CHRIS IMLAY ON AM REVITALIZATION — Page 28

NewBay Media

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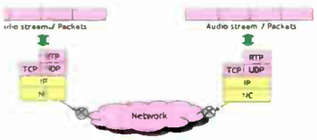



# LPFM Faithful Prepare for Expansion

## How many viable applications will emerge from process is up for debate

BY RANDY J. STINE

**WASHINGTON** — More space on the FM dial is coming for low-power broadcasters, but demand for those new frequencies is expected to be very high, according to low-power advocates.

The FCC is targeting October to open a filing window for new LPFM licenses.

Low-power FM stations, which broadcast at a maximum of 100 watts and typically reach seven to 10 miles from the antenna, have until now been relegated to mostly rural locations. However, the commission believes that frequencies in urban areas will become available due to relaxed criteria for LPFMs seeking a waiver for second-adjacent channel spacing requirements and an interference remediation scheme.

According to FCC figures, there are 824 licensed LPFMs at present. Thousands of new LPFM stations are expected to be authorized as a result of the agency's action in November, according to LPFM broadcast observers.

Common Frequency, an LPFM/college radio advocate and consultant, called the FCC's action "historic" and "a lifting of the barriers of entry into noncommercial broadcasting that have resulted in media ownership diversity statistics hitting record lows."

It's been more than a decade since the first LPFM filing window, according to the FCC. Estimates of the likely number of applications vary widely; Amherst Alliance has put it at up to 10,000, while other estimates are lower.

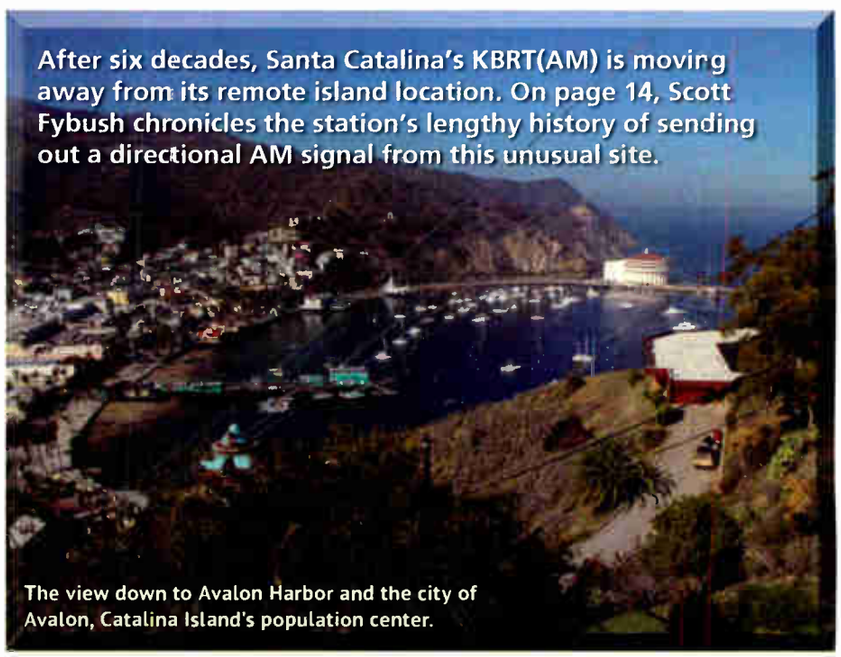
Prometheus Radio Project, an LPFM advocate and consultant, said the long-awaited action is expected to generate strong interest from non-profit organizations, schools, churches, public safety agencies and other eligible groups. Prometheus estimates a community group can launch a low-power FM station for as little as $10,000 for the engineering work and equipment needed.

### WAIVERS

"There is a lot of interest in starting stations, particularly in urban areas, so the limiting factor will be the availability of urban channels. Many urban channels will require second-adjacent frequency waivers, and applicants will need to hire consulting engineers to produce the studies required for waiver requests," said Brandy Doyle, policy director at Prometheus.

That's a change from the first round of LPFM licensing, when it was easier

(continued on page 6)



After six decades, Santa Catalina's KBRT(AM) is moving away from its remote island location. On page 14, Scott Fybush chronicles the station's lengthy history of sending out a directional AM signal from this unusual site.

The view down to Avalon Harbor and the city of Avalon, Catalina Island's population center.

WHEATNET

THE INTELLIGENT NETWORK

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"Wow, Wow!"

