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## Impact Studios Gets Talent Stations

**Talent Stations take their place among, well... talent!**

Marc Lehmutz sent us these recent photos of Impact Partnership's new 10-studio installation in Kennesaw Georgia. Shown is Studio A with several mic positions and Wheatstone TS-4 Talent Stations (with mic on/off/cough, talkback, and headphone source) mounted into the desktop, all networked through the WheatNet-IP audio system. The new recording studio was built for Impact Partnership's radio "dream team," which develops talk programming for financial advisors as well as related spots for radio. This isn't Marc's first experience with Wheatstone. Marc was previously the engineering director for Cumulus Media in Atlanta, where he started out with Wheatstone's TDM routing technology and added WheatNet-IP audio networking and control surfaces using a MADI interface. When Marc became the director of engineering for Impact Partnership earlier this year, he brought along some Wheat. See more photos...

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## We've Split the Scene!

**The LX-24 can get even MORE modular!**

Look what we showed off at IBC this year! This split frame LX-24 control surface arrived in Amsterdam in two pods, six modules on each side. With all the console action off to the side, announcers can work the show from their keyboard, monitor and mouse in the middle. There's no need for a backplane for the modules, and the motherboard is conveniently mounted under the table. (Look closely - you'll see two TS-4 Talent Stations, table-mounted, as well).

If you missed us at IBC, come see us at NATEXPO in Moscow, Russia, November 19-21; we'll be in booth A69.

[INN15.wheatstone.com](http://INN15.wheatstone.com)



## Sound Off

**Our friends south of the border sure know how to do radio. When we sent our audio processing specialist Mike Erickson packing to Radio Grupo in the Mexican city of Aguascalientes last month, we expected him to come back with tales of AM flamethrowers and hot tamales.**

Instead, he wound up doing something he rarely gets to do at a Top 40 station: setting the sound for clarity first and loudness second. "They were going for long term listening and clean sound, which is a welcome change for guys like me who appreciate some dynamic range," says Mike. "When processing for CHR, it's usually loud and exaggerated. But they wanted open, clear and engaging!"

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View from the control room window of the Kix Brooks Studio. Kix and his guests feel comfortable and cozy in this inviting room. Mics, headphones and cables are unobtrusive. Cleverly positioned HD PTZ cameras with low camera angles get under hat brims.

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**On the cover:** The set and studio for "America's Morning Show" from NASH. This space can seat an audience and the set can be removed from the stage to accommodate live performances by guest artists.

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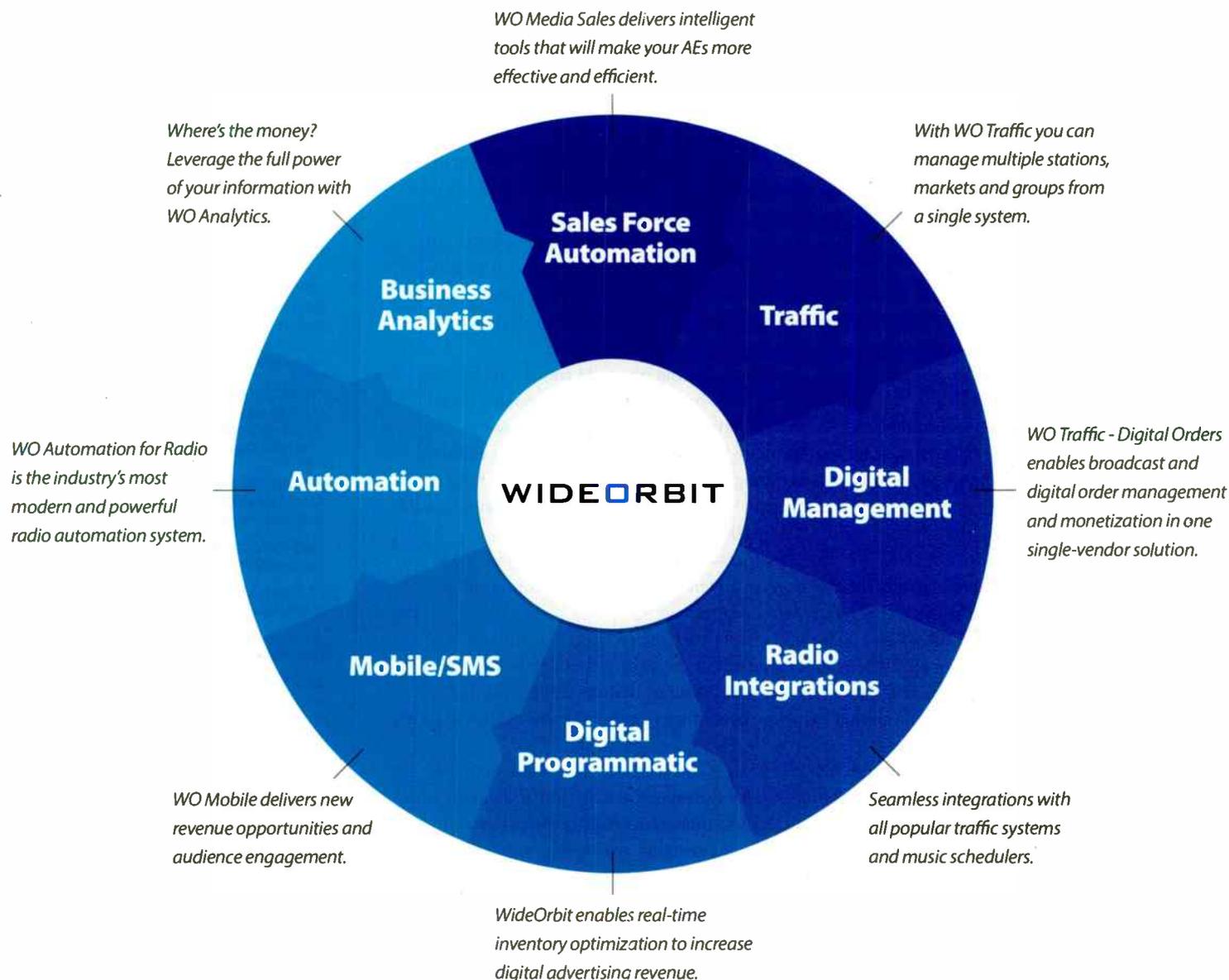
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### FIND THE MIC AND WIN!

Tell us where you think the mic icon is placed on this issue's cover and you could win a **Hosa CBT-500 cable tester**. Send your entry to [radio@RadioMagOnline.com](mailto:radio@RadioMagOnline.com) by **November 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](http://RadioMagOnline.com).

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World Radio History

# What About AM?



**L**ast month I visited the annual fall Radio Show. It was an eye-opening event on many fronts. I came away from the show with a number of impressions, the first of which is that while the industry remains vibrant; it is in an ongoing period of change.

So where does the industry currently stand and what do we as broadcasters need to do in order to thrive? It depends on whom you talk to and what hot button industry topic you bring up. One topic in the forefront of the minds of many broadcasters right now is the future of the AM band.

Radio Disney recently announced plans to sell the majority of their broadcast properties, all but one of which are AM stations. While the stations will not be going dark during this process, this announcement brought up additional questions about what will ultimately become of the AM broadcast service as it faces increasing threats from noise and interference, poorly designed (or non-existent) AM receivers, and encroachment on tower sites by development.

