveniently already collocated on the WARK tower, was purchased and the project began. This was originally a noncommercial translator but was relicensed to a fill-in cross-service for WARK, allowing an increase in HAAT and ERP. The result was 250 watts ERP in to a single-bay Nicom BKG77 antenna at 340 feet on the AM tower. This configuration required 610 of TPO for 250 watts ERP.

After research of several transmitters and the recommendations of Phil Joiner at RF Specialties, we decided on the Crown-branded Ecreso E750. Installation was straightforward and basically plug and play.

What a great choice it turned out to be. So when we decided to launch HD2 and HD3 services on our Class B WVEG(FM) with fill-in translators in 2015 and 2016 respectively, there was no doubt what the transmitter choice would be after a year of trouble-free operation of the E750. We diplexed the 98.9 and 102.1 transmitters into the single-bay Nicom and the 100.5 transmitter diplexed into a two-bay Nicom with a noncom on 99.5 MHz.

The three Ecreso transmitters have performed flawlessly since installation in a transmitter building that is not climate-controlled with temperatures going over 100 degrees in the building on the hottest sum-

mer afternoons and dropping below 50 degrees on the coldest winter nights. We have also had zero lightning issues with the antennas mounted on a unipole fed grounded tower.

The E series transmitters are loaded with features that include stereo generator, dynamic RDS, internet GUI remote access for control and monitoring, plus built-in five-band audio processing, making them an

The three Ecreso transmitters have performed flawlessly since installation in a transmitter building that is not climate-controlled with temperatures going over 100 degrees.

even better bargain. A D-sub connector supplies the necessary control and metering functions for interface to a remote control system; ours are connected a Burk ARC-16.

We've been totally satisfied with Ecreso transmitters and would recommend them to anyone needing a low-power or translator transmitter. It truly can be a one-box solution for many operations. If Manning Media has future needs for translator transmitters the Ecreso will be at the top of the list.

For information, contact Tony Peterle at WorldCast Systems/Ecreso in Florida at 1-305-249-3110 or visit www.worldcastsystems.com.



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ROHDE&SCHWARZ

(continued from page 30)

The R&S THR9 is fully remote control-capable through a web GUI, can be remotely monitored through SNMP, and an optional GPIO unit can be added. While the importer/exporter is running on a Linux platform, at this time an external Windows computer is needed to run the JMSAC software for Artist Experience. The cooling system is monitored and controlled via the same integrated GUI.

Overall the R&S THR9 is a functional, compact and extremely efficient transmitter that should be considered for any system upgrade. Especially for those wanting to broadcast in HD at -10 dB. We love our R&S THR9.

For information, contact Don Backus at Rohde & Schwarz in Maryland at 1-616-206-0301 or visit www.rohde-schwarz.com.

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USERREPORT

BY **BEN DOWNS**
General Manager
Bryan Broadcasting

BRYAN/COLLEGE STATION, TEXAS
— I am the general manager of Bryan Broadcasting, which owns and operates 11 radio stations in Texas.

We needed a new FM transmitter for our station KKEE(FM), Bryan/College Station, TX, but had limited space available and we wanted it to be energy-efficient, reliable but not terribly expensive.

At the NAB Show we happened to stop by the Bext booth and saw the Bext XL 6000. We were intrigued by the surprisingly compact size of just four rack spaces high. That amounts to only 7 inches of rack space, and we certainly have never seen before (or after, for that matter) a 6 kW transmitter so compact, and with everything included.

From what we could see in the booth, the unit looked solidly constructed, and we decided to buy it. Because of its remarkable compact size, installation was straightforward. It was fairly easy to take it out of the box thanks also to its relatively limited weight, considering the power level. All we had to do was insert it into a rack cabinet, connect everything and turn it on. The transmitter can be wired for three-phase or single-phase AC power.

Right away we liked the practical access to all functions via a touchscreen on the front or, alternatively, via a web interface. And over time we realized that we made a good investment. Our Bext XL 6000 always operates at its maximum rated power of 6,000 W, is energy-efficient and has never let us down since the first day of operation, going into its third year soon. It has performed exactly as we had hoped.

