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Lockwood Travels the Globe for AM

Hatfield & Dawson engineer handles issues for broadcasters, power and cell companies

SEATTLE — Stephen S. Lockwood is a senior professional engineer and a partner with Hatfield & Dawson Consulting Engineers: his communications career

NEWSMAKER

has spanned more than 28 years. He works on both AM and FM engineering projects but specializes in AM, and is slated to take part in a session at the upcoming Radio Show about AM technical solutions to revitalize the senior band.

Radio World News Editor/Washington Bureau Chief Leslie Stimson caught up with him after he had returned from a quick trip to California to help a client, a power plant under construction near an AM station.

RW: What's going on in California?

Lockwood: If you put up a construction crane near AM stations, the end of it will give you a pretty good arc. That tends to make the people working around it somewhat upset. So we've been working with a power plant from the beginning — helping them work with the AM stations, and also when they've had other

Lockwood on a Qatar Coast Guard tower at Al Aish Qatar. He was helping with electromagnetic compatibility issues caused by proximity to a 2 MW medium-wave station about a mile away. New antenna system designed by dJTreil Lundin & Rackley/Hatfield & Dawson Joint Venture and constructed by Harris Broadcast.



problems along the way because they're building right next to the AM station where the field is 10 Volts per meter. There are certain electronics problems that you'd expect to have with interference issues.

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Museum Spotlights Mics and More

In Milwaukee, a piece of radio history

BY KEN DEUTSCH

One visitor to the Mic Museum lay down on the floor and said to proprietor Bob Paquette: "I died and went to heaven!"

Anyone who appreciates radio's history would feel overwhelmed staring at more than 1,000 microphones

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Bob Paquette with an old microphone that was used in 1929 by Richard Evelyn Byrd during his exploration of the Antarctic plateau. The mic is a 1929 RCA condenser weighing about 15 pounds. It was later used by WKRC(AM) in Cincinnati.

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World Radio History

AM Owner: Boost Nighttime Power

Brian Winnekins met with Commissioner Pai and discussed several options to help AM

COMMENTARY

BY BRIAN WINNEKINS

In November 2009, my wife Karla and I began a journey that continues today. It was during a trip to the National Association of Farm Broadcasters Convention in Kansas City that we worked on our first business plan to purchase WOOQ(AM) in Durand, Wis.

On the banks of the Chippewa River, Durand is in western Wisconsin near the Minnesota border. The population was just over 1,900 at the 2010 census.

WOOQ had been on and off air for many years, and we believed that if we could have a local station with programming geared toward Durand and the surrounding area, the station could be viable.



WRDN's Brian Winnekins met with FCC Commissioner Ajit Pai to discuss AM.

Commissioner Pai telling him what the station meant to them and why it was important the commissioner support allowing increased power for stations like ours at night. Not only did I receive letters from city leaders, but others residents offered letters of support.



In fact, the day before I flew to Washington, two residents, hearing about my meeting, came to me with handwritten notes expressing their voice of support. In one of the letters, the writer told the commissioner it had been at least 15 years since he listened to AM radio, and he was now listening to WRDN. Another



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In June of 2011 we took control of the license, changed the call letters back to the original WRDN and put the 2 kW station back on the air the next year. So far it has been a very challenging and humbling experience for both of us.

It's been challenging from the standpoint of finding qualified salespeople, equipment issues and the same issues that face many small mom-and-pop stations. It's been humbling from the fact that we have received so much support not only from our personal friends but complete strangers in the broadcast industry who have helped with engineering, offering equipment and advice, an idea or a voice for a commercial.

Because we feature local news with obits, farm news and markets, local high school sports, church services and other local programming, we have received support and thanks from so many in the Durand area for bringing back the radio station.

The one question we are always asked

is, "Why do we get this St. Louis station at night instead of WRDN?" When I told them that, by law, we must lower our power to 152 watts at night, they ask why. When I explain it's because of rules passed in the 1930s due to skywave transmissions, they say, "Well that's just crazy!"

That community support extended to a recent meeting that I had with FCC Commissioner Ajit Pai in May. I had read about the commissioner's round table discussion at the NAB Convention, about revitalizing the AM band, in Radio World. I was taken aback that there seemed to be no input for small broadcasters like my wife and me.

Since I was going to be in Washington for the NAFB Washington Watch program, I emailed Commissioner Pai to ask for a meeting so he could get a perspective from a small broadcaster. I was not expecting a reply, but within a few hours our meeting was set.

At that point I asked some of our community leaders for a letter to

resident didn't just ask, but begged the commissioner to do everything in his power to allow stations like ours to increase power at night.

Because of all the letters I had with me, when I met Commissioner Pai on May 13, I thanked him on behalf of the residents of Durand and Pepin County, Wis., for taking time to meet with me. Commissioner Pai and his aide were impressed by the letters and interested in what I was proposing.

SUGGESTIONS FOR AM CHANGES

First, the AM IBOC idea is a non-starter for stations like ours.

We would have to invest in a new transmitter and studio equipment, processing — even an STL. That, coupled with no "converter box," begs the question, how are people supposed to listen to us? We can't wait five to 10 years for new radios to come out. Then there is the licensing fee to iBiquity Digital. We have

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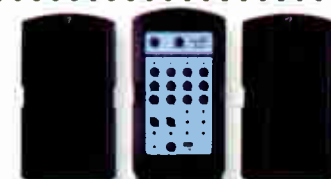


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How Will iTunes Radio Play Out?

We ask two noted radio observers how Internet radio might be affected

BY JAMES CARELESS

The June announcement of Apple's iTunes Radio, with its Pandora-like mix of ad-supported free content and ad-free paid content, fired debate about this behemoth's potential impact on Internet radio.

Will iTunes Radio spur more people to tune into Internet radio as a medium, or will it seize the market from Pandora, Spotify and thousands of standalone Internet radio stations on the Web?

THE BIG PICTURE

To tackle these and other concerns, Radio World turned to James Cridland and Fred Jacobs, respected experts on Internet radio.

Cridland is managing director of Media UK, a free portal for everything in U.K. media. Jacobs is president of the radio consultancy Jacobs Media and the man widely acknowledged as

having invented the "classic rock" format in 1983.

Certainly Jacobs was impressed. "It's a big deal," he said. "Whether Apple promotes it on all cylinders is a factor, but any time this company takes on something new — and in this case, part of a space they already excel in, which is music — you have to respect the entry."

Cridland voiced a qualification: "They haven't entered the Internet radio market; they've entered the Internet algorithmic jukebox market," he said. "Which is lovely, but they're not radio, and them stealing the radio name and passing off their product as 'radio' isn't fooling anyone."

Semantics notwithstanding, Cridland admitted that iTunes Radio does have a real advantage — even if it is a "me-too product" — due to Apple's powerful distribution network. He considers the ser-

vice attractive for anyone with an "iOS device and any device that has iTunes already installed, so PCs and Macs."

With 70 million and 24 million users, respectively, Pandora and Spotify are well established in the Internet radio medium.

However, Jacobs said, "It could affect them heavily, depending on which of the two services it is most similar to," he said. "There's not a great deal of loyalty in this space. Consumers will gravitate to the music service that's offering the best deal at the moment, so existing pure plays are in the crosshairs."

The great joy of Internet radio, from a listener's standpoint, is the wealth of station genres and broadcast locations that are easily accessible via the Web. But convenience is another consideration, and iTunes Radio — like Pandora — makes it easy to get all kinds of music through one convenient portal. So what does its existence mean for standalone Internet stations lacking Apple's marketing clout and deep pockets?

Jacobs isn't sure. "On the one hand, Apple coming in legitimizes and mainstreams the space," he said. "On the other, it adds to the confusion. Google's service, and even MySpace's new version of radio, may actually make it more confusing for consumers to sort them all out."

Cridland expressed no doubts: "I think you're comparing chalk with cheese," he said. "Lots of people like radio. Some people — a tiny minority — quite enjoy algorithmic jukeboxes like iTunes Radio. Sure, it'll damage Internet radio stations that offer nothing more than nonstop music; but then, that's the difference between radio and an algorithmic jukebox."

When Internet radio started, there was no Pandora, Spotify or iTunes Radio. But times have changed, and now these players command a lot of listeners online and on mobile.

So is the Internet transforming from a universe of stations to a popular oligarchy of major music services? "I don't see any evidence of any loss of audience to any online service as a result of Pandora," Cridland said. "I think it's helping to grow the universe."

Perhaps, however, "you can visualize how, like in other businesses, a



Managing Director of Media UK James Cridland



Jacobs Media President Fred Jacobs

FROM THE EDITOR



Just how big is the entry of Apple into the Internet radio market? James Careless reports here.

— Paul McLane

few mega brands will survive, leaving smaller ones at the very end of the long tail," said Jacobs.

WHO LIVES, DIES

What will determine which Internet radio stations thrive or dive? "Ultimately, it will come down to the same marketing differences that impact

other verticals," he continued. "What's different about your service, what does it offer that the others can't — what's the value proposition? If it's just like everything else, and not supported with a back end like iTunes, it's hard to imagine that tertiary services can survive."

To conclude this discussion of iTunes Radio's impact on Internet radio, we asked our experts where they expected the medium to be in a year.

Fred Jacobs was bullish. "Internet radio continues to become more mainstream over time," he declared. "In our newest Tech Survey, we now show 45 percent of our radio-centric audience using streaming audio weekly — an increase of 18 percent year-to-year. Among younger alternative fans, it's closer to 70 percent. And as mobile devices and cars support and showcase the technology, there is a great deal of growth ahead."