Some solutions proposed to address the issue include allocating more FM translators for AM, moving to an all-digital AM band, or at least allowing some broadcasters to drop analog for all-digital operation, and a long-standing proposal to eliminate the so-called "ratchet rule."

Others believe that the solution is to address the noise and interference issue, and to enhance the audio quality of analog AM along with receiver design. Yet another proposal would involve shifting stations to a different chunk of spectrum, again, possibly in digital. A few naysayers would even go so far as to suggest that stations should just be allowed to go dark.

No single issue in broadcasting brings out as many passionate discussions as this topic. AM broadcast has been a valuable source of information and entertainment to many communities over the years, and is where broadcasting has its very deep roots.

I personally believe that as others and I have said many times before, content is the key. We can discuss the delivery method all day long, but at the end of the day the message matters at least as much if not more than the medium. I know of many AM stations that are still providing the same local service to their communities that they have been since they went on the air. It can be a lifeline, particularly in very rural areas.

If the service a station provides through AM broadcast is still working for its audience, I see absolutely no reason to suggest immediate change just for the sake of change, but at the same time the threats are very real. A long-term solution is in the best interests of both the industry and listeners. Exactly what that long-term solution will look like remains to be seen.

Do you have stories of AM broadcasters serving the community or thoughts on the future of the AM band? E-Mail your comments to [radio@radiomagonline.com](mailto:radio@radiomagonline.com).

Shane Toven | Editor

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by Lee Petro

# Tell City Waiver Denied

**T**he FCC's Media Bureau issued a big decision regarding the long-pending Tell City waiver request. The waiver request proposed to move an FM translator's transmitter site and operating channel so that it would operate as a fill-in translator for an AM station. The waiver sought to build off the prior Matoon waivers, but the Media Bureau ultimately found sufficient differences to deny the waiver request.

First, the Matoon waiver standard included the requirement that the 60 dBu contour of the existing contour overlapped with the 60 dBu contour of the proposed facility. This requirement was important to the staff when it granted the first Matoon waiver because the two facilities were mutually exclusive, i.e., both could not be authorized to operate at the same time. The Matoon waiver also focused on the use of the FM translator to rebroadcast the signal of an AM station. Since the first waiver request was granted, a significant number of other FM translators have requested waivers.

However, the facilities proposed in the Tell City waiver request were not mutually exclusive. Instead, the Tell City applicants sought a waiver of the requirement, arguing that no other applicant would be

harmed. The principal involved is based in a 1945 Supreme Court decision – Ashbacker – that underpins the FCC's processing of applications.

Where two applicants are given the opportunity to file applications that could be mutually exclusive (i.e., the LPFM filing window), the FCC is said to have satisfied Ashbacker. When one applicant files a "minor" change application, Ashbacker is not an issue because no other party would be able to file an application that conflicted with the minor change application, in light of the minor change application's mutual-exclusivity with the applicant's underlying authorization.

However, in the case of Tell City, the applicant sought a waiver to file an application that was not mutually exclusive with its current authorization, but it still sought processing as a minor change application. Setting aside the laudable goal of beefing up the number of FM translators eligible to fill in AM signals, the Bureau's staff focused on the fact that no other party could have filed for facilities that conflicted with Tell City's proposed facilities since minor change applications are processed on a first-come, first-served basis. Thus, unless another applicant by chance filed an application on the same day as the submission of the Tell City

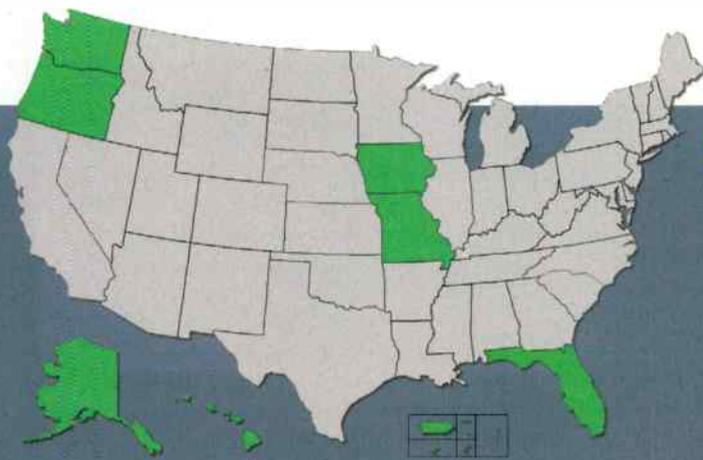
application, that other applicant was out of luck.

Because the submission of Tell City-like applications would largely undermine the FCC's processing guidelines by eliminating the difference between major and minor change applications, the Bureau found that the waiver request was better suited as a petition for rulemaking.

In fact, the Bureau also noted that there was a rulemaking pending relating to the revitalization of the AM service. In the many proposals set forth therein, the FCC had proposed opening a limited filing window for AM licensees to file for FM translators. So, separate from the finding that a waiver was not appropriate due to Ashbacker concerns, the Bureau pointed to the ongoing rulemaking proceeding as the best source for relief.

As one can imagine, the response by most broadcasters was not supportive, especially since many licensees and the NAB filed comments urging the Bureau to grant the waiver. In addition, Commissioner Ajit Pai has been vocal in his support for the FCC to promote the AM service. In the wake of the Tell City decision, Commissioner Pai issued a statement expressing his disappointment, and urging the FCC to move forward on adopting rules in the AM Revitalization proceeding. **Q**