***Rick Hunt, Vice President & Director of Radio Engineering, Entravision Communications Corporation***

"Considering the LX-24's attractive good looks, modularity, traditional console layout and functionality, I can't wait to get my hands on one!"

***Greg Landgraf, Senior Engineering Manager, Corus Radio Western Canada***

"A high performance, reasonably priced, great looking console integrating common sense features such as overload indicators for meters and ergonomic controls. Very impressive and well thought out."

***Benjamin Brinitzer, Regional VP Engineering Clear Channel Media & Entertainment***

"By far the most elegant and feature rich control surface on the market. The attention to detail and functionality is remarkable. Its architecture, such as "hot swappable" modular design, is a winner. A traditional meter bridge is appreciated by users and your millwork guy will appreciate the fact that it's a table-top design."

***Kris Rodts, Director of Engineering, IT & Facilities, CKUA Radio Network***

"Wheatstone's innovation continues to make AoIP a viable product for professional broadcasting facilities. Just a few things that make the LX-24 stand out to me are the clear and decisive metering, individual fader modules, and "out of the box" thinking with faders for the headphone and monitor volume controls instead of rotary knobs."

***Phillip Vaughan, Chief Engineer KFROG, CBS Radio***

"Leave it to the exquisite design talents of Gary Snow and the Wheatstone team to really hit the nail on the head. The LX-24 is not only the most functional, feature-laden IP based console for radio, it also raises the bar for the finest ergonomic radio command center on the planet."

***Tim Schwieger, President / CEO, BSW - Broadcast Supply Worldwide***

"I didn't think Wheatstone could improve upon the E-Series of consoles, but they have done it with the new LX-24. This is a beautiful, well designed console and the individual faders, integrated meters with overload indicators and low profile table-top design make this a must have for our facilities."

***Michael Cooney, Vice President of Engineering & CTO, Beasley Broadcast Group, Inc.***

"Cool and sexy (I sound like Bruno from Dancing with the Stars). A great addition to the WheatNet-IP family."

***Norman Philips, Vice President of Engineering, Townsquare Media***

"I am very impressed with the sleek new design that incorporates single channel-strip architecture, integrated metering and stereo cue speakers in a thin, sloping chassis that needs no cabinetry cut out. Well done."

***Erik Kuhlmann, Senior Vice President of Engineering, Clear Channel Media + Entertainment***

"Wheatstone continues to hit balls out of the park and this year they did so again with the LX-24 control surface. This new product marries the best of the old (modular design architecture) with the new (Audio-over-IP). Continuing in that theme was a Wheatstone module that marries their bridge router system to the new "BLADE" audio-over-IP system. This has the potential to extend the life of bridge router facilities indefinitely."

***W.C. Alexander, CPBE, AMD, DRB, Director of Engineering, Crawford Broadcasting Company***

"The LX caught my attention on the NAB Show floor. The look, form and function are unlike any other IP console available today. The easy-to-read buttons and displays are just second to none, not to mention the most bang for the buck. I can't wait 'til I have the opportunity to deploy my first LX."

***Anthony A. Gervasi, Jr., Sr. Vice President Engineering & Technology, Nassau Broadcasting***

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# Dedicated Ham Keeps Morse Code Alive

BY JAMES CARELESS

**GLACE BAY, Nova Scotia** — On Dec.17, 1902, from the seaside Table Head radio station at Glace Bay, Nova Scotia, Guglielmo Marconi made the first radio transmission from North America to Europe.

This Morse code transmission completed his tests. A year before, Marconi had transmitted Morse code successfully from Poldhu, Cornwall in the U.K. to a receiving station on Signal Hill, Newfoundland.

The Morse code signals were blasted from Table Head using an awe-inspiring 35 kW spark-gap transmitter. They were emitted at 500 kHz from a square vertical curtain array antenna, strung between four massive wooden 64-meter towers. This was brute-force broadcasting, using the same engineering paradigm that chose monstrous Saturn V rockets to take men to the moon decades later.

All photos courtesy of Parks Canada

Jim Charlong works his Morse code key.

## LIFELONG PASSION

A few years later, Marconi moved the Table Head towers to a site he deemed more suitable for commercial ship-to-shore wireless traffic. But the tower's concrete foundations still remain at this windswept rock plain, which is now home to the Marconi National Historic Site of Canada (*www.pc.gc.ca/marconi*).