As for Cridland, he said that given the choice between Internet radio and algorithmic jukebox services, "I think Internet radio will continue to do well and focus on personalization and non-music content, to continue pulling in the audiences. I think algorithmic jukebox services like iTunes Radio will also do well, and at some stage might sound better than just a bunch of disjointed music audio files thrown together and put on shuffle."

But he adds a million-dollar question: "Won't it be interesting if someone — Pandora or Apple or someone else — actually discovers a business model that actually earns a profit?"

James Careless reports on the industry for Radio World from Ottawa, Canada.

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



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WINNEKINS*(continued from page 3)*

never had to pay the Marconi family for the right to use a radio transmitter, why do we have to pay iBiquity?

AM DRM. What hasn't this been explored? It seems to me that Europe has been using this system, and since we did a full-digital test of AM IBOC why can't a test of AM DRM be conducted? Yes, we have all the same problems implementing this just like IBOC, but we should at least test it. Oh, and at least I wouldn't have to pay that licensing fee every year.

The FM translator is an interesting idea. In fact, for our station, it could work well, as our tower used to house WRDN(FM) before that was moved to Baldwin, Wis. But first, I have to find a translator, then I have to play hop-scotch across the state or country. The only people who get rich are my engineer, and the FCC with all the fees and studies we have to do to move the translator. Then if I do get the translator on-air, some full-time FM comes along and now I have to start over. Why can't we just move it from a city to Durand?

One suggestion I gave the commissioner is to allow stations like ours, the Class D stations, the ability to find a full-time FM frequency. If my engineer can find an FM frequency that has similar coverage to what we have during the daytime, we should be allowed to apply for it and move to that frequency — with no waiting for an auction. However, three months after our license to cover is received, the FCC will delete the AM signal from the table of assignments, and we *must* return the license.

Since we would now be a standalone

FM, under current law, we shouldn't be allowed to move it to a metro area. With us leaving the AM band, that should give the opportunity for the station in St. Louis or Mankato, Minn., or Beaver Dam, Wis., to increase their power day and night. So everyone wins, and it will be *much easier* for our station to get financing for this compared to financing for AM IBOC!

CITIZENS BACK WRDN(AM)

Commissioner Ajit Pai says Winnekins gave him several suggestions for helping AM, as well as 10 letters from citizens of Durand, thanking the Winnekins for bringing back the station in 2012; the station had been silent for five years. The documents include letters from the local fire department, churches and the local school district. In one, a private citizen signs off by apologizing for a handwritten note, saying "computer is broken."

Prime Realty Owner Robert Pelke writes: "Before Karla and Brian put WRDN back on the air I had not listened to AM radio for years! Please help our station and other stations like it by allowing this very affordable way to allow the smaller station owners and their communities a chance to succeed with decent night time service."

"Having a local station with local owners, makes emergency situations or severe weather made known to people at any time," writes James Sedlmayr, a firefighter and treasurer of the Durand Fire Department. "But at night it can be hard to get information out because AM radio stations have to turn down their power at night. A simple and cost-effective solution is to allow the AM radio stations to keep operating at full-power 24 hours a day, 7 days a week."

Several of the letters note that WRDN has helped local residents who were elderly or physically impaired stay informed about what's going on in their town, such as church services and weather updates.

Pai has been pushing the commission to pay attention to the senior band and figure out ways to help AM station owners. He says the letters had a strong impact on him and help illustrate why the commission should start an initiative to help AM. He said in a statement, "In places like Durand, a local radio station is an important way — sometimes one of the only ways — for folks to feel like they really are a part of the community."

— Leslie Stimson

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LOCKWOOD

(continued from page 1)

I was buzzing down there yesterday because they're getting ready to finally start spinning the turbines and discovered that they had instrumentation that wasn't performing the way they thought it ought to. So I went down and performed what Benjamin [Dawson, the company president] calls "consoling engineering." We patted them on the head and said "We can fix this," and we showed them the way to solve these problems.

RW: Broadcasters have pulled back from station facility projects during the recession.

Lockwood: I think broadcast has probably been traditionally 60 or 70 percent of our practice. One of things that Benjamin has done over the years is diversify this practice. We have two of our engineers who do nothing but public safety land mobile systems. That diversification has helped us survive the recent unpleasantness. ... We do land mobile engineering

The U.S. government repurposed this site in Pul-e-Charkhi, Afghanistan, in 2003 for the International Broadcasting Bureau and Afghanistan Ministry of Communications; it had been a Radio Moscow site and was first built in 1984. The joint venture of duTreil Lundin & Rackley and Hatfield & Dawson designed the feed system for operating two Harris 400 kW transmitters into the Soviet antennas. Lockwood is shown with a Gurhka guard.



for public safety systems large and small, as well as for transit agencies, busses and trains. We also do engineering for difficult and complex SCADA systems for utilities. We are also very experienced in in-building radio system design, ranging from jails to the NPR parking garage.

We always seem to have some international work we're usually doing with the joint venture with Ron Rackley and Ben. [A joint venture formed by duTreil, Lundin & Rackley and Hatfield & Dawson conducts engineering work for the U.S. government's International Broadcasting Bureau. Since its inception, the Joint Venture has worked on high-power antenna systems that operate on LF (30-300 kHz), MW (300-3,000 kHz), and HF (3 MHz -30 MHz), not only for the U.S. government but for other governments and other providers of high-power radio services worldwide.]

WINNEKINS

(continued from page 5)

manufacturers allow that 15 kHz to be received. I remember when AM radio still sounded pretty good on my home Pioneer stereo system, and I would listen to WDUZ in Green Bay or driving to school and listening to animal stories on WLS on the tube radio that was in my 1961 Oldsmobile 88.

Finally the commissioner and I talked about what I believe is the easiest thing he could do to help stations like ours. I proposed that the FCC conduct a nighttime power test from Sept. 1 through March 31. The commission would allow all Class D and Class Bs that have to lower their power at night, or stations that go off-air at night, the ability to keep their power at 2,500 watts or their regular daytime power, whichever is less during the night.

Why Sept. 1-March 31? That is the primary time for stations across America to have the chance to cover their local high school sports teams. If owners know about the test in advance, it would give them a chance to sell this local programming and maybe make some money! It doesn't cost anything extra in new equipment and there are no licensing fees.

I know right now there are engineers shaking their heads, thinking this guy knows nothing of AM propagation. You're right. I don't know anything about that; but why is it that right now, there are stations across the country staying at high power (we all know that goes on) and it has not caused the end of the world. I'm betting most of the stations that are "protected" haven't been adversely affected or even know that a co-station is running at high power. Yes, I know there

When we do work offshore, especially if it's in the medium-wave area, we typically do that as a joint venture so we almost always have some project in the Middle East where somebody's putting in a couple hundred-kilowatt transmitters or designing antenna systems. Those odd projects have really helped us survive. But the nice thing is the phone's ringing again on the broadcast side. We're starting to see some additional work there.

RW: In our March 27 issue, Ron Rackley and Ben Dawson made several technical suggestions to the FCC to fix AM; and the question of AM's future is in prominent industry debate. What should the commission do? Should it eliminate minimum antenna requirements or city of license coverage requirements, for example?

Lockwood: All of these suggestions that Ron and Ben had, those are things that we've been talking about here for years. There are many rules that the AM service is saddled with that go back to previous models of broadcasting where we were still trying to protect the Class A stations. I love the Class A stations, they're wonderful history. And it's really cool to have a radio station that covers five states at night. ...

But the protection of that nighttime contour on adjacent channels ... and you look at minimum efficiency and these kinds of rules that came up through the

(continued on page 8)

are formulas that prove how AM goes farther at night, but do those formulas take into account all of the new manmade interference? I haven't seen any that do.

I believe that with the higher power, we won't hurt other stations in their primary city of license, while we would be able to give decent service to our primary city of license. Yes, in the station's fringe areas there will be issues, but I believe that is the only place where that would happen.

If we can't do this nationwide, at least let stations in the same region on the same frequency work it out. For example, Durand, Wis., St. Louis, Mankato, Minn., and Beaver Dam, Wis., would agree to try this and see what happens, or allow us to stay at the higher power until 10 p.m. local time. I also understand the international implications, but there is no way to renegotiate this at all? Let's at least try *something!*

Finally, I want to publicly thank Commissioner Pai for taking the time to meet with me. It was a pleasure that a high-ranking FCC official would be willing to spend 40 minutes with a small AM broadcaster from Durand, Wis., population 1,931 and be concerned about our station and the thousands of AM stations across the country, big or small.

After our meeting, I met with members of the Wisconsin and Minnesota congressional delegations asking them to give Commissioner Pai the political support he needs to help make changes to the AM band. It has been a very long time since we have had a commissioner take a radio issue under his wing, and I encourage every station owner to contact their congressional leaders and tell them to give Commissioner Pai their support.

Brian Winnekins is co-owner, WRDN(AM), Durand, Wis. Reach him via email to brian@realcountry1430.com.



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LOCKWOOD

(continued from page 6)

years, were really efforts to try to protect the Class A stations and they were also, more about the restraint of trade during those times than any good engineering practices. They were just trying to keep the other broadcasters out and to keep the value of the existing facilities as high as they possibly [could]. With that said, I think that looking at all of these rules, there's probably a few others we can add, but probably not as important as the ones that Ron and Ben settled on. ...

You look at these rules and loosening them up and giving some flexibility, I think that gives the owners some ability to make some facility improvements and increase their coverage where that makes sense to them but puts them more in control of their license. And it puts them in a situation where they can make decisions based on financial and engineering considerations and coverage considerations versus historical political reasons.

RW: Do you have any hope anything's going to change?

Lockwood: I'm cautiously optimistic. Many of these rules, I think, 10 years ago if you had wanted to change these rules there were certain [radio] group owners that were still trying to hang onto some

of these things to protect their assets, or felt that they protected their assets.