*Petro is of counsel at Drinker Biddle & Reath, LLP.  
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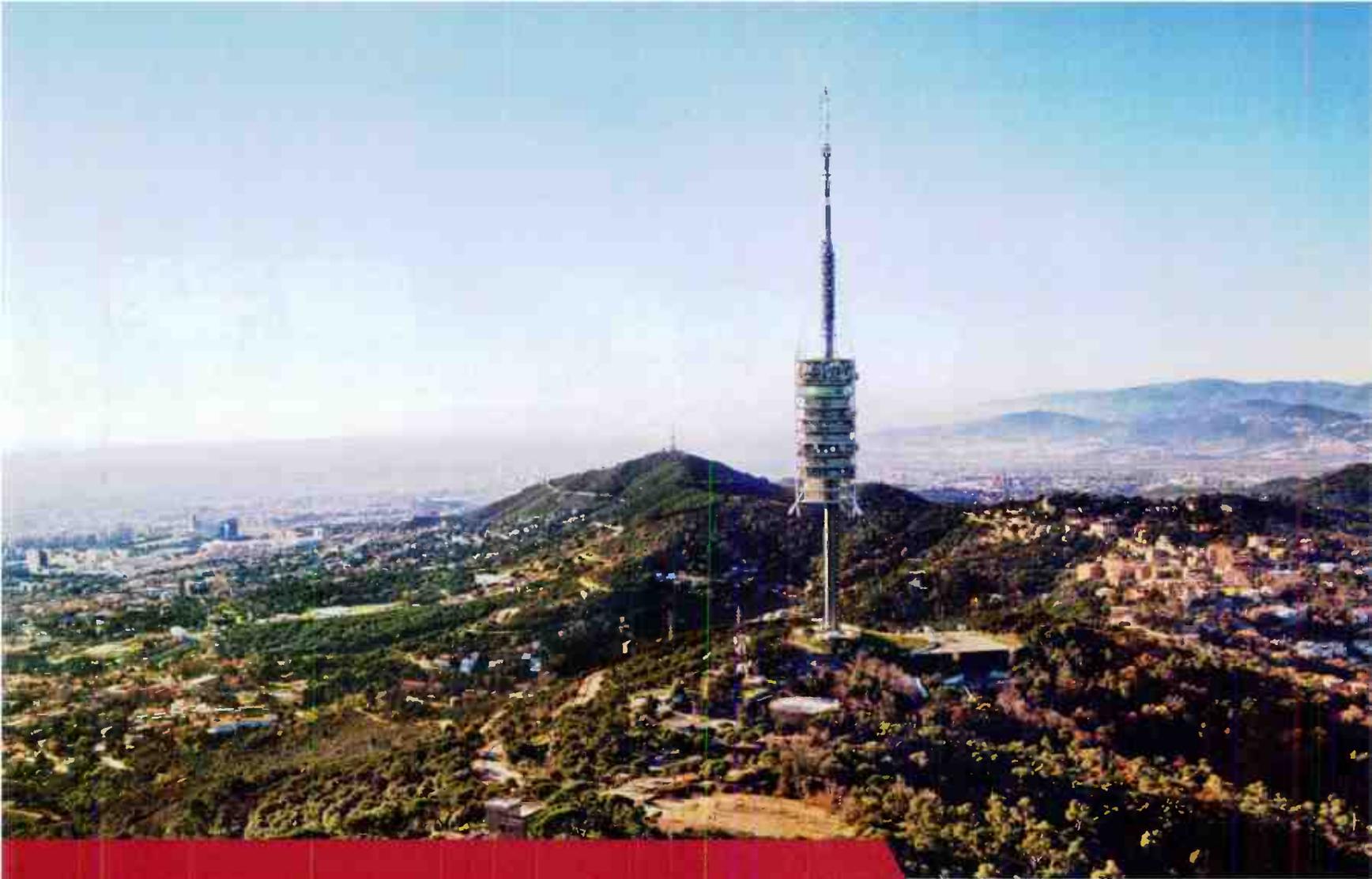


## DATELINE

**October 1, 2014** – Annual EEO Public File Reports placed in station's public file in Alaska, Florida, Hawaii, Iowa, Missouri, Oregon, Washington, American Samoa, Guam, the Mariana Islands, Puerto Rico, Saipan and the Virgin Islands.

**October 1, 2014** – Biennial Ownership Reports for Noncommercial stations in Iowa and Missouri must be filed with FCC and placed in public inspection file.

**October 10, 2014** – Third Quarter issues/Programs lists must be placed in public inspection file in all states.



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# Powered by NASH: Cumulus Delivers Country From Nashville

by Shane Toven, Editor

Cumulus wishes to acknowledge some of the engineers that assisted with the build:

- Marc Lehmuth
- Zach Harper
- Troy Pennington
- Martin Stabbert
- Yancy McNair
- Robert Combs
- Justin Tucker
- Dave Supplee
- Bobby Dotson
- Trey Bryant

**W**hen you think about Nashville, the first thing that comes to mind is probably music—particularly country music. In 2013, Cumulus launched the NASH brand of country music lifestyle and entertainment programming with NASH FM 94.7 in New York City as the flagship station. Early that year, the NASH brands received new headquarters as Cumulus constructed the NASH campus and studio facilities in the heart of Nashville.

The NASH label encompasses a number of brands spanning various multimedia platforms including "America's Morning Show," "NASH Nights Live with Shawn Parr," "American Country Countdown with Kix Brooks," "Kickin'

It with Kix" and others. All of these brands originate from the new campus.

## BEHIND THE BUILD

Radio magazine interviewed Gary Kline, director of engineering for Cumulus, about the new facility.

**Radio:** *This truly is a unique facility. Tell me a little bit about some of the main design goals behind the NASH studios.*

**Kline:** The goal was to lay the foundation for a cutting-edge broadcast and production facility to support our NASH brand globally. We intend for this property to become a campus with various production facilities located on our expansive property near downtown Nashville. We wanted the very latest and most modern technology for audio, video and multimedia production. One of our design goals was to ensure we could distribute and produce high-quality HD video, and the very best audio content for broadcast, streaming, web, television, etc. All of this had to be handled in an efficient manner so that we could maximize

our production capabilities while retaining the ability to reconfigure and respond to new programming requests quickly. We also incorporated space for our publishing partner, Country Weekly Magazine. They have a full editorial room as well as storage and conference areas.

**Radio:** *Building a new facility always comes with unique challenges—I can imagine the challenges are even greater when building a facility designed for national origination of an entire family of brands. Can you tell me a bit more about some of the challenges that you faced during the design and build process?*

**Kline:** Essentially we gutted the old Citadel facility down to the concrete floors and steel rafters. Before we could do that, however, we had to move WGFX (FM) and WKDF (FM) over to our other large broadcast facility at Music Circle. WGFX is a sports/talk station with a complex format, and the flagship station for the Titans. Building new studios for them was no small task, and that had to be done before the operation could be moved. The same is true



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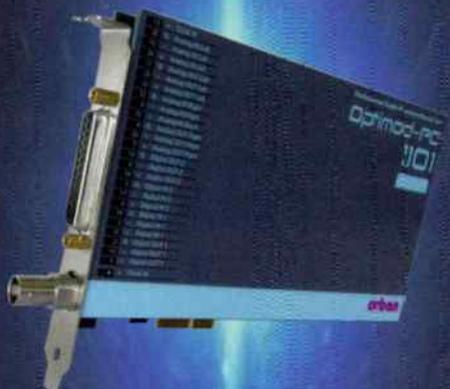
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## FACILITYSHOWCASE

for WKDF. A lot of work had to be done at Music Circle to expand and prepare our existing TDM audio routing system to accommodate the new family members. Hats off to our excellent Nashville engineering team, which handled this large project. Another challenge (after we cleared the building of live broadcast stations) was designing the new layout, which had to accommodate both radio and television studios. We brought in an architect and interior design firm to assist us with this. The design was an iterative process with many meetings to hash things out. The challenge was not only figuring out what went where, but also thinking in terms of the future. For example, we had to make sure we had enough rooms allocated for video and audio production to handle growth over a period of years. Another challenge was being ready for future furniture and studio layout changes; so we installed floor conduits and cable jacks throughout the facility in all sorts of places, some hidden. If you pick up the floor rug in Kix's studio you'll see what I mean! Oh, one other interesting challenge—one that I think we nailed...Installing multiple monitors and mics without blocking camera angles. Check out Blair Garner's studio.