Operated by Parks Canada, the Marconi site features a museum with a model of the original transmission structure, a historical multimedia display and tour — and Jim Charlong, who keeps the site's Morse code broadcast legacy alive and on the air.

Charlong is a dedicated Morse code operator with 50 years' experience under his "fist" — fist being a ham radio term that describes the signature speed and style of an operator's key-tapping skills. Since the Marconi museum opened in July 1989, he has volunteered as its resident Morse code radio operator. From his "radio shack" inside the museum, Charlong regularly communicates with other Morse code operators around the world.

"I'm here from 10 a.m. to 6 p.m., seven days a week, from the time the museum opens on June 1 to when it closes on Sept. 15," said Charlong. "For a Morse code operator, this is heaven. I'm living the dream."

The Marconi museum with Charlong's multiband antenna

When Jim Charlong was growing up in rural Nova Scotia in the 1950s and '60s, Morse code was a requirement for anyone wanting to obtain an amateur radio (ham) voice license.

However, even though he learned the code and earned the right to broadcast his voice at age 16, Charlong has stuck to the key. "I have no use for the microphone," he said. "Morse code is a better medium, because it can go places the voice can't."

Charlong is correct: The dot-and-dashes used in Morse code transmission are much easier to pick out amidst RF static and lightning crashes that make voice transmission unintelligible.

## VAS HOME

In recent years, the Morse code requirement has been dropped from the ham license. But there are still Morse code hams on the airwaves. One can hear their rapid code streaming from the speaker of Charlong's Kenwood TS-2000 transceiver. It sits on a shelf with various vintage ham radio transceivers at the museum's radio shack.

In truth, the museum's shack is a spacious part of the exhibition hall. It is dominated by the letters "VAS" on the wall. They stand for "Voice of the Atlantic Seaboard," the call sign of Marconi's Nova Scotia radio station until it ended service in 1946.

(continued on page 5)

# 'First Informer' Concept Spreads

## In Illinois, broadcasters soon will have the benefit of emergency credentials

When I first heard broadcasters describing themselves as first informers, I was uneasy. While acknowledging the truth of that phrase, I felt we were taking a term, "first responders," that is highly valued in our society, and trying to catch some of its reflected gloss. I worried about how law enforcement and other authorities, who are such important partners to radio and TV, would view broadcasting's use of those words.

Over the years, I've come to see how suitable the phrase is for radio and TV stations that take their public service roles seriously. A recent news item out of Illinois is a reminder that as long as broadcasters handle this correctly, there's little cause for concern.

The Illinois Broadcasters Association reports that a "First Informer Broadcasters Act" passed the legislature unanimously and was headed to the governor's desk. The bill ensures that broadcasters and cable operators will have emergency credentials to gain access to their operations; it also recognizes that broadcasters need access to deliver fuel for emergency generators in time of disaster.

As Radio World readers know this is not the first such effort.

Dennis Lyle, president/CEO of the IBA, told me that then-Chairman John Chadwick pushed for this because he knew about Wisconsin's credentialing program, coordinated by the Wisconsin Broadcasters Association, and thought it important for Illinois to have a similar opportunity. IBA also was following the Nevada Broadcasters Association, which lobbied not only for a credentialing program but to have it codified into state law. That happened in 2009.

"Once [Chadwick] learned of Nevada's successful effort in securing *legislation* of a recognized emergency credentialing program for broadcasters, the decision was made to pursue a credentialing program through the legislative process here in Illinois," Lyle said. Also playing a role were "the growing number of horror stories of broadcast-related access issues during times of emergencies and disasters of the past."

To my knowledge, and assuming the governor signs it, Illinois will thus be only the second state with "first responder" legislation.

### FEW CONCERNS

What feedback from the law enforcement community did the association hear? They were very supportive, Lyle said.

"In all honesty, the only real concern was whether or not we [wanted to] pursue asking for emergency-type lights to be placed on our station vehicles. The answer, of course, was 'no.' We simply want to make sure we have every opportunity to keep our stations on the air."

As to terminology, "The subject came up ever so briefly in early discussions, but we resolved any concerns of confusion quickly by suggesting use of the term 'first informers,' a term already penned months earlier by the NAB in their many published documented stories of broadcasters' critical role in past disasters and emergencies," Lyle said.

"Nobody can argue that, whether a 'first responder' or 'first informer.' History shows both play a significant role in saving lives."

