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# Radio

THE RADIO TECHNOLOGY LEADER

# Jazz 88: KBEM-FM

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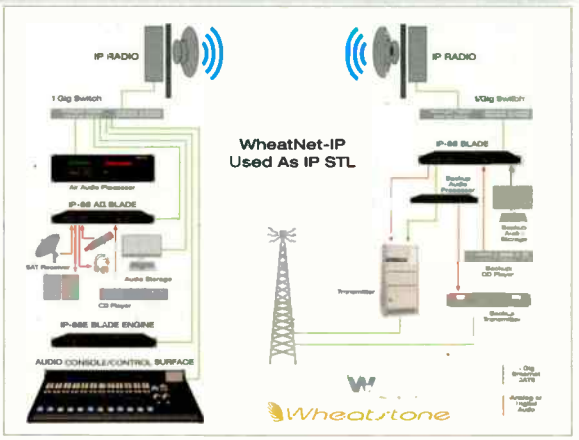


## Multimedia Madness

**Rethinking radio because of multimedia? We're putting more shared resources on the WheatNet-IP audio network and discovering some interesting uses for logic, including video following audio.**

If you wanted to mess with cameras all day you wouldn't have gone into radio, right? It's not just YouTube, either. Or the station website that needs a continual stream of video and audio, or the photo bombs that are going off all day, every day. Or even that the morning guys are running all over town with a microphone and a camera.

Multimedia is requiring all of us to rethink radio.

We're putting more shared resources on the WheatNet-IP audio network in order to clear the studio of old gear and other camera eyesores, and we're putting audio processing at every access point in the network for the disparate sounds coming off the Internet, for example. We're finding a lot of new uses for logic control, too — like, triggering the studio camera to take a picture for Instagram or record video for YouTube whenever talent talks into the mic. For more ideas on how to deal with multimedia madness, go to...

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For more, visit...

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**FIND THE MIC AND WIN!**

Tell us where you think the mic icon is placed on this issue's cover and you could win a Hosa USX-110 mic-to-USB interface. Send your entry to radio@RadioMagOnline.com by September 10. Be sure to include your guess, name, job title, company name, mailing address and phone number. No purchase necessary. For complete rules, go to RadioMagOnline.com

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# "Strong Demand for NextRadio," According to Coleman Insights and knowDigital

RESEARCH TRIANGLE PARK, N.C.— Research indicates that consumers are interested in the service provided by smartphone FM radio app NextRadio, according to Coleman Insights and its knowDigital division.

These conclusions are based on national survey of 801 online interviews with 18- to 49-year-old smartphone owners who viewed a 90-second video explaining the app. The sample employed quotas to ensure that it appropriately represents the national population in terms of age, gender, ethnicity and geography and so that the responders were split roughly equally between smartphone owners with unlimited data plans and those with metered or pre-paid plans.

The research was supported by the National Association of Broadcasters and completed in cooperation with NextRadio developer Emmis Communications.

Here are a few excerpts from the findings:

- 88 percent had a positive reaction to NextRadio, including 56 percent who described their initial reaction as "very positive"
- 45 percent said they "definitely would" use NextRadio if it was installed; another 43 percent said they "probably would" use the app
- 80 percent said they "probably would" or "definitely would" download NextRadio if the app was not already installed on their smartphones
- 63 percent say they would listen to local FM radio more if they had NextRadio
- 73 percent of those with metered or pre-paid data plans acknowledge that such plans limited their consumption of audio entertainment on their smartphones
- Low battery and data plan usage were evaluated as the most positive benefits of NextRadio's "People want free, local FM radio on their smartphones," said Emmis Chairman and CEO Jeff Smulyan. "And NextRadio gives them exactly what they want."

A streaming video presentation and a written summary of the study's findings are available online, and the research firms will also share additional findings from the study in private briefings with the consortium of radio broadcasters supporting NextRadio's launch in the coming weeks and months.

## EBU Technical Report Examines LTE Capability to Deliver Broadcast Content

GENEVA—EBU's Technical Report 027 examines the possibility of delivering broadcast content and services over LTE networks, and presents the outcome of the first-ever jointly conducted study by broadcasters and the mobile industry focused on the capability of a mobile broadband technology to deliver linear TV on a tablet either at home or on the move.

This initial study provides the essential technical information about the capabilities and performance of the LTE eMBMS system with a focus on broadcasters' requirements, in particular, the possibility to deliver services free-to-air which is very important to EBU Members, according to EBU news.

According to the report, LTE could be a useful complement to the broadcast distribution platforms. However, it is not realistic to expect that LTE will become a viable alternative to broadcast distribution, including terrestrial TV networks (DTT) in the foreseeable future. The report recognizes that non-technical aspects such as operational scenarios, regulatory conditions, business models, and costs need to be better understood before any conclusion on the viability of a large scale delivery of broadcast content over LTE can be drawn. These elements have not been studied in depth but will be addressed in the follow-up work of the EBU project group.

## Clip Interactive Expands Partnership With Salem Communications

PORTLAND, ORE. —Salem Communications has expanded its partnership with Boulder, Co.-based technology company Clip Interactive to create custom mobile apps for 15 stations in five markets around the country: Portland, Seattle, Minneapolis, San Antonio and Atlanta.

Christian multimedia company Salem Communications first implemented Clip Radio-powered apps for their four Portland stations in 2013. Salem was pleased with the results in Portland with listener engagement, conversion rates and revenue potential and therefore is expanding to additional cities.

"As more of our stations implement Clip Interactive's technology, we can better engage our listeners across the country while better measuring the effectiveness of our advertisers' campaigns and providing real ROI," said Director of Digital Media Salem Communications Rodney Whitaker.

With Clip Interactive's technology, these apps now enable users to access a live feed of what's playing and to browse the content aired in the past hour. Users can also interact with what they hear by rating the music, entering contents and accessing special offers.


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VIEWPOINT

# Radio: The Mobile Platform

As a relative newcomer to the field of trade journalism from broadcast engineering, I found myself seeing the terms "mobile" and "digital" used in completely different contexts than I was familiar with. Broadcast radio has always been mobile, and certainly has the potential to be digital. When speaking of new content and advertising initiatives, however, the terms now broadly refer to any platform such as smartphones, tablets and presumably the "connected car."

Advertisers are constantly seeking new ways to reach their potential customers, no matter where they are, or what technology platform they are using. For many years, radio has been a primary means to accomplish this since at least some segment of their target audience listens to radio in various situations, and in various locations throughout the day. Radio is everywhere—in the home, in the car, at the office, and on the street or at the gym while walking or jogging. It has always been (and continues to be) a very widely used mobile platform for audio.

There is apparently, however, a perception that radio is no longer a viable platform for reaching some of those mobile audiences. Look around, and you now see many people listening to audio from their smartphones far more than you see them listening to a portable radio. Combine this with the number of available content options in the car, and it is certainly understandable where the perception of radio as no longer being a mobile platform arises.

While it certainly is true that people are using smartphones in almost every aspect of their daily lives, many still listen to radio on a regular basis. A number of people listen to station streams via their smartphones, but are quickly discovering that their data usage and costs are skyrocketing as a result. One solution to this is to incorporate FM receivers into smartphones. According to a recent study by Coleman, many would reportedly like to have radio in their smartphones. This month, we cover the Emmis NextRadio project, which aims to work with broadcasters and cellular providers to do exactly that.

For advertisers, one big reason why digital platforms have become so appealing is near real-time feedback on the reach and effectiveness of their campaigns. Radio has been able to deliver listener numbers through ratings services, however, there has never been any good way to quickly measure listener engagement or response to a particular ad campaign for radio with the same level of accuracy as other platforms. Projects such as NextRadio have the potential to change this by combining the best of broadcast radio and data services.

Emmis CEO Jeff Smulyan has been quoted as saying we need to make radio "cool" again—I'm not so sure it needs to be "cool" as much as it needs to be relevant and accessible to consumers while being appealing to advertisers. Making broadcast FM radio available to consumers again on a platform that they carry with them constantly, while combining it with the interactivity they have come to expect from other media apps on their smartphone is certainly a technological step in the right direction.