**Radio:** *So how long did the project take from initial concept to completion?*

**Kline:** There really were a couple of periods of time here. We built the facility in different phases with Kix's studio being Phase 1, "America's Morning Show with Blair Garner" being Phase 2, and "NASH Nights Live" being Phase 3. We are working right now on a Phase 4 studio as we are regularly engaged in supporting our brand. That being said, I think it was July of 2012 when we first decided to begin designing the facility. It was then that we hired an interior



Left rack: Op-x automation and VoxPro PCs; right rack: codecs and AoIP studio engines

design firm and began working on plans. We used two different architects assisting with certain construction and design elements as well as providing stamped plans for permitting. The next step in the process was equipment selection and studio furniture design. By January of 2013 we had a general contractor on board with plans in hand. In March of 2013, we moved Kix into his beautiful new studio where "American Country Countdown" and "Kickin' it with Kix" is produced. The design, planning, bidding, permitting, and demo work took the most time up front. Once we had all of our ducks in a row it was full steam ahead, not unlike most studio projects. Blair's studio went online from NASH campus around September of 2013. He broadcast his show from temporary studios at Music Circle until the new studio at the NASH campus was



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## FACILITYSHOWCASE

studios and throughout the campus. Omnirax handled all of the custom—very custom—studio furniture. Mika provided the mic and monitor arms. Dell and HP provided the many audio, video, storage and archiving servers. Sadie and Adobe provided much of the editing software.

**Radio:** *These studios are absolutely gorgeous. Attention to detail is important when designing a room with proper studio acoustics—even more so when that studio will be used for video as well. Who did you use for the architectural and studio design?*

**Kline:** Anderson Design handled our interior finishes, consulted on overall layout, and was an integral team member working across all disciplines. For example, studio furniture placement had to be carefully coordinated with regular furniture locations, backdrops, and lighting angles. Kathy Anderson's



The Kix Brooks Studio Control Room, where "American Country Countdown" and "Kickin' it with Kix" are produced.

firm has handled many major projects for both residential and commercial clients, some very famous folks I can't mention. Ever been backstage at the Grand Ole Opry? That's her work. West Construction also contributed to the architecture design, and handled all non-equipment construction. Clair Systems (Clair Brothers) handled most of our lighting and video design and integration. David Holland at Omnirax, as always, was invaluable with studio furniture design as well as giving advice on line of sight and overall layout. There is much more to studio furniture design than choosing a color and size—When you add TV cameras it gets even crazier. Cumulus engineers from around the country drove and flew to Nashville to wire, build, and configure all of the broadcast gear. It was a team effort.

**Radio:** *I see a few very cool features that stand out to me, including a guitar neck shaped countertop leg in the "NASH Nights" studio. Tell me a bit about some of the more "unique" features of the facility. Is there anything in particular that you really want to highlight?*

**Kline:** I think the automatic camera switching based on who is speaking is amazing. Our graphics package for video is excellent and very social media friendly. The lighting control can be handled manually using sophisticated lighting controllers, or via our Crestron lighting package. For example, Kix can walk into his room and convert the entire lighting scene to video interview mode by pushing one button. If he hits another button, all the lights return to

## FACILITYSHOWCASE



A multi-purpose basketball, volleyball and tennis court gives NASH guests, staff and talent a place to unwind.

normal. We provide title and artist data from all playout systems via a special data path to the uplink, and pass that data to the affiliates of our live programs. Blair's morning show studio is also a live audience performance space. We can accommodate about 17 people in a very comfortable and intimate environment for watching the live nationally broadcast radio show or occasional live act performances. The entire studio set can be disconnected (via pre-made cable harnesses) and wheeled off the stage for multi-person acts that require the additional space. We have an entirely separate digital mixing console and Clair Brothers designed sound system for these events. The band mixer feeds the Axia system for broadcast use. We have a full Crestron matrix for video switching. This allows monitors in the lobby, green room, studios, wherever, to

be remotely set to show a number of different feeds. We can display the TV feed from a studio in one spot while showing CNN somewhere else. A great example of this is in the green room; Artists can hang out and see what's going on in the studio before they are interviewed. Oh, and we installed a Sonic Ice machine—The real deal. If you want those little pieces of ice, come by. We've got

them. We have two green rooms: one of them for artists who visit, and the other for the air talent. Did I mention the full basketball court?

**Radio:** *A number of engineers tend to look back at a new facility build and say, "I wish I had done that differently." You have obviously been involved in a number of facility builds and have learned from those projects, but are there any things that you would change now that the NASH project is complete?*

**Kline:** We need a larger generator and more sophisticated building-wide UPS system than was there before when Citadel used the property for local radio broadcasting only. Work is in progress to upgrade both.

**Radio:** *Thanks for your time, Gary.* 🍷

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## TRENDS IN TECHNOLOGY

# Alternate Transmitter Sites

by Doug Irwin, CPBE DRB AMD

In last November's Radio Magazine I contributed an article entitled "Building Better Backups." The running theme through the article was "how badly do you want to stay on the air, really?" I'm going to reprise that theme in this article, with an emphasis on practical solutions.

We all know as broadcast engineers that our primary function is to keep the station on the air and to "drop everything" to get the station back on the air should a failure of some sort take it off. Keeping our stations available to listeners is our business; but whether your station is commercial or non-commercial, there's a practical limit. Having an alternate transmitter site is the best way to keep your stations "on-air" no matter what. Whether you work in a small or major market, there's likely an approach you can take within your practical limits, to make such a site available.

Let's take a look at an unusual occurrence that prompted a large alternate site project.

### THE STATION FIRE

Having burned 160,557 acres, the Station Fire was the 10th largest in modern California history, and the largest wildfire in the modern history of Los Angeles County. The Station Fire burned up the slopes of Mount Wilson, threatening nearly all of the television and FM radio transmitter sites on the summit, as well as the Mount Wilson Observatory. Around \$100M was spent fighting this fire. (Source: Wikipedia.)

I was working in New York at the time, but I went to the Mt. Wilson webcam many times to see the progress of the fire as it approached the summit.

You may know that Los Angeles is the number 2 market in terms of population, but in fact it's the number 1 market in terms of revenue. Facing the possibility of their main transmitters sites being destroyed by the fire, major broadcast companies took quick action.

CBS Radio has a large portfolio of FM stations in Los Angeles: KRTH, KTWV, KCBS-FM, KAMP and KROQ. All but KROQ have their main

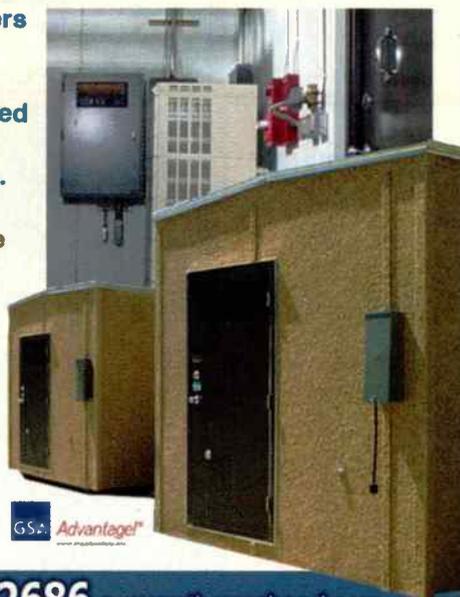


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The Station Fire threatens Mt. Wilson transmitter facilities

transmitter sites at Mt. Wilson. Lynn Duke is the engineering manager for KRTH, KTWV and KNX 1070. He is also responsible for the FM transmitter sites for KROQ, KAMP and KCBS-FM and was kind enough to assist with this article. Like many other LA radio engineers, Lynn lived through the Station Fire, and gained new experience from it.