But I still remember quite the surprise during installation, when our chief engineer turned it on for the initial setup. The transmitter runs so cool that under normal operation the fans don't run at full speed, and after the initial



turn on they gradually slow down. At first we did not know that. So our engineer was certain, after initial run-up, that the transmitter had failed when the fans ramped down. But it turns out that's the magic trick Bext has implemented to make this transmitter reliable. It runs cool at full power. In our transmitter building, the transmitter case at 6,000 watts is only about 12 degrees above ambient room temperature. The low fan speed is more than sufficient for the very moderate heat the unit generates, and we appreciate that moving a modest amount of air also means less dust would get inside the transmitter.

We also liked the sound quality. The station never sounded better.

And because of its compact size, this transmitter provides a portability that others of such power level do not. If we ever needed to, we could move it from site to site by simply carrying it in the trunk of a car, which is unheard of for a 6,000 W transmitter.

Over time, we had good results with Bext, like when I bought a Bext 500 W unit a few years before and had the same experience with reliability; since then, its RF power output hasn't varied more than two watts at any point in time.

Although we did not need all of them for the specific XL 6000 unit we purchased at the time, we heard that these Bext XL transmitters may offer a variety of built-in options. They include AES-EBU digital audio input, stereo generator, internal micro SD memory card, RDS encoder, web interface, SNMP interface, audio over IP input, FM receiver card, FSK ID keyer, sync port to inject external frequency reference for booster applications, capability to save multiple stations' profile settings and probably a few more that I might not remember.

For information, contact Tino Romagnoli or Andrea Hill at Bext in California at 1-619-239-8462 or visit www.bext.com.

TECHUPDATE

ELENOS ADDS DIRECT DIGITAL MPX TO ETG SERIES TRANSMITTERS

Elenos now offers direct digital MPX input to its ETG series via the new Direct to Channel ETG transmitter.

The company says it has placed more than 40,000 transmitters in more than 100 countries and that the ETG series has proven popular for its compact design, lower energy consumption, sound quality and reliability.



Features include intelligent system protection, ICEFET technology, Ecosavings energy efficiency and Lifextender performance efficiency algorithms, as well as the company's own power supply design for performing in extreme conditions.

Audio performance is ensured by advanced digital signal processing technology (e.g. 2.4 GHz clock, 24-bit analog converter). Elenos highlights the transmitter's sound fidelity, purity and the absence of microphonic noise over the entire band.

The Direct to Channel ETG transmitter offers MPX inputs, MPX over AES, AES/EBU input, analog inputs, stereo generator, RDS encoder, audio over IP support, internal storage for MP3 audio/playback in the event of total STL failure.

Integrated SFN functions, integrated web server, SNMP and transmitter control and transmitter status board provide for traditional remote control and telemetry.

The transmitter is available in 20, 150, 500, 1,000 and 2,000 watts in two rack units, and 3,500 and 5,000 watts in a 4 RU package.

For information, contact 305 Broadcast, an Elenos Company, in Florida at 1-855-305-3058 or visit www.305Broadcast.com or www.elenos.com.



Shortwave Supports Secure Digital Communications

Taking advantage of its long-distance capabilities, the established technology has a new mission

TECHNOLOGY REPORT

BY DR. SIMON KEENS

The author is head of sales and marketing for the Ampegon Group.

TURGI, SWITZERLAND — There are many innovative ways the industry can use shortwave broadcasting to provide secure data transmission and high-speed communications.

The modern world increasingly requires available real-time secure communications between centralized locations and often to many receivers in unknown locations thousands of kilometers away.

The reasons for this are endless. It might be to allow for critical software updates, transfer sensitive business information, or to disseminate warnings or instructions as quickly as possible.

Information transfer via the internet or via fiber optic cable was once the reference. However, the use of such technology means that the information is only delivered to fixed points. In addition, the use of third-party infrastructures provides a security risk and increases transport cost.

