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# WXLW(AM) Reconfigures to Add Cellular Towers

BY MICHAEL BALDERSTON

After standing tall for 67 years — since the station they served was built — three towers at WXLW(AM) in Indianapolis have been removed. Two are to be replaced with new cellular towers.

A decision to reconfigure the AM station array from 5 kW directional to 1 kW non-directional came after test broadcasts indicated it could still effectively serve its primary target audience in the north section of Indianapolis, according to Ron Crider, director of engineering at Pilgrim Communications, which owns WXLW under the name Creative Data Management and has carried out several such conversions at other stations. WXLW airs at 950 kHz.

The new cell structures, made by Sabre Towers, will be delivered and installed before the end of the year. The first, a 150-foot tower with the ability to house up to four carriers, was to be delivered the second week of September and is expected to be operational by the end of the month. The second will stand at 190 feet and house up to five carriers; it will be delivered in November and be operational before the end of the year. WXLW's initial cellular client will be Verizon.

WXLW is licensed for operation on 950 kHz with a power of 5 kilowatts daytime and 0.036 kW nighttime, employing directional antenna patterns during daytime and nighttime hours (DA2-U). The station in July secured



The old three-tower array is visible.

permission from the FCC for special temporary authority to operate with emergency antenna facilities, saying an inspection had determined that its towers were no longer safe and needed to be demolished. It's now under an STA for daytime power at 1,000 watts and nighttime of 12 watts, that runs to January 2016.

The original towers were built by Bethlehem Steel in 1948. World Tower will put up the new single AM stick. All three are being installed by Tower Works Inc. FCC engineering work was done by Graham Brock and legally moved through the FCC by John Trent. Ron Crider has been the concept engineer on all the Pilgrim properties for the past 20 years.

Pilgrim Communications previously added cellular towers to other AM stations as well, including in Denver, Gunnison and Buena Vista, all in Colorado. While it has had success with such "scale-backs" to cellular, Crider points out that it is not a fix for everyone.

"It just so happened it worked out great for us," said Crider. "It does require a little bit of engineering to be sure if you do a downgrade you're not sacrificing any sales quality. But, if in fact downgrading doesn't really affect your primary coverage area, it's a great thing to do."

Tell us about your own radio station project or business strategy. Email [radioworld@nbmedia.com](mailto:radioworld@nbmedia.com).

Rebar is put in for the new facilities.





# DTS Steps Into Radio's Tech Spotlight

Acquisition of iBiquity puts HD Radio in hands of an owner whose business is audio

It remains to be seen whether the new owners of iBiquity Digital Corp. will, over time, lead the company in the direction to which we are accustomed. But the acquisition appears to be a vote of confidence in iBiquity's business model and puts the technology into the hands of an owner whose main business is audio and enhancing consumers' experience of it.

In September, DTS Inc. entered into an agreement to acquire iBiquity for \$172 million, as we reported at *radioworld.com*. DTS will pay for it with a combination of \$135 million of new debt and \$37 million in cash. The deal is expected to close this year, subject to conditions that seem a formality.

## THE STORY 'TIL NOW

The new owner DTS is publicly held; its stock trades on NASDAQ. The company makes "high-definition audio solutions and audio enhancement technologies."

Its roots are in cinema sound, having introduced master-quality sound in 1993's "Jurassic Park." It entered the

consumer products sector in 1996 with "scalable" digital audio architecture for consumer and pro audio products and multimedia formats. Its audio technology is used in car audio systems, digital media players, home theaters and various other consumer electronics platforms; you may know it for offerings like DTS Headphone:X, DTS Play-Fi and its new DTS:X sound system.

Radio World readers also may know the name through its pro audio acquisitions. In 2009, DTS acquired surround sound company Neural Audio; in 2012, it bought SRS Labs, which makes audio processing and enhancement. Its Play-Fi technology grew out of an acquisition of Phorus, also in 2012.

DTS corporate headquarters are in Calabasas, Calif., and licensing operations are in Limerick, Ireland. As of the end of last year, it had 372 employees, according to its annual report.

iBiquity, of course, is the developer of HD Radio technology familiar to most Radio World readers, the basis of in-band digital radio transmissions used

in the United States and in some other countries. It is a privately held company based in Columbia, Md., plus offices in New Jersey and Michigan; it has approximately 120 employees.

It grew out of efforts by commercial U.S. broadcasters to explore digital in the late 1980s and early 1990s. CBS, Gannett and Westinghouse formed USA Digital Radio in 1991, marketing IBOC as a way for stations to move toward digital on existing spectrum and on their own timeframe via a "hybrid" approach in which digital and analog signals coexist until such time as the industry might choose to turn off analog, if ever.

USADR became a separate company in 1998, with backing from 15 broadcast groups. According to a company history, two years later it secured \$40 million in additional funding from strategic partners and venture capital firms. It later merged with Lucent Digital Radio in 2000, forming iBiquity. While broadcast groups at one time were a significant part of its ownership, the largest of its current owners are financial firms: Bank of America, Columbia Partners and Silver Point Capital.

HD Radio technology has been controversial within radio. About a fifth of

## FROM THE EDITOR

Paul McLane



U.S. FM broadcast stations have adopted it, though those tend to be in the largest markets; iBiquity believes virtually all of the top-billing FM stations in the country carry HD Radio and that around three-quarters of American listening (albeit both analog and digital) is done on stations that have it.

The technology also has brought multicast channels to FM, offered a "translator play" to help stations extend their brands and provided data capacity that backers say adds to radio's appeal. On AM, however, the digital efforts were sidetracked by interference problems, especially at night.

In recent years, iBiquity has focused its marketing on growing the number of vehicles that have HD Radio receivers, seeking to make the technology ubiquitous in the car environment.

## LICENSING MODEL

Why buy iBiquity? DTS cited its technology, content and penetration at top stations, its footprint in the auto

(continued on page 5)

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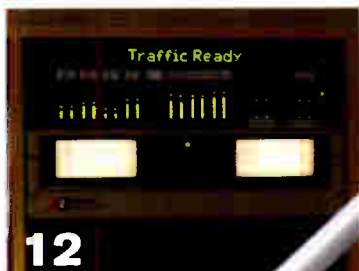
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SEPTEMBER 23, 2015

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Photo courtesy WUKY

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## OPINION

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market and opportunities for growth in mobile and international markets. It likes iBiquity's 100 or so patents and related intellectual property.

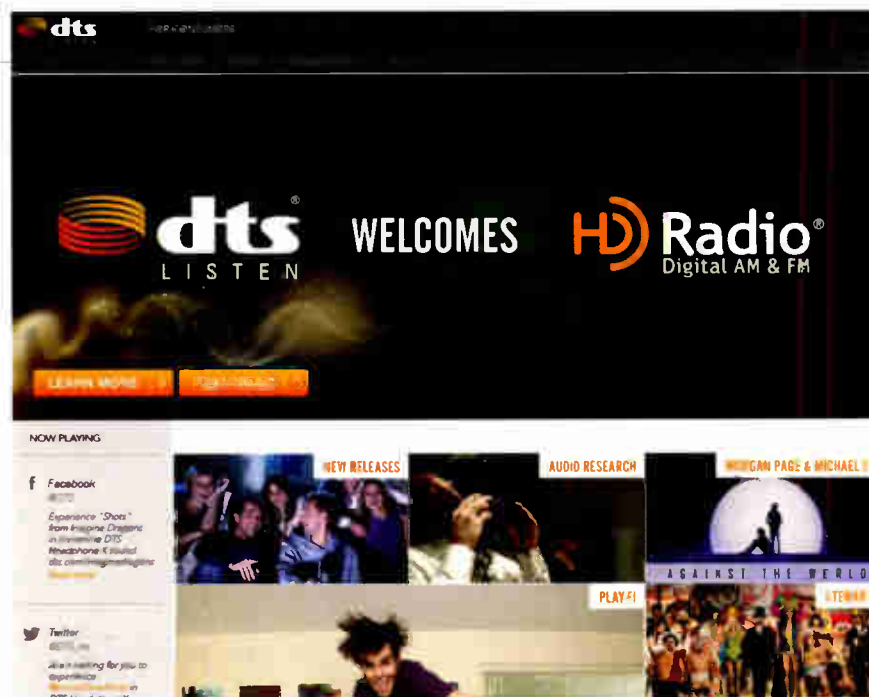
Radio's global transition to digital, Chairman/CEO Jon Kirchner said, is still in its nascence. "Digital radio broadcast is an ecosystem. From a U.S. perspective, HD Radio is the core ingredient technology," he told me.

DTS likes the revenue, too. It estimates that iBiquity's revenue for 2015 will be about \$40 million to \$50 million, according to information on its website. That is fresh info for us about iBiquity's business and may surprise some observers in radio, where skeptics often scoff at its business model.

But though station fees are what broadcasters see, such income is "a wholly immaterial part of our business model," iBiquity President/CEO Bob Struble said. "We make our money on the sale in HD Radio receivers. The real value of the business is not on stations going on the air but on the radio being sold in cars."

And apparently that money is pretty good. He said that with millions of radios now being sold, mostly in cars, "you're able to build a good business. For some time we've been profitable and cash flow positive."

This, of course, doesn't tell us how past investors made out in this \$172 million sale. An iBiquity bio of Struble states that during his tenure, he had raised over \$300 million to date from the investment community, though it was unclear as of when or over what period of time; so someone lost money in there somewhere.



A message on the DTS website welcomes the iBiquity acquisition.

"There is overwhelming support for the deal amongst our investors," Struble told me when I asked about this. "As with the sale of most companies who have been in business for a long time and had multiple rounds of fundraising, there are some investors who will do very well and some that will do not so well."

(Some other financial data: DTS listed iBiquity's operating income for this year as \$12 million-\$18 million, with operating margins of 30 to 36 percent, and it identified \$5 million of annual interest expense from debt financing. The companies together are expected to bring in \$140 million to \$145 million in 2015, with an operating income of \$34 million to \$38 million, DTS said. It expects the acquisition to begin adding to its investors' earnings per share in 2016.)

Struble said the companies are similar in their approach to technology and IP development. He said there isn't much overlap; DTS has only a limited presence in iBiquity's core broadcast markets, and while DTS is active in OEM automotive, iBiquity's footprint there is greater.

Kirchner said that DTS adds, among other things, a strong international presence and a lot of experience in licensing IP, an important part of what iBiquity does. He also mentioned strong relationships with Silicon Valley that will add value to HD Radio.

Struble describes DTS as "stable, long-term committed ownership" and is pleased to have what he calls a strategic owner. "For the last many years we've been owned by financial investors; they've been

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## LPFM

(continued from page 1)

"A permittee requesting an 18-month extension of the original permit must submit a letter to the FCC Secretary, in triplicate, explaining the reason for the extension," according to the FCC.

The commission's Audio Division through late August had granted approximately 450 extension requests and cancelled about 100 expired permits from the pool of the 2013 filing window that expired in July and August.

### NUMEROUS CHALLENGES

More than 2,800 LPFM applications were filed in the 2013 window, according to REC Networks, a community radio advocate that provides a variety of LPFM services and monitors such data. More than 700 of those were dismissed because of errors and omissions, including technical and paperwork errors as well as applicant requests. This left approximately 2,100 applications to be considered for approval.

From that filing window, approximately 585 new LPFM stations are now licensed, and an additional 1,158 hold CPs, according to REC Networks. The FCC continues to process mutually exclusive applications for contested slots.

As of Sept. 1, a grand total of 1,338 LPFMs were licensed to be on the air, including the 750 or so that predated the recent window.