Not surprisingly, CBS Radio has a long-standing commitment to disaster preparedness and had alternate transmitter site arrangements in place for most of its stations even before the Station Fire. KRTH had a 5 kW backup site at Verdugo Peak; KCBS-FM and KTWV shared a GatesAir ZX-3500 in an N+1 arrangement at Verdugo—meaning that either KCBS-FM or KTWV could be on the air from there. I should note that Verdugo Peak,

about 10 miles north of downtown Los Angeles, is the main transmitter site for KROQ.

In 2009 KROQ already had a full-power backup site at Flint Peak, about 3 miles southeast of Verdugo, but with the fire threatening Mt. Wilson, CBS engineers were able to use an emergency antenna notification to the FCC and put the KROQ aux transmitter at Flint Peak on the KAMP frequency (97.1). The Flint antenna is broadband enough to make that work. CBS Radio also has an emergency response vehicle that is posted in LA. The vehicle has a small studio with 3 kW FM transmitter on board, and serves as a shared resource for all of the CBS Radio stations in the Western Region.

In the end, the fire was never did burn up to the top of Wilson. All of the transmitter sites survived, but CBS Radio management quickly decided that they needed a more robust system that allowed for all of its FMs to remain on the air in the event of another potential catastrophe such as the Station Fire. The “scare” precipitated a major set of upgrades beginning in 2010. Thanks to Lynn, I had a visit to the site, and I’m able to share that visit with you.

The KROQ/KAMP/KRTH site is actually built inside of an old cold-war relic bunker that is up on top of Verdugo Peak. Once you go down the stairs into the bunker, it looks like most other transmitter sites, except that the equipment complement, the system design, and

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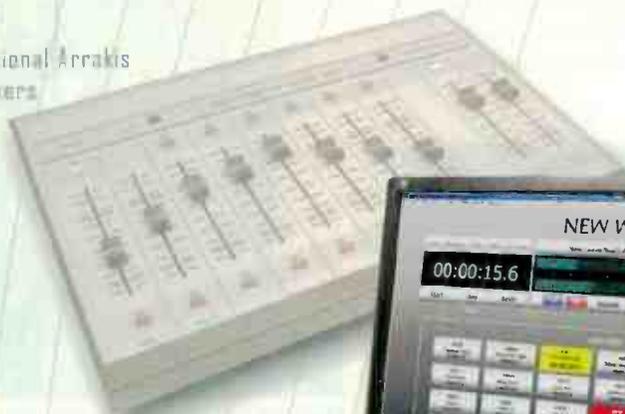
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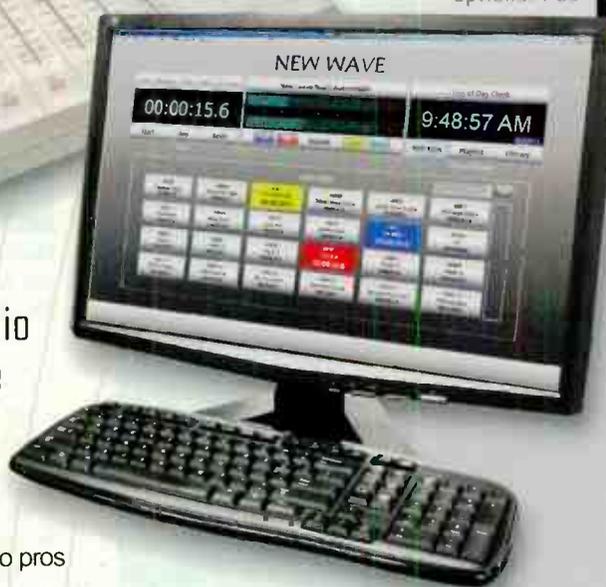
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the construction techniques are absolutely first rate.

KCBS-FM and KTWV are in another building adjacent to the bunker on top of Verdugo.

"We tried to include most of the features we have at our main sites at Verdugo. The thinking was that if we ever did lose Mt. Wilson, we might

end up operating the Verdugo site for a prolonged period of time," said Lynn. "The site has already saved us a few times when there was a serious problem at a main site or when we needed to power down a main site to allow a tower crew to work safely." The main STL for each of the Verdugo transmitters consists of an Intraplex frame



Racks at the Verdugo bunker site, including the KAMP auxiliary transmitter, a GatesAir ZX-5000



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fed by a T1. KRTH also has a 950 MHz backup using a Moseley Starlink. Plans are in the works for 950 MHz hops for the other stations as well. For the time being, backup STLs are provided by Telos Zephyr ISDN codecs. Additionally, each station on Verdugo has its own AudioVault playback workstation, flash media players with updated music and IDs, and for real emergencies, an AM receiver tuned to KNX as well as a TV receiver tuned to KCBS-TV.

The main remote control for each of the stations is a Burk ARC Plus, riding up on IP over T1 from the studio locations. Each site has a secondary dialup remote control as well. A third remote control is planned for each station, consisting of a Broadcast Tools SRC-16 fed via serial data coming up on the 950 MHz STL links. "That last layer gives us control of the critical site functions independent of Telco connectivity," says Lynn.

One thing I'd like to point out is that CBS Radio has built full HD Radio systems at each of its backup sites as well.

*Continued on page 26*

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World Radio History

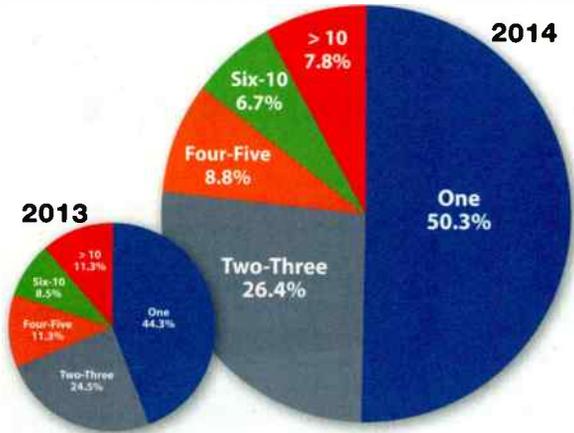
# 2014 SALARY SURVEY

by Shane Toven, Editor

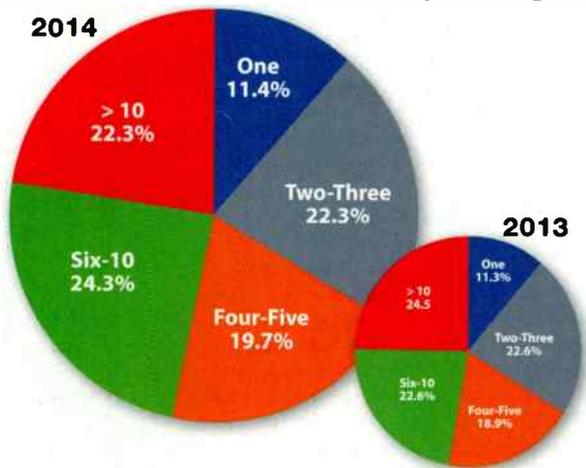
**E**

Each year, *Radio* magazine conducts a survey to measure compensation of technical professionals within the industry. This survey has been held annually since 1994 and serves as a valuable reference point. The data is gathered from readers who responded to links in the magazine, on the website, and in e-mail newsletters. Thank you to those who took a few moments of their time to provide input. 0