RW: What about analog AM, should it be sunsetted in favor of a digital sunrise?

Lockwood: In general terms, I like that concept, but I look at all of the proposals out there...when I first saw that Channel 5 and 6 discussion I thought it was a neat idea if the world was a perfect world, that'd be great. But once again with those kind of changes, that wholesale change, there's a real problem because it's the haves vs. the have-nots. ...

The political side of who gets and who doesn't get is, in my view, the biggest part of the problem. I don't know how we get through that side of it and keep most everyone happy.

RW: You mentioned diversification. Are you involved in cases where a radio station leases tower space to a wireless company?

Lockwood: We've done a lot of that kind of work at all power levels and helped folks through that process. Sometimes it makes sense. Sometimes it doesn't. One of the things that we have come to appreciate is that it can be done, it just needs to have some thoughtful engineering approach to it. It is often so out of the box for the cellular companies and the types of firms that they hire to



Lockwood makes RF exposure measurements at the IBB shortwave site at Lampertheim, Germany, an old Radio Free Europe/Radio Liberty site built in the early 1960s and designed by Kershner & Wright.

do the rigging and installation work that a lot of those folks make mistakes along the way, so it takes a lot of handholding. But once you're through that process, it can write a nice check [for the station], and continually write that check. It makes quite a difference to some of the facilities that we've helped through that process, where, essentially they've got enough money coming in off the rental to pay for half of an engineer.

RW: What does the firm do on the public safety and mobile side?

Lockwood: [W]e have work from the cellular companies. Often there'll be interference disputes between parties and we will go help mitigate those and/or even determine if any of it's real. We've helped landlords negotiate leases.

In the Pacific Northwest, we have the 100 percent employment program for consulting engineers, and that is, a lot of jurisdictions require a PE stamp on an RF exposure study for a cell site, which is one of those things that we continue to do.

RW: What about instances where the station has signed the contract, and the engineer walks into the transmitter site later to find the cell people have created a mess. Do you have clients who run into that?

Lockwood: Oh yes, and it's interesting from company to company. The cell companies have gotten so that the companies themselves really have no employees, and they're all contractors of contractors. There's no continuity in their site installation or their maintenance.

One of the things we found particularly funny is with AM towers, you have a cell company that will issue an edict and they say "On all of our sites we will have these particular features."

A few years ago one of the cell companies in Alaska had problems with ice falling off the tower and damaging the transmission lines, so they said, "All of

our sites will have ice bridges cover the site." They did that at the AM site of one of our Alaska clients. They went and got time with the owner, turned the AM stations off and went and installed their ice bridge and grounded out the tower.

RW: You said things were beginning to turn around on the broadcast side. It sounds like stations are spending money on engineering projects again. Are they building new or upgrading? What are some typical AM and FM projects you're doing lately?

Lockwood: The biggest projects that we have going on right now have been sort of bubbling along for awhile. They're situations where facilities have been on an STA and/or there's some sort of move or something like that that has been going along and they've just not been funded. Now that things are loosening up a bit we're getting "go's" on a number of those projects. But they all are projects that 10 years ago would have been done instantly because of the concern about compliance with regulations and getting off STAs and things like that, depending on the owner, of course.

On the FM side we're starting to see some movement, some places that have had construction permits loafing along for awhile. People have tried to keep them alive but they didn't want to spend any money on them. We're finally seeing some of those either bought or sold and then implemented. In multiple user sites, that usually requires someone else to move, so there's some system integration issues that need to be taken care of. We've probably got half a dozen of those happening right now.

RW: What about HD Radio on the FM side. Are people implementing the power increase?

Lockwood: We have some. I think the [FMs] that were able to do that by walk-

(continued on page 10)

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HIGH CAPACITY EVENT STUDIO TRANSMITTER LINKS



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Moseley EVENT STL/TSL systems provide up to 155 Mbps combined IP, T1/E1 payloads. Multi-station clusters can convey multiple linear uncompressed audio pairs for a truly cost-effective STL/TSL link. Connect your existing T1/IP audio hardware directly into the EVENT system, or use Moseley Rincon for your audio payloads. An optional DVB-ASI module is available for full duplex video.

EVENT systems are fully bi-directional including a Software Defined Indoor Unit (SDIDU) and Outdoor Unit (ODU), eliminating the need for costly waveguide hardware. The ODU is available in the license free 5.8 GHz band, or licensed 11, 18, or 23 GHz bands. Appropriate external antennas are selected based on path length.



INTELLIGENT SYSTEM DESIGN

Spectrum-scalable digital radios with user-selectable data rates enable broadcasters to have greater flexibility in STL planning and future growth. The integrated T1/E1 and Ethernet interfaces allow for a combination of T1/E1 and IP packet data.



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LOCKWOOD

(continued from page 8)

ing over and getting their little green screwdriver out and cranking things up did that right away. We had a few folks, and still do, that are contemplating it but that requires capital expenses. ...

On the AM side, which is where I've spent more time on it, I think that there are a lot of folks who went through the process of installation and have shut it down. My observation of the AM side is I don't think it really got a fair shake. I say this from looking at all of the things that needed to be done to the AM antennas that we had talked about at a number of NABs over the years, we noticed even at several high-profile stations, that these things were not done.

RW: Meaning the antennas weren't optimized for HD because they didn't have the money?

Lockwood: It's either they didn't have money or they didn't understand the process. ... These are some high-profile cases where I went and visited the facilities on other business and looked at what the transmitter was seeing and it was not optimized for AM and not really optimized for the transmitter.

Back with our experience with the CPB grant for the conversion of the AM projects, there were a number of those

that got their grant and went and did it and just kind of laughed off the antenna side of it. If you don't take care of the antenna side on AM, it just doesn't work. We've watched people spend tens of thousands of dollars on the HD conversion and then get to the antenna system, and throw their hands up in the air and not do anything about it.

RW: What does the audio sound like when that happens?

Lockwood: You get digital in your analog and you get analog in your digital. So you

2 millivolts or something like that. The problem is, you've put in a system but you haven't optimized it and if you don't take care of that antenna component, it just doesn't work.

RW: Are you doing more AM or FM projects right now?

Lockwood: I typically do more AM projects and I get the weird projects, which I like. We do work for all sorts of governments all over the world. We've had modeling projects for foreign governments on Navy-type installations.

Often there'll be interference disputes between parties and we will go help mitigate those and/or even determine if any of it's real.

hear the bacon frying in the background. That's where the digital's getting in the analog. You can hear the bacon frying in the background, the hissing, the noise ...

RW: From the host station, right?

Lockwood: Yes, it's interfering with the host station. And the other side of it is, if the analog gets in the digital, the signal doesn't go as far. The digital signal is not decodable all the way out to

We've had situations where wind farms have come in near AM stations so we've done a little modeling on those. A couple times a year we seem to have projects that involve power companies putting new transmission lines near AM stations. We've worked on all sides of that. Often it seems the last few years we've ended up working for the utilities to help them through the process and then work with the broadcaster and

make sure that they understand that the utility understands the problem and this is what they're going to do to solve it.

RW: To make sure the utility doesn't interfere with the AM station?

Lockwood: Right. It's another one of those situations where, like cell towers near a facility, if you build additional structures that are somewhat similar to the height of the AM towers nearby, it can really distort their pattern and problems can occur. Thoughtful engineering needs to accompany those kinds of installations.

RW: How did you get into radio engineering?

Lockwood: I come from a line of engineers, my grandfathers and father were all engineers. My father was a mechanical engineer and he was interested in radio. Both my grandfathers were mechanical engineers as well. When I was in junior high I had a neighbor who was also a teacher at my junior high who was a radio engineer and taught history and electronics. His name was Dr. Tom Gruis. As members of the radio club, he gave us lots of tours of radio facilities around Des Moines, Iowa. I got my Third Class license fairly early. My first Class license I got just after I got out of high school.

Comment on this or any story. Email radioworld@nbmedia.com.

NEWSROUNDUP

WHEELER: The Senate Commerce Committee approved Tom Wheeler, President Obama's choice as FCC chairman, and sent his nomination to the full Senate. Wheeler, a venture capitalist, was an Obama fundraiser and was chief of the National Cable & Telecommunications Association from 1979 to 1984, and head of the Cellular Telecommunications & Internet Association from 1992 to 2003. Senate Republicans wanted to wait to pair Wheeler's nomination with a Republican nominee to fill the slot filled by former Commissioner Robert McDowell, however Wheeler's nomination passed by voice vote. When the Senate would vote on the nomination was unclear at press time. Lawmakers are on their August break. That means further action on the FCC nominations will need to wait until fall, leaving Acting Chairwoman Mignon Clyburn in place.

FM TRANSLATORS: The FCC has opened a filing window for certain FM translator applications pending from Auction 83. The window is for some 1,200 "Tech Box" proposals that don't compete with any other such applications that remain pending from 2003. Applicants have until Aug. 30 to submit Form 349 electronically. The action is another step as the commission clears the decks to prepare to open a filing window for new LPFM applications in October.

FCC: The House Energy & Commerce Committee approved a bill to streamline the FCC's processes. The measure would consolidate what are now eight

separate reports the commission must prepare annually for Congress into one. The legislation also eliminates four outdated reports, including one on the status of competition in the telegraph industry. The committee approved an amendment that allows a newly sworn-in chairman extra time to complete the portion of the report on the chairman's agenda.

AUTO: Advertising consultancy Borrell Associates predicts a 15.9 percent drop in advertising on radio from automakers in 2013 compared to the prior year. The company says that's part of the migration of ad dollars to digital and away from traditional media in its latest automotive advertising outlook. Within five years, digital annual spending by auto dealers and manufacturers will go from \$2 billion to more than \$9 billion — "most certainly at the expense of local radio and TV," writes principal report author Kip Cassino, executive vice president of Borrell Associates.