Some LPFM observers said the commission simplified the 2013 application process to help amateurs and newcomers enter the service. Nevertheless, successful implementation of an LPFM station, not to mention its long-term operation, requires significant expertise and capital.

"LPFM broadcasters face the same obstacles as any other new broadcaster but without the promise of financial reward to warrant taking the necessary risk and committing the necessary resources," said Peter Gutmann, a telecom attorney with Womble Carlyle Sandridge & Rice, who also contributes to Radio World.

"Some parties discovered they lacked the expertise necessary, whether through inadequate planning or just letting their good intentions get ahead of practical considerations."

Gutmann said he expects "extensions will be liberally granted by the FCC, given the reduced regulatory requirements and intended purpose of the service."

Christian Community Broadcasters co-founder John Broomall said any number of reasons could explain why a LPFM permittee would return a CP or allow it to expire, including a loss of interest, higher-than-expected costs and problems with tower site approval.

"In many cases LPFM applications

were prepared by third parties. The actual applicants might not even know their CP is expiring or understand the process for getting extended," Broomall said.

He said CCB submitted a last-minute extension for a permittee in New England that was planning to give up because a full-power station had changed formats to what the LPFM planned to air. In the Pacific Northwest, another permittee gave up because the person who'd had the original vision for the organization left, and the person tasked with getting on the air discovered that the costs — including \$18,000 in county permit fees — had been underestimated while projected coverage in a heavily wooded area had been overoptimistic.

## The actual applicants might not even know their CP is expiring or understand the process for getting extended.

— John Broomall

One advocate told Radio World that some potential LPFM broadcasters simply lose interest once they learn how limited the signal's coverage area would be. Low-power FM stations broadcast at a maximum of 100 watts and typically reach a radius of approximately 3-1/2 miles from the antenna. They must be licensed to non-profit entities and often are operated by schools, churches and small community groups.

Sabrina Roach, a community radio advocate for Brown Paper Tickets, said poor organizational development can hurt LPFM hopefuls, but a lack of fundraising ability is likely the biggest hurdle. "I've met many savvy and resourceful LPFM applicants, though. They have access to a wide array of public agency and local foundation funding that full-power stations don't. Full-power community and NPR stations for the most part aren't eligible for Neighborhood Matching Grants, community technology grants, etc.," Roach said.

In Seattle, her advocate group found a pool of \$9 million in such funding for which LPFMs could qualify. "In total I think they've already been granted roughly \$80,000 to \$100,000 from public agencies."

Financial and organizational challenges are not new in the LPFM sector. The Low Power FM Advocacy Group believes more than 600 LPFMs have turned in their licenses or CPs since the low-power service launched 15 years ago, though others have disputed that number in comments to the FCC. LPFM-AG blames complicated and burdensome rules; it recently asked the commission

to reclassify low-power FM as a primary service, allow expanded sponsorship sales, increase power levels and implement other regulatory changes, as we have reported.

Sanjay Jolly, policy director for Prometheus Radio Project, which builds and supports community stations, said Prometheus does see LPFM attrition but is not surprised by how much.

"There have been some LPFMs who have let their CPs expire; and that steady trickle will likely continue. Organizational priorities change, key staff members move on, etc.," Jolly said. "We saw the same thing happen in the 2000-2001 LPFM window. It's not new.

"People are excited to have these sta-

highly automated.

"Cañon City, while within the service contours of most Colorado Springs/Pueblo radio stations, is shadowed by foothills and mountains so most signals that don't originate here in the Arkansas River valley end up being a scratchy, multi-pathed mess," he said.

Johnson joined the local Chamber of Commerce; he also launched a Facebook page and a GoFundMe campaign to drive his fundraising efforts. "I spent \$200 to incorporate my community organization, but did my own engineering work, which limited my expenses."

When Johnson learned the owners of the tower where he planned to locate his LPFM reactivated a FM translator, taking the last available slot, the daunting task of doing new engineering work and moving to a new channel were overwhelming.

"I could have used my own funds to build the station, but with a daughter getting ready to enter college next year, I decided that what limited funds I had needed to go for helping with her tuition," Johnson said.

Confusion about rules may also contribute. Engineer Kyle Magrill mentioned an experienced client who had been struggling to fulfill the "points criteria" under which they'd successfully applied to change from a time-share to a full-time station. He said the station board was under the mistaken belief that it had to fulfill the points criteria, building and staffing studios immediately. But because its application had been a "singleton" with points criteria not coming into play, he said, the station in fact was not obligated to fulfill those commitments.

"They can now concentrate on buying the equipment that they actually will need," Magrill wrote in an email. "I wonder how many other singleton applicants are laboring under the same misconceptions."

Another LPFM permittee, Growing Gardens — an organic gardening group in Portland, Ore., that builds raised vegetable gardens throughout the community — lacked the internal capacity and community partners to move forward, according to David Greenberg, its executive director. "We returned our construction permit," Greenberg told Radio World in an email.

LPFM proponents still believe many more new LPFMs eventually will be on the air as a result of the application filing window in 2013, as many as 1,800 total by some estimates.

*How many LPFMs actually get built, survive and thrive? How many become community institutions? Has LPFM achieved what its backers hoped for it? Comment on this or any story. Email radioworld@nbmedia.com, attention Letter to the Editor.*

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# SURETTE

(continued from page 1)

Surette developed an early interest in electronics, but the path to a career in antenna engineering at Shively Labs was not a straight one. It started at age 12 when he was growing up in Reading, Mass.

## RÉSUMÉ BLITZ

"A neighbor was a ham radio operator. His sons and I helped him build an open-wire 6-meter antenna, which was strung up between two houses," Surette said. This early exposure sparked an interest in electronics, antennas and, briefly, amateur radio. "I put together a few Heathkits and began to study for my amateur license. I got up to 13 words per minute on the code, but eventually lost interest."

He served four years in the Navy, much of that time spent doing electronics repair, including stops in Florida, Tennessee, Maine and Virginia. After leaving the service in 1969, he enrolled at Lowell Technical Institute, earning a BSEE degree. The program included electronics and computer programming, which at that time meant mainframes, writing code in Fortran and transferring it onto punch cards. Surette graduated in 1973.

At least in the short term, his academic efforts seemed to be for nothing. "The economy was in a downturn when I finished school. I sent out countless résumés but got no job offers," he said. Eventually Surette did land a position in Hartford, Conn., writing programs in Fortran for an insurance company.

But the résumé blitz did produce further results. One landed on the desk of Ed Shively, an antenna engineer. He had worked for RCA and Dielectric but set out on his own in 1963 to form Shively Labs in Raymond, Maine. The company needed a Fortran programmer to write programs for the pattern range.



**Left:** On the shop floor at Shively Labs in 1984, Bob Surette, left, and Ed Shively, far right, inspect cavities destined for the 441 site, a multi-channel tower facility built by Guy Gannett Communications in the Miami area. The combiner was the first band-pass filter system that used square cavities and group delay equalizers in the United States, Surette said.

**Below:** Around 1976, Surette, under the tutelage of Ed Shively, designed this panel antenna, which was installed in North Bay, Ontario. At the time it was the most omnidirectional panel antenna on the market.



**Surette, right, discusses cross-polarization following a day at the NAB Show.**



"Ed was quite a mentor, and he engrossed me in everything that he did." Shively's skills ranged from the theoretical to the practical. "He taught me about wave motion, and got me to visualize what would happen before we actually ran the pattern," Surette said that Shively was a visionary, designing and building one of the first directional FM antennas and doing much of the pioneering work for circularly-polarized antennas. Shively also built the first circularly-polarized TV antenna for a station in Altoona, Pa.

On the practical side, Ed Shively was a hands-on guy who did a lot of the fabrication himself, building antennas and tuned cavities to exacting tolerances. These skills, too, passed along to Bob Surette.

He worked for Shively for six years, then moved up the road to work for nearby Dielectric; but the stay was short.

"Shortly after I left, Ed became seriously ill, and decided to sell the company. Shively Labs was purchased by Howell Labs in 1980, and they needed someone to fill Ed's role as an RF engineer. I was approached by a headhunter and asked to return, and they hired me back."

The ACP work had been a boon to Shively in the 1970s but it also meant that it had neglected the U.S. antenna market somewhat. Surette's job description expanded to include promotion and public relations.

He joined the Society of Broadcast Engineers, Association of Federal Communications Consulting Engineers and the Institute of Electrical and Electronics Engineers; he toured the country making numerous presentations about FM antennas and doing Ennes workshops for SBE.

Through this work, Surette's name became known around the country, and ultimately, around the world.

## HE "SAVED MY BACON"

After 40-odd years, there are a lot of Bob Surette stories.

Mike Pappas of Pappas Consulting LLC recalls Surette as a wealth of knowledge. "He has saved my bacon on countless occasions and was one of the brightest guys in the industry. Every time I got on the phone with him or spent time with him at a show, my IQ went up by 10 points. He built me a raft of great antennas that worked perfectly and made me

(continued on page 10)

## ROUND TRIP

Surette signed on in December of 1973. "Getting a program done was a tedious process in those days," he said. "I had to write the programs out on paper, then drove to Portland, where they were put onto punch cards and then the program was run."

That hard work would pay off. The next year the Canadian government launched ACP, the Accelerated Coverage Program, where communities with more than 500 inhabitants would get FM coverage. Shively was in on the ground floor and eventually fulfilled 80 percent of the work.

Around this time, Surette's job description also began to expand. "We were short-handed in those days, and I went from Fortran programmer to installation engineer rather quickly." Surette spent so much time up north that he had to get a work card from the Canadian government.

This rapid transition in job functions was possible in large part thanks to Ed Shively's tutelage.





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## SURETTE

(continued from page 8)

look good, no small feat.”

Jonathan Clark, sales manager for Shively Labs, believes Surette will be best remembered for his communications skills.

“Bob had a way of dealing with customers that was enviable to most people. He could quickly assess someone’s knowledge of antennas and explain things at exactly the right level.” Clark said this is not an easy thing to do, because much of antenna engineering is something of a black art.

“He was so good with customers, we felt it was important to get him out in front of people even more,” Clark said. So Surette began giving papers and doing presentations for the SBE and IEEE. “He was out there so much, most people thought he owned the company.”

Clark says Surette remained humble and gracious. “When taking questions, he would be quick to say, ‘Let me check with my people and get back to you,’ if he didn’t know the answer. He truly appreciated the support people behind him.” Clark appreciates his colleague’s ability to excite others about antennas and to create an understanding about what goes in to making them work properly.

Jerry Dowd, Greater Media market chief for WBT(AM) and WLNK(FM) in Charlotte, N.C., said, “We had some



Surette, right, talks at the 2013 fall Radio Show with Nathan “Briton” Smith of ADX Communications over a single-bay 6828 FM antenna.

issues with a particular Shively antenna. I asked Bob how many others they had built in that configuration. He said that was the first and last one. I asked him if that made it a collector’s item. He replied that it depends on what you collect.”

For stations in the New England states,

the local connection to Bob Surette and Shively has been especially important.

Ira Wilner, chief engineer of Monadnock Radio Group in Keene, N.H., said, “Bob has always gone out of his way for customers. While I was working as a contract engineer for WKNE(FM) in Keene, we had an antenna failure one

night. The next morning I called Bob, and gave him the details of our antenna. That day, they fabricated a temporary antenna and had it tested. A couple of our guys drove over to Bridgeton that night in a pickup truck and brought it home.