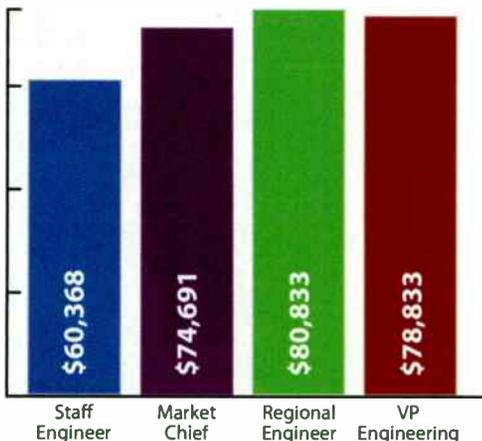
## MARKETS YOU ARE RESPONSIBLE FOR



## STATIONS YOUR DEPARTMENT IS RESPONSIBLE FOR



## ESTIMATED MEDIAN SALARY



## BY THE NUMBERS

**11.1**

Average years in current position

**28**

Average years in the broadcast engineering field

**59.6**

Percent belong to the SBE

*Other memberships:*

- 2.5% NARTE
- 3.9% AES
- 4.9% IEEE
- 6.4% APRE
- 22.7% ARRL

**45.6**

Percent who received a raise in the past 12 months  
Median increase 3%; average 5.4%

*In 2013, 53.4% received a raise while the median and average amount remained unchanged.*

**51.9**

Percent age 55 and older  
64% in 2013

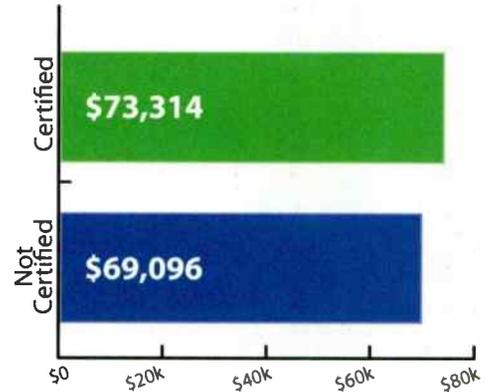
**41.7**

Percent who are *not* certified  
41.7% are SBE certified  
2.9% are NARTE certified  
6.8% are Microsoft certified  
6.8% are Cisco certified

*SBE Certification stats:*

- 1.0% CRO
- 1.9% DRB
- 2.4% CBNE
- 2.9% CEA
- 3.4% AMD
- 8.3% CSRE
- 10.2% CBNT
- 10.2% CBRE
- 10.7% CBT
- 11.7% CPBE

## SALARY BY SBE CERTIFICATION



## STAFF ENGINEER MEDIAN SALARIES

above and below top 50 markets

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014									
Median Salary	\$61,428	\$41,250	\$65,333	\$44,249	\$64,999	\$48,000	\$65,833	\$46,111	\$64,999	\$49,999	\$71,250	\$50,714	\$62,500	\$52,500	\$71,250	\$49,166	\$54,999	\$54,999	\$60,000	\$52,500	\$60,368

<b>CONTRACTING</b>	<b>15.4%</b> Respondents who are contractors	<b>\$75.16</b> Average hourly rate
<b>17.2</b> Average hours booked per week	<b>42%</b> Charge emergency rate	<b>\$100.28</b> Average emergency rate

**Methodology:** From Aug. 4 through Sept. 22, Radio magazine solicited responses to an online survey by posting a link at RadioMagOnline.com and noting the link in all its email newsletters.

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KCBS-FM and KTWV GatesAir HPX-20 auxiliary transmitters on Verdugo Peak

Continued from page 22

**SMALLER-MARKET STRATEGIES**

All the problems that exist in larger markets exist in smaller markets as well. Let's review the basic ones:

- Both antennas on the same tower? This is an obvious flaw. If the tower falls over because of a weather event, you're dead. Poor tower maintenance can also be problematic.
- Access to the transmitter site: Again, think about weather-related events. Can you even get to the transmitter site under all circumstances? Probably not. Is the road too snowy? Is it flooded out because of a hurricane? Have trees fallen over it? Have the authorities closed it down for some reason, like a forest fire?

- The generator: It's important to have a reliable generator, clearly. What is the longest power failure you have planned for? Do you have enough fuel to run for a week or so? If not, can you get a delivery, or are they unable to drive up the road? Are they even open for business? Can you get your generator tech on the phone if need be? Can he even get there?
- Three-phase main distribution panel: If this panel encounters problems, then you're really in trouble. You can do IR studies and maintain it, but no guarantees of course.

"We're a smaller market and we simply can't afford to have an alternate site!" Well, you can say that of course, and you can sit back and do nothing, or you can figure something out. Rarely are there the



"Finley" backup site with frequency agile transmitter serves four stations.



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- Mark Jensen, MWB Broadcasting/York, NE



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resources necessary to make the job at hand easy; often times some sort of technological strategy must be employed. Let's take a look at an example of exactly what I'm talking about.

Townsquare Media's Tri-Cities cluster (Richland/Kennewick/Pasco, Wash.) provides a great example of "engineering strategy" that you should know about. They built an N+1 site known as "Finley" that serves all four of the company's FM stations in the market (KXRX, KEYW, KOLW and KORD). Market Engineer Tim Schall described the system for this article.

The N+1 site is basically composed of a Nautel VS2.5, and a two-bay Bext TFC2K, which is a broadband antenna. Each of the four stations has a licensed auxiliary for 2 kW ERP. All four stations are currently received at the site by their normal microwave channels. Each STL receiver feeds a composite switcher input—and naturally



Coaxial switch and transmission line routing for KCBS-FM and KTWV transmitters

the output of that switch in turn feeds the composite input of the VS2.5.

In order to turn up the site, Tim establishes an IP connection to the transmitter, and then using the Nautel AUI he simply selects a particular profile. A profile is configured in the transmitter for each station—in this case, all that really needs to change is the frequency. Also

configured in the profile is a logic high output that is wired to a particular input select on the composite switch. When each profile is selected, the appropriate composite feed is sent to the VS. The station chosen then comes up at the right frequency, TPO, and with the correct audio.

One interesting change that Tim plans in the near future is making use of another available feature in each profile: receiving audio via a Shoutcast or Icecast stream. Townsquare maintains a full 25 Mbps IP radio link to the site. By installing four Barix Instreamers at the common

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Broadband antenna at the "Finley" site serves as backup for all four stations.

studio location, he'll be able to have the VS grab the correct audio for each station, replacing the composite STL receivers and switch. This will allow Tim to re-allocate the four STL receivers at their associated main transmitter sites as backups.