Shane Toven | Editor

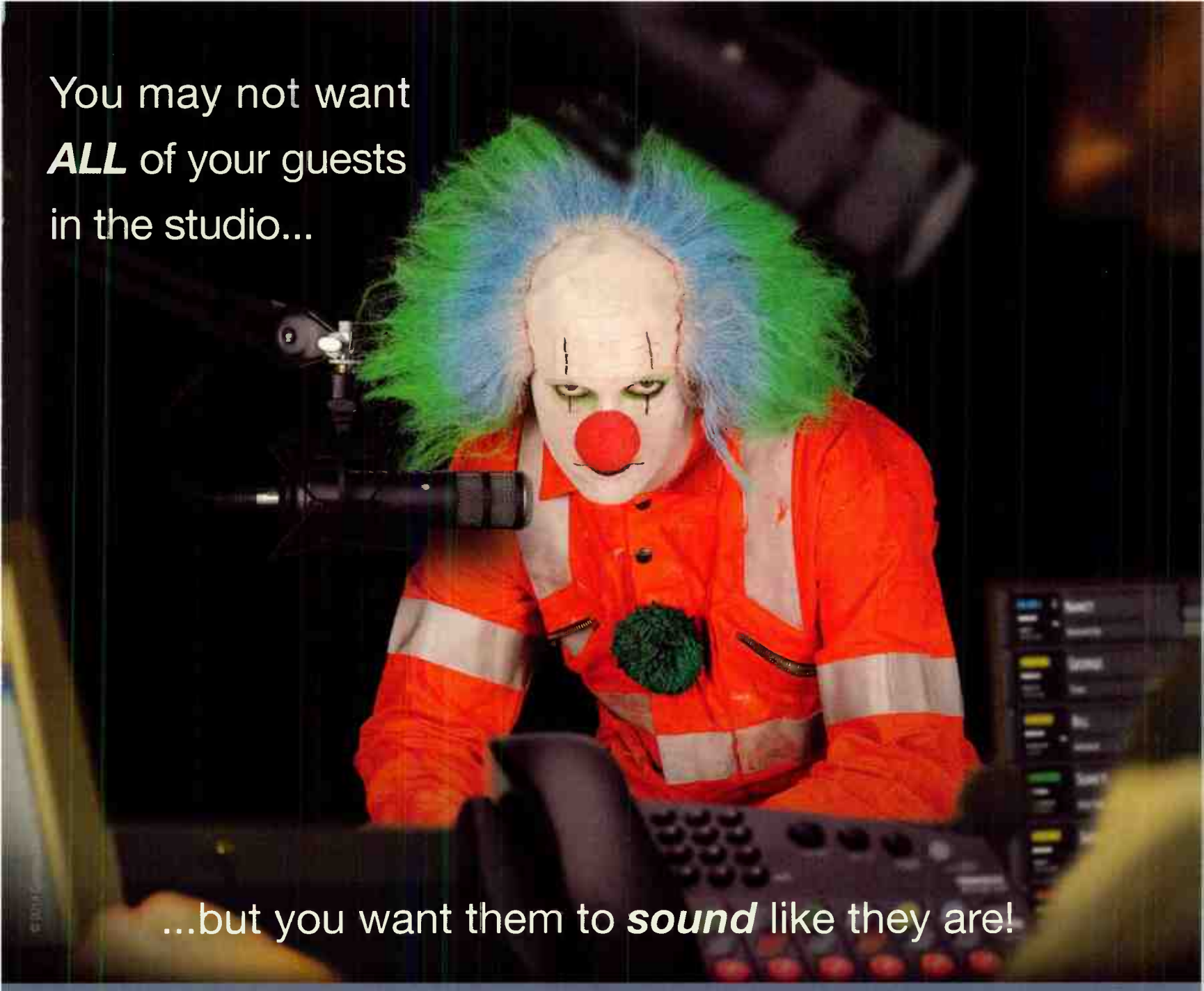

Radio
THE RADIO TECHNOLOGY LEADER

August 2014 | Vol. 20 No. 8





Radio, Volume 20, Number 8, (ISSN 1542-0620) is published monthly by NewBay Media LLC, 28 East 28th Street, 12th floor, New York, NY 10016. Periodical postage paid at New York, NY and additional mailing offices. Postmaster: Send address changes to Radio, PO Box 1884, Lowell, MA 01853.

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# FCC Tees Up Some Late-Summer Business

by Lee Petro

While the rest of Washington is on vacation, the FCC has teed up several issues to keep broadcasters busy over the next several months. First, the FCC released a Notice of Proposed Rulemaking to make further changes to the Emergency Alert System in the wake of the 2011 national EAS test. During the 2011 test, certain problems arose from conducting a nationwide EAS test, including the lack of a location code for nationwide tests. While each U.S. state and territory has its own geographic code, the current FCC rules do not have a geographic code to be used for nationwide alerts. During the 2011 test, the code for Washington, D.C., was used, but some equipment rejected the test alert because it was not local. The FCC has proposed to use "000000" as the code for future nationwide alerts, which should not require substantial reprogramming of EAS equipment.

The FCC is also proposing to create a National Period Test code that would be used instead of the Emergency Action Notification that was used in the 2011 test. The NPT would eliminate the confusion arising from whether the future use of the EAN was a test or a real emergency. The proposed NPT would be similar to the EAN, but would not be limited in duration, which would permit more extensive testing and the distribution of information. The FCC is also looking to strengthen its rules to ensure that people with disabilities are aware of future testing. To that end, it is considering the adoption of a text crawl requirement similar to the FCC's current closed captioning rules. Comments in this proceeding are due on Aug. 14, and reply comments are due on Aug. 29.

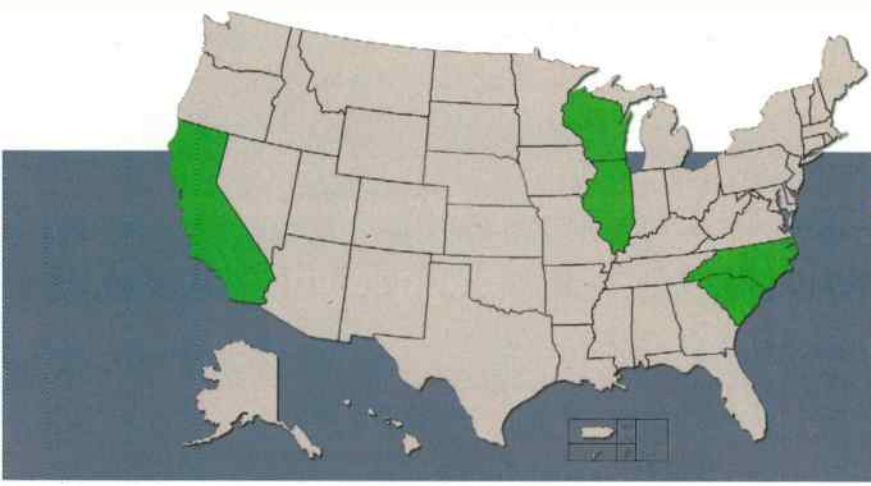
Next, as reported last month, the FCC's Media Bureau had said at the June FCC Meeting that it would releasing a public notice dealing with the first group of mutually-exclusive low-power FM applications. On July 9 the FCC released the public notice and also opened a filing window for applications listed in the public notice to file major modification amendments to their applications in order to eliminate conflicts. Petitions to deny the tentative selectees are due by Aug. 8.

The major change amendment filing window opened on July 10, and will close on Oct. 8. During this window, those applications listed in the public notice, which comprises 79 groups in the western states (AZ, CA, CO, HI, KS, MO, NE, NV, OR, SD, TX, UT, WA), may file amendments. The applicants can file both non-adjacent channel changes and site relocations of greater than 5.6 kilometers in order to eliminate conflicts. However the amendments may not create new conflicts with other pending LPFM applications. The Public Notice also listed all of the LPFM stations in the region that had requested second-adjacent waiver requests, and the full-power FM stations to which the waiver requests apply.