“Antenna and line went up the next morning, and WKNE was back on the air with low power.”

### HITTING THE LINKS

After retirement, what comes next for Surette?

“First off, I want to play a lot of golf. Beyond that, the plans aren’t as definite.” He has accepted a position teaching Algebra II at Bridgton Academy. On his to-do list are renovating his primary residence to sell, and moving into a smaller house and upgrading it.

“It will be nice to stay at home, although I’m not entirely sure how to do that.” One thing is certain: “I don’t want to travel any more. I’ve done that all my life.”

He lives in Harrison, Maine, with his wife of almost 30 years, a few miles from the Shively offices. He has two grown children.

Staying in touch with colleagues is important. He invited them to send email to [bob@bobsurette.com](mailto:bob@bobsurette.com). “I hope to hear from colleagues and friends I’ve made over the years. ... I fell into this job 42 years ago, and now I’m sure I’ll fall into something else.”

## NEWSROUNDUP

**TFT SHUTTERS:** Equipment maker TFT Inc. closed its doors. Longtime Vice President Darryl Parker told Radio World that he resigned Aug. 31 and that the manufacturer subsequently laid off all employees. He referred questions to CEO Michael Reddy, who had not returned queries. Founded in 1970, TFT made STL, modulation monitor and EAS equipment.

**AM:** Radio groups responded negatively to news that the FCC was considering allowing stations to relocate FM translators up to 250 miles. Most AM broadcasters seek a more dramatic step, a window in which they could apply for new translators. David Honig of the Multicultural Media, Telecommunications and Internet Council said “it would be a tragic mistake if the FCC did only 250-mile relocations” rather than a full window. NAB was among those criticizing the plan.

**LPFM:** A dramatic proposal by the LPFM Advocacy Group to change rules is “directly contrary to the policy goals espoused by the commission in establishing the LPFM service,” a group of full-power stations told the FCC; other established organizations are similarly critical including NAB and state associations. Among commenters who expressed support, one wrote: “We are not asking for the ability to make money here. We just want a fair chance to survive.”

**NAB LABS:** NAB Labs is participating in financing tech startup Antenna, which has an online “engagement platform” used by publishers. Its purpose is to enable users to interact with mobile and Web content. Matheny told Radio World that Antenna’s overall seed round was \$650,000. “We were one of several investors and took a minority position,” though he didn’t specify a dollar value. Prior investments include Syncbak, starting in 2007, and NextRadio in 2013 during FM chip API development for cellphones; NAB Labs has an ownership position in the core FM chip API.

## IBIQUITY

(continued from page 5)

great owners but not the kind of guys who can help us get to the next level.”

### DIGITAL NASCENCE

More broadly, the companies positioned the move as a vote of confidence for over-the-air radio.

DTS talks about the power of traditional over-the-air broadcasting to provide content and entertainment. Kirchner said, “We believe broadcast radio has interesting opportunities for expansion in home and mobile markets.” Noting rising costs of broadband for consumers seeking content, he said, “Free over-the-air broadcast radio — upgraded to digital with HD Radio — has an important place in the range of options. This was a natural fit for us.”

Struble added, “I view this as a strong vote of confidence for terrestrial AM and FM broadcasting. This is a state-of-the-art technology company that has looked long and hard at the business we’re developing, [one] that is based solely on AM and FM radio, and come to the conclusion we’re a valuable asset that they want to have as part of their company.”

Many questions can be asked about what comes next: How HD Radio can further its penetration in the car; what role it will play a role in smartphones and mobile devices; what will happen with digital on the AM band; and how might iBiquity’s back-end IP be used in future DTS product offerings.

But Kirchner said immediate objectives include how to drive faster adoption and how to integrate two businesses without too much disruption.

Struble will lead the HD Radio business, providing continuity. I asked Kirchner what he could say to iBiquity employees about their long-term job outlook and about office locations.

“It’s too early to tell, ultimately, about the final integration,” he replied. “We’ll spend probably two or three months learning about how we’ll ultimately integrate the platforms.” He said there’s no plan at this time to change business locations. He complimented the iBiquity staff, saying, “There’s a lot of people hungry here to further change the world. As tech innovators and ecosystem builders, that’s why we get up in the morning — to create more immersive and compelling personal experiences.”

Comment on this or any story. Email [radioworld@nbmedia.com](mailto:radioworld@nbmedia.com).



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# The Traffic Reporter Appears Magically!

Also, should you trust your digital voltmeter?

## WORKBENCH

by John Bisset

Read more Workbench articles online at [radioworld.com](http://radioworld.com)

If your station uses an off-site traffic reporting service or if your traffic reporter doesn't have line-of-sight with your air talent, I'm sure you've heard the air person introduce the reporter only to be met with dead air. Not only is this

CPBE, worked with the Total Traffic & Weather people and iHeartMedia engineers to develop a solution. Even though the reporters are by and large reliable, he says, this fix ensures that every report airs.

Being associated with KQED(TV) has its advantages. Image Video signs, common in TV stations, provide a matrix of multi-colored LEDs that can spell out warnings or notifications to air staff.

tact closure provided in the Comrex BRIC-Link boxes that connect the traffic center to KQED. Your audio codec probably has contact closure capability too. As soon as a Total Traffic & Weather Network reporter selects KQED as a destination for a report, a closure is sent to KQED via the BRIC-Link. The phrase "Traffic Ready" phrase appears on the Image Video sign in green LEDs, as seen in Fig. 1.

This lets the local announcer know

Video LED sign to provide additional text messages for the air staff. These include EAS alert, audio fail and transmitter off-air alarms, loss of HD audio, hotline ringing, and various NPR, T-1 and STL feed alarms. As shown in Fig. 2, the sign is visible to the board operator.

This next tip comes from Greg Muir of Wolfram Engineering and should be filed under the heading "There's always time to learn something new."

The local power utility told Greg it needed to cut power to one of his transmitter sites for the day in order

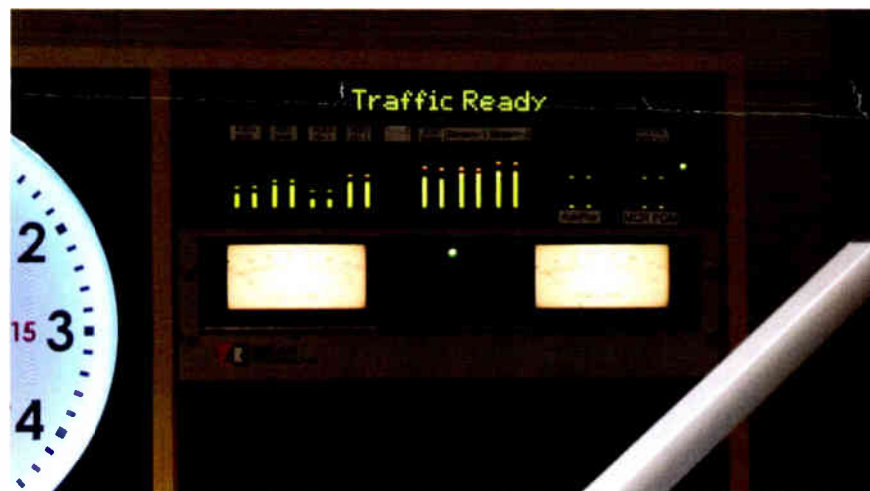


Fig. 1: An LED sign lets the operator know the traffic reporter is ready.

embarrassing but listeners may feel the lack of a traffic report is the talent's fault.

Let's face it: Such problems simply sound unprofessional. KQED(FM) San Francisco Chief Engineer Larry Wood,

There are lower-cost versions that may be more suitable in radio settings; see [www.imagevideo.com](http://www.imagevideo.com) or ask your favorite broadcast equipment dealer.

So Larry took advantage of the con-



Fig. 2: The sign is mounted so that it is visible to the board operator.

that the traffic or weather reporter is ready to send a live report when cued. The occasional miscommunications or delays are avoided.

Larry has taken advantage of the Image

to reroute the HV primary power feed from another pole and install a new cross arm on the existing one. The site has backup generator power so he wasn't worried interruption to the six transmitters housed inside.

The utility cut the power, the generator started and all was well.

The utility crewmembers disconnected the feed to the building on the pole and then measured the voltage on the phases at the outputs of the transformers. They found the voltages all over the place, looking suspicious. Working on the premise that they may have a bad pole pig, they ordered up a new one and installed it in place of one of the three existing units.

But now things looked *really* bad.

Greg told the crew that everything had been hunky-dory before they disconnected power, so he was skeptical about what they were seeing. When he returned to the site later in the afternoon, the crew had changed the span and two were still up in the bucket truck; the power drop to the building was still not connected. And now there were four or five more people present, some from the utility's engineering department. All were scratching their heads about seeing such squirrely

(continued on page 14)

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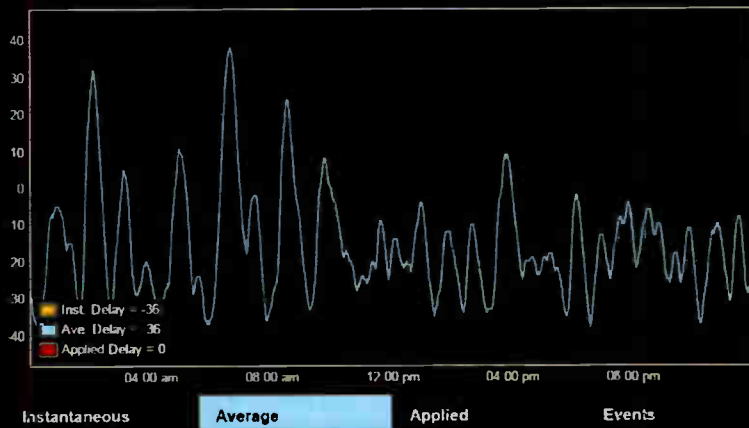


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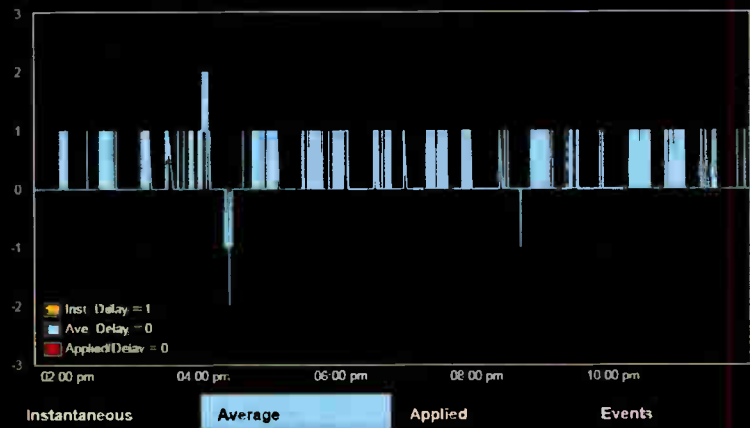
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# WUKY Turns 75

This 100-watt AM station became the voice of the University of Kentucky

## ROOTS OF RADIO

BY TOM GODELL

*Good evening, ladies and gentlemen. This is radio station WBKY, Beattyville, Ky., owned by the University of Kentucky and operated in cooperation with the Lee County Board of Education, broadcasting tonight for the first time on a federally authorized frequency of 42,900 kilocycles. This initial program*

lem: The inaugural broadcast was heard only by a handful of Lee County residents who crowded into the auditorium that evening because no radios capable of receiving the station's experimental "shortwave" signals were yet available.