PIONEER APPRADIO; Pioneer Electronics says 16 more Android-based smartphones are compatible with AppRadio Mode in-dash receivers, including models from Samsung, HTC, Motorola and Sony. That means Android users can access music, apps and information from their phone via the display of their Pioneer receiver. Pioneer debuted the AppRadio 3 in-dash technology platform in May with iPhone 5 compatibility. AppRadio turns a car into a "connected" vehicle and includes MirrorLink compatibility, Siri Eyes Free and Google Voice Rec-



Pioneer AppRadio 3

ognition and Bluetooth hands-free calling, audio streaming and wireless control of compatible devices, according to the consumer electronics manufacturer.

The company

posted a list of compatible smartphone models at pioneerelectronics.com/android.

SPONSOR ID: Townsquare Media is paying the equivalent of a \$15,000 fine to settle a dispute with the FCC over cigarette advertising. The licensee of KLAQ(FM) and sister station KROD(AM), El Paso, Texas inherited the problem from previous station owner Regent Broadcasting. The FCC alleged that the stations dropped the word "Cigarette" in 2010 from an ad sponsor called "The Cigarette Outlet" to get around the federal ban on cigarette advertising on radio and TV. Regent argued it wasn't necessary to include the full name because the ads included the Outlet's address, directions and phone number. To settle the dispute both sides signed a consent decree. Townsquare Media pays a "voluntary contribution" to the U.S. Treasury, admits no wrongdoing and creates a process at the El Paso cluster to ensure all future spots meet the sponsorship identification rules. In exchange, the FCC stops the investigation.

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World Radio History

SUMMER of PRODUCTS

We conclude our Summer of Products series with more new gear introductions from radio broadcast equipment manufacturers. Don't forget your flip-flops!

AXEL RELEASES FALCON 3I

Italy's broadcast equipment manufacturer Axel Technology offers the Falcon 3i entry-level FM digital audio processor.



Based on dedicated DSP technology with four-band architecture for the audio processing, the Falcon 3i has a dual-band AGC, a speech detector, a three-band equalizer for low-middle-high frequencies and a brilliance control. Besides processing, it offers a stereo generator and an RDS encoder.

The internal RDS encoder provides two data sets, each with a range of services including static programmable PS 60 messages and 16 RadioText messages, Alternative Frequency (AF), Traffic Program (TP)/Traffic Announcement (TA) and functions such as EON, M/S, DI, CT, PI, PTY and PIN.

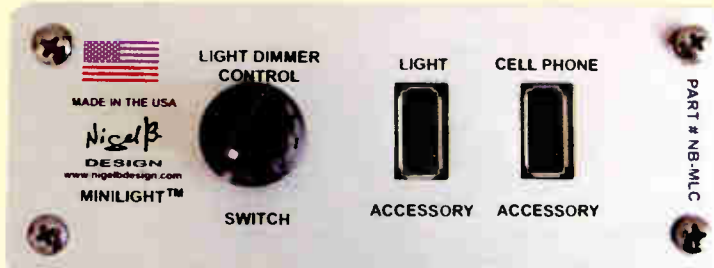
It can be controlled remotely via Windows-based client software and receive commands by Ethernet TCP/IP, USB, RS-232 port and four GPI/Os. An internal stereo generator guarantees the accurate modulation levels, in respect of the deviation limits acknowledged by worldwide standards.

INFO: www.axeltechnology.com

NIGEL B DESIGN DELIVERS USB POWER

While it doesn't scream "broadcast," there's no denying that the Nigel B Design's Minilight Flush Mount is a nifty little widget.

The Minilight Flush Mount is a countertop/tabletop utility panel with a pair of USB ports and a dimmer pot for one of the USB connectors. It is designed to be installed on a desktop/countertop or wall.



The USB ports are power-over-USB ports. One is designed for recharging cellphones and one for powering lights. Both ports will accept USB-powered accessories such as a fan or a vacuum cleaner.

Nigel B Designs says the cellphone port delivers 80 percent more power than a standard computer-based USB port, so recharging times should be lower. Power is 8–15 VDC, so it is compatible with most 12 VDC-powered items. The unit is powered by a wall wart.

Nigel B Designs sells a number of compatible accessories.

INFO: www.nigelbdesign.com

SINE CONTROL TECHNOLOGY UNVEILS SERIES 10

There is a new, more powerful PowerClamp transient voltage surge suppressor from Sine Control Technology, the Series 10.



The latest series provides protection against power line surges and spikes. Rated at 200,000 surge-amps, the company says that the unit will absorb the extreme transients that would cause serious damage to transmitting and studio equipment.

The company also says that the PowerClamp TVSS units are maintenance-free, and do not degrade even after thousands of "hits."

The Series 10 has a 1–2 nanosecond response time and meets ANSI/IEEE C62-411980 and UL-1449 specs. It has a parallel wire-in design and is a passive, voltage reactive system.

INFO: www.sinecontrol.com

NEW COMMENTATOR UNIT FROM SONIFEX

The Sonifex CM-CU1 is a small, single-mic input mixer for remote duties, designed for small crews or single-operator operation. It's a smaller, single-operator version of the CM-CU21.

It has four input channels and four talkback outputs (and ganging controls). It also has multiple monitoring options. There are a rear-panel program/effects input and a front-panel line input. Other features include switchable 48V phantom power, a built-in limiter, test tone generator and on-air security lock, along with an LED bargraph.

All inputs and outputs are transformer-balanced. The whole package is housed in a metal case with Formica scribble strips.

INFO: www.sonifex.co.uk



The Perfect Translator.



bw broadcast

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AWARD WINNER



RBRX1 FM RE-BROADCAST RECEIVER

Sensitivity and selectivity like never before gives superior reception even at the toughest translator sites. Radio World's 'Cool Stuff' winner, the RBRX1 has set new standards for FM reception around the world. This box is the industry standard and for good reason.

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Radio 'Pick Hit' winning V2 FM Transmitters are packed with features to improve sound quality & reliability. Built in 4-band DSPX audio processing, Ethernet control and FSK IDer in every transmitter eliminates the need for any additional equipment.

Our customers think so too.

"Our receiver continues to perform exquisitely in a difficult translator application. It outperforms every other receiver we know!"

Ian Perry, USA

"A top of the line relay receiver for a translator in a congested signal area."

Robert Reymant

"Our RBRX1's are fantastic. We have some very difficult sites and these are the only receivers that pull in the signal and give a clean re-broadcast."

Juan Turner, Energy FM

Contact SCMS for more information

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TIME FOR ESE

Need some time? Equipment maker ESE has a new model timecode display, the ES-976.



The 976 uses large, seven-inch red LED digits for SMPTE/EBU time of the day, RS-232C ASCII Time Code or ESE's own Time Code. The unit automatically determines the format that it is being fed.

Time can be displayed as a 12-hour clock or 24-hour military-style clock. Time zone and NTP options are available. Amber, blue and green LED clocks are also available by request.

The wall-mountable box is made of aluminum, with a black textured coating.

INFO: www.es-web.com

ALLEN & HEATH'S NEXT XB-14

Mixer maker Allen & Heath says that it has made some improvements to its XB-14 tabletop mixer, drawing on broadcast user feedback.

The XB-14² has upgraded mic preamps, an audition bus, enhanced stereo channel configurations, flexible monitoring and a matte paint finish, according to the company.

In addition, the EQ for the built-in hybrid has been replaced with variable high/low-pass filter. The mixer is aimed at small and Internet-only radio stations.

INFO: www.allen-heath.com



IK MULTIMEDIA iKLIP IS A HELPING HAND FOR iPADS

IK Multimedia has developed the iKlip Stand for iPads and iPad minis.

The iKlip is made of thermo-plastic. It has a variable joint for angling the boom, and a ball joint for rotating the device holder anywhere between landscape and portrait orientations and adjusting the angle of viewing.

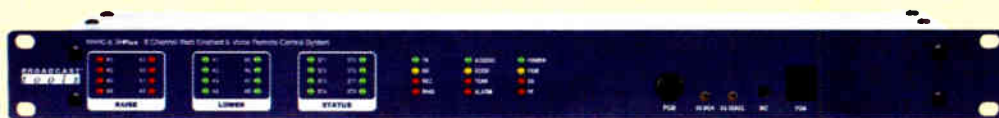
The iKlip stand has two bases — a horseshoe for desktop placement and a clamp for attachment to furniture edges or similar shapes. Comes in two sizes — iPad or iPad mini.

INFO: www.ikmultimedia.com



REMOTE MONITORING FROM BROADCAST TOOLS

Widget maker Broadcast Tools says that its WVRC-8 Plus provides a cost-effective, one rack-unit solution allowing dial-up recordable voice response and web-enabled control and monitoring via a web browser and/or smart phone.



It adds that the WVRC-8 Plus was designed from a user's point of view, so all of the basic functionality users need is included to control and monitor site equipment, while including the accessories other manufacturers consider optional. Furthermore, the WVRC-8 Plus may be programmed for dial-up operation via the Web interface.

The WVRC-8 Plus is supplied with spoken words and phrases in English, but the user is free to record words and phrases in their language.

Each analog, status, silence sensor, temperature sensor and power failure input can be configured to dial-out and/or email up to eight individual phone numbers and/or email addresses, allowing different input alarms to be routed to different call-out numbers and/or email recipients. Event-driven and time-based automatic command capabilities, allows 50 user-defined macros to enable the WVRC-8 Plus to make corrective actions; 100-event program scheduler for relay control, DST correction, macro actions and alarm muting. There is support for basic SMTP authentication as well as SNMP.