Finally, on July 18, the FCC released a public notice regarding a petition for rulemaking filed by SSR Communications Inc., to create a new class of FM stations and to make other changes to the FCC's spacing rules. The new class – C4 – would fit between the Class A and Class C3 allotments, and would permit a maximum height above average terrain of 100 meters and maximum ERP of 12 kW.

The rulemaking also proposes the adoption of a "show cause" procedure by which facilities that are operating below the maximum power and height for their respective class for more than 10 years could be subject to reclassification as a Section 73.215 station. This approach is similar to the Class C0 FM rules, and the reclassification could be avoided by tendering a minor change application by the targeted station within 180 days. Comments on this petition for rulemaking are due no later than Aug. 18.

*Petro is of counsel at Drinker Biddle & Reath, LLP. Email: lee.petro@dbr.com.*



## DATELINE

**Aug. 1, 2014** – Stations in California, Illinois, North Carolina, South Carolina and Wisconsin must place Annual EEO Reports in public file.

**Aug. 1, 2014** – Noncommercial Radio stations in Illinois and Wisconsin must file Ownership Report (FCC Form 323E) with FCC.

**Sept. 5, 2014** – Lowest Unit Charge obligations commence for political advertisements by candidates for federal, state, and local races for the general election to be held on Nov. 4, 2014.

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- Detect whether or not the air conditioner is "called" by the thermostat.
- If the temperature is increasing, and if the air conditioner is called, then the outlet air should indicate its normal "cool" temperature, and clearly the room temperature should start to decrease.

Even with a simple remote control, you could analyze the data at hand (temperatures and status) and tell whether everything is working as it should. However, since you are likely doing other things, you could also develop a script for your remote control system that would analyze this information for you, and contact you with an alarm only if a problem exists.

There are at least two remote controls out there that will support this. First, you could use Auto Pilot 2010 with Jet Active Flowcharts from Burk. In the case of older Burk units (like the ARC-16) this runs on a separate Windows-based machine, and communicates with the remote control via a serial connection. The flowchart uses information gathered from the remote control (analog data and status) and provides control via the normal relay outputs.

Another option would be a remote control that supports ScriptEasy from WorldCast Systems: the Mini Control Silver or Relio would handle this application easily. Since either of those remote controls acts as an SNMP agent, you could potentially read your AC temperatures and status outputs by way of IP, thus effectively "modernizing" an unsophisticated (or just plain old) AC unit.

## KEEP TRACK OF YOUR GENERATOR

Generators are similar to AC units in that if you are buying a new one, you've got a great opportunity to take advantage of the 21st century features that many older sets simply don't have. The perfect example of that is the gathering of all the engine data along with voltage and current readings on the generator itself. Kohler calls its system Power Scan, Cummins (Onan) calls its system Remote Power Monitoring and Caterpillar calls its system Condition Monitoring.

But like so many of us, you may have an older generator that simply has nothing in the way of remote monitoring. Let's see what we can do in that case.

Between test and/or use periods, there are a few generator parameters you can keep track of with your remote control:

- Monitor the voltage across the battery. You should always see the "float" voltage from your battery charger.
- Monitor the block heater operation by measuring the current flow through the heater itself.

The photo (Figure 1) shows both block-heater current sensor as well as a battery voltage sensor (built by Jerry Burnham). The block-heater current sensor works like an old-fashioned tower light sensor, with the load wire wrapped around a ferrite donut on its way to the connector. A voltage is developed across another couple of turns of wire around the same donut; those leads are used to generate a small DC voltage that drives the remote control analog input. The battery voltage sensor makes use of a fairly high resistance potentiometer connected across the battery terminals. The

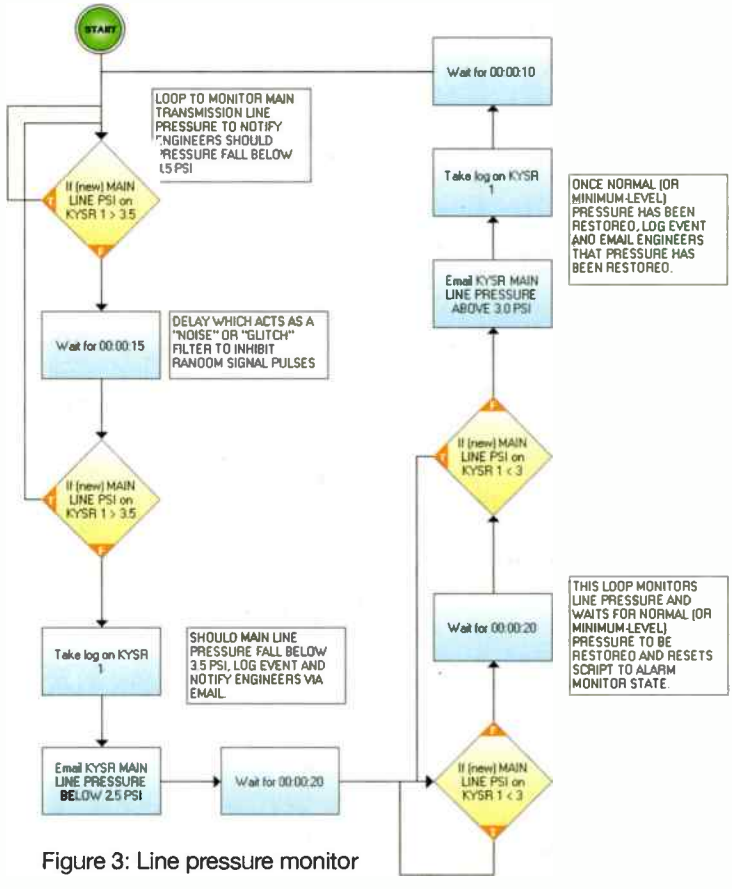


Figure 3: Line pressure monitor

wiper arm is used for the output. Both pieces of information are sent in to the remote control, and are used for remote readings of course and more importantly, alarm outputs. (A word of caution here: Mount the sensor close to the battery, and also be certain that the remote control "ground" and the DC "ground" of the generator are the same. If not, consider using an isolating DC amplifier.)

Just because both of those parameters look good doesn't mean that your generator is guaranteed to start when you need it. However, with the wrong battery voltage, you know it won't; and with a cold block, chances are you will have problems as well.

## TOWER LIGHT MONITORING

If you have a tower with lights, you know that meaningful and reliable measurements are an absolute necessity. Many broadcast engineers have rolled their own tower light monitors over the years, but the availability of devices such as the FM Services TLM-1 makes it much easier to build and configure a system. The TLM-1 Tower Light Monitor is a microprocessor-based system designed to monitor the status of FAA Type A incandescent tower lights. It has an overall summary alarm output, as well as individual alarm outputs for flasher, beacon, obstruction lights, and the photocell itself, all optically-isolated. The alarm outputs are normally closed without alarm conditions, allowing you to know that the unit has power applied. There's a one-button calibration procedure, and according to the manufacturer, the TLM-1 "insures total lighting compliance — alarms for single-bulb failure (marker and beacon), beacon flash rate or on/off ratio outside of FAA specifications and photocell failure."

The TLM-1 is fairly compact and can be installed in a NEMA box, as in Figure 2 (again, construction by Jerry Burnham). The TLM-1 is in the

lower-left hand corner of the NEMA box.

You may have a tower that has a medium intensity lighting system installed upon it — in which case you could consider something like the MON-950 from International Tower Lighting. The MON-950 can utilize direct wired Ethernet or wireless cellular communication to provide monitoring of tower lighting systems, and it works with SNMP manager software to provide real-time and historical reporting on tower lighting systems. The MON-950 supports "virtually all existing medium intensity lighting systems" and is adaptable to new systems. It's capable of monitoring triple-beacon systems for towers over 350 feet high; it has remote control capacity for day and night mode; it has 10 dry-contact inputs and two Form C relay outputs, and it has an embedded web browser for system configuration.