How a tiny, 100-watt AM station in a remote region of Kentucky became the radio voice of the University of Kentucky is a tale of the perseverance and dedication of many broadcasters against often overwhelming odds.

By the time WBKY signed on in 1940, the University of Kentucky had been producing radio programs in Lexington

existing facilities within the school of music were quickly pressed into action. An instrument storage room doubled as master control and the band room became the main studio. No wonder Sulzer was relieved a decade later when he identified an unwanted cafeteria on campus that he could transform into a somewhat more permanent radio facility. That space, on the top floor of McVey Hall, remains WUKY's home today.

### PROGRAMMING

During the 1930s, Sulzer oversaw a radio operation that produced five educational and three musical programs weekly. Years later, he recalled, "Our education programs, if I say so myself, were pretty blame good!"

These shows aired at noon and ranged from "Animal Friends and Enemies" to a discussion of cesspools that WHAS's

studio, and a dramatic group would be going in our other studio, possibly to a local station."

Around this time, First Lady Eleanor Roosevelt visited campus. Sulzer arranged a 30-minute broadcast with her for WHAS. Because she had a luncheon engagement immediately before the program, Sulzer worried that Mrs. Roosevelt might be late to arrive. So he invited music professor and dean of America's balladeers John Jacob Niles to fill the airtime, if necessary. Roosevelt arrived just moments after the broadcast had begun. Alas, by then Niles had already launched into his rendition of "Barbara Allen" — all seventeen verses — and he was not about to cut it short, even for so distinguished a guest. Later when asked why he refused to yield the stage he replied curtly, "Do you realize that long after Eleanor Roosevelt's words are



Student Bob Taylor is shown on the air during the 1940s.



Although the station had paid staff, students did much of the work.



Sulzer conducts a live, on-the-air performance in the 1940s.

*tonight over WBKY heralds a significant occasion and marks the fruition of plans that have been formulated and carried to completion during the past few years.*

With those words, solemnly intoned by announcer Wayne Howell, a new radio service was born at precisely 7:30 p.m. on Oct. 17, 1940. A heady start indeed, though there was one small prob-

lem for over a decade. Shortly before the 1929 stock market crash, the University of Kentucky's Elmer "Bromo" Sulzer approached Credo Harris, the general manager of Louisville powerhouse WHAS, and Sulzer offered to produce regular educational programs for WHAS and send them to Louisville via telephone line.

Harris agreed without hesitation, so

lunchtime audience found particularly unpalatable. Musical programs featured a variety of genres, including Hawaiian, big band and Hillbilly.

"[Our] three studios were mighty busy in those days," Sulzer said. "One studio might be putting on an agricultural program for WHAS, our orchestra would be rehearsing for a program for coast-to-coast mutual in our biggest

forgotten, my mountain ballads will still be sung all over the world?"

### TRAILBLAZER

In 1938, Sulzer met Ruth Foxx, a sophomore at the University of Louisville. She was, by any standard, a formidable young lady. While still a student, she began producing programs for WHAS. Her assignment was to profile a different

## WORKBENCH

(continued from page 12)

voltages out of the transformers.

Greg went inside the building for about 20 minutes. When he came back out, one of the crew gave him "thumbs up." Greg walked over and asked what they'd found; they said they had two bad digital voltmeters. (Are you starting to suspect something?)

Greg asked more questions and found that the bad ones were from a single manufacturer and were of Chinese origin; the third, which was working, was a nice Fluke meter.

Greg proceeded to educate the crew about effects of stray RF on digital voltmeters. There were silence

and puzzled looks, followed by a lot of questions. Greg said that since the transformers were connected to the primary high-voltage side but not connected to the building (which would have presented a much lower impedance load and probably would have swamped most of the RF on the wires), what they probably had up there was a fantastic three-phase "antenna" coming up to the pole loaded with lots of near-field RF, which promptly accompanied the measured AC voltages into the Chinese voltmeters — and thereby affecting their readings.

It was a little hard for the crew to accept his theory, especially after they'd spent five hours fighting the "problem;" the utility engineers also were a little miffed. So Greg took one of the Chinese meters and asked a crewman to hold it in his hand as he stretched

the test leads out in a dipole fashion. The meter began to read voltage, which convinced them.

Greg asked if they had any old Simpson 260s lying around. They did, in a box in their warehouse. Greg suggested they throw some in their trucks just in case they encounter work at another broadcast site.

The cheaper DVMs are nice to have and may work in a pinch, but Greg's experience suggests you not put all your faith in them, especially in an RF environment. Those old Simpson 260s may be from another era but if you don't have a Fluke, you can usually trust their readings.

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## FEATURES

here; WBKY is not, as sometimes reported, the first university-owned FM station. Copies of the 1940 construction permit and the 1941 FCC license verify that the transmitter's type of emission was "A-3" (i.e. Amplitude Modulation).

"At the time I moved to Lee County," Foxx wrote in "Public Telecommunication Review" Sept.-Oct., 1979, "it was rated a pauper county ... Farming, the chief industry, consisted of attempting to grow crops in light, thin soil on hill-sides which constantly eroded with the weather. In an area of 199 square miles, there was a total population of 9,600 ...

[There were] 56 schools; 54 were without electricity."

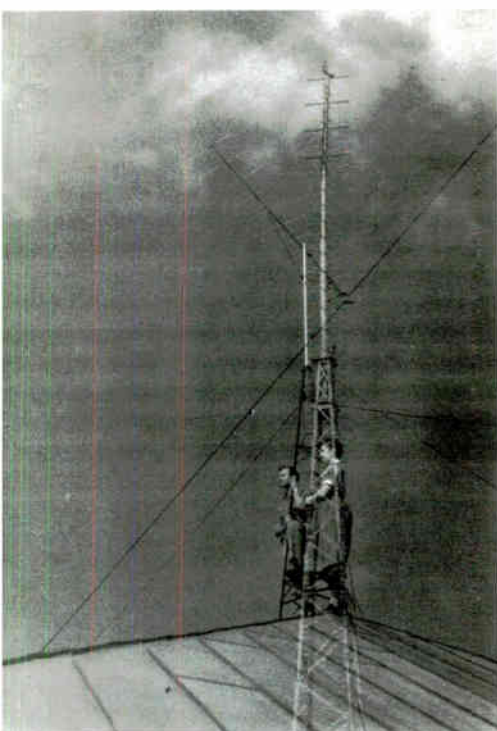
Despite grinding poverty and treacherous terrain, volunteers flocked to the station to present daily newscasts, agricultural programs, radio dramas, and religious talks. "Everybody pitched in," said Foxx. She never had the heart to tell them no one was listening. Receivers, built at Sulzer's behest by high school and college students working for the National Youth Administration, were late to arrive and never did work properly. Ultimately, the Lee County school board decided that Foxx's salary could

be put to better use by hiring school bus drivers. According to Foxx, WBKY "ended its last day of broadcasting" on Friday, June 27, 1941.

### WAR-TIME BROADCASTS

Not quite. Sulzer had other plans and somehow kept the station going, despite Foxx's untimely departure. That year Sulzer won a Peabody Award for a series on a very controversial topic: venereal disease. The show was quickly banned from all Kentucky radio stations. There is no record as to whether it aired on WBKY

(continued on page 19)



Dave Wright and Norma Fields enjoy the view from atop WBKY.

department at the university each week.

In due course, she came to the segregated university's Negro Municipal College. According to Foxx, "I took them in one night to WHAS to rehearse, and I did not know that this was the first time black people had been inside the studios of WHAS."

Credo Harris called her into his office the following morning. He told her that his announcers were threatening to strike, and she would have to cancel the broadcast. Foxx had in her hand a copy of Harris's latest book. She told Harris in no uncertain terms, "I brought it with me for you to autograph, but if you're not going to let my students come in here this afternoon, I don't want your autograph!" Harris threw his head back, laughed and said, "Give me that book! I'll sign it." Foxx's program aired as scheduled.

Upon her graduation from U of L, Sulzer tapped Foxx to run WBKY at a salary of \$80 per month. By contrast, teachers in Lee County earned only \$72. Sulzer intended for WBKY to be the first in a chain of stations across eastern Kentucky providing educational programming, each tailored for the specific needs of its community. Unfortunately, this ambitious plan was never realized.

### THE A-3 EXPERIMENT

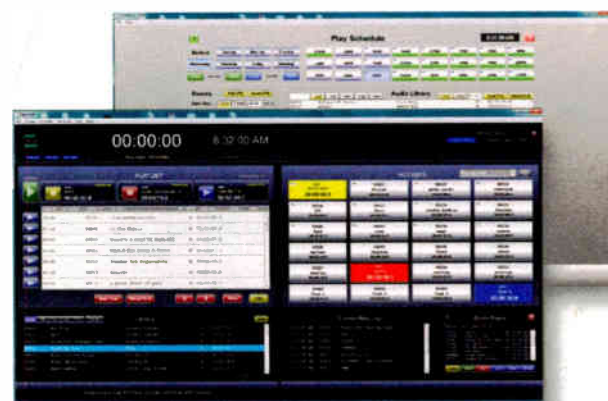
For WBKY, however, the time was right. The FCC had just designated a new band (42-50 MHz) for experimental FM and wide-band Apex AM broadcasting. Further, the commission had set aside a portion of the band for what they called "Non-Commercial Educational" broadcasting. School boards in Cleveland and New York quickly licensed stations. WBKY was next in line, and thus UK became the first university to obtain an NCE license.

A bit of myth-busting is necessary

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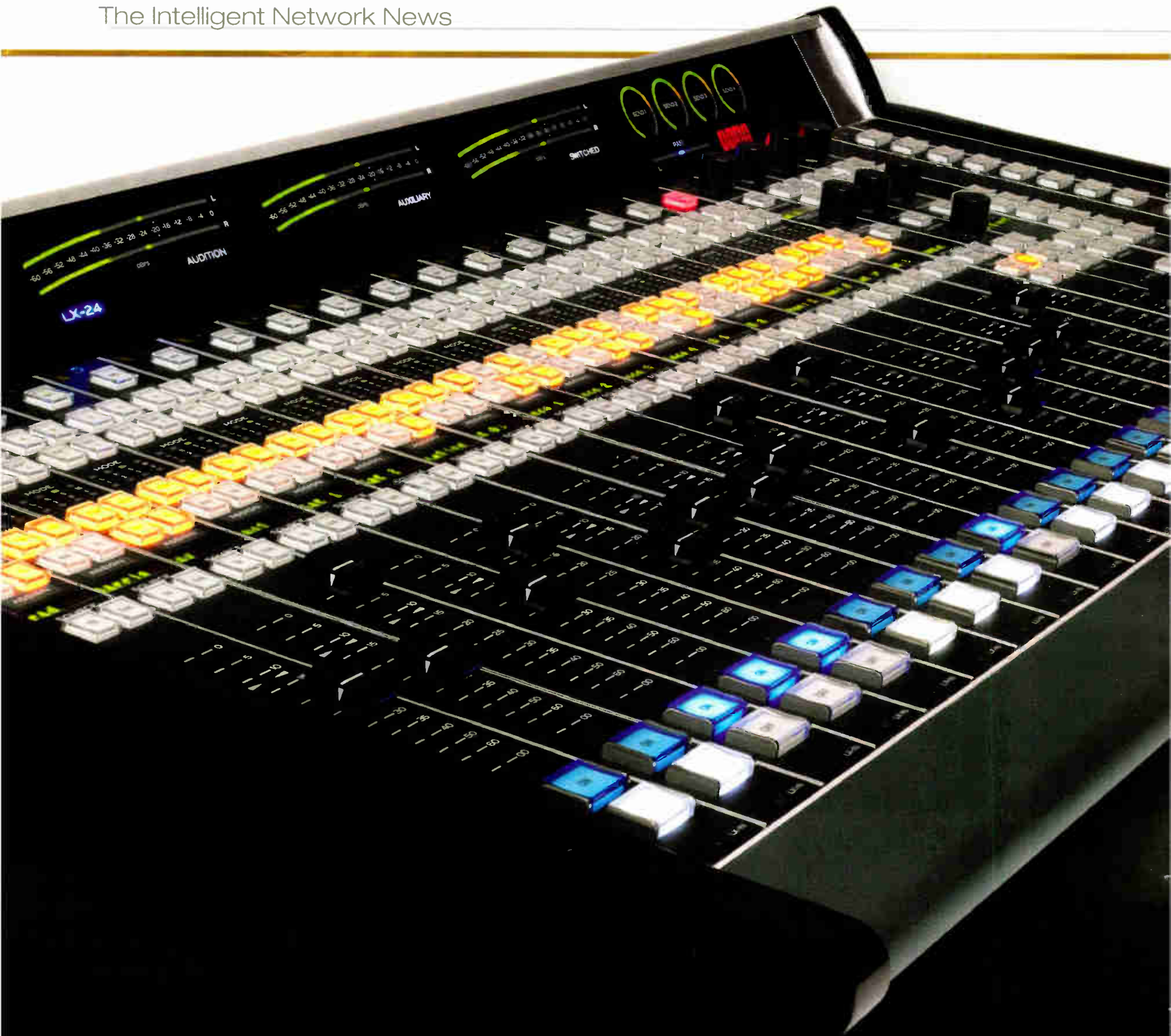
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## AES67. Hear, There and Everywhere.