IBA noted that the legislation faced no objection from the Illinois Emergency Management Agency, the Illinois Sheriff's Association, the Illinois State Police or the City of Chicago. The lack of a single "no" vote in the legislature suggests that law enforcement raised no meaningful concerns, because when cops talk, lawmakers usually listen. It's evident that IBA, like any effective state association, is adept at working with its interest groups and in anticipating concerns before they reach the public eye.

**This is a topic of direct concern** for Radio World readers, many of whom are the ones who get the call that the transmitter is down or the generator has konked out.

Now the state association will work with the Illinois Emergency Management Agency in designing a training curriculum that broadcast and cable personnel must complete before earning emergency credentials.

This is a legislative win for the IBA and another model for state associations to follow. It further is a topic of direct concern for Radio World readers, many of whom are the ones who get the call that the transmitter is down or the generator has konked out, and who might be confronted with a police officer in a wind-blown intersection who says, "Sorry, I can't let you through."

I'm interested in hearing from readers who have had experiences, good or bad, with such credentialing programs, and what others can learn from the experience. Write to me at *pmclane@nbmedia.com*.

(One engineer told the Wisconsin Broadcasters Association about an instance in which he responded to a transmitter problem late one evening and ended up being detained at gunpoint by police who believed he was the one who'd been stealing copper recently. It didn't help that they found him with a screwdriver and a piece of equipment in his hands. A couple of phone calls to the station made things right but the engineer said he was "really glad" he had that emergency credential card. "It made them put the guns away.")

The Illinois bill also highlights the good work that state broadcast associations can do and further demonstrates how associations can reinforce one other. Lyle said he's grateful for the work of the National Alliance of State Broadcasters Associations for helping keep "our close family of state broadcasters association executives" informed and involved.

In hailing passage of the bill, he emphasized that local broadcasters have proved many times to be the first means for first responders to disseminate emergency information to the public. For him, this bill was all about "allowing us to do what we do best during emergency situations: keeping the public informed."

FROM THE EDITOR

Paul McLane

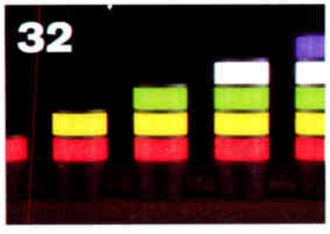
## THIS ISSUE

JANUARY 16, 2013












# NEWSROUNDUP

**PATENT:** Action by the U.S. Patent & Trademark Office appears to reject all the claims by Mission Abstract Data in its re-examination of both patents regarding studio digital storage and automation systems. That's according to two documents released by the Patent Office in December. Mission Abstract Data has until Jan. 19 to respond.

**SMITH-MUNDT:** A defense-related authorization bill signed by President Obama includes a provision that allows the Broadcasting Board of Governors to disseminate materials originally intended for overseas audiences within the United States. The development means that news and information programs produced by BBG journalists can also be made available for broadcast within the U.S. The provision repeals the domestic ban spelled out in the Smith-Mundt Act of 1948. Capitol Hill supporters of the legislation, originally known as the Smith-Mundt Modernization Act when it was introduced in Congress in 2010, have said such a change was long overdue considering that technological advances already make much of the content readily available in this country.

**SATELLITE:** The FCC approved Liberty Media's takeover of SiriusXM. In the order, International Bureau Chief Mindel De La Torre wrote that the deal is in the public interest. Liberty held about 47.3 percent of SiriusXM shares in November and told the agency it would soon buy additional shares to reach more than 50 percent. Liberty lent SiriusXM money in 2009 and has been increasing its ownership stake since. SiriusXM President of Sales and Operations Jim Meyer was named interim chief executive officer after CEO Mel Karmazin departed in December.

**RFE/RL:** Radio Free Europe/Radio Liberty President/CEO Steven Korn resigned. The Broadcast Board of Governors accepted his resignation effective Jan. 25. Korn was appointed to the post in June of 2011. The search is on for his replacement, according to BBG.

**CUMULUS, ARBITRON:** After more than three years without diary service, Cumulus Media stations in 44 markets will subscribe to Arbitron ratings again. The companies signed a multi-year agreement that also renews ratings in 17 Portable People Meter markets and 39 diary markets. Cumulus also agreed to collaborate with Arbitron on cross-platform services that would quantify the total impact of the Cumulus radio brand.

# MORSE CODE

(continued from page 3)

Thanks to Charlong, VAS is on-air and heard around the globe. The proof can be found on a world map mounted beside the VAS logo. The map is studded with colored pins, to mark the places Charlong has reached. There are pins everywhere.