Figure 4: Omega tank pressure sensor

### TRANSMISSION LINE PRESSURE

Transmission line pressure has been something typically looked at during inspections and noted in a log; if the pressure suddenly leaked to zero between visits most engineers wouldn't know about it. There are some accurate and inexpensive devices out there that will help you in developing a remote control system that will alert you to problems between site visits.

Dennis Sloatman, the director of engineering for Clear Channel in Los Angeles, has developed numerous monitoring systems using Burk's Jet Active scripting and sensors from Omega. Take a look at Figure 3. The operation of this script, which measures transmission line pressure, is straightforward and occurs in this order:

1. The Burk remote control continually measures the line pressure to see if it exceeds 3.5 pounds.
2. If it doesn't, wait 15 seconds, measure again
3. If it still doesn't, take log entry, and alert engineers via e-mail
4. Continue to measure pressure every 20 seconds
5. If the pressure exceeds 3.0 pounds take log entry and alert engineers via e-mail

*Continued on Page 30*




# What's "Next" for Radio?

by Ed Bukont, M.Sc., CTS

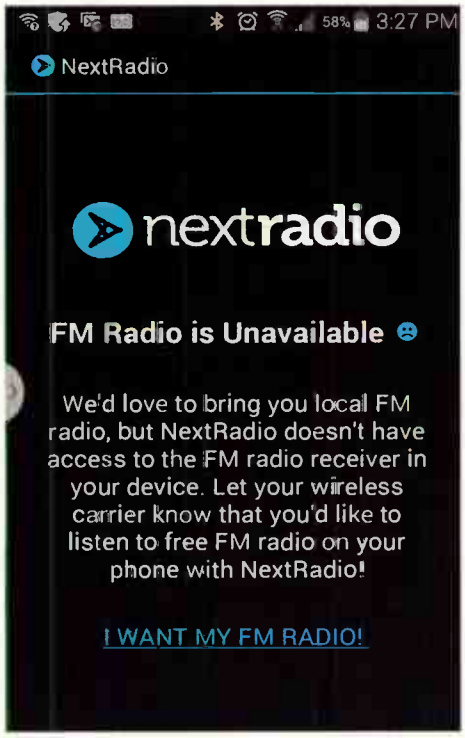
None of the major cellular carriers responded to requests for information, yet in the words of Pogo, "We have met the enemy, and he is us." Having expected the cellular industry to be the big bad wolf, it became clear that as with AM stereo and HD Radio, here we go again, because we are afraid to lead and afraid to be lead.

For nearly a year, Emmis has offered NextRadio, http://nextradioapp.com/, an app for smartphones with the Android OS. While it has received some recent new attention, I have to ask: Where is the effort as an industry?

In 1954, the transistor took radio from transportable to truly portable. Within 15 years, that was reduced to pocket-sized. You could leave your car, and easily take radio with you. Sony's Walkman 25 years later made your tape collection portable. For the next 35 years, portables still had tuners, fancy features, and a headphone jack even as the tape media changed. Today that size hosts a lifestyle and technologies that did not exist 5 to 30 years ago. So why isn't there an FM radio receiver in your smartphone? The technology is readily available to include FM (yes, even IBOC) receivers in smart phones.

There are, in fact, at least 30 models of smartphone by Samsung, LG, HTC and others operating on the Android OS reported to include FM receivers and support the NextRadio app. I have one of those. A Samsung Galaxy 5, with service from AT&T Mobile. I downloaded and successfully installed the app. Here is the result when I try to run the app (see image). The app is indicating that the phone hardware is restricted, but it is not clear if by Samsung, AT&T or both. By some reports, there are 4–5 times those numbers in various cellular phone models that include an analog FM Rx. Kind of surprised, are you? Let's get educated about the NextRadio app.

NextRadio is a smartphone FM receiver and data hybrid application spearheaded by Emmis and offered initially by Sprint (also Boost and Virgin Mobile). The app, which is free, allows a listener's phone to access FM station interactive content without a hit to their data plan. Radio stations can sign up (nominal charge) for a TagStation license that allows the enhanced use of metadata, song, artist, and title info, station specific content, even messages, to the phone. With an FM receiver chip, the user gets content (even absent NextRadio) including emergency mass notifications, where no data network, usage charges, or subscription are required to receive on the portable device. There are reports that using the FM receiver to receive content increases battery life by three times. Searching the Internet, most of the carriers and some manufacturers in the U.S. market have taken to disable the FM receiver. They all make claims that the OTA restriction is offset by the ability to receive streaming media, in many cases at the cost of additional data consumption. The carriers all offer competing services that are supported by subscription and advertising, which has placed them in the role of being competitors to over-the-air broadcasting, with several unfair advantages, most being the result of antiquated regulation. The inability to use the included FM receiver in my S5, after downloading the NextRadio app, causes one to wonder if this isn't a restraint of trade issue. That would be an FTC/DOJ matter, not an FCC matter. Imagine not being able to use the clock in your microwave because Samsung also sells clocks bundled with a Microsoft NTP subscription. But … are they the villain in this story?




Samsung Galaxy S5 on AT&T error message

Digital media research firm Coleman Insights has produced some rather startling research with regard to under-40 listener perceptions on behalf of NextRadio; see http://www.colemaninsights.com/nextradio. In the survey video, there are interviews and summaries with a decent sample of listeners. The most startling takeaway, in my opinion, is that listeners are not aware that free OTA radio reception is portable. They are of the impression that radio is something that comes with a car (and is going away). So…the chip is disabled in the phone, and the consumer is not complaining because they have no idea that it is either there, or how they can use it.

How did this come to happen, that the industry that birthed portable media, is now shut out of portable media? The research goes on to show while there is interest; there is little knowledge of the OTA or streaming media aspects of FM. NextRadio addresses both of these, but how is the industry making the consumer aware? We seem to be a much bigger part of the problem that the survey expected to reveal. If you don't know, how will the listener know?

Recently NPR, American Public Media and Educational Media Foundation have become active voices in educating the industry about NextRadio. The industry has to educate the regulators. BlackBerry is reported to offer some models with FM receivers active in the US. HTC's One (M8) is reported to allow FM reception on most carriers. Cox is reported to have subscribed to TagStation, as have many other broadcasters. Digital isn't going away. We can lead, or we can follow, but if we do nothing, we are going to be pushed out of the dashboard, out of the portable device, and out of the way. Decide what's Next for Radio.

*Ed Bukont owns E2 Technical Services, providing consulting and construction services to broadcast and A/V clients.*