Today, near-instant communication to unknown, remote receivers using shortwave is being developed as a new secure means of communications without the need for external providers, delivering signals directly to multiple, or even mobile, destinations regardless of fixed infrastructure. Messages may



Ampegon's 100 kW shortwave transmitter, showing the P5M (pulse step modulator) power supply (left) and RF amplifier section (right).

be dispatched much faster, thus for situations where time is critical, each additional second could be profitable and even save lives.

Ampegon supplies turnkey broadcast solutions based around its TSW-2000 series of transmitters and station auxiliaries to provide secure, near-instantaneous communication capabilities quickly and efficiently. Ampegon antennas can direct information: point-to-

point or cover entire continents.

In addition, users can preprogram automatic remote transmitter operation or control it over IP, ensuring necessary channels are open before the critical message even arrives. This way, critical information can be delivered anywhere on the planet with less than a second's notice.

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MISCELLANEOUS

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WYBG 1050, Messina, NY, now off the air is selling: 250' tower w/building on 4 acres; collection of very old 78s dating back to 1904; 12' satellite dish on concrete base; prices drastically slashed or make offer.



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

Equipment Wanted: obsolete, or out of service broadcast and recording gear, amplifiers, processing, radio or mixing consoles, microphones, etc. Large lots preferred. Pickup or shipping can be discussed. 443-854-0725 or ajkivi@gmail.com.

I'm looking for KFRC radio special of Elvis Presley which aired on January 8, 1978. I'd be willing to pay for a digital copy. Ron, 925-284-5428.

I'm looking for the Ed Brady radio show in which he did a tribute to Duke Ellington, the station was KNBR, I'd be willing to pay for a digital copy. Ron, 925-284-5428.

I'm looking for KTIM, AM, FM radio shows from 1971-1988. The stations were located in San Rafael, Ca. Ron, 925-284-5428.

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 ronwtamm@yahoo.com.

Looking for KSFX radio shows, Disco 104 FM, 1975-1978. R Tamm, 925-284-5428.

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

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Schnader telecriptions 16 mm musical films produced in the early 50 s. Bill Cook, 719-684-6010.

Standard Short-tune series. Bill Cook, 719-684-6010.

(2) LPFM radio stations for sale, located in the NW part of central Florida on the gulf coast, covers the county, get out of the cold weather, come to Florida, call or write for particulars, 352-613-2289 or email boceey@hotmail.com or Bob, PO Box 1121, Crystal River, FL 34423.

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READER'S FORUM

MORE ON DEALING WITH MULTIPATH

Responding to "Dealing With the Multipath Phenomenon," Feb. 1 issue:

Back in the late 1980s, Los Angeles' KIIS(FM) was getting high ratings; but with an ERP of 8,000 watts, we needed to get every benefit possible for that power level. The market included several counties in southern California, but with the exception of the metropolitan Los Angeles and Orange County areas, San Gabriel Valley and San Fernando Valley communities, there are mountains and hills involved. That creates multipath for many listeners in those areas. I personally live in an area with mountains blocking a direct signal from our transmitter on Mt. Wilson and could receive the station perfectly up to about a half mile away. At home it was still listenable in mono but scratchy in stereo.

Upon purchasing and installing a new solid-state Nautel 10 kW transmitter, we noticed that its metering showed a slight mismatch to the antenna that had not shown up on our old RCA tube-type rig. We arranged a night soon after that for John Hignite's steeplejacks and a service technician from Jampro Antennas to come and



work on the issue. Using a network analyzer below and adjusting the two-bay directional antenna on top of our tall pole, the SWR was brought down to virtually 1:1. Any reflected power back down the transmission line from the antenna to the transmitter will create the multipath effect caused by that delayed energy mixing and returning to the antenna. The result is similar to a receiver receiving one signal directly with the same signal bouncing off something, being delayed and received over a longer path at the same time. Multipath is multipath, regardless of how it is created. There was definitely an improvement in reception at my home but room for more.