INFO: www.broadcasttools.com

INTERMODULATION ANALYSIS PROGRAM FROM V-SOFT

RF signal propagation and analysis software maker V-Soft has a new program designed to analyze intermodulation analysis of a selected geographic site.

Called, appropriately, InterMod, V-Soft says the program is designed to "perform detailed intermodulation analysis at a specific site. It also includes an advanced mapping study to identify possible intermodulation issues globally within a station's coverage area."

InterMod allows the user to enter any number of radio or TV transmitters for a given location. The program will access radio and TV databases. A geographical representation of the area will outline trouble areas in red. A frequency graph allows users to access information about the frequencies active in the area.

V-Soft has also announced that 2012 U.S. Census Estimate data is available for its AM-Pro2 AM signal coverage and interference and Probe 3 and Probe 4 RF propagation and interference analysis programs.

INFO: www.v-soft.com



DIGIGRAM OFFERS LATEST CANCUN

Digigram offers the latest in its Cancun line of digital audio soundcard/interfaces.

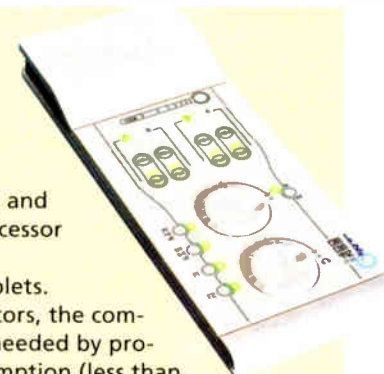
The Cancun 442-Mic (shown) is a high-end USB sound card for reporters and audio professionals. It has four mic preamps, analog and AES/EBU digital inputs and less than 4 mS latency. A dual-core processor keeps things moving.

Digigram's Q-Mic is a petite mic preamp for smartphones and tablets. Housed in a light and ruggedized casing with professional connectors, the company says, it provides the low noise and high gain (up to +24 dB) needed by professional dynamic microphones. It has extremely low power consumption (less than 500 µA) enables long recording sessions and uninterrupted on-air interviews.

The company also highlights its IQOYA family of codecs — including the IQOYA *Mobile iPhone app for remote audio over IP field contribution and the IQOYA *Call/LE, a versatile AoIP codec for professional IP audio contribution.

Also of interest to radiocasters are the PCX-IP and VX-IP Livewire sounds cards that enable broadcasters to interface with Livewire networks. And Digigram recently released AQORD and AQILIM video encoders and the AQORD *Link IP video encoder/decoder.

INFO: www.digigram.com



Bright idea.

All of our consoles have LED button lamps. They'll stay lit for — well, practically forever. Let's just say, your kids won't have to change bulbs, either.

Big Shot.

Your station super-sizes everything? No problem; iQ can scale from 8 to 24 faders. Handles even the most zany morning crew, talk show — or anything else you think up.

Control at your fingertips.

See these buttons? You can program them (or the button modules available for Element consoles) to perform routing salvos, system-wide scene changes and more. Because great power requires control.

Smarter phones.

Not only are hybrid controls built into iQ for direct-from-the-board control, the iQ6 phone system connects with just one Ethernet cable.

Network everywhere.

No need for cheesy A/V mixers — RAQ lets you put a networked, professional console anywhere, at a price that'll make the even stingiest GM smile.

Double your pleasure.

Did you know that one QOR.16 console engine will power 2 RAQ or DESQ mixing consoles? Makes your money go further on news bullpens, production pods, ingest stations, etc.

Step to the side.

Dirt and liquids: a console's most hated enemy. Element foils 'em with premium, side-loading conductive-plastic faders: dirt drops past, not in.

Who's da boss?

Clients rave about them, talent loves them: over 5,000 on the air makes Axia radio's favorite IP console.

Built to last... and last, and last.

Element modules are machined aluminum with wear-resistant Lexan inserts for long life. We've even designed custom-molded guides to prevent tears around the fader slot. No "ouchies" here.

Unlimited vision.

Some console makers give you "switched meters" to save costs. iQ does away with that annoyance: high-rez OLED displays meter all 4 buses at once.

A low price shouldn't mean "cheap".

Other companies cut corners on their low-cost consoles. Axia packs in as much as possible. Real conductive-plastic faders, machined-aluminum work surfaces, anodized rub-proof markings, aircraft-grade switches. At a price less than some analog "bargain" consoles.

Rack 'em up.

Turn your Radius 8-fader console into a rack-mount powerhouse. Great for OB vans, performance studios, concert remotes and more.

Good timing.

Unlike those other guys' small consoles, DESQ has an event timer and an NTP-capable clock — built-in, not extra-cost. Because time is money (pardon our pun!).

Small but mighty.

DESQ packs big console power into just 18" square. 6 faders, 2 buses, automatic mix-minus, Show Profiles and more. Perfect for standalone or networked studios.

Axia makes the switch.

No "plug-n-pray" unmanaged switches here; Axia builds our own custom zero-config, built-for-broadcast network switch right into our PowerStation and QOR console engines.

Show-off.

Element lets you store up to 99 Show Profiles — "snapshots" that recall channel sources, bus assignments, EQ settings, even fader positions. So every jock can have their own customized console.

Speak your mind.

Element consoles have comprehensive talkback features. You can talk directly to remote codecs, phone callers, adjacent studios... even individual talent's headphone feeds. Even our most cost-effective boards let you talkback to callers and codecs.

Handsome devil.

Our meters aren't just good-looking; they're designed specifically to convey the most information possible at just a glance. And Axia consoles support VU and PPM metering styles — something you might not find on consoles that cost a lot more.

Big power, small price.

Radius loads you up with 8 faders, 4 mix buses, automatic mix-minus, onboard EQ and voice dynamics and more — for just \$5990 USD. Shh... don't tell the accountants.

CHOOSING AXIA FOR YOUR NEXT CONSOLE IS EASY. SELECTING ONE MIGHT TAKE AWHILE.

When we introduced AoIP to radio in 2003, some folks thought we were off our nut. Today though, broadcasters agree: picking Axia is the right choice. With over 5,000 on air daily, broadcasters have voted Axia the world's most popular networked console.

Who can blame them? Axia fans say that Livewire™ networking is the most intelligent, flexible IP-Audio system in the industry. And that our huge number of partners, with over 75 broadcast products from phones to transmitters that connect to Axia networks,

makes life much simpler. They also appreciate our 5-year warranty and 24/7 technical support (not that they need it).

In fact, we calculate that thanks to our huge selection of frame, module and mixing engines, there are at least 32,209,982 different ways to order an Axia console. With that many options, you'd better get started now! Mmm... don't you just love that new-console smell?

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Radio World Profiles Portland's Seven Station Move

Huge WheatNet-IP system makes it an exceptionally smooth move

Radio World magazine's story about Clear Channel in Portland, Oregon who moved seven stations under one roof. They're under one network, too - WheatNet-IP! Quite an undertaking, this was an exciting project for us.

Get the whole story here:
RWPORTLAND.wheatstone.com



VP-8 Gets an IP Boost

Wheatstone's most popular processor just got what it takes to be a little more popular. Meet VP-8IP!



The VP-8 has become our top selling processor and with good reason. It's incredibly powerful, has a library of universally lauded great-sounding presets (with some new tweaks for the VP-8IP) and is priced exactly where you'd want it to be. And now, it's got something else - native support for WheatNet-IP. Which means it's easier than ever to deploy and control these from any place in your facility.

Get the whole story here:
VP-8IP.wheatstone.com

one way or another, you're gonna need help recovering after your first encounter with our **LX-24...**



...yep, THAT good...



gotta have it!



THE INTELLIGENT NETWORK

Minneapolis Station First To Air With All-Digital Chain Using Wheatstone® baseband192 Technology



A Minneapolis station became the first to broadcast with an all-digital air chain using Wheatstone® baseband192 technology, marking an historical event in radio transmission.

Northern Lights' KTWN-FM (96.3) went on the air with Wheatstone's new AirAura X3 audio processor Thursday, clearing the last obstacle to a 100% digital air chain by using the processor's new baseband192 interface.

Wheatstone baseband192 is an open standard technology that eliminates the need for an analog composite interface between processing and transmission. Offering AES-EBU output into FM transmitters now equipped with a digital baseband input, the baseband192 interface is available as a standard feature in Wheatstone AirAura X3, FM-531HD and VP-8IP audio processors.

Get the whole story here: BASEBAND192.wheatstone.com



Wheatstone Central to CKUA's Epic Move

For the CKUA project, we set up our WheatNet-IP AoIP networking around a central production studio surrounded by control rooms, voice booths and newsrooms that share I/O and line-of-sight between them. Kris Rodts, Director of Engineering, IT, and Facilities for CKUA, gives all the details in the cover story of the June issue of Radio magazine. You can download a reprint below, courtesy of Radio.

Get the whole story here: CKUA.wheatstone.com



8 Things You Need to Know About IP Consoles

There's just something about that subtle "click" of the controls and the way those Penny & Giles glide up and down. Are we right? Yeah, we've been known to cop a feel every now and then, too, and we make them — hundreds of Wheatstone and Audioarts consoles every year. There's actually some pretty cool stuff we've discovered... Get the whole story here: 8THINGS.wheatstone.com

Winner's Circle

Wheatstone's goal is to give you the best possible tool set to become the best possible station in your market. WheatNet-IP represents an incredible leap forward in AoIP technology and is truly the next generation. More people are hopping on this platform every day and it's making a world of difference in their operations.



Higher Education Chooses Higher Quality Broadcast Equipment

What colleges are looking for when building or updating their studios

Get a look at what is governing the decision making process when it comes to designing modern college broadcast facilities and why Wheatstone is a perfect fit.