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AES67 is everywhere. It's in every major audio network, including our WheatNet-IP, which means that you'll be able to transport audio between all these systems and other devices and peripheral gear that are connected to them. This IP audio transport standard was ratified in 2013 by the AES X-192 task force, of which Wheatstone was a member.

But, AES67 is by no means a complete interoperability standard. It doesn't provide for discovery and control, both of which are needed for any kind of interfunctionality to take place. These standards are in the works, but in the meantime, turning devices on and off, controlling peripheral gear from the console, signaling when a source is ready for air play, and controlling the playout system with a fader – these are all functions of WheatNet-IP and similar audio networks. In the case of WheatNet-IP, for example, a single Ethernet cable carries the real-time audio stream as well as network and device control messages and other metadata. AES67 covers the audio streams only.

With all this in mind, here are straightforward answers to the more common questions our engineers receive on AES67.

For the entire story... [INN27.wheatstone.com](http://INN27.wheatstone.com)

## New Studio?

Heaven Forbid You Forget the Elevator.

It's easy to lose track of the many details of a new studio project. Let us take a moment to remember

Edificio Intempo, the 47-floor skyscraper built in Spain that was said to be missing one important detail. Elevators.

The good thing about being in the audio network and console business is that we get to tour more than our share of broadcast studios from around the world. Our Director of Sales Jay Tyler has been in no less than 3,000 broadcast studios in his 20+ years at Wheatstone, and he has seen it all

Here are a few things Jay, along with Studio Technology's Vince Fiola, who builds broadcast studio furniture, has noticed lately.

For the entire story... [INN27.wheatstone.com](http://INN27.wheatstone.com)



## Wheatstone Network Edge: BEST of SHOW at IBC!

At IBC, judges are comprised of engineers and industry experts who spend a great deal of time poring over every considered product before they choose a winner. So, it's great news when they select your gear! This year, we are proud to have won *the NewBay Media Best of Show Award from Radio World International* for our **Network EDGE**, which lets you use IP wireless radios to establish STLs (and more)!

For the entire story... [INN27.wheatstone.com](http://INN27.wheatstone.com)



Pictured left to right: Wheatstone's Kelly Parker, Raffaella Calabrese (Publisher, Radio World International), Marguerite Clark (Editor in Chief, Radio World International) and Wheatstone's Jay Tyler

## AM Redux

Beyond FM translators

AM gets a bad rap. Fortunately, recent changes to FCC regulations are helping some AM operators turn things around with the use of FM translators.

We're firm believers in translators to extend coverage, which explains why we've just come out with the FM-25 audio processor for this purpose (we also make a step-up version, the FM-55). But we're also firm believers in AM radio and began to wonder why so little in the way of new technology is available to adequately process the AM signal. So for our engineers Jeff Keith, Steve Dove and Mike Erickson, it was back to the drawing board – and Mike's large collection of AM radios....

For the entire story... [INN27.wheatstone.com](http://INN27.wheatstone.com)



## Dan Slentz Sayz 'Thanks'

LPFM advocate predicts new 100W will rank in ratings.

We received an email from Dan Slentz, an engineering consultant who has become a tireless advocate and industry friend to LPFM. He recently flipped the on-air switch to new WDPE low-power, non-commercial, educational FM radio station licensed to Dover - New Philadelphia, Ohio. He's got stuff to say about the AIR-4 console and other gear he's installed at the station.

For the entire story... [INN27.wheatstone.com](http://INN27.wheatstone.com)





# All Songs — and Many Platforms — Considered

NPR Music has a modern, multiplatform take on radio

## VIDEO FOR RADIO

BY EMILY M. REIGART

It's easy to get caught in the cycle of keeping up with the Joneses. Buzzwords and trends offer the promise of the new and the next, but for long-term success, it's crucial to know your audience and to know your own passion.

Case in point: Bob Boilen and the evolution of "All Songs Considered."

Boilen is the host and creator of both "All Songs Considered" and the Tiny Desk Concerts live performance series. In the course of his 27-year public radio career, he has worked his way up through the organization from "All Things Considered" assistant producer — Boilen jokes that his unofficial title was "tape cutter" — to director of "All Things Considered," to his current role.

When Boilen took the reins of the signature news-magazine, he was put in charge of selecting the songs that played between stories. He remembers that artists were sending in many more songs than he had time to use on the air (a good problem that he says has intensified over the years). These songs also generated a lot of listener engagement — which in the 1980s and '90s meant handwritten letters. Boilen got the distinct impression that listeners were "music starved," but affiliate stations were not interested in a music show produced by NPR.

After all, "remember what bandwidth was like in the year 2000." Compounding the difficulties of 14.4k modems was Boilen's goal of a one-hour multimedia slideshow featuring images and words, as well as the songs. Despite these obvious challenges, NPR offered support for the endeavor because "it's the nature of the organization," he says.

Boilen. They polled their audience and the results were clear: a weekly 40-minute, audio-only program was preferable to a bimonthly multimedia one.

## PODCASTING

In August 2005, the first "All Songs Considered" podcast became available, which came with a new set of music rights issues, including the need to get permission to play all the songs in a downloadable show.



Photos by Colin Marshall/NPR

Tiny Desk Concert with John Reilly & Friends on Jan. 28, 2015.



NPR Music video producer Nick Michael during a January 2015 Tiny Desk Concert with Mucca Pazza.

However, in the late '90s, when "the Internet was beginning to take shape," Boilen says he "thought it would be really cool to do an Internet-only music show." A self-professed tech junkie, he saw the potential to "narrowcast" on the Internet.

"Given the whole country, we could find enough people who had enough interest in one show," Boilen explains.

## ALL SONGS CONSIDERED

In 1999, Boilen pitched the idea, which he says was greeted with "resistance and puzzlement."

For two years, Boilen and Hilton worked on the multimedia show, a process that Boilen remembers as "a beast" because of what it took to get the necessary permissions, write the copy and build the slideshow.

"A lot of people probably weren't watching the multimedia show because they were still on dial-up. We were really limited in what we could do because of the tech at the time. But as bandwidth grew, so did our imaginations," Hilton says.

The pair wanted to produce "All Songs Considered" more often — which would require dropping the slideshow and doing "basically a radio show," according to

Boilen then put the initial episode of "All Songs Considered" online the first week of 2000.

Boilen explains that this endeavor posed little risk for either NPR or for his career. Initially, he spend a few hours per week producing "All Songs Considered." It was essentially a side gig as he continued to direct "All Things Considered." In late 2000, Robin Hilton was hired as a producer, taking on much of the show's Web work.

"But we won lots of battles along the way of getting music on, full songs, online and on podcasts quicker than anyone else did," Boilen notes. "And part of the reason we did that is because people like NPR. And they like their music and respect it. They know it's not going to be wrapped in a Coca-Cola ad, and they're appreciative of that. And they trust us."

That same year, Boilen and co. began broadcasting live concerts, starting with the 9:30 Club in Washington. In 2008, they started to cover music festivals — an effort that today has expanded to include Bonnaroo, Sasquatch, Newport and SXSW, among others. They also added a blog around that time.

The first Tiny Desk Concert (a name inspired by Boilen's own former band, Tiny Desk Unit) was filmed in March 2008 and went online in April, adding video to an already extensive repertoire. The project was cofounded with Stephen Thompson, an editor and reviewer for NPR Music.

"There's something about video that attracts people who may not take a gamble on a band that they've never heard of, but by seeing them I think they're drawn to it," Boilen says. "And also the intimacy of it gives them a better shot at liking it."

Earlier in his professional life, Boilen had a music video show on a local TV station in Washington that he produced called "Captain Fogel's Music Machine." Perhaps because of this experience, Boilen says, "The

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## KENTUCKY

(continued from page 15)

before the ban. In February 1942, Broadcasting Magazine reported that WBKY's newly announced program schedule placed "strong emphasis on morale, Western Hemisphere appreciation and educational phases aimed to assist in the war effort." Meanwhile, interest in and ratings of UK-produced educational programming on WHAS were beginning to wane, and it was time for bold action.

The station limped along until April 1944, when Sulzer persuaded UK President Herman Lee Donovan to recommend dismantling WBKY, which had "served its purpose," moving it to Lexington and at long last applying for an FM license. The proposal was unanimously adopted by the board of trustees, who allocated a whopping \$5,000 — equivalent to nearly \$70,000 today — for the move. Wartime shortages undoubtedly slowed the process, and the move was not completed until the following spring, just as World War II was winding to a close.

In May 1945, WBKY's Production Director Casey Russell was monitoring European shortwave for news and recording soundbites on 16-inch transcription discs. Just as she dropped the needle on that fateful day, she heard Winston Churchill say "My friends, the war is over!" Churchill's words were quickly put on the air. Broadcasting Magazine reported a similar effort in September when WBKY once again "scanned the shortwaves for news from all over the world" and "went on 24-hour duty for five days ... beginning with the first news-flash of the Jap surrender."

### FM TRANSITION

Uncertain about what to do with the FM band after the war, the FCC first moved WBKY from its original frequency to 44.3 MHz. Then in January 1947, WBKY was assigned its permanent dial position at 91.3 on the brand-new "high" FM band. At the same time, the station's power was doubled to 1 kW.

Undaunted by shortages of funds and supplies, Sulzer sprang into action. He persuaded graduate student James Hisle to design and build the new transmitter as his Master's thesis.

"I think we had to plunk out about \$300 in parts," Sulzer recalled years later. The antenna, built by a friendly chief engineer at Lexington's WLAP(AM), added another \$200 or so to the budget, and the tower was scrounged from the Lexington Police Department.

"The transmission line we fabricated ourselves, using as an outer conductor hard copper refrigerator tubing and buying from the American Lava Company down in Chattanooga the little circular insulators that we put in every foot or something like that," said Sulzer. The

total cost was "something less than a thousand dollars."