At the time, there were papers written and discussions on how the multipath effect increased with stereo separation. We had several homebrew units on KIIS(FM) at the time, including microphone preamps and processors, air-chain audio processors controlled by joy-sticks, studio switchers and a lot of control equipment. It was normal for our engineers to build something on our own that might improve multipath.

I built the unit pictured above using a design by Paul Donahue, Gannett's corporate director of engineering, who had his office in our facility. It used the theory of limiting the L-R component such that it would never exceed the L+R audio. It certainly was not as complex as the Wheatstone version, no algorithms or microprocessors, just basically analog audio and comparators controlling the L-R levels.

This would not have worked with extreme L-R such as old Beatles songs that had the vocal on one channel and the music on the other or fancy promos where the audio would ping-pong between channels; we did not air such things anyway. The unit did work and was used on the air for several years. The reception was significantly improved at home, but I still had the multipath caused by the nearby mountains. Two of the three sources of multipath that we could control had been greatly reduced.

Jeremy Burnham
Retired radio engineer, iHeartMedia
La Crescenta, Calif.

NEVER TOO LATE FOR C-QUAM?

I read Alan Jurison's interesting "best practices" article ("NRSC Adopts IBOC Time and Level Alignment Guideline," Nov. 22). While I'm not going to comment on the topic *per se*, I noticed a chart in the column that indicated that around 45 percent of all new cars (2017 model year) are equipped with HD Radio.

This is a very good development indeed, and it's high time for broadcasters to make more of an effort to sell the public on the HD format.

It's also a good time to emphasize improved AM fidelity with broadcasters either adopting HD AM transmission or C-QUAM analog AM stereo.

Recently, I ran across an interesting online article by Paul Thurst from 2014 (www.engineeringradio.us, keyword "renaissance"), making the point that most HD-capable radios will demodulate the C-QUAM AM stereo signal and present the listener with an analog stereo product. Depending upon the HD Radio receiver used, the bandwidth fidelity will be anywhere from 5 to 9 kHz — not spectacular, but certainly far preferable to the typically crappy audio produced by contemporary AM analog mono radios.

One other point: Analog AM stereo is not perfect on an HD receiver — when decoded, the radios flip the stereo channels, left becomes right and vice versa. However, if I were a small- or medium-market AM station without the budget to spend on an IBOC digital transmitter and all of the other expense that goes with it, I might find it worth my while to reinstall that C-QUAM stereo exciter gathering dust out at the transmitter site.

It wouldn't sound as good as the digital HD signal, but it would represent a vast improvement over what is available to the listeners. And another advantage is that since many broadcasters already own C-QUAM exciters, the cost of reinstalling this equipment could be minimal.

The reality is that there are more radios today in listeners' hands capable of hearing AM stereo than there were in the 1980s, when the product was introduced.

Mark Carbonaro
Monterey, Calif.

PEAK RADIO

Responding to "It's Time for Peak Radio," radioworld.com, keyword "Winzenburg":

Somehow I missed reading this particular issue of Radio World in a timely fashion, but the article to which I'm referring is as apropos today as it was in the Sept. 27 issue. It is a commentary by Stephen Winzenburg. He is dead on as to what has happened to radio. This article should be required reading by every owner, and particularly the multi-chain programmers (think iHeart etc.).

You have to give a potential listener a *reason* to listen to your station. An announcer doing liners in several markets is not the answer. Sure, it's cheaper, but at what ultimate cost?

If radio stations are only offering music as a reason to listen, there are too many other choices to choose from, and they are, for the most part, commercial-free. And just wait till Apple and Google take over the dashboard in most cars, as they are soon to do.

I am an old radio guy and I can clearly see what has caused the demise of this wonderful industry. Hopefully, radio will survive, but I think it will only survive if it is again run by people who understand the medium.

Don Mosley, Sr.
Owner, Sound of Birmingham Recording Studio
Birmingham, Ala.



READER'S FORUM**KEEP A COOL HEAD**

Responding to "How Would You Diagnose This Signal Loss?" Feb. 14 issue:

I always read RW cover to cover, and it is still the best mag in the business. Even though the covers keep getting closer together, it is always full of good info.