Get the whole story here: COLLEGE-BROADCAST.wheatstone.com



A Pair of Hands in an Old Pill Bottle

Also in Workbench: How to best recycle collected junk

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

Chuck Lakaytis of Lakaytis Broadcast Service told me about a favorite adaptor that lives in a pill bottle.

Chuck learned this tip from a seasoned AT&T engineer who happened to visit while Chuck was trying to rack-mount some heavy equipment. In the shop, the engineer grabbed a couple of 2-1/2-inch-long rack screws and, using a hacksaw, cut off the heads. He then cut a slot in the end of each rack screw, deep enough for a straight-blade screwdriver to fit. This left him with a pair of headless rack screws that can serve as a temporary mount for heavy equipment.

Here's how it works: After you "locate" the equipment in the rack and note where the top two permanent rack screws will go, insert your "adaptor" screws into those holes. Then lift the equipment and hang it on the headless rack screws while you secure the bottom with regular rack screws. Then remove your temporary top screws and replace them with regular rack screws.

To remove equipment, just do the reverse. Take out the regular rack screws from the two top holes and insert the headless screws; then remove the bottom screws. The equipment will "hang"

on the temporary top screws until you remove it.

This extra set of hands makes racking equipment easier; you won't need a second person to do the job. Store these little gems in a pill bottle so they'll always be handy. Thanks, Chuck, for sharing an ingenious idea.

Reach Chuck Lakaytis at chuck-lakaytis4@gmail.com.

Repairing several classic Orban 4008 FM processors, frequent contributor Charles S. "Buc" Fitch identified a functional equivalent for the original and unidentified switch used in the "pilot on-off" and "operate-test" positions.

It's C&K Part Number F2UEE, which is DigiKey part 401-1223. The matching push button cap in "red" is C&K Part Number F0203, which is DigiKey 401-1218 (www.digikey.com).

Buc Fitch can be reached at fitchpe@comcast.net.

Belden's Steve Lampen drew my attention to the simple circuit in my July 3 column (to adapt a balanced line microphone for iPhones). The one major problem Steve finds with the circuit is that it unbalances the mic. If there is any significant length of cable between the mic and the iPhone, this could be a major source of noise and interfer-



The PA911 (below) and PA912 (above), part of the ETS PA-910 series, can be used as an iPhone adapter.



Courtesy Energy Transformation Systems

ence (EMI and RFI). The solution is to maintain a balanced line, which will reject noise.

One way to avoid this problem is to buy the iPhone adaptor from ETS (Energy Transformation Systems) in

Fremont, Calif. (www.etslan.com). It's part of their PA-910 series but contains the four-conductor plug mentioned in the column.

Inside the XLR is an actual balanced line transformer. This means that the mic and any cable between the mic and the adaptor are balanced. The transformer blocks DC, so you don't need a blocking capacitor, and the resistance of the winding of the transformer is more than enough to load the iPhone input, so you don't need the resistor either, when you use this adaptor.

Also in that column was a discussion about wires running in conduit. Steve points out those NEC guidelines suggest a maximum conduit fill of 40 percent. This permits cables to be added or removed, and makes the original bundle easier to pull. Did you know that the maximum fill inside a conduit is 40 percent? So how do you calculate the percentage of fill?

Belden offers a paper called "The Adventures of Conduit Phil," which takes you through the calculations. Download it by heading to radioworld.com/links.

Steve is the multimedia technology and product line manager (entertainment products) for Belden. Email him at steve.lampen@belden.com.

I have found that many engineers don't like to throw things away, and I admit to being a packrat to a point. But it would drive me crazy, as I made my way through contract stations years ago, to see engineers toss bad components in with the good ones. You'd have a drawer of parts, half of which were useless. This made a troubleshooting job that much more difficult, not knowing which part was good or bad.


Broadcast Engineer Paul Sagi has a solution: Turn the useless parts into refrigerator magnets.

Paul picks up tiny powerful magnets and a tube of super glue, attaching the magnet to the IC, or even several interesting components. It makes for some fun creations ... unless you mind seeing reminders of past repairs every time you open the refrigerator.

Paul Sagi can be reached at pk.sagi.92@gmail.com.

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

Author John Bisset has spent 44 years in the broadcasting industry and is still learning. He handles West Coast sales for the Telos Alliance. He is SBE Certified and is a past recipient of the SBE's Educator of the Year Award.



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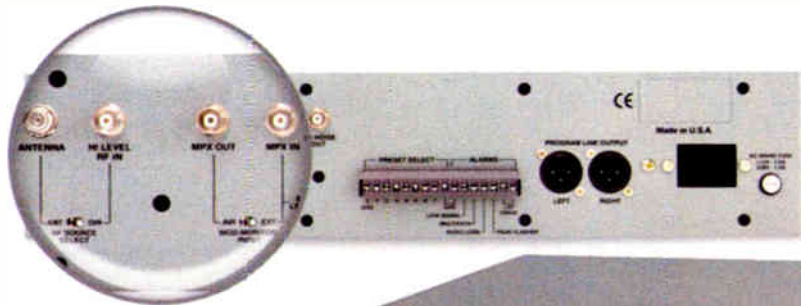


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Don't Just Paint It Pink

How radio marketing can tune women in, rather than out

BY ELIZA KRIGMAN

Out of the approximately 92 percent of all Americans ages 12 and up who are reached by radio each week, the Radio Advertising Bureau reports that more than 90 percent of women in nearly every age category are listening. Globally, women control roughly \$20 trillion in consumer spending and "drive the world economy," according to the Harvard Business Review 2009 article "The Female Economy."

Veterans of the radio industry and leading marketing professionals have a few pearls of wisdom to offer station managers and advertisers on the best ways to pursue female listeners. On the top of that list is being practical with the incentives used to lure women to promotional events, and with the information provided about a given product.

PRAGMATIC CONSUMERS

"Women would really appreciate prizes that help them save time," Marti Barletta, author of "Marketing to Women," told Radio World. "Instead of offering tickets to a conference, offer a promotion with Domino's for free pizza or a maid service."

The modern woman is busy and often needs a rationale to attend an event, Barletta argues. Another way of attracting women is to offer a learning component, she added.

"Women are a lot more pragmatic," said Kathy Sheehan, executive vice president of GfK Consumer Trends, a research and marketing firm headquartered in Nuremberg, Germany (Sheehan is based in New York). "When you talk about innovation, for women it's much more about 'show me how this solves a problem.' Men are more likely to see innovation for novelty alone; it's just the latest and greatest."

Corinne Baldassano, a programming and marketing executive at the "Dr. Laura Program," makes the case for using social media.

"I don't think a lot of radio stations



really understand the power of social media," said Baldassano. Facebook and Pinterest, in particular, are a great way to engage with women, she said. According to a recent study from PEW, women are five times more likely to be on Pinterest than men; women are also more likely to be on Facebook than men.

"Some stations have Facebook pages, but it's all promotional — 'We're doing this and that.' You have to connect with the audience more, particularly with women," Baldassano said. When promoting Dr. Laura's show on social media, she takes care to include clips and information with which users can interact.

Marketing effectively to women means making them "feel cool and relevant at any age," said Heidi Raphael, vice president of communications at Greater Media and a board member at the National Association of Broadcasters, in an email to Radio World. In order to do that, Raphael recommends holding informal focus groups to inform their campaign strategy.

Raphael helps lead the Mentoring and Inspiring Women in Radio Group, which is dedicated to the advancement of women's careers in radio.

Equally important to the practices radio and advertising executives *should* follow are the ones they shouldn't.

Don't try to get women's attention by "painting it pink," says Blaise Howard, general manager at WBEB(FM).

Trying to appeal to women by exploiting extreme gender stereotypes

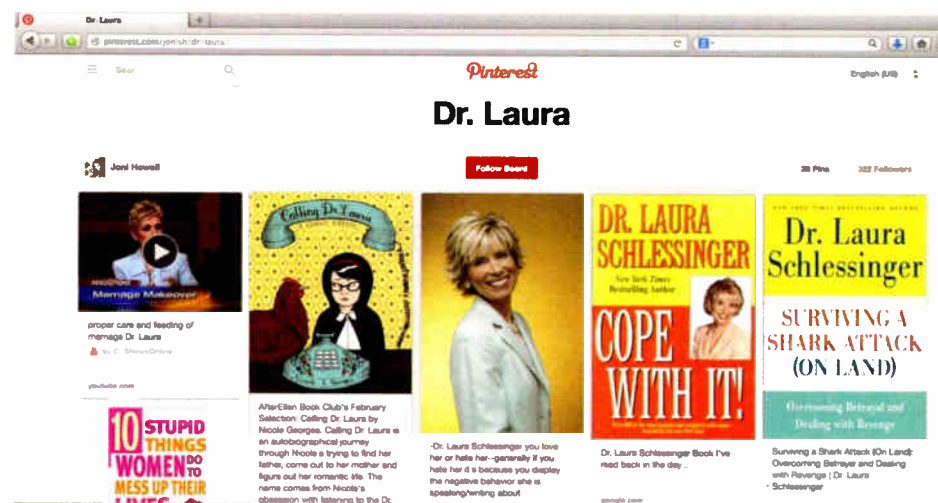
demographic with the savvy that they should, Barletta says.

Raising awareness and staying up-to-date on best practices is a way that radio executives and advertisers can ensure they are harnessing the airwaves to reach women. Howard has taken that to heart by creating a website singularly focused on advertising to women.

With the tag line "she earns, decides, and buys," the site acts as a clearinghouse for statistics on female purchasing power, organized by category of product, and also chronicles the latest news highlighting research in this space.

The awareness campaign, Howard says, has helped advertising clients do a better job.