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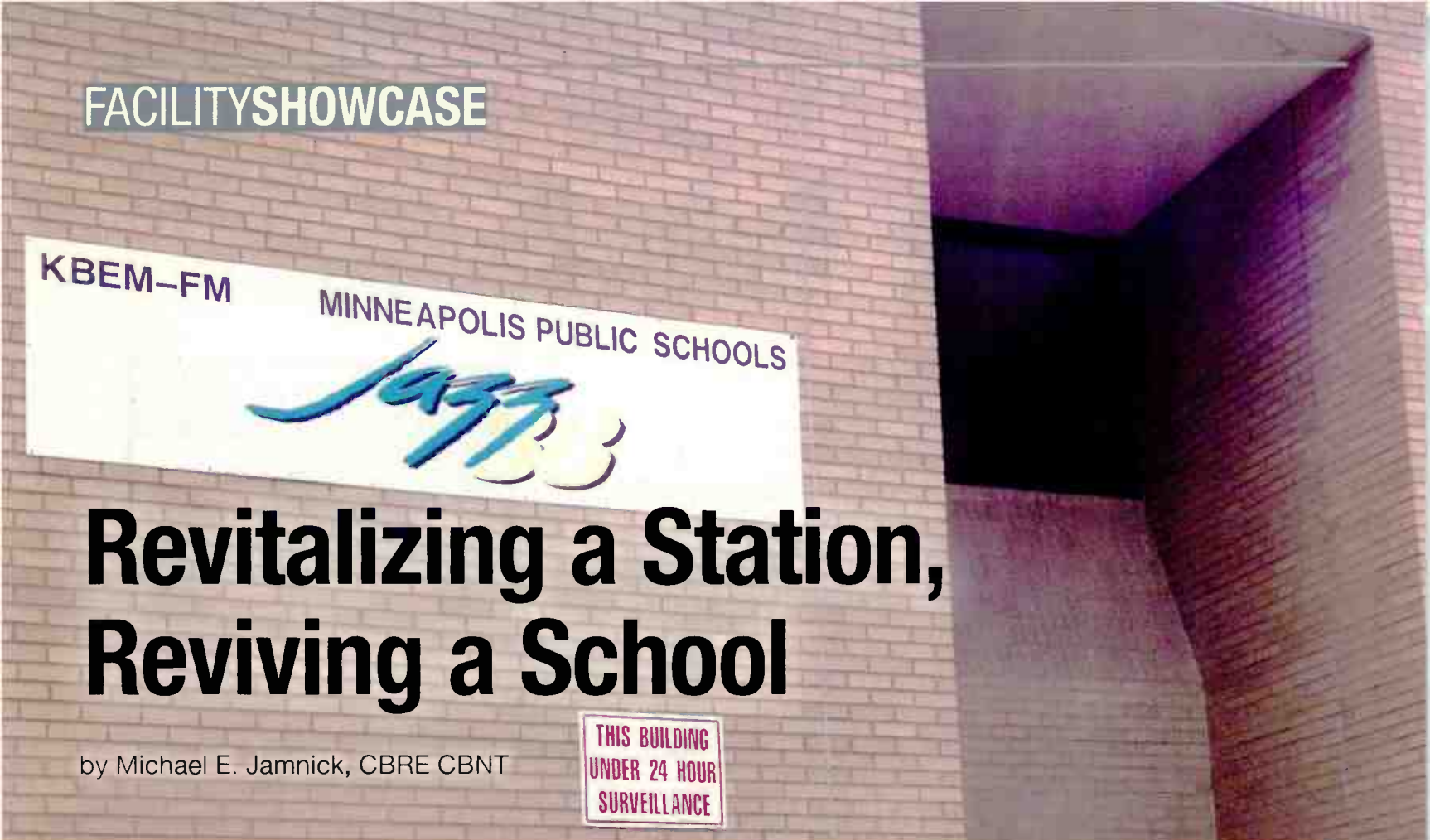



# Revitalizing a Station, Reviving a School

by Michael E. Jamnick, CBRE CBNT

**Housed in a north side neighborhood of Minneapolis, a station and its host high school both see opportunities to grow and improve.**

A little over three years ago, I walked into KBEM for an interview to become the new engineer. Having worked for another station within the same statewide affiliate network, I was familiar with some of the challenges that the station was facing.

The station is owned by the Minneapolis Public Schools and is housed in the struggling North Community High School. Hardly a year before my hire, the school district staved off an effort to shut down the building (putting KBEM down a path of uncertainty) and began to invest in a new future for the school and the neighboring community.

In doing so, MPS opened the door to make KBEM a stronger asset for education and outreach.

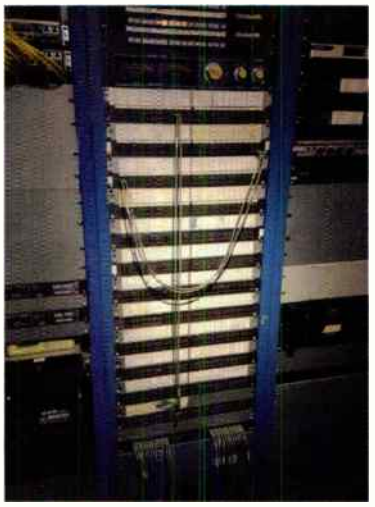
## ASSESSING THE FACILITY

My first week at KBEM basically consisted of a "this is over here, that is over there" walkthrough with the outgoing engineer. Although I have quite a bit of respect for his planning and design, he and I fundamentally disagreed on what technology should be in the facility. Two engineers, three opinions, right?

At the time, I felt that the technology that was available to the station and the staff was greatly underutilized. Each studio had an iMac with Amadeus editing software, but dubbing into a CD recorder was the preferred method for nearly all of the production work. Loading files into our ENCO automation system was done via manual internet downloads and ripping in all of our locally produced content off of the recorded CDs. Additionally, the protocol for scheduling daily ENCO playlists was carrying a USB drive between offices.

Audio routing between studios was done through multiple switches and a patch panel. Initially, I saw the value in this design, but the recent history was that the engineer was the only one who ever really understood how that all worked. It took all but 5 seconds for the station manager and me to agree that we needed to develop a plan that better maximized staff efficiency and streamlined station operations.

Finally, and most important, we needed to devise ways to make KBEM appealing to students. The school district takes their goal of "Every child college and career ready" very seriously. So, in addition to making the facility work better for me and other staff members, we assessed what we can do to help serve our student population.



Patch bays

Punch block wall

It does not take much imagination to figure out that a member of the Class of 2014 would not be impressed with technology from 2004. However, the considerations of the staff members and volunteers who have been with the station for decades also have merit. So, the ultimate challenge boils down to this: How can I design a facility that is useful and relevant to a 14-year-old as well as a 74-year-old?

## LAYING THE GROUNDWORK

The two major undertakings on my agenda before I started rebuilding the facility were to make sure the station was technologically stable and to begin easing the staff into a new way of thinking. The first six weeks of my time at KBEM were mostly cleaning up wires — XLR plugs out of phase, re-terminating Cat-5 with industry-standard methods, fixing headphone jacks in the studios and so on. As daunting as the task was, it gave me a solid idea of what I had to work with at KBEM. It forced me to understand how the facility was built and where exactly each wire goes in short order.

Before I was hired, the station had purchased new ENCO workstations and server, and I was tasked with completing their installation. This was another situation where I learned the new system quickly, having never worked with this program before. However, as I learned ENCO and read up on some of the functions, I began to envision possibilities for the future of the station. Understanding my automation system painted pictures on how it would integrate with new consoles, how it could save staff time, and how to apply it to other upgrades I had planned.

Getting my coworkers on board was hit-or-miss in the beginning. There was a lot of skepticism about using AoIP and whether or not there is any security risk in putting anything at all on the network. In an effort to show that "yes, we can rely on the Internet for what we do here," I purchased a Comrex Access for remote broadcasts in late 2011, specifically, a rack unit for the studio and the portable USB model for in the field. Our first broadcast was a modest morning show remote from a coffee shop. Upon realizing the ease, convenience and flexibility of the units, my fellow staff members became excited with the possibilities, so much so that we just completed our third year of broadcasting the Twin Cities Jazz Festival live from Mears Park in St. Paul using Ubiquiti AirGrids to deliver our IP link from the roof of a downtown bar.

After getting buy-in from my staff and supervisors, I purchased our new STL. KBEM has been using a T1 circuit to connect to our tower on the University of Minnesota campus, so I selected the Moseley Rincon. Previously, we had been using an Intraplex, which still serves as our backup. The Rincon was my choice because I needed a solution for digital audio delivery that could use T1 and/or IP links. The STL was simply fed with an analog to digital converter until I could build the new studio and station infrastructure.

## UPGRADE-A-THON

In the summer of 2012, I planted the seed that our master control room was going to be rebuilt the next year. Throughout the following 12 months, many a staff meeting involved some aspects of what the new space would look like. Ergonomics were a big issue in the old studio setup. Previously, the host would have to turn 100 degrees to the right of the console to talk to guests, and there was a lot of wasted and unusable space in the old furniture. Additionally, one of our interns that year used a wheelchair and we quickly realized that the old studio was, although technically legal, not very accessible. Our old console, a Wheatstone A-300, was starting to fail and I was buying spare parts from a guy in Alaska I found on eBay. It became apparent that the whole room was to be gutted and rebuilt.