Steve Eberhart wrote a funny piece about when he couldn't hear his AM station anymore in places he usually could. Reminds me of one time ...

It was 1997, and I was the semi-new chief engineer of the Citadel cluster in northern California. I was still pretty young, and this cluster had three of the top five stations in the market, including the No. 1 station. In fact, 50,000 watt KATM was number one by so much, you could cut the ratings in half and it would still be No. 1. That in itself is a lot of pressure on a young guy who finds himself suddenly responsible for such an outfit, but made worse by the ridiculously old equipment that kept the thing on the air.

The main transmitter was a very old RCA that had been abused, and the auxiliary transmitter had been parted out by predecessor engineers and basically just a shell — never to work again.

So I get a "911" page from the GM one sunny day, and another, and another. I call him back on his cellphone and ask what was wrong. Not to mention names or anything, but Tommy Ehrman said, "I just tuned in KATM and it's off the air!" I calmly hit the button for that station on the radio in my office and noticed it was on. I asked "Where are you?" Tommy replied, "The car wash on McHenry!" I told him, "Look on your dashboard and tell me what you see." Tommy (still with panic in his voice) said, "The antenna for the car ... Oh." and hung up.

Broadcast engineering has taught me this: You have to find tranquility where you can, and fight everything to keep it.

Paul Shinn

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

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HAM RADIO

I was appalled at the opinion that Burt Fisher offered in the Oct. 11 issue ("Ham Radio Wasteland"). His skewed opinions about ham radio do not belong in your newspaper.

There were, and still are, dozens of hams helping with the Puerto Rico storm relief because of the failure of satellite and landline communications. Here in South Carolina, our Skywarn and our SCHEART Network that connects hospitals is a valued resource for emergencies and weather alerts. The availability of a technician's license, which does not require a code test, has allowed us to license many hospital and emergency room personnel to operate our network of VHF and UHF repeaters.

John Seibel's
K4AXV

**THE FUN PART OF ENGINEERING**

Responding to "Doesn't Anyone Build Anything Anymore," Oct. 25 issue:

Just read James O'Neal's article. The paragraph about broadcast engineering's DIY articles brought back an ancient memory. I tracked down an article I wrote while I was an engineer at WABC. Just like everyone at the station, I had times of franticity, but also downtimes, sometimes lasting a whole shift. I asked my boss if I could take a stab at building an automatic EBS monitor that would automatically detect alerts, which were occasionally missed.

Seeing an opportunity to make a few bucks or at least brownie points, I sent an article to Broadcast Engineering (<https://tinyurl.com/ybuzhzhhs>), which joined the parade of construction articles he mentioned.

Those days at WABC remain fond memories, although shortly thereafter I left the station, eventually to start Eventide and to build store-bought instead of bespoke equipment. After an almost 50-year career of doing just that, and continuing to attend NAB Shows, I happened to run into Mr. O'Neal on an elevator at the Westgate Hotel in Las Vegas. We had an hour-long conversation about our mostly parallel careers, of which the above is an example. Perhaps FH run into him again this year.

Richard Factor
WAZIKL

I really enjoyed James O'Neal's article about "building stuff." Yes, that is what made broadcasting fun! FYI, when I was CE of Drake-Chenault, I built lots of stuff. Interface amps, DAs, switchers and audio consoles.

Take a look at www.drakechenault.org/textpg.html. About halfway down the page, you'll see info about the custom audio consoles that I designed and built. We got a superb product for a fraction of what it would have cost to buy them off the shelf — if they existed, which they didn't!

And with the "leftover" parts, I built a console for myself. I use it to this day, 38 years later, and it works great. The D-C boards (and mine) were built with the best components I could get: P&G faders, Honeywell-Microswitch switches, Grayhill rotary switches, API VU meters, etc. (Maybe that's why it still works!)

And the "projects" I built at D-C eventually morphed into the first products produced by Henry Engineering.

It was fun for sure.

Hank Landsberg
President
Henry Engineering & Sine Control Technology
Seal Beach, Calif.

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