One success story Howard points to is a foreign luxury SUV (he declined to name the brand) that advertised with the station and decided to lend one of its cars to one of WBEB's female disc jockeys for several months, recognizing that women buy the majority of new cars, according to She-conomy. They created a radio spot using her testimonials from the experience and subse-



This screenshot of Dr. Laura's Pinterest page demonstrates social media strategies that can be used to gain your target audience's attention.

is an obtuse technique that actually alienates more than it draws women in.

It's about time, too, Raphael argues, that the business move on from sexist gimmicks like booth babes, which remain a fixture at industry conferences.

"I will walk by a trade booth at a trade show — despite how good their product may be — if having booth babes are the only way they know how to promote their product or service," Raphael said.

'SHE DECIDES'

Despite the facts and growing understanding that women control the purse strings, not everyone markets to this

quently became one of the top sellers of that model in the region, according to Howard.

The annual Marketing to Women Conference (M2W) aims to help managers do as its name says; and the conference website, www.m2w.biz, is a resource for finding leading experts and relevant research.

When it comes down to it, Howard says, if you aren't talking to women, "you are missing an entire market. This is a growth opportunity."

Eliza Krigman is a freelance writer based in Washington. She has written for *Politico*, *National Journal*, *Los Angeles Times*, *The Atlantic* and *The Washington Post*.





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Put Ads in Their Proper Place

Plan topics and shows that will generate the most revenue

How do you know when you haven't created enough great assets for your sales department to monetize? When the general sales manager begins "suggesting" content for your radio station.

While there is a chance you'll receive a few plausible gems from the GSM, program directors are in charge of content for a reason.

To prevent a series of potentially uncomfortable conversations, it helps to review sponsored assets on a regular basis in order to determine if a GSM is satisfied that she has all the tools she needs to generate revenue.

Here's the special twist that is subtle and frequently overlooked by program directors: If a GSM doesn't believe she can sell a feature, a show or anything else on your air, then it will not be sold. It doesn't matter if said PD believes it's an amazing asset perfect for sales; it's the GSM who must have the perception that it can and will be sold for top dollar.

Let's do a quick inventory check of items to be sponsored:

MORNING SHOWS

Say what? Your high-profile morning show doesn't have a title sponsor? That doesn't make sense to me. The one

show you're going to promote the most — with lots of promotional announcements wherein you can add a mention for the sponsor — should be sold!

If you can't sell it for the year, sell it by the month. Twelve morning show sponsors may even make you more money than one annual sponsor. This asset is precious; don't even think about giving it away as "added value."

If you must have added value in the morning show, use the smaller features (and only when you can't sell them for

cash), like news, weather, sports, traffic reports and school closings.

FEATURES

What lifestyle short vignettes that your audience will love and your sponsors will appreciate can you record and air daily?

Topics to consider for nearly any station: Technology (think phone apps and the like), fashion, entertainment/concert listings, ski reports, fishing and tide reports, horoscopes, obits (don't shake your head; in small towns especially, these are huge), travel, crime reports, birthday wishes and so many more.

Too often, these sound great but are not aired with enough frequency. Give up on the belief that a listener has his radio on for three hours at a time, and embrace the fact that frequency on the air is a good thing for all parties concerned — the advertiser, the listeners and you.

STUDIO

Is there anyone out there who hasn't sold a studio to a sponsor yet? "Live from the Joe's Carpet Cleaning Studios, it's 97 Rock, Pound Ridge!"



At WSPL(AM) in Streator, Ill., the 'Morning Show With Colin McIntyre' is sponsored by Liberty Village of Streator and Metcalf Martin.

PROMO POWER



Mark Lapidus

CONTESTS

Every time you conduct a contest, it can be sponsored. Be careful of adding a tag line in there with the name. Typically, a lot of information is being communicated. Long copy doesn't work well with this element.

TIME

It may be old fashioned, but it takes a licking and keeps on delivering dollars: "The time is 8:20, brought to you by Joe's Jewelers."

No doubt during this sponsorship conversation, your discussion will naturally lead to which sales elements to affix to website, email, social media and SMS. We will address this topic in a "monetizing the Web" article next month; the basic platform being that your digital assets are not the place for added value.

Begin practicing this simple but powerful phrase: "Starting January 2014, we will stop giving away advertising of any kind, online or mobile. Instead, we will use these precious assets to generate money for our radio station."

Join me next month as we talk trash to generate cash. See you then.

Mark Lapidus is president of Lapidus Media. Reach him at marklapidus@verizon.net.

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MIC MUSEUM

(continued from page 1)

that date back to the late 1800s. Paquette began his impressive collection in 1950, but the 83-year-old didn't put it on display until 1970. Along the way, he also picked up some mic enclosures, transformers, preamps, test equipment, spec sheets and related paraphernalia. Other mic-related exhibits include patent applications, catalogs, broadcast periodicals, technical papers and a few transmitters for good measure.

The collection, arranged chronologically, resides in several rooms of Paquette's business, Select Sound Service in Milwaukee (find link at radioworld.com/links).

THE ACID TEST

Paquette has learned a thing or two over the years.

"One of the very early mics was called the 'liquid transmitter,' and it was made by the company later known as AT&T," says Paquette. "The thing you talked into was a long funnel on a little structure that sat on a base. There was a pin hanging down into a cup of acid and water and, when you spoke, it agitated the pin up and down. So that is what they used in the late 1800s."

According to Paquette, microphones became more practical between 1920 and 1930, as radio found its way into homes, increasing demand for a device to pick up and amplify human speech.

"At that time, there were about 80 companies that made microphones of one type or another," he said. "Everyone was building them in their basements,



Bob Paquette loves to talk about his mics. Behind him is a shelf full of microphones that once found their homes at radio stations. Note on the shelf just below his right hand is a set of NBC tone chimes, a four-chime model.

but of course a lot of these companies disappeared. The biggest early names were Shure, Turner, Electro-Voice, RCA and Western Electric."

In pictures of radio studios from the roaring '20s, one would likely see the "candlestick" microphone, which was based on the telephone model of the day. There was no "on" or "off" switch. When you hung up the receiver, the device was no longer broadcasting. When it was off the hook, the talent was

on the air. Only later was a "press-to-talk" feature added.

"All mics were of a carbon design at first," says Paquette. "Radio stations and the first recording studios used the same models, which were all omnidirectional. Then Western Electric came out with condenser mics, designed primarily for movie studios. The first dynamic mics were available for radio around 1931, and people liked them because they didn't need a power supply. You could

buy a little three-tube preamp and when the station had a remote broadcast, the engineer would run the audio through a mixer to a phone line to get the signal back to the station."

In the early 1900s, the general population was not familiar with the principles of electricity, other than what could be read about prisoners being electrocuted in various penitentiaries. Thus, when confronted with a microphone with a wire hanging off of it, the average

PRODUCTS & SERVICES SHOWCASE

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civilian might head for the hills. This perception would change with time.

A more serious problem lay in that the transmitting gear was fragile, and there was no such thing as compression on the mics. An over-enthusiastic announcer could yell into the mic, blow the tubes and kick the station off the air.

"By the Big Band era of the 1930s, stations used double-button carbon mics," says Paquette. "They were about two to three inches in diameter and an inch and a half from front to back. The pick-up was spring-loaded within the housing."

America joined World War II in 1941 and by that time, RCA ribbon mics were available. The physics involved a magnet coupled to a metal frame with a space in the middle for the ribbon to move, providing the modulation. Finally microphones could be bidirectional, which helped with noise cancellation. Instead of picking up audio on all sides of the microphone, these were more selective, allowing audio only from front and back.

One of the first widely used models was the RCA type 44. Later, that company developed the 77 series that culminated in the 77 DX multipattern model, still sought after today. The users of these treasures could select an omnidirectional, bidirectional (figure

eight) or unidirectional pattern.

By the 1960s, radio stations began diversifying their programming into more specialized formats such as middle-of-the-road, top 40, country and easy listening. It became evident that different formats might be enhanced with certain microphones. While the 77 D might be perfect for a soft-spoken announcer, a screaming DJ might need something more rugged, such as a dynamic mic. Electro-Voice made a very durable model, the 664, which was heavy and shaped like a thick cigar. The Shure SM5, nicknamed the "Fat Albert," was a cardioid design that could stand up to high voice levels, as could the SM7, a refinement on the earlier design.

Neumann was, and still is, a German company known for its high-quality condenser microphones. In 1949, it released the U 47, later supplanted by other models such as the U 87. "I have a pair of U 47s," said Paquette. "I was offered \$15,000 for them, but I'm not going to sell."

SETTING THE TONE

Looking around the museum, you can't miss the dozens of call letters crowning some mics, stamped or painted on others — WLW, WOR, WABC,

(continued on page 26)



Paquette with an unusual mic in his collection that sat in the studios of WLW(AM). A carbon microphone element sits atop a cylinder that has lights in it for 'PREPARE' and 'BROADCAST.'










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MIC MUSEUM

(continued from page 25)

WGN, WLS, WTMJ, KWRT, WNJR, WCLO, KYUM, WLDB, WISN, WPAY, WMAQ, KFZ, WRNY, etc. — and numerous iterations of the major radio broadcasters, NBC and CBS. That doesn't even count the number of loose flags and other station memorabilia such as a set of NBC tone chimes.

Paquette says, "You know, in the early days you could pick your call letters to suit the station. WLS stood for 'World's Largest Store' and WGN stood for 'World's Greatest Newspaper.' I have those mics, and even one from the Moody Bible Institute, which was WMBI. We also have a local mic here from WTMJ, which stood for 'The Milwaukee Journal.'"