As you can tell, quite a bit of time and resources have been invested in this site. I asked Tim for a couple of examples when it came in handy. "Recently, there was a lot of tower work to be done at the KORD site. There are three FMs on that tower. The other two are owned by another company. To maintain NIER compliance, only one station could be on from the tower while the work was being done and it had to be at *greatly* reduced power. Townsquare Media moved the operations to our Finley site and actually got better coverage from there than we would have at the power level necessary from the main site," said Tim. "There was another instance when the power failed at the KEYW site and it (Finley) was pressed into service. There is no backup generator at KEYW."

Even with the advantages of an N+1 site, Tim has some warnings that he wants to pass along. "If someone were to build a site like this, or even if I were going to build

another one, I would insist on having the discussion of station priority. That is to say, if something happens and two stations are down at the same time, which station gets the backup? My market manager has made it clear which station gets this site if that should happen," said Tim. Again, this is part of the engineering strategy, but one that is decided along with your local manager and PD.

The approach you take toward establishing an alternate site depends upon the resources available to you. That, in turn, depends upon what is at stake in your particular business circumstance. In smaller markets it may be that you'll have less to work with, sure. However, that should not be an insurmountable obstacle. Look at tower space that's under lease or otherwise available inexpensively, figure out a way to make space in the racks for a frequency-agile transmitter, and determine a backup means of getting program audio out to another site. Use your imagination and study what others have done. Borrow their best ideas to help solve your own. That's how it's done. 

*Irwin is RF engineer/project manager for Clear Channel Los Angeles and a regular contributor to Radio magazine*

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# Steinberg UR44

by Chris Wygal, CBRE

**T**he 1990s introduced the idea of “virtual reality.” While it seemed strange that a computer could replicate physical touch and experience, less than 30 years later we are taking full advantage of it. The audio recording industry has wholeheartedly replaced familiar rack mounted audio gear with VST (virtual studio technology). Developed by Steinberg during the birth of the virtual reality era, audio “plugins” are frequently preferred over actual hardware. Additionally, DAWs live on laptop computers. An entire studio fits into a carry-on bag. What happened to all the knobs and buttons?

USB 2.0 I/O interfaces have all but eliminated real-time control. Mixing and processing are done in “post,” and the physical control of signal flow is done in an edit window. Thankfully, by way of offering a high-quality interface

for non-linear editing and DAW control, Steinberg’s UR44 delivers a powerful solution. The rugged six-input USB interface is packaged with the dspMixFx UR44, a virtual on-screen mixer that brings back the comfortable functions of faders, knobs and all the other mixing surface favorites.

### WHAT IT IS

The UR44 is a rugged metal box with four XLR-type and phone-type inputs on the front panel. These jacks offer options for mic and line-level inputs as well as two high-impedance inputs for guitars. Each input has gain control and 48V phantom power as well as red peak indicators. The front panel is also home to two headphone jacks with volume control and a master output control. The back panel houses two ¼” jacks for inputs five and six, four ¼” jacks for line outputs and ¼” jacks for the main outputs. All the jacks facilitate balanced or unbalanced connections. Additionally, there is a standard MIDI I/O interface, USB 2.0 plug and the power connection. The UR44 will interface



The UR44 features numerous front- and rear-panel I/O options

directly with an iPad, and the “CC MODE” switch (also located on the back panel) must be turned on for this function. Six sampling rates from 44.1 kHz to 192 kHz are available, as well as 11 buffer size options.

### THE VIRTUAL TOUR

The UR44 comes with an installation CD with the USB (ASIO) driver, dspMixFx UR44 mixer application and UR44 Extension, which allows the device to link properly with Cubase AI. The CD also includes the Basic FX Suite, providing the Sweet Spot Morphing Channel Strip, REV-X and Guitar Amp Classics. While guitar amp simulation may not apply to most radio production environments, it can still be used for some great effects! Cubase AI is free with the UR44 and the aforementioned downloads will work seamlessly with other DAWs and editors via the dspMixFx UR44, or

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by employing them as VST3 plugins.

dspMixFx UR44 is a powerfully nifty virtual mixing board that displays six input faders, a DAW fader and a master fader. It has highly granular input and output meters and two mixing surfaces via "Mix 1" and "Mix 2." Up to 20 user-defined presets can be stored. Each input channel has a stereo link feature, high-pass filter, phase inversion, effects send, pan, mute and solo controls. Additionally, each fader has on/off and edit enable button for the Sweet Spot Morphing Channel Strip. This is where the serious toys are made available for real-time dynamic processing and equalization. Traditional attack, release, ratio and knee functions are a mouse click away. A parametric equalizer and side chain filter live on the channel strip as well. The "drive" knob adjusts how much compression is applied to the process. However, for ultimate adjustment and control the "Morph" knob adjusts the "Sweet Spot Data." Sweet Spot Data is pre-determined combinations of compression and equalization parameters. The function is very much experimental in the way it is used. It is, however, excellent for quickly finding a preset that works in a particular application. Once the "sweet spot" is found, store it! The most valuable aspect of the dspMixFx UR44 mixing, equalization and processing is that it is done in real time allowing for live monitoring of the effects. When a preset produces the right results, the parameters can be recorded and monitored live each time. All the processing is hardware-based, so there is no latency when monitoring.

In addition to the Sweet Spot Morphing Channel Strip, four guitar distortion effects are available on each fader channel. The master fader houses "Rev-X" digital reverb effects. Each input send function is automatically routed to Rev-X, where hall, room and plate reverbs can be crafted for highly accurate and clean acoustic effects. A three-dimensional grid displays the parameters of the effects based on time, frequency and signal level. The Rev-X parameters include reverb time, initial delay, decay, room size, diffusion, high- and low-pass filters and a few other familiar acoustic effect adjustments.

**ALL IN ONE BOX**

The UR44 boasts extremely quiet input and output preamps. The noise floor is practically non-existent, even while critically monitoring with headphones. During testing, two popular condenser mics and a well-known dynamic mic were used. The inputs were smooth, full and quiet.

The UR44 introduces no measurable noise to the signal chain. Its size and weight (3.5lbs) make it easily portable or installed, taking up very little room in both situations. Plus, for those tried and true audio gurus who still want knobs and faders, the dspMixFx UR44 offers it onscreen with all the same functions. **9**

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

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## TECHTIPS



by Doug Irwin  
CPBE AMD

# Repurposing Older Equipment

**A** recurring theme throughout this column has been repurposing older gear that one often finds around a radio station. Many of us don't like to relegate classic pieces of broadcast gear to the e-waste pile.

I think the one device I have seen on storage shelves more than any other classic is the Orban 8100 (Figure 1). No one wants to get rid of those it seems, and for good reason. The 8100 is a dual-band AGC, HF limiter and stereo generator combination all in one box: analog audio in,

composite baseband out. The 8100 had a production run from about 1981 through about 1992.

Like any other device that is 20+ years old, the 8100 has parts that wear out. If you plan to put one back into service, consider changing the major power supply caps at the very least. The attenuator pots also get noisy as they age; you'll likely need to change those out. You might be able to get older ones to be quiet enough by applying a product such as Stabilant 22 from D.W. Electrochemical (Figure 2).