Of course, Charlong's range is boosted thanks to an excellent multiband antenna, which sits on the museum's outdoor tower (with rotor head), plus a 100 W transmitter to kick his signal up into the ionosphere, which it bounces around to the other side of the world and back. (All the equipment is maintained by the Sydney Amateur Radio Club of Nova Scotia, a group of ham enthusiasts to which Charlong belongs.)

Madeleine Harvey is the Marconi National Historic Site's visitor experience manager. She cannot believe the museum's good luck in having such a dedicated and qualified volunteer on site.

"The passion Jim has for wireless is infectious," Harvey said. "It brings it alive for our visitors — and it helps us tell the story of Marconi, a genius who truly was the 'Wizard of Wireless.'"

### LIVING TREASURE

In honor of his efforts, Parks Canada gave Charlong a Volunteer Recognition Award in 2011. Yet no matter how much he appreciated the recognition, Charlong sees his real reward as being allowed to keep VAS alive — and having daily access to a quality of equipment and transmission power not available at his seniors' residence in nearby Sydney.

"The romance of Morse code and wireless has never faded for me," said Charlong. "Being able to send and receive it from the site of Marconi's first North American transmission — literally working where he and his operators made broadcast history? It just doesn't get any better than this."

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

# LPFM EXPANSION

(continued from page 1)

for laypeople to submit applications without hiring engineers, she said.

Prometheus expects new LPFM licensing in major cities like Miami, Denver, Chicago and some others, though not all. "Unfortunately, the LPFM outlook in Detroit and New York City, for instance, isn't good. Although there will be some opportunities in the broader market, we don't expect anything in those cities."

Potential LPFM applicants should begin preparing as soon as possible, Doyle said, because consulting engineers will get busier as the filing date window gets closer.

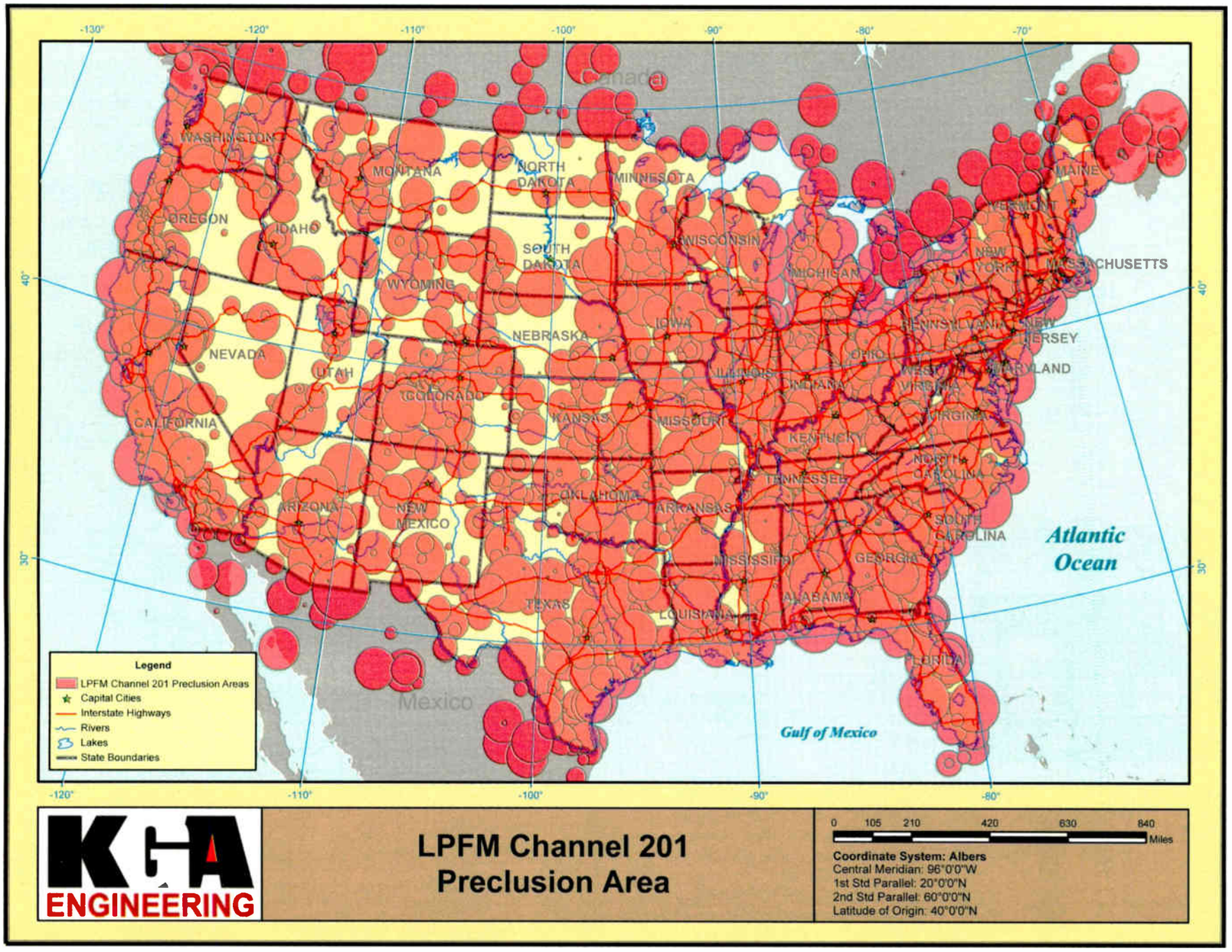
LPFM advocate Conexus expects 3,000 to 5,000 applicants will ask the FCC for LPFM licenses. Conexus bases its estimate on customer inquiries, Internet forum chatter and FCC comments concerning the latest Report and Order.