Perhaps the queen of the collection is an enormous diva of a microphone apparatus from Powel Crosley's Cincinnati-based monster 500 kW station, WLW. In its prime, it could be heard across almost half of the 48 contiguous states. That microphone was one of the instruments bringing entertainment throughout dozens of states.

"I had put on a show in that area where I displayed a bunch of my mics. I met the people from the station and got a tour of WLW ... It's interesting, because that's only the top half of it. The whole thing is like a long cylinder."

He continues, "We have it on what they called a IA stand with a ring. It's a little mount with a Western Electric carbon mic, and then the call letters are on top."

He then points to two windows in the front, "Inside, there is an early on-the-air light. They'd tell the announcer to go out by the mic and prepare, and the bottom window would light up and say, 'PREPARE.' Then, when it was time, the upper window said 'BROADCAST.' Then he knew it was time to talk."



Here is a grouping of German-made microphones, including what is probably a very rare original Telefunken Ela M301 in the center. In order to provide some historical context, there is also a picture of Adolf Hitler speaking into a microphone, as well as the swastika symbol, used by the the Nazi Party. Various other contextual displays throughout the museum include pictures of FDR doing his "fireside chats," and of Dwight Eisenhower, among others, Paquette told Radio World.

So how did Paquette come across all of this history? "It just happened over 53 years of collecting," he replies, sheepishly. Much of it was just luck and being in the right place at the right time. "I put this collection together over 50 years of collecting," he says. "When I started, it was 1950 — radio stations were trashing a lot of mics from the early days because things were improving technologically."

As the collection grew, Paquette began to step up his acquisition methods. "I ran ads asking for pre-1940 mics. I'd also go to antique radio swap meets. I'd go to ham radiofests as well. In the

summers, I'd cover a 200-mile radius looking for mics. They were often found at rummage prices. Mics that are selling today for over \$1,000 could be had back then for \$25–\$30. The stations would keep buying new ones and I'd get the old ones when they were through with them."

He adds that he has traded and sold a few mics, but is in general trying to continue building the collection, rather than giving away or selling anything.

And what of the future of the Mic Museum?

"I have offered it for sale for \$1 million, but no takers yet. I have a company here, Select Sound Service, with about 12 family members working here and 40 employees in all. There's no one really interested in maintaining the collection. No one can give tours but me. But my sons want to keep the museum here because people come from all over the world to see it."

With such a collection, it's hard not to imagine that Hollywood hasn't come calling in need of historical accuracy. Turns out, yes, but Paquette has a cautionary tale.

"I had a lot of trouble with Woody Allen," he says. "I rented him 16 mics for a movie and he wouldn't return them. He wanted to buy them, but I didn't want to sell. I couldn't get them back, so eventually I had to sell them to him. It took me eight years to find replacements."

It's not all glory in the mic collecting biz.

HE WROTE THE BOOK

Using his accumulated knowledge, Paquette authored "The History & Evolution of the Microphone," a tome that weighs six pounds and comprises 840 pages in 8.5 by 11 inches format. There were just 500 copies printed, and it sells for \$100 plus \$10 shipping, available only through his company at www.sssmilwaukee.com. The first chapters detail the earliest efforts to convert acoustic energy into electrical energy, and the others guide the reader through various broadcast and non-broadcast uses of microphones and related equipment.

While this work covers primarily United States-manufactured products, important designs from international manufacturers are also included.

Paquette owns examples of all of the above-mentioned microphones and much more, all housed in his museum.

Other oddities one might see during the museum tour include a big horn-style speaker that was used behind the movie screen for the earliest "talkies." There are wire recorders, tape recorders, recording lathes and a full replica of the B-17 bomber radio room, circa World War II.

The Mic Museum is open to the public at no charge, but by appointment only. To schedule a tour in Milwaukee, call (414) 645-1672.

Ken Deutsch still carries a Neumann TLM 127 around the house so he can practice his "radio voice." His wife is not amused.

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1934 RCA 77A double ribbon microphone, originally used by Arthur Godfrey at WFBR Baltimore. 100% perfect condition. Contact Bill Cook, 719-684-6010.

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

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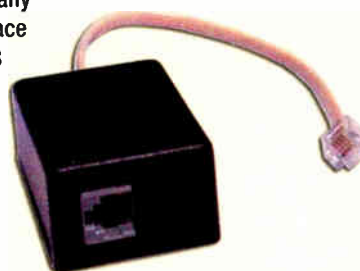
Delta electronics - OIB-3 operating impedance bridge with 18" leads including RG-4 receiver/generator 240V AC with battery, £5995.00, equipment is brand new supplied with a storm carry case. Item in the UK - Shipping at buyers cost. Email: claudia@incomtel.co.uk.

Radio broadcasts of Major League Baseball, NFL, and some college football games that are on cassette tapes, approx 100 to 125 games, time period of entire collection as

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Behringer FBQ3102 Ultragraph 31 band stereo EQ, \$75; Behringer PEQ2200 Parametric EQ, \$75; free shpg continental USA, both units like new, very little use. Ed Davison, 217-793-9980 or we9d@comcast.net.

Kintronics RFC40-20-2 contactor; Delta TCA20EX RF ammeter & TCT-1 current transformer & cable; Delta TCA-5EX RF ammeter & TCT-5 current transformer; Delta TCA-10EX RF ammeter & TCT-4 current transformer; Delta TCT-3 current transformer; Bird 3126 wattmeter, rack mount & 4802-

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WANT TO BUY

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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 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, KSF, KQBY, KCBS, KQW, KRE, KTIM, KYA, etc. I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

Looking for a broadcast excerpt of a San Francisco Giant's taped off of KSFO radio from 1959, interviews

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

Looking for KFRC signoff radio broadcast from 1930 Andy Potter, running time is 0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne Truax, Susanne Caygill, running time is 13:44. Ron, 925-284-5428 or email ronwtamm@yahoo.com.

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

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American Made SCA Decoders, 417-881-1846.

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Abacast Aims at the Bullseye

Cloud-based ad targeting is this company's business

COMMENTARY

BY JIM KOTT

Much has been written lately about cloud-based services and the benefits they are providing businesses and consumers. Abacast, a provider of online audio streaming and monetization services since 2001, has recently released its "cloud-based ad insertion" technology. Here is an overview of the technology and a few ideas about how it can benefit the radio industry as it continues to invest in digital delivery.

Cloud-based ad insertion enables live broadcasters to provide advertisers with different ways to target audiences, no matter what player or device those audiences are using to consume content.

Inventory CPM rates for targeted ads are typically 50-to-100 percent higher than non-targeted ads, and because advertisers are only reaching the audiences they desire, ad inventory tends to be much easier to sell.

With cloud-based ad insertion, a user listening to a live stream can receive a certain in-stream ad while a person listening to the same live stream — on a different device, in a different location or of a different age or gender — can receive a different ad, inserted right into the same live programming.

TARGETING OPTIONS

Common audience targeting options include audience geo-location, player or device, and any data that broadcasters collect about their audience such as age or gender or even favorite food. Examples of target audiences that can be reached include "all smartphone listeners," "all listeners in the top 20 DMAs that are on desktops," "all listeners in the Eastern US regardless of device," "all male listeners in the 25-34



Jim Kott

age range in a group of Zip codes," "all listeners listening on the TuneIn player," "listeners in the South who say they like ice cream" and of course many more.

HOW IT WORKS

With cloud insertion, in-stream ads are inserted on the server side right into the content and therefore sound like they are part of the broadcast. When the encoding of the ads matches the content, it's virtually impossible to tell a broadcast ad from an inserted online ad.

One key aspect of cloud-insertion is that it utilizes what is called "chunk-based delivery."

Chunk-based delivery converts video or audio streams into discrete files that are two-to-10 seconds in length and distributed using HTTP. The Internet is built to deliver content via HTTP on a massive scale. Apple's HTTP Live Streaming (HLS) and Adobe's HTTP Dynamic Streaming (HDS) are examples of chunk-based delivery implementations.

It's safe to say that all streaming will be moving to these "chunk-based" technologies, opening up new possi-

bilities for targeting, increased revenue, decreased costs and more partnership opportunities.

IMMEDIATE TARGETING WITH NO CLIENT TARGETING CODE

Even with the exploding number of new mobile and other connected devices — it feels like new gadgets come out every week — broadcasters can serve targeted audio or video ads to these audiences immediately. There is no lag time or development cost to create special targeting code for the new device. Rather, targeting is supported immediately through the player's built-in HLS or HDS support.

MORE REVENUE, LOWER COSTS

On the revenue side, because advertisers pay more to reach the audiences they want to reach, and because cloud-insertion provides the ability to target

When the encoding of the ads matches the content, it's virtually impossible to tell a broadcast ad from an inserted online ad.

discrete audiences, broadcasters will realize higher CPMs and thus more overall revenue.

On the cost side, because the content is distributed via standard HTTP, any Content Delivery Network works as a conduit. Broadcasters can shop for the best CDN based on price, reliability or other factors. Currently Abacast's cloud-insertion is used on three different CDNs — Abacast's, Amazon and Akamai — with more to come.

Advertising inside live streams now has the capability to be completely dynamic, based on audience characteristics that include geo-location, device, player, demographics and even the service that the listener uses (i.e. aggregator, portal, media guide, etc.). Targeted cloud-based ad insertion technologies will be an imperative driver for increased revenue as we continue to see consumers using many different devices to consume content at the time and place of their choosing.

Jim Kott is senior vice president of products and marketing at Abacast.

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



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

ACCESS Portable lets you send studio-quality live audio, real time over IP using 3G, 4G, Wi Fi, BGAN/VSAT, PSTN or DSL to make any remote broadcast really stand out. Connect with your audience from anywhere, live, with the easy to use, handheld ACCESS Portable!

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