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Figure 1: Orban Optimod 8100-FM with XT chassis

around the Orban analog processor line. You could consider getting an older 8100 completely rebuilt prior to use. (See: <http://www.optimod.fm>)

So just what could you do with an older analog FM processor like the 8100? The most obvious use would be its original purpose—an on-air processor for FM. Since you found one on the shelf, I'll infer that you have something

8100 had an accessory known as the “XT chassis.” (Pictured below the 8100 in Figure 1) This was a 6-band AGC that was inserted between the output of the dual-band AGC section and the HF limiter. Many people like the sound of the XT but there really aren't that

many of them around. If you want to “hotrod” the 8100 (to some extent) you can make use of the same send and return audio points available on the motherboard that were used to make insert points for the XT. Instead of the XT chassis, you can make use of a pair of Texar Prisms, for example. Your system would then be dual band AGC >> multiband AGC >> HF limiter >> stereo generator. You would use the 8100's AGC to ride gain into your multiband, and then you would use the output level of your multiband to drive the HF limiter inputs. Not a bad “backup” processing scheme by any means.

Another common use for the 8100 is a headphone processor for the air studio. “Back in the day” it was common for jocks to listen directly off-air to themselves. Today there are many reasons why that may not be possible: a profanity delay inserted in the program chain, delay due to HD Radio transmission, or delay due to a digital STL system or

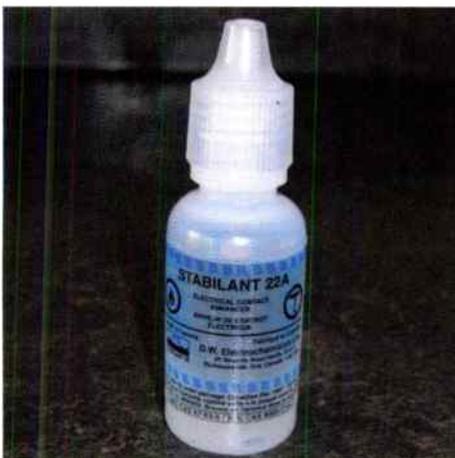


Figure 2: Stabilant 22A

else on the air as a “main” processor. Instead of letting the 8100 collect dust, put it in place as a ready-to-go spare. Don't just wait until something happens to your “main” processor; have the backup installed and ready to go, with the ability to switch to it remotely. An easy-to-use composite switcher can be made using a Broadcast Tools SS 2.1 MLR/BNC. (See Figure 3)

Some of you likely know that the Orban

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certain digital audio processing techniques. Jocks rarely listen to themselves in real time anymore. Universally, jocks seem to like to hear themselves with some sort of audio processing going on. The 8100 can fulfill this role pretty well, and hopefully give your jocks some feel for how the AGC affects the on-air mix. This is important because when someone talks over a music bed (for example) they really need to



Figure 3: Broadcast Tools SS 2.1 MLR/BNC

hear the effects of AGC so that they can tell whether or not their own voice is loud enough with respect to the music bed and not getting “drowned out” by it. If they listen to “flat” (unprocessed) audio it’s really hard to tell if the mix will be good from the standpoint of the listening audience. That’s where an AGC for headphones helps.

If you use the 8100 for this purpose, there are RCA connectors on the rear apron that have processed audio on them—with

pre-emphasis. You can use these, but you’ll need to add de-emphasis ahead of the feed to your headphone amps. The better way is opening up the 8100 and stealing the output of the dual-band AGC from the correct points on the motherboard. Clearly you will need to have an 8100 manual for this. **U**

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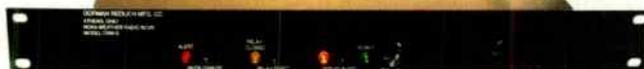
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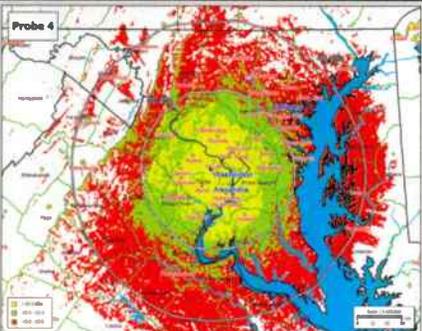



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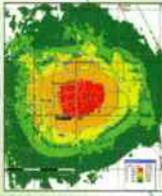
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## This Month in SBE History

2014 Marks the 50th Year of the Society

# This Month in SBE History: A National Voice

by Chriss Scherer

**A**s the Society of Broadcast Engineers grew and evolved in serving its members, it also expanded its role in being a technical voice in broadcasting issues. After the Communication Act of 1934 was passed to consolidate the regulation of telephone, telegraph and radio communications under the oversight of the Federal Communications Commission (which replaced the Federal Radio Commission), subsequent changes added television broadcasting in 1967 and cable TV in 1984.

One of the first efforts by the SBE to express its voice on a larger scale, the SBE formed the SBE Technical Advisory Committee in October 1978. The committee's goal was to represent the SBE on panels, board and industry committees on matters relating to SBE and broadcast interests.

This committee's first chance to participate came in 1979 when the Society of Motion Picture and Television Engineers asked the SBE to be part of a committee to write technical standards for the digital control and interface of automatic television control systems.

Later, the SBE began submitting comments to the FCC rulemaking process and even making visits to legislators and the FCC in Washington, DC. SBE Past President Richard Rudman, CPBE, on business trips to DC, would often schedule appointments.

In the 1980s, the SBE began making regular FCC filings via an ad hoc committee headed by Dane Ericksen, CSRTE CBNT 8-VSB, which later became a formal under the FC Liaison Committee about 1991, which Ericksen chaired. In 2008, the FCC Liaison Committee was reorganized and given an updated mission as the Government Relations Committee by then SBE President Barry Thomas, CPBE DRB CBNE, which was launched in 2008.



Over the years, the SBE has gained a respected voice in the industry. The SBE has been asked to partner on filings by other organizations, including the NAB, MSTV, the ATSC, and even governmental agencies.

SBE efforts to affect legislation have included visits to Capitol Hill, like the one pictured above in 2011. Left to right: Vinny Lopez, CEV CBNT (then past president); Barry Thomas, CPBE DRB CBNE (past president and then Government Liaison Committee chairman); Ralph Hogan, CPBE DRB CBNE (then president); Chris Imlay

(general counsel); John Poray, CAE (executive director)

### CERTIFICATION EXPANSION

The SBE's Program of Certification was launched in 1975, but in December 1978, an FCC action brought on an update to the program: The FCC eliminated the Third-Class operator license. This left a void in broadcasting for an entry-level standard to demonstrate a person's technical abilities. The SBE began developing a new level of certification.

In October 1980, the SBE unveiled its plan to create the Certified Broadcast Technologist (now abbreviated as CBT) level of certification. The CBT is now the first level of what I have always called the "core four" levels of SBE certification. The other three are the Certified Broadcast Engineer (CBRE and CBTE), the Certified Senior Broadcast Engineer (CSRE and CSTE) and Certified Professional Broadcast Engineer (CPBE).

In 1995, the FCC eliminated all licensed operator requirements at radio stations, and in response, the SBE created the Certified Radio Operator (CRO) and Certified Television Operator (CTO) levels of certification. The SBE is currently revising the "SBE Certification Handbook for Radio Operators," which is the preparation guide to take the CRO exam. The second edition of the book is in its final stages of editing and will be available by the end of 2014. **O**

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





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