By contrast, Sulzer reported, a comparable system at the University of Michigan (WUOM) had cost \$80,000 to construct.

Four months later, the station became one of seven non-commercial FM affiliates of the Mutual Broadcasting Service, although the university had been supplying programs to the network since the 1930s. Local programming on the station grew slowly over time. Sulzer: "We started adding 30 minutes here and there as we could con students into doing the work and as the university gave us

a little more money — and as, which is more important, the number of FM sets proliferated in the area."

Sulzer left the University of Kentucky in 1952. While some lamented the end of the station's "Golden Era," WBKY continued to grow. A series of programs in 1953 focused on weaknesses in Kentucky's education system; these led to an amendment to the state's constitution. As late as 1962, WBKY was still airing university courses, including "Kentucky History" with historian and Kentucky Writers Hall of Fame author Dr. Thomas D. Clark.

Today the station is poised to begin a

new era. Earlier this year, the University of Kentucky received the generous gift of a building, which will soon become the first new home for WUKY since 1939. The St. Claire Studio in Lexington was designed by Pilchner Schoustal International in 2004. Alejandro Escovedo, Willy Porter and others made records there, and by the summer of 2016 WUKY will be fully operational at the new site.

*Tom Godell has been the general manager of WUKY since 2004. He is a 40-year veteran of public radio and has written extensively on classical music.*

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## TINY DESK

(continued from page 18)

marriage of the two was always sort of natural for me. And so Tiny Desk seemed a perfect thing to do a video of. But it was also important to keep it simple .... I wanted to be able to film and produce and do it all, and be able to produce one of these things in the morning, or in afternoons, I did not want it to be complicated. It was really important to be able to turn it around quickly."

Initially, Boilen served as the audio engineer, one of two camera people, video editor and sound engineer. He also uploaded the "Tiny Desk" shows.

That same spirit remains a goal for Tiny Desk today, even though the concert series has a team of people involved in its production.

### SIGNATURE SOUND

As audio technical director, Kevin Wait was integral in making sure that the sound of Tiny Desk Concerts and other NPR Music projects retain that "signature audio quality." Wait is now working as an audio trainer for NPR, and Josh Rogosin has taken over as the lead audio engineer for NPR Music.

However, he says, "A day in the life of the audio technical director is basically chasing a calendar."

Wait explains, "Bob Boilen is booking acts all the time. And he doesn't tell us. He just plops them on the calendar — and if we're lucky, we'll have a meeting that week where we could sort of prepare for things. And within those [calendar] entries, he includes basically what is going on with the band."

However, the key is to expect the unexpected. The very nature of the Tiny Desk Concert is meant to help artists feel laid back and at home in an unconventional space.

"So typically we'll start to set up maybe an hour or two before downbeat, depending on when the band arrives," Wait says. "That's also a critical moment, because that's when we really find out what's going to happen. And part of the magic of the Tiny Desk is you're just never really sure who's coming and what they're bringing and what they're going to do. And I think Bob likes it that way."

Wait says that the original Tiny Desk sound "was very organic, very simple" because they "used to try to shoot with



Tiny Desk Concert with Anthony D'Amato. Kevin Wait is visible in the center of the photo, wearing a black shirt.

one mic." However, "now that the video kids have switched to high definition, I think there's an emphasis on better audio as well. And we've also moved from ... mostly acoustic, very quiet, self-balanced acts to DJs and electronics and electric instruments.

"I never want to say 'no' to anything that music wants to do. But what that requires is building a toolbox that's extremely versatile and mobile, that doesn't have to be shipped, is reliable, yet in some ways replaceable."

Wait concludes, "What I need are mics and recording devices that can wear lots of hats." He cited two tools of the trade as the Sound Devices 788T portable audio recorder and Sennheiser MKH 418 Stereo shotgun microphone, and explained, "I use the same device when we go out and we record concerts, like the SXSW showcase, Tiny Desk, field recordings; same mics, same box."

### VISUAL REQUIREMENTS

Because NPR has a signature sound, it should come as no surprise that Tiny Desk Concerts have their own signature look and feel. In addition to the bright, fun backdrop of Boilen's bookcase, it isn't unusual to see audio equipment.

"We don't try to strip it of the mics because it's going to be impossible to get the sound [Kevin] wants. And I think it has probably informed our aesthetics, that's just become part of the thing," says lead video producer for NPR Music Mito Habe-Evans. "And it makes sense because we are NPR, and I think people understand that the roots of NPR are radio and audio recording.

"I like having the mics in the shot. I don't try to pretend they're not there. They sort of become a character," she said. "And I know they're a huge character for Tiny Desk."

Maggie Starbard was an assistant producer/photographer and served as the video producer for Tiny Desk until

June of 2015, when she left to pursue an independent project. Her role was filled by former NPR intern Morgan Walker.

Starbard explains the equipment for filming Tiny Desk succinctly: "For the Tiny Desk, we usually do a three-camera shoot, and we do those on DSLR cameras. We usually have one angle that's a wide angle, and we usually shoot that on a 14 mm lens, but our cameras have a crop factor, so it ends up being a 20ish mm lens. And that's a static angle: it's not a tripod. And then the other two angles are medium to longer ones. So a 24 to 105 mm lens. And those are shot usually on monopods — it gives it a little more motion and energy. And that's our basic kit. Just a few cameras. Occasionally, we'll add a fourth one on a really long lens, a 70 to 200 mm lens."

Recording in the field, "There's a lot of balancing the needs of video and audio," Habe-Evans explains. "And I think what I often find in the field is that what works best for video are the most dynamic scenes, with the coolest angles or locations, are usually the *worst* possible situations for Kevin in audio."

But Wait also notes that there are inherent difficulties in getting the audio right for Tiny Desk. "It's a compromised space because it's not acoustically treated. It really is an office cube with a desk and lots of hard surfaces and air blowing out of the ceiling and things," Wait says. "So I sort of inorganically will try to use the I-box, the direct injection boxes, especially bass instruments, if possible. And that allows me a little more flexibility in the mixing."

But Starbard and Wait have also chosen to embrace some of the less-than-ideal elements that come from shooting in an open office.

"We use a lot of the crappy camera audio for the intro [Tiny Desk] B roll," Starbard says. "Then it opens up, you know, so it's mono and it's kind of com-

pressed, not that great audio. And then when they start playing it opens up to this beautiful stereo mix. And that sort of happened because it had to, but then ... we realized that we should go with it, so we tried to make sure that we don't have stereo for the opening part, you know, so that there is this transformation once it gets to this audio, it kind of opens up. So that's another thing. It's just our limitation, but we like it."

### LOOKING AHEAD

However, the Internet presents more opportunities than limits in the 21st century, and Tiny Desk is poised to take advantage of them.

As long as Boilen is at the helm, Tiny Desk and "All Songs Considered" will probably continue to innovate — because it's the smart move in today's media environment and because that is the nature of NPR Music as a whole. And, maybe, because Boilen wants to do so.

"You can think of radio as anything that's audio that comes to you," Boilen says. "It might not come over the air, it might come over a pipe, it might come over digital wire, or whatever. But still I think of it as radio ... people get their stuff all sorts of ways. It's nice to be a part of whatever's out there."

He elaborated, "I don't think we're in a generation that cares what we call [it] or how they get their medium .... Their radio could be something that is like NPR One, which is a streaming affair that you can skip through. Your radio could be Pandora, or it could be the All Songs 24/7 stream, none of which come over in the air ... All this stuff is just a medium for people to absorb, and the heart of what we do is try to tell stories and involve personalities and make connections for people between what we think is worthy and what we think people should know about and try to tell that story in the best way we can."

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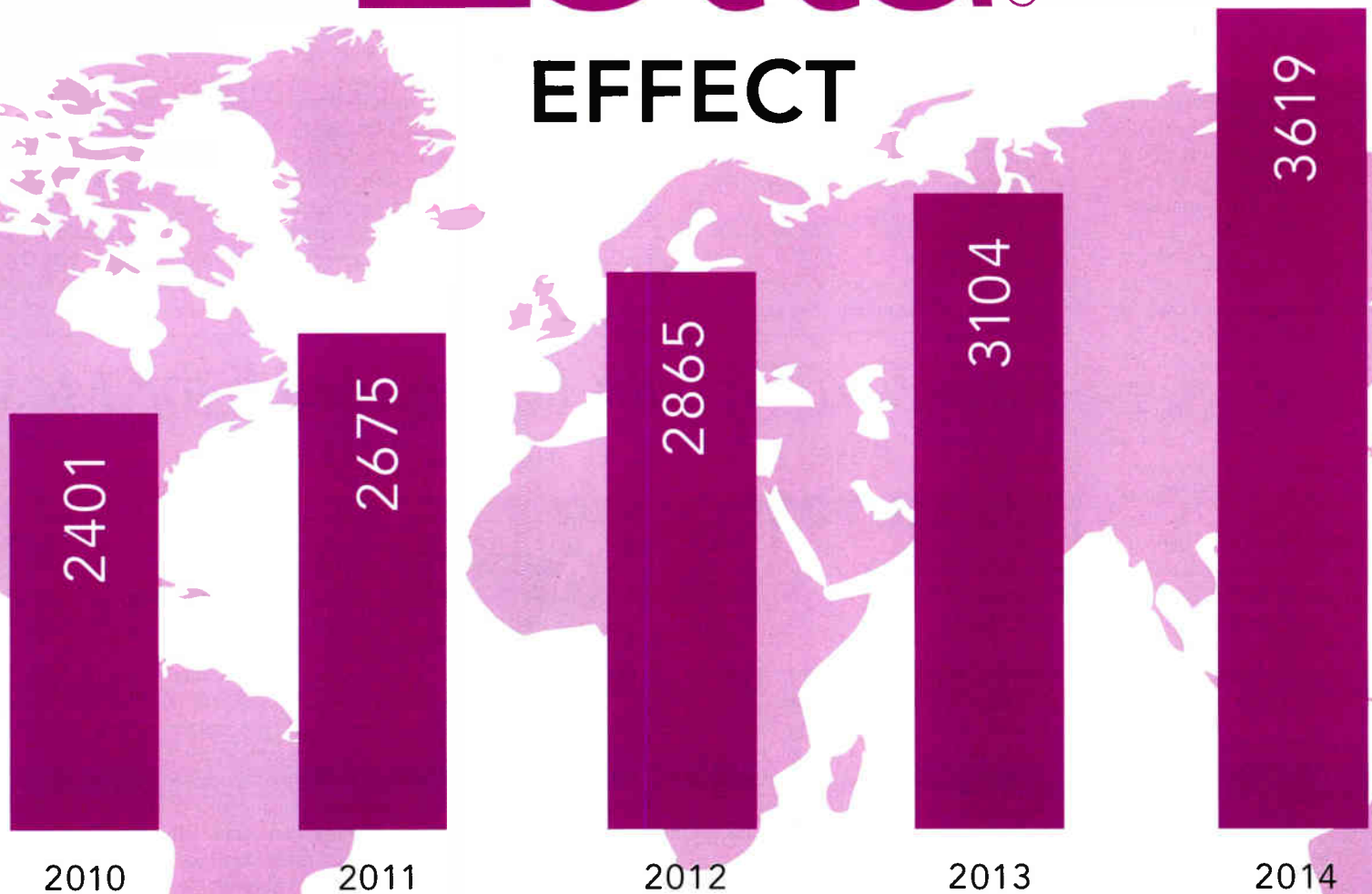
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# GPB Automates Workflow With ENCO

Public broadcaster links studios and stations under one umbrella

## USERREPORT

BY TOM BARCLAY  
Radio Operations Manager  
Georgia Public Broadcasting

**ATLANTA** — As the radio operations manager for Georgia Public Broadcasting, my responsibilities center on managing programming, traffic and scheduling across a statewide network. It encompasses a hybrid news and music format for 15 stations, and a separate all-news feed for our Atlanta and Carrollton, Ga., stations. An 18th station out of Milledgeville, Ga., carries select programming from the main feed.