Conexus principal Leo Ashcraft, a broadcast consulting engineer, reminds potential applicants that the FCC requires an LPFM applicant to be a non-profit entity as recognized by the state in which it is based.

"So while IRS 501(c)(3) status is not required at the time of filing, some sort of state non-profit charter is required," said Ashcraft. "A tower site needs to be located and secured before the engineering portion of the application can begin. That means locking down a tower

(continued on page 8)


**REC Networks' official finder tool is found at *mylpfm.com*.**




**Kessler and Gehman Associates Inc. prepared this study of 88.1 MHz prior to the FCC action. White areas were those where a new LPFM could operate on that frequency; areas in pink were precluded. The company says this demonstrates how little space was available to add LPFMs on 88.1 prior to the changes. (The map considers third-adjacent, second-adjacent and IF limitations.)**

**1664:** Just what it looks like. Two tin cups and a string. But it transmitted sound!

**1876:** Alexander Graham Bell's commercially viable telephone.

**1900:** Phones become fixtures in more well-to-do and steam-punk homes.

**1920:** Every home is working toward having a telephone!

**1936:** The advent of the dial desk phone. No more asking the operator to connect you.

**1963:** Push buttons usher in the thoroughly modern world. Touch tones enter pop culture.

**1983:** The mobile phone is a reality. Plots in all TV shows get a boost!


**2004:** IP Telephones begin to become the staple of modern business.


**2007:** Smartphones are complete communications centers. AND they can sound great!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# LPFM EXPANSION

(continued from page 6)

site with a lease option."

Conexus wasn't completely satisfied with the FCC order. It stated in a press release, "While the FCC has made great strides with this latest order, and moving forward towards and October 2013 filing window, we feel a few items were swept under the proverbial rug, including lack of a LP10 class of stations and more power for rural radio stations."

REC Networks is another proponent projecting high interest levels this October. Founder Michi Eyre expects a minimum of 2,800 LPFM applications.

"Organizations such as Prometheus Radio Project have done an amazing job with outreach and I am pretty sure they have a lot of eligible organizations waiting in the wings to get their voices heard on the air," said Eyre, who also is an aspiring LPFM broadcaster.

Eyre recommends that potential applicants begin searching for open channels via the FCC LPFM Channel Finder program at *www.fcc.gov*, or REC's finder tool at *mylpfm.com*.

"If you use the FCC LPFM Channel Finder for searching for LPFM channels at this time, you need to keep in mind that the results coming back may be very conservative as those tools do not take into consideration the translator applications that could be potentially dismissed as a result of the anti-preclusion requirement," Eyre said.

As Radio World previously reported, the FCC attempted to balance the competing needs between those hoping for new LPFM stations and existing broadcasters that have had some 6,000 FM translator applications pending since 2003.

### TRANSLATOR CAPS

The agency bumped up the national cap on pending FM translator applications that one entity can pursue from 50 to 70, as long as no more than 50 are in the top 150 markets. It relaxed the local cap of one application per entity to up to three applications one company can pursue in more rural markets.