LX24 Control Surface and LCD monitors

Equipment rack rewiring

### THE BUILD

During the Upgrade-a-Thon, while everyone else was otherwise occupied, I prepared one of our production rooms for the task of being our main on-air studio. At the time, the bulk of our station's switching and routing was done by a Broadcast Tools 16x16 switcher. I set up a 16x4 to run parallel while I started disassembling the master control room.

On July 18, 2013, immediately upon completion of the fundraiser, I officially began tearing down the existing studio. After removing the old console and all other equipment, I borrowed a sledge hammer from the janitors and gave each one of the summer interns and staff members a good whack at the old furniture before I finished it off. It was a very satisfying feeling, I must say. Upon emptying the studio space, patches of carpet and paint from the original 1981 construction were visible. The school district paid for the updates for that as well as the installation of electrical outlets under the floating floor to power the new equipment.

I ran into a bit of a snafu when the new furniture arrived from Forecast Consoles. I had found Forecast at NAB while spending a whole afternoon furniture shopping. They sold me on their product's durability, something that was important to me when you consider high school students and their gum, pens, paper clips and whatever else could damage the furniture. Although Forecast had constructed the piece perfectly, I had misunderstood their drawings. The wiring cubby is apparently at the foot of the host, under the control surface. I had planned for it to be under the rack turret and that's where the outlets were installed. Oops. I decided to run audio and network wires through their cubby and still feed the power as originally planned. Forecast offered to make custom panels to hide the mess I had created for myself, but the cost of custom work concerned me. After some brainstorming, we decided to put a shelf in that space to hide the wires and provide some extra surface area that wasn't the table top. Luckily, the Room Essentials bookshelves at Target fit in that space perfectly, leaving about half an inch of clearance around the top and sides. The best part was that it was on sale for $18.

We went live from the newly constructed studio on Oct. 9, 2013 — a few days early of my 90-day goal. I sat in with each of our hosts the first two days to answer any questions or address any concerns they may have. The new studio was a hit with the students, one of them saying it "looks like something from Star Trek." I decided to add a heads up display from Radio Station HUDs

New furniture installed in studio

Radio Station HUD (above) displays key information at a glance

(a custom data display system based on the Raspberry Pi) for the convenience of the air staff, a feature that is second in popularity only to new control surface. The LX-24 console has been user-friendly and the Wheatnet routing invaluable to me and the way I designed the station's future.

## LOOKING AHEAD

Since the completion of the new studio and the installation of the WheatNet infrastructure, I've continued to implement new cost saving measures and other technical upgrades. Our station archive once was a shelf full of burned CDs, now is housed on a Synology DS1513+. I've added our ENCO machines to our local network to eliminate the USB sneakernet we had before. We've even been able to cut our telco bill into less than half by replacing some of our services with IP solutions.

KBEM continues to march forward from the aging operations we had only three short years ago. Our plan is to replace and update the remaining studios by 2017, starting with our recording and performance studios this fall. The school district is also looking to invest further into the station as a part of their commitment to grow North High. The investments so far have paid off, with projected enrollment on the rise. The television studios in the building were also redone in the last year, further strengthening the communications program we're building at North. KBEM is proud to be building a modern facility that our students can learn and grow in while simplifying operations for all generations of user. 0

*Michael E. Jamnick, CBRE CBNT. Currently the engineer for KBEM(FM) in Minneapolis, previously with KVSC(FM) and Leighton Broadcasting, both in St. Cloud, Minn.*

## EQUIPMENT LIST

**New Equipment**
- Wheatstone LX-24
- IP88A, IP88D, IP88AD, M4-IP, IP88E blades
- Moseley Rincon
- Audemat Relio
- Comrex Access
- Enco DAD
- Emconveyor
- Telos Hx6
- Radio Station HUDs
- Inovonics 730
- Electrovoice RE-20
- Ubiquiti AirGrid M5
- Yellowtec Mika Arms

**Existing Equipment**
- Tascam CD1-RJ
- Shure SM5B
- Sage ENDEC 3644
- Comrex Nexus
- Telos Zephyr Classic
- Inovonics 531

# JBL LSR308

by Chris Wygal, CBRE

When the day-to-day radio listener has the opportunity to visit a radio station, the "snazzy" parts are showcased first. At some point in the tour, however, the visitor is shown a lowly production room.

Every radio facility has one or two (or more). These production suites provide the space where the station's imaging and spot load are created. Although not glamorous, it's where the production staff requires the best available tools to do their jobs accurately. The 3 Series from JBL introduces a few innovative tricks that take homely production spaces into consideration and guarantee accurate results.

LSR308

## THE BASICS

The LSR Series is a powered nearfield-reference monitor that boasts a 5-inch LF driver (LSR305), an 8-inch LF driver (LSR308) and an available subwoofer (LSR310S) with a 10-inch LF driver. For the purposes of this article, we reviewed a pair of LSR308 monitors.

The back control panel is fairly straightforward, with typical controls. Power switch, input level adjustment, HF and LF trim controls, input sensitivity controls and balanced 1/4-inch TRS and XLR inputs. In the LSR308, the crossover frequency is at 1.8 kHz with a Linkwitz-Riley design (essentially meaning there is no gain or a "flat" response at the crossover frequency). The LSR308 HF (1-inch) and LF (8-inch) drivers are each powered by 56-watt Class D amplifier which provides a maximum peak SPL of 112dB. Frequency response ranges from 37 Hz to 24 kHz, providing highly accurate "bottom end" reproduction. In studios that require lower than 37 Hz referencing, the LSR310S will get you down to 27 Hz. From a real-estate-on-the-desk perspective, the LSR308 measures 10 inches across and 12 inches deep and stands 16.5 inches tall.

## THE GOOD STUFF

I saw the LSR308 at the 2014 NAB Show in Las Vegas. The first feature that stood out was the HF driver cone and its rounded bumps. I assumed the bumps were added for aesthetic purposes. I soon learned, however, that the rounded bumps were the 3 Series Image Control Waveguide. JBL's Linear Spatial Reference research gave birth to this design feature unique to the LSR 3 Series. Since perfect audio reference environments are hard to come by in the real world, the Image Control Waveguide design improves off-axis listening and widens the center image. It also helps reduce the effects of reflected sound that interferes with the mix position.

## PERFORMANCE AT A GLANCE POINTS

- Matte black finish
- 8-inch LF driver for clean bass response
- Bi-amplified 56-watt Class D amps
- 37Hz to 24 kHz response
- 112 dB SPL
- Image Control Waveguide for improved mix position referencing and off-axis listening
- Balanced 1/4-inch TRS and XLR inputs

## THE REAL WORLD

On-the-ground observations in my own studio yielded the same results JBL reported. I first moved around the speaker cabinet and found myself well "off-axis" when compared to most reference monitors. I was nearly on the same plane as the face of the LSR308 and could hear virtually no degradation in the sound. The Image Control Waveguide also seemed to reduce unwanted room reflections. This was most noticeable when listening to the clarity of a familiar piece of audio. Different nuances in the mix were markedly noticeable. Some were good, and some were terrible! I actually remixed one project due to the more accurate reproduction I was hearing on the pair of LSR308s.

Most of the attention concerning the LSR308 has been given to the Image Control Waveguide, but the LF driver must be given its due. In a typical radio production facility, the 8-inch woofer is more than sufficient for accurate bass response. From classical to hip-hop, the woofer performed nicely and loudly. Nothing is muddy or "impure" about the LSR308 woofer, and while being reasonable during testing, I was never able to overdrive it.

## THE WRAP

While we may try our best, quality audio production creativity and design are impossible without proper referencing. Many times the problems are poor monitor speaker selection or environment. The JBL LSR3 Series is designed with features in mind that help overcome problems that plague many a production facility. By offering clean bass response with a beefy LF driver and greatly improved HF propagation through the Image Control Waveguide, the LSR308 is a must for achieving excellent production results in the most challenging environments.