The need to manage two completely different program streams, fire up to 18 different IDs per hour and handle local content insertion for unmanned stations demands an automation system that is reliable, feature-rich and easy to use. ENCO and its DAD platform fill the role across these requirements.

### MIGRATION

We had been running an older-generation version of DAD since my arrival nine years ago, and decided to upgrade to version 15 upon receiving some state funding earlier this year. This coincided with a hardware and Windows operating system upgrade, all programmed with DAD gateway software to ensure seamless content management between our Atlanta headquarters; our Savannah, Macon and Augusta bureaus, all of which originate additional content; and our remaining network locations for local payout.

The upgrade comes at an interesting time for our division. Georgia Public Broadcasting is in the midst of a comprehensive workflow transition that, in addition to automation, includes a traffic system upgrade and a new newsroom system. The transition to ENCO DAD version 15 has been seamless through the disruption and is already bearing fruits.

Network-wide content manage-



GPB-Atlanta afternoon host Rickey Bevington uses ENCO DAD 15 in the control room.

ment has always been fairly easy with DAD, but the integration of ENCO's new Dropbox utility has been an enormous time-saver. Prior to upgrading, we needed to convert audio manually on a file-by-file basis to import news reports, promos and more into the automation system. That has been reduced to a simple one-step import process that automatically ingests audio files into the system.

For example, much of our programming is delivered via satellite to our headquarters and bureaus. However, we still receive a fair amount of content on

other sources not connected to satellite. We can simply download these programs and convert them through simple drag-and-drop functionality. On average, we shave off five hours of labor a week through this program alone.

Version 15 of DAD also adds some intriguing mobile capability. Our reporters in Atlanta, Savannah and Macon will no longer need to return to the studio, edit files and upload reports to FTP or email for delivery. Instead, using the iDAD remote app, reporters can file stories in the field, which production staff can access immediately. The take-

away is that we can bring timely news to air quickly, and eliminate the more traditionally labor-intensive processes for news production and payout.

The reliability and user-friendliness of DAD are important everyday benefits. DAD is rock-solid from an operational standpoint. We have external silence detectors to make us aware of outages. There have been very few over the years, none since upgrading to version 15. When I do need to troubleshoot, I can connect via VPN to any machine on the network, eliminating the need to visit locations physically.

The DAD platform also ensures that our operators can work anywhere on the network with ease. Occasionally, we will bring in a local host from Savannah or Macon to host a statewide show from our Atlanta headquarters. There is no learning curve; that host can easily play news cuts and promos, and have everything at their fingertips to put together a program.

I worked in commercial radio for 30-some years before coming here and have used several automation systems. I have been very happy with the capabilities that DAD provides over the years, from general playlist creation to the more advanced capabilities of version 15. They offer quality software and excellent customer support. Most important, they have accommodated everything we have needed in an automation system to make our lives easier across the network.

For information, contact Ken Formmert at ENCO Systems in Michigan at (248) 827-4440 or visit [www.enco.com](http://www.enco.com).

## RadioTraffic.com Is Top Notch for Max

Broadcaster uses system for 31 stations in seven states

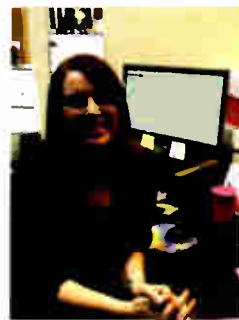
### USERREPORT

BY SHERRY CRIDER  
Director of Traffic  
Max Media

**CAPE GIRARDEAU, Mo.** — I am so pleased with RadioTraffic.com.

Max Media started using RadioTraffic.com in February 2014 for our 31 owned or operated radio stations and several websites in seven states. Although corporate headquarters are in Virginia Beach, Va., traffic and billing operations are centralized in Cape Girardeau, Mo.

I'll admit that in the beginning, I questioned if RadioTraffic.com would be able to provide us with the same reports and information that we had been accustomed to getting from our much more expensive traffic software.



But the reports in this system have been top notch. I love showing a new manager how they can run their own reports in different ways and watching them be amazed at the flexibility they have. Reports in RadioTraffic.com have far surpassed what our old traffic software provided.

I absolutely feel that RadioTraffic.com has saved Max Media time and money. With the sales feature allowing our account executives access to their own reports, accounts receivable, invoices and order confirmations, they are not always asking questions of the traffic department and that allows them to have the tools they need when they need them.

The RadioTraffic.com programming staff and support staff have been so helpful. Plus, with this being a web-based program, we're able to work from virtually anywhere.

For information, contact RadioTraffic.com in Texas at (866) 500-0500 or visit [www.radiottraffic.com](http://www.radiottraffic.com).

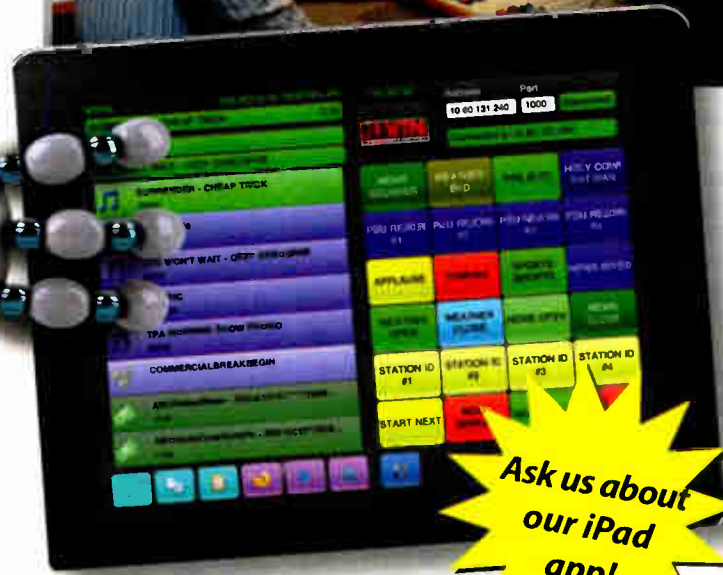
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RADIO AUTOMATION SOFTWARE



# DJB Has Value Sweet Spot for WHGM

Mixing features and value makes the sale for start-up station

## USERREPORT

BY JEFF DAVIS  
General Manager  
WHGM (AM/FM)

**HAVRE DE GRACE, Md.** — Since October 2014, WHGM (AM/FM) has been using DJB Radio DJB II software, formerly Digital JukeBox, with Westwood One's 24-hour "Good Time Oldies" format.

In our search for reliable and cost-effective satellite software, we had looked at several automation systems available, but as with most startups, cost was a factor in our decision. However, at the same time, we didn't want to sacrifice quality and features.

From the first hour of having the system on the air, we knew we made the right decision, with tight segues, auto ducking of music when a voice-track played and even the ability to tag our weather forecast with the



correct time and current outside temperature.

We were pleased to find out when purchasing the system, that there was no need for a proprietary soundcard. We selected a soundcard of our choice (Lexicon

USB) and all the features were instantly there. This alone was a major savings for us.

When it comes to using DJB with our 24-hour satellite music format, DJB came out fighting with flexibility of selection various triggers to play different audio during different day parts. This is also handy when using magic calls and liners that are supplied from the network.

We have just added our live morning show and DJB works well in our live setting, too. We have our sound effects and frequently used beds loaded into the hot keys that are available on the main screen with plenty of pages to add more.

On the weekends, we voice-track some of the day parts and the VT module is the easiest I have used, with wet voice-tracking so that my talent can hear the tail end of the music and the intros into the next song.

If you're looking for a quality automation system with loads of bang for the buck, Ron Paley and the folks at DJB should be one of your first calls. They even allow a full working-demo period for you to try before you buy.

For information, contact Ron Paley at DJB Radio in Nevada at (702) 487-3336 or visit [www.djbradio.com](http://www.djbradio.com).

## TECHUPDATES

### MUSIC 1 OFFERS VERSION 7

The Music 1 Windows-native music scheduling software. Its latest version, Version 7 includes the Traffacta traffic and billing module.



A built in auditioning player has been added allowing a music director to click-and-hear any song in Music 1. The player is incorporated into the Music 1 scheduler itself and is not dependent on any automation system.

The company says that Music 1 can schedule everything: including jingles, liners, links, voice tracks, long form programs and automation system commands. The nonmusic scheduling functions are incorporated into M1.

Music 1 is networkable and portable. Music and program directors can install it on their laptops (no additional fee) and can take it with them on the road, do their scheduling from anywhere and then email or FTP the automation playlists back to the station.

A single install of M1 is capable of scheduling any number of stations, channels or streams from the one computer, the company says and it has built-in interfaces for most of the widely used automation systems in the world.

Music 1 says it also sells and support Music 1 SE, a lower-cost scheduling software for Internet radio. According to the company, SE is based on the source code of the full Version 7 with some scaled down functionality, the company says, thereby providing webcasters with an advanced and efficient scheduling tool that meets all their needs at an affordable, buyout price.

SE is an option for broadcasters' HD channels or standalone webstreaming stations.

For information, contact Music 1 in Texas at (512) 392-2415 or visit [www.music1.pro](http://www.music1.pro).

### WINMEDIA INCREASES PRODUCTION AND MULTIPLATFORM DISTRIBUTION EFFICIENCIES

WinMedia says its latest release provides new capabilities for broadcasters and content producers. WinMedia 2015 allows customers to manage radio, TV, Web and social media activities from a single platform.

The program is media asset management-based and covers all aspects of content creation. WinMedia says this eliminates the need to piece together heterogeneous applications and tolerate shortcomings of integration workarounds. It covers ingest through automated payout, archives, multiplatform delivery and interactions with social media sites.

WinMedia 2015 offers two new modules:

- WinMedia Web provides broadcasters with a Web template and mobile application that are customizable using the platform CMS. Features include a player for live shows, ad blocks, playlists, podcasts and news updates. This tool combines Web and mobile features in a cost-effective package.
- WinMedia Visual Radio is an automated, software-based solution that allows broadcasters to turn radio shows into visual productions. Able to analyze everything that happens in the radio studio, WinMedia Visual Radio automatically switches cameras by controlling a third-party video production software.

In addition, enhancements have been added to WinBizz, WinMedia's traffic and billing solution. It now offers real-time online ad booking and radio, TV and Internet sales management in a single application. The company says WinBizz allows users to increase productivity and facilitates ad workflow organization while providing broadcasters with helpful customer relationship management.

For information, contact WinMedia in France at 011-33-494-102-101 or visit [www.winmedia.org](http://www.winmedia.org).





# KNDR Upgrades Arrakis Digilink System

Digilink-HD brings new features and network options to broadcaster

## USERREPORT

BY BRAD BALES  
Station Manager  
KNDR(FM)

**MANDAN, N.D.** — One inevitability of a radio station is the need to update studio equipment regularly. On that list is the automation system.

I am the station manager for KNDR(FM), a Christian-based radio station out of Mandan, N. D., that serves the central Dakotas. And just this last year, I was tasked with updating our automation.