LPFM advocates generally seem satisfied with the FCC's action regarding translators and think the Media Bureau did the best it could without further delaying the processing of translator applications from the 2003 filing window, according to Radio World inquiries.

"Any delays for the 2003 backlog of translator applications would have also delayed the LPFM filing window," said Conexus' Ashcraft.

The pending filing window may very well be the last chance for LPFM hopefuls to get a slice of FM spectrum, according to Bill Godfrey, engineering associate with Kessler and Gehman Associates Inc.

(continued on page 10)

## HOW MANY NEW LPFMS?

It remains to be seen how many LPFM frequencies become available due to the relaxed criteria for second-adjacent channel protection waivers, but one LPFM advocate sees opportunities as well as limitations.

"The second-adjacent waiver will definitely allow for opportunities in certain urban areas as long as your transmitter site is near the second-adjacent channel full-service stations," said Michi Eyre, the founder of REC Networks. "The problem I think we are going to face in some second-adjacent channel situations is that the predicted overlap zones will be too large due to distance to the second-adjacent channel sites."

Eyre predicts that more LPFM stations in urban areas will actually be located in the "urbanized areas" and not communications sites that serve a particular area.

For example, Eyre points to Compton, Calif., as what should be a perfect candidate for a local voice.

"There are two potential second adjacent waiver channels in the area. However, each channel is estimated to require about a 160 meter zone of no 'potential listeners.' In a densely populated area, this eliminates the ability to construct the station at a place like a community center or something similar because the community center and surrounding homes and businesses would be considered potential listeners."

Perhaps with some "engineering trickery" or an expensive directional array, Eyre said, an LPFM could overcome the obstacles.

"But in cities like Los Angeles, where all of the big sticks are on Mount Wilson and other distant sites, this greatly reduces the opportunities in the inner city."

— *Randy J. Stine*

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# LPFM EXPANSION

(continued from page 8)

"It wouldn't surprise me if as many as 7,500 applications are filed during the FCC window that is projected to open in October of 2013," said Godfrey. "The FM airwaves are already very congested in many areas so an LPFM filing window of this magnitude, followed by an FM translator filing window projected to open a year or two later, could truly extinguish any future filing windows for new LPFM stations."

Further, Godfrey said applicants should recognize that the competition for LPFM stations will be intense and many applications will be won based on a points system.

**A tower site** needs to be located and secured before the engineering portion of the application can begin. That means locking down a tower site with a lease option.

– Leo Ashcraft, Conexus

"Therefore, with only 10 months until the window opens, now is the time to prepare so that applicants can retain the services of broadcast attorneys and consulting engineers early in order to maximize the points that will be awarded by the FCC during the selection process in the likely event that their application is evaluated with other competing applications in a mutually exclusive [MX] scenario," Godfrey said.

Another LPFM supporter agreed the congested FM spectrum will present ever-shrinking opportunities for licenses.

"Crowded spectrum is spreading to more and more geographical areas," said Don Schellhardt, president of Amherst Alliance and a government relations attorney specializing in communications and energy. "Sooner or later, and I sure hope it's sooner, the comparative social value of [LPFM] stations must be taken into account when frequencies are being allocated."