*Wygal is the programmer and engineer for Victory FM at Liberty University, Lynchburg, Va.*

# Simian Gateway

## Remote Control for Simian 2.2 PRO Radio Automation

Simian Remote
is available for PC, iPhone, and iPad

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### Full Featured Remote Voice Tracking

With Simian Gateway and Simian Remote clients, you now have the ability to create and insert voice tracks remotely! We aren't talking a simple insertion of a recorded audio file. Simian Remote's advanced voice track editor can download intro and segue cuts that the Simian Gateway creates for the songs surrounding your voice track so that you can fully preview and set cross-over points for your voice track!

### Cost Effective

Simian Gateway comes at a very affordable add-on price to Simian 2.2 Pro. Contact BSI Sales for pricing information.

Simian Remote clients are completely free. All you need is the Simian Gateway and you can install and run a Simian Remote client on as many devices as you wish. There are Simian Remote client versions for both Windows PC and iPad.

## Simian Gateway runs alongside Simian 2.2 PRO to manage TCP/IP communications between Simian Remote clients & Simian 2.2 PRO.

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# How to Be in Two Places at Once

by Doug Irwin
CPBE AMD

Status Sentinel 16

Do you ever get the feeling that you need to be in more than one place at the same time?

Elsewhere in this edition of Radio I wrote about the various devices and systems (aside from your transmitter) that can be remotely monitored in some fashion. It's quite likely, though, that the transmitter site (or sites) is not the only place that could benefit from remote monitoring. In reality, you probably have far more going on at your studio location than you do at the transmitter site. I mean after all, you have cause to know about all of these conditions:

- Is the air conditioning working in the rack room, with all those automation computers?
- Is there nothing but silence coming from the on-air studio?
- PPM encoding OK?
- How's the AC voltage? Generator running?

I'm sure there are many others, especially-site specific ones. The real question is this: What can I put down at the studio for remote monitoring?

"Back in the day," when there was always someone at the studio, you naturally relied on them to let you know if something untoward was happening there. With no one at the helm during nights and weekends, as is so often the case now, you really need some way to keep informed.

At the transmitter site you have the need for various "raise" and "lower" commands that you probably won't at the studio; you'll be more interested in status and analog readings as well. If money were no object you could just buy

another copy of the same remote control and put it at the studio. I'm going to discuss less-expensive alternatives this time that (hopefully) won't create too much consternation in the accounting department.

Status inputs are probably the thing you will want most of from the studio location; for plain old status (only) you might want to consider the Status Sentinel 16 from Broadcast Tools. This is a data acquisition device with 16 logic-level inputs, all activated by a closure to ground, by relays, open collectors, or 5, 12, 15 and 24-volt logic-level sources. It can be monitored over any IP network and users can operate the product using a web browser or web-enabled mobile device. Email notification can be configured to alert up to four recipients when alarms are detected. Logging of system status, along with the site ID (in case you have more than one going) may be emailed in time spans from once an hour to once a day. The device can also be monitored via SNMP. If you need relays as well, you could consider Broadcast Tools Relay Sentinel 16. It's equipped with 16 solid-state relays that can individually switch up to 500 ma at 50 volts DC, and each can be turned on, off, pulsed or timed latched using the built in web pages. (You can also latch/unlatch the relays by way of SNMP "set" commands.)

All of the connections to and/or from the Sentinel 16s are done via Phoenix connectors, and I've found it much more convenient (over time) to "build out" all the connections to a Krone block (or whatever your favorite is). That's an investment in time that pays off early.

Perhaps even more important than remote status and relays is the remote "re-booter." There are many made but I want to point out the Synaccess netbooter. Take, for example, the NP-02. It has two independently managed power outlets, which you can access via a web browser or via telnet. Network security is accomplished by way of username and password. You can schedule "re-boot" events as part of the configuration (just in case you have a troublesome device that could benefit from a routine boot). Local log files are generated, and you can set up the device to e-mail you when it takes action.

More on this topic next month; we'll talk about devices with a higher level of capability. Have a clever tech tip that you want to share? Send it to radio@radiomagonline.com.

## RESOURCES

Broadcast Tools | www.broadcasttools.com
Synaccess | www.synaccess-net.com

## WE NEED YOUR TIPS

Tech tips may be suitable to earn SBE recertification credits. Send your tips to radio@RadioMagOnline.com.

*Irwin is RF engineer/project manager for Clear Channel Los Angeles. Contact him at doug@dougirwin.net.*

*Continued from page 15*

6. Assuming the pressure now exceeds 3 pounds, wait 10 seconds, and start the process over again

Omega makes an entire line of pressure transducers; in this application Dennis uses the PX319-015G5V. This device has a 0–5 VDC output that tracks the pressure linearly, with NIST-traceable calibration and .25 percent full-scale accuracy. It uses a standard NPT 1/4-inch-18 type fitting. You could make a system for monitoring nitrogen tank pressure by using a similar script and a PX319-3KG5V, which goes up to 3000 pounds of pressure. (See Figure 4.)

## UNINTERRUPTIBLE POWER SUPPLIES

UPSs have been the topic of controversy among radio engineers since they started showing up at more and more transmitter sites that had one or more devices with internal microprocessors. Personally I feel that they are a mixed blessing from a reliability standpoint. That said, however, if you keep track of what is going on inside of them, you can at least know if they are ready to fulfill their duty or not. Many UPSs have remote management capabilities — even smaller inexpensive units.

Let's take a look at the APC Smart UPS line, as an example. This line has an option you may not know about, the AP9630 network card. The installation of this card, and an Ethernet connection, allows you to look at its parameters remotely. Taking that one step further, if you have a remote control that makes use of SNMP (or some other SNMP manager), you can remotely monitor what's going on "in the background" without actually having to browse the thing. (After all, you're not really at work all of the time, right?)

Take a look at Figure 5. This is a simple user interface, accomplished with a Relio from WorldCast Systems. This display shows information gathered by the Relio, which is located in our rack room in Burbank. The

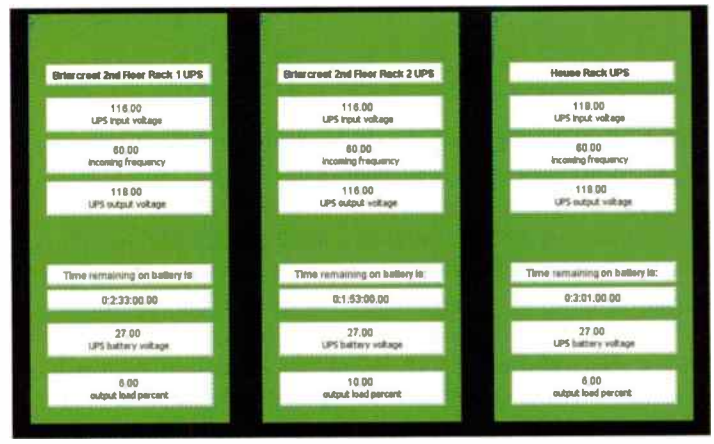


Figure 5: Relio user interface

Relio is in constant contact (by way of SNMP) with the three different APC UPSs seen in the display; two of the UPSs are next to one another in adjacent racks, but one is in another building "on-campus" at our Briarcrest transmitter site in Beverly Hills. Alarms are configured so that if the rack voltage drops below a pre-set threshold, or if the UPS output gets too high, or too low, e-mails are issued. At that point someone in engineering would take a look at this same display to see what was going on at the site. (The green "field" turns red in the event power is off in the rack.)

I'm a big believer in remote monitoring, as you can likely guess having read this far. Even after I close the door to the transmitter room, I want to be able to figure out what's going on inside; the current crop of remote controls make that so much easier than when I started out. It "used to be" that we would have one or two stations in our purview; but today, with a half-dozen or more, it's an absolute necessity to make your use of time as efficient as possible. You can't necessarily visit every transmitter site as often as you would like. By the correct application of remote monitoring, you can know what you need to know without having to make constant trips. "Work smarter, not harder" is a cliché that applies very, very well in the life of a broadcast engineer.