We had an Arrakis Digilink DL4 system in place, but the drives on the old system were beginning to show their age, and it was time to plan for an update. Having been a Digilink customer for 13+ years, we decided to stay with a product that we were familiar with. It is always nice to know who you are working with and that the transition would be simple.

### TRANSITION

When we looked at Arrakis, we saw their new lineup of automation systems. We do satellite automation, so their New-Wave software wouldn't work for what we wanted to do. The Digilink-

Xtreme handled satellite, but looking at Digilink-HD ... we really liked the idea of going with their top system.

Naturally, there have been many advances with automation over the years from our first system. But I think the biggest factor that attracted us to

is a great bonus; that we didn't have to go out and buy expensive cards on our own. The Bridge helps us with our satellite switching needs and gives us high-quality sound with its soundcards.

At the time of the update, KNDR was building a much needed (albeit)



Digilink-HD was the audio file management and the one hardware box that does it all, "The Bridge."

The Bridge will accommodate various satellite network sources, time records and other switching. This was an easy choice for controlling and setting up multiple channels of audio. The Bridge also included soundcards, which

small production room to relieve the heavy usage of the existing single production room. Since the Digilink-HD will accommodate several production rooms, it was easy to set up the second new room quickly and economically. Digilink-HD has a software application, which they call DHD-Tools, for use in production rooms. Now that we have two production rooms, we can utilize both spaces at the same time with this software, without tripping over the other. This made Digilink-HD attractive

for our needs.

After moving forward on our decision to purchase Digilink-HD, we received the systems quickly. The Bridge, Digilink-HD software (which comes loaded on a PC) and third cart play option were up and running in about two hours. That included the wiring.

If you are starting a studio from scratch, I'd imagine it will take longer, and this project was for a single station with two production rooms. The DL4, a previous Arrakis product, used the same Molex connectors, so much of the wiring was plug-and-go.

Over the past year of having Digilink-HD, we have saved many, many hours of production time with the various features of the HD library management. One such example, this system will allow users to voice-track on the fly (yes, within a current hour if need be) without "copying files" to other studios, etc. The time record function also allows users to manage background recordings easily. The numerous features add up to tons of time savings and make our work easier.

My advice for this type of project, or any studio project for that matter, is to plan ahead as you would with any major change in your station. I believe it is important to know what you need in an on-air system and production room in advance of purchase. After having run through the entire process of research, installation and now operating, I am glad that we didn't rush ourselves at any step.

For information, contact Ben Palmer at Arrakis Systems in Colorado at (970) 461-0730 or visit [www.arrakis-systems.com](http://www.arrakis-systems.com).

## TECHUPDATE

### WIDEORBIT DEBUTS PROGRAMMATIC RADIO MARKETPLACE

WideOrbit Inc. has launched WO Programmatic Radio, a marketplace for connecting broadcasters, brands and agencies to execute automated advertising transactions.

The solution is integrated with WO Traffic, WideOrbit's traffic system, making it simple for stations and networks to review, accept, air and get paid for programmatically transacted ads.

The company says WO Programmatic Radio matches advertiser demand with inventory from stations and networks running traffic operations on WideOrbit's WO Traffic. Offers to buy spots arrive directly in participating stations' traffic systems along with creative executions. Stations can approve or reject the offer for any reason, including pricing.

The manufacturer says that stations using WO Programmatic Radio gain access to demand from advertisers that may not usually consider purchasing local radio. "Digital-first" marketers accustomed to buying audiences based on proprietary audience metrics can bring their own data to the system for identifying and targeting valuable new audiences, it says.

Participating stations are not required to set aside inventory for programmatic sales, nor are there monthly or setup fees.

For information, contact WideOrbit at (208) 788-1564 or visit [www.wideorbit.com](http://www.wideorbit.com).



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## AUDIO PROCESSING (INCLUDES ON-AIR)

### WANT TO BUY

Teletonix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST - 214 738-7873 or [sixtiesradio@yahoo.com](mailto:sixtiesradio@yahoo.com)

## AUTOMATION EQUIPMENT

### WANT TO SELL

DIY-DJ Version 2.0 is now available. Over 500 copies of DIY-DJ, a Linux based radio automation system, have been distributed and now version 2.0 is available. Voice tracking, joint satellite feeds, do unattended sports and remote events, temperature announce, scheduler,

automatic cut editing on import, and much more. It's FREE. If you are using version 1.0 or would like to try DIY-DJ, go to [krwfsfm.com](http://krwfsfm.com), register and download your free full version. The only thing we ask is that you let us know if and how you are using the software. Call (406) 679-0527 or email [krwfs@digitaldevelopment.net](mailto:krwfs@digitaldevelopment.net) for a copy today.

## MICROPHONES/ HEADPHONES/ SPEAKERS/AMPS

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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](mailto:sixtiesradio@yahoo.com)

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After 56 years, WYBG 1050 AM closed operations on June 30. For sale: Contents of 3 complete studios, control room with 8 channel consoles, turntables, cart machines, microphones. Newsroom: smaller console, microphones, etc. Production Studio: small console, 2 turntables, CD and cart machines with 3 SX and Music Jingle Production libraries. 1,831 45s; 213 LPs; 331 CDs—not used in 20 years. Plus, filing cabinets, large decks, secretary desk with IBM wheel writer and accessories. Please call Curran Wade, 315-287-1753. Let's Make a Deal!

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Collector wants to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035 or [ilg821@aol.com](mailto:ilg821@aol.com).

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

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

## RECEIVERS/ TRANSCIVERS

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I am a vastly diverse Professional with a passion for broadcasting. I am proficient in many broadcasting areas, including: On-air, production, and copy writing. I'm very energetic, informed, and reliable. I stay optimistic and I'm looking forward to working with you. [shebasfish@yahoo.com](mailto:shebasfish@yahoo.com), or 405-637-6560.

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READER'S FORUM

READER SERVICES

As part of a nearly 40-year career in non-commercial broadcasting, I spent three-plus enjoyable years operating the Evergreen Radio Reading Service at the Washington Talking Book & Braille Library in Seattle. Sadly, that service, founded in 1973 and airing on a sub-carrier of public radio station KUOW, is now one of many that have gone silent in recent years.

At the end of 2011, the service lost its funding source, as the State of Washington (which operates WTBBL as part of the secretary of state's office) dramatically cut funding to library services. My co-operator John Pai and I figured out a way to keep the service on-air with no staff and minimal cost, utilizing a handful of our volunteers along with automated recordings from several other IAAS members; we went from about 85 percent local programming to about 15 percent. Further cutbacks silenced the operation altogether in mid-2014.

Volunteer reader Gregg Porter, right, and WTBBL's John Pai hold up the autobiography of local musician and Guns N' Roses bassist Duff McKagan.

It is truly depressing to see the struggles of so many radio reading services, and your article ("Radio Reading Services Face Obstacles," Sept. 1) outlined many of the arguments we were making during our fight to keep ours alive — how the alternatives that many people suggest are not necessarily available to many of those who most rely on such services.

(John has since returned to WTBBL to run their audio-book recording program, where I am now a volunteer reader; I returned to work as an announcer at KUOW, where I have worked off-and-on since 1984.)

Gregg Porter  
Announcer  
KUOW(FM)  
Seattle

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RDS LIMITATIONS

Just catching up on some reading. The article ("A First Look at RDS2," July 15 issue) mentions that it is easy to exceed the present RT field length (64 characters) in RDS1. The real problem here is that many car receivers do not even allow *all* of the 64 characters in the RT field, meaning that the receivers are not designed to the specs. My real point is: How are they going to make the receiver manufacturers adhere to even the present standards, let alone enhanced ones?

Case in point, my GMC Terrain with the upgraded audio system and navigation has a nice display but the RT is nowhere near 64 characters. When the PS scrolling is the same as the RT, the characters that did not appear on the RT line appear in the scrolling PS.

Hal Kneller  
VP Global Sales and Business Development  
GeoBroadcast Solutions, LLC  
Punta Gorda, Fla.

FREE SPEECH

Paul, thanks for the recent From the Editor column (Sept. 1 issue) on the topic of approval for forum posts and letters. This can be hard when emotions are strong, but by posting and following your rules, you keep this as fair as possible.

I would like to emphasize a peripheral point you made in your discussion — that of free speech. Since this is well within the realm of broadcasting, it is worth emphasizing the point you made.

In recent years, we have seen increasing confusion about just what is constitutionally protected free speech, often by those who (should) know better.

However, the issue of public versus private is the most important distinction. Even though broadcasters are tasked with serving the public, they are independent of the government, and are thus under no obligation to air any particular person's material. Just as a private club can decide who performs and set rules on content, so can the press.

In recent years, I have heard politicians claim that their free speech has been violated, simply because something they said wasn't reported the way s/he desired. That is a gross misunderstanding of this right, and I was glad to join in your dismissal of this proposition.

Rolf Taylor  
Rocket Engineering and Consulting  
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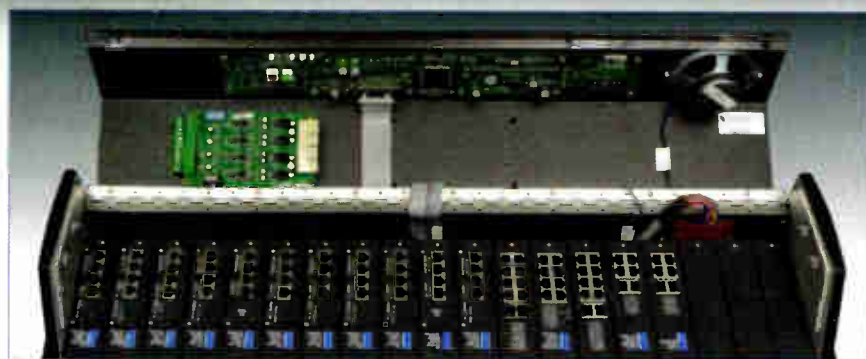


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# AIN'T NOTHIN' LIKE THE REAL THING.... THE AUDIOARTS D-76 DIGITAL CONSOLE



The Audioarts D-76 console has all the practical style and rugged functionality of the beloved D-75 standalone console, a staple in radio studios for the past 15 years, but with modern necessities such as an RJ connector system for all your I/O.

The D-76 is a tabletop, modular console available in a 12-channel or 20-channel frame, and includes StudioHub+ RJ45 connectivity.

Sporting a sleek new profile, the D-76 comes standard with ample mic preamps, plenty of stereo busses, and a comprehensive monitor section that provides separate feeds to control room/headphone and studio monitor outputs — plus headphone jack and built-in cue speaker.

It has four stereo busses, dual-domain outputs, sample rate conversion on all digital inputs, and interchangeable input module daughter cards for easy analog-to-digital conversion in the field. Its modern design features backlit controls and meter

bridge with full-scale bargraph digital peak plus VU metering and automatic timer and clock.

Individual plug-in modules make installation and service a breeze. The D-76 can be ordered with an optional SUPERPHONE module, which supports two callers. It can also be ordered with the optional IP-76 plug-in module for interfacing to the WheatNet-IP Intelligent Network.

This new console has everything you have come to expect of an Audioarts console — like ease of use and rock solid reliability (including a KILLER power supply, built by Audioarts).

It is laid out in a sleek new design that is both affordable and practical for modern radio stations of all sizes.

Contact Audioarts Engineering for more info on the D-76 Digital Audio Console.



- Modular hot-swap plug-in design
- Optional IP-76 module provides connectivity and additional I/O through WheatNet-IP network
- Optional SUPERPHONE module with dual caller support
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