## Reader feedback

*We received these comments from a reader in response to July's Viewpoint column:*

I thoroughly enjoyed July's editorial and found it both agreeable and enlightening. As an "old school" radio guy (started listening in the '50's and working in the '60's,) I've found myself wanting to hold on to the radio that I knew. However, your piece really put things in to present-time perspective and I "get it."

For years, I've been preaching "live and local" . . . that's the secret. But nobody (apparently) has been listening. I read many of the publications on our business and the hot topic of late is cutting down the length and number of units in spot breaks! Duh? But I rarely see any dialog on "hey . . . let's get local and relate to our coverage area." Unfortunately (in a way) the "coverage area" of "radio" online is worldwide . . hard to get local with that, eh? But, how about if the online part of our business set defined its own "local" coverage area? If somebody in Timbuktu wants to listen fine but I'm aiming my programing (for example here in New Jersey) at Monmouth and Ocean counties. That just might work . . . and get people who haven't left already or never listened in the first place to tune us in. It's worth a try.

—Charlie Roberts

**Have a comment? Send it to radio@radiomagonline.com.**

**Note from the editor:**

We received a number of questions about the $50 clocks mentioned in last month's facility showcase. The author was referring to radio controlled clocks synchronized to WWVB. If you are located in an area where you are able to reliably receive this signal, these clocks can be an inexpensive alternative to traditional master clock systems for smaller facilities. The specific model the author used was a Lorell LLR-60993 14" diameter radio controlled clock.

*http://lorellfurniture.com/products/?id=1014567579*





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50 YEARS SBE. 1964-2014

# This Month in SBE History

*2014 Marks the 50th Year of the Society*

## Engineers Learn Leadership Skills

by Chriss Scherer

The station engineer is someone with a wealth of knowledge about all the technical aspects of the station operation. But the chief engineer is also typically a member of the station management team. The skill and knowledge of electronics, RF, data and IT are important to the engineer's job, but so are the skills needed to be an effective manager.

The Society of Broadcast Engineers Leadership Development Course is one of the cornerstones of the SBE's education efforts. But while the SBE is behind the course today, it started as an endeavor of the National Association of Broadcasters.

The SBE has presented the SBE Leadership Development Course since 1997. The NAB sponsored the course from 1965 to 1995. This intense course is designed for broadcast engineers who have or aspire to have management responsibilities. Today the SBE offers the course in cooperation with instructor Rodney Vandeveer, a professional leadership and management trainer and a professor of organizational leadership and supervision at Purdue University.

In 1963, the idea for the course was set by NAB Science and Technology Vice President George Bartlett. Bartlett contacted Robert Flanders, the director of engineering at WRTV-TV in Indianapolis, to be involved. Flanders would later serve as president of the SBE from 1971 to 1973. Bartlett and Flanders saw a need to train engineers in management skills because too many of them failed after being promoted to those positions. They were good engineers but not necessarily adept at people and management skills.

The story goes that Bartlett travelled to Indianapolis and the two of them began driving to Chicago to visit the University of Chicago and potentially other schools to see if there would be interest in partnering with the NAB to start a management course for broadcast engineers. When they reached Lafayette, Ind., Flanders suggested they stop at Purdue to see what might be available. They didn't need to travel any farther.

Dick Cupka, a faculty member at Purdue, was a first instructor of the course. He taught it until passing the reins to Vandeveer, who taught his first course in 2011.

The NAB stopped running the course in 1995. After a year off, the SBE Executive Committee investigated taking the course over. Chuck Kelly (then past president of the SBE) and board member Tom Weber were graduates of the course and lead the effort to bring it under the SBE. They contacted Cupka and brought him on board as well.

The course has been taught in various locations over the years. It started at Purdue in West Lafayette, Ind., then was held at Notre Dame and other locations. When the SBE took it over, the course was held in Indianapolis for several years. When Turner Broadcasting was interested in sending several employees, the class was held in Atlanta. The class attendance has grown in time. The most recent three classes had 25 or 26 students. As an SBE educational offering, 208 students have attended the course. Since the course's inception, more than 1,100 have attended.

*Scherer is a contract engineer and recording engineer in Kansas City, and former editor of Radio magazine.*

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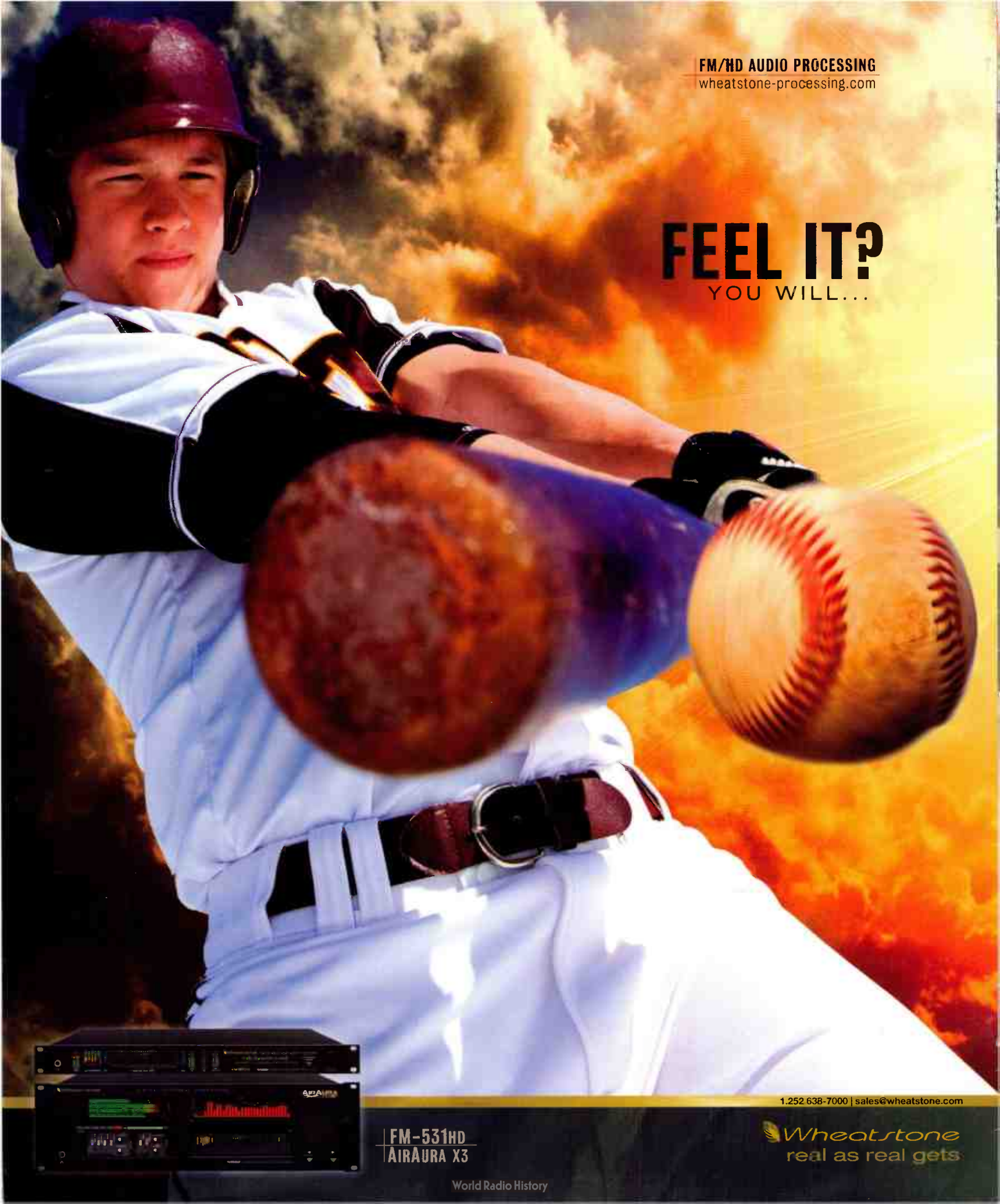
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