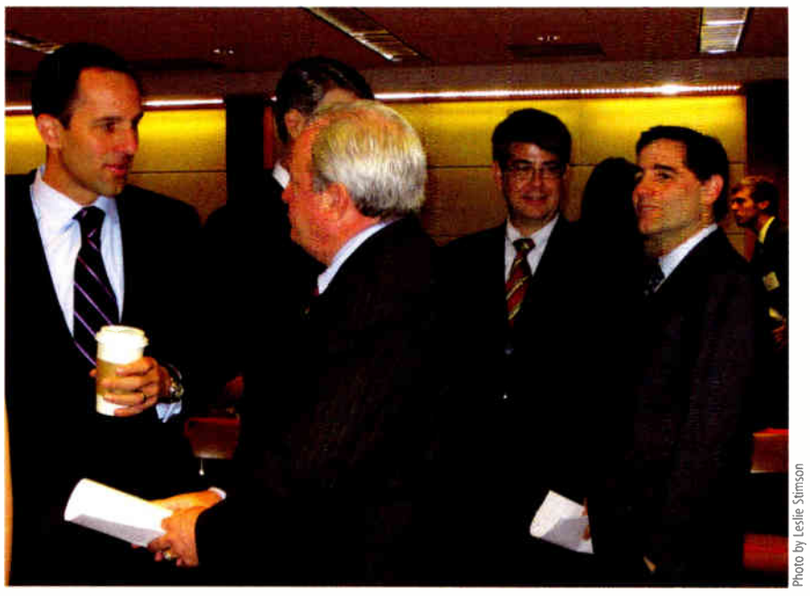

Photo by Leslie Stimson

**Among those chatting after the November FCC vote on LPFM are Reps. Mike Doyle, D-Pa., at center looking left, and Lee Terry, R-Neb., facing the camera and talking to Chairman Julius Genachowski at right. Doyle sponsored the bill in the House and Lee was a co-sponsor. Commissioner Robert McDowell is obscured.**

Power levels remain contentious for some faithful who advocate higher power, perhaps 250 watts, for rural LPFMs. And they believe that a class of 50-watt stations possibly could have boosted the number of opportunities in heavily congested urban areas. However, many analysts agree any further LPFM adaptations will have to wait.

"For both LP50 and LP250, it's in everyone's best interest that we wait until after the window," said REC's Eyre.

Meanwhile, a group of low-power FM advocates, unhappy with current power levels, has formed to encourage the commission to reconsider an LP250 radio service.

"We will take no immediate action at the FCC," a spokesman for the group explained, "because we do not wish to disrupt the LPFM filing window which is currently unfolding. Instead, we will file a Petition for Rulemaking in 2013, asking for the commission to take action in 2014 — after the LPFM filing window has closed. At that time, where feasible and appropriate, licensed LP100 stations should be permitted to upgrade to LP250 stations."

Conexus said the original LPFM service was proposed at 1,000 watts but was limited to 100 watts and below, in part, due to potential the interference with full-time FMs.

The FCC created the LPFM radio service in 2000 and authorized it for non-commercial educational broadcasting only. Stations must operate with an effective radiated power of 100 watts or less with a maximum antenna height of 30 meters above average terrain, according to the agency. The LCRA, which was signed by President Obama after its passage by Congress in late 2010, explicitly authorized the FCC to license more local low-power FM radio stations.

NAB spokesman Dennis Wharton stated after the new LPFM rules were released: "We support faithful implementation of the [Local Community Radio Act] and look forward to working with the commission and the LPFM community in the future."

*Next time: The impact on translators.*

## MAJOR POINTS IN THE FCC'S LPFM ORDER:

- Sets Oct. 15, 2013, as the target date of a new LPFM filing window.
- Adopts an LPFM service standard for second-adjacent channel spacing waivers, which specifies the manner in which a waiver applicant can satisfy the standard and the manner in which the FCC will handle complaints of interference caused by LPFM stations operating pursuant to second-adjacent waivers.
- Establishes separate third-adjacent channel interference remediation regimes for short-spaced and fully-spaced LPFM stations.
- "Upon receipt of a complaint of interference caused by an LPFM station operating pursuant to a second-adjacent waiver, the commission must notify the LPFM station by telephone or other electronic communication within one business day. The LPFM station must suspend operation immediately upon notification that it is causing interference to the reception of any existing or modified full-service FM station. The LPFM may not resume operations until such interference has been eliminated or it can demonstrate that the interference was not due to [its] emissions. The LPFM station, however, may make short test transmissions during the period of suspended operation to check the efficacy of remedial measures."
- Revises rules to permit cross-ownership of an LPFM station and up to two FM translator stations. The FCC has adopted a number of restrictions on such cross-ownership in order to ensure that the LPFM service retains its extremely local focus.
- Modifies the point system used to select from among mutually exclusive LPFM applications by adding new criteria to promote the staffing of a main studio, radio service proposals by tribal nations to serve tribal lands and new entry into radio broadcasting.
- New LPFM stations will be required to broadcast periodic announcements that alert listeners to the potential for interference and instruct them to contact the station to report any interference. These announcements must be broadcast for a period of one year after construction.
- Requires LPFM applicants to protect the reception directly, off-air of third-adjacent channel input signals from any station, including full-service FM stations and FM translator stations.
- Eliminates the LP10 class of service and does not create an LP50 class.
- Eliminates the intermediate frequency (I.F.) protection requirements applicable to LPFM stations.

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# A DIY Power Supply Replacement

## Bruce Roberts brings his FM1C back to life with an affordable part

Apex Broadcasting's Chief Engineer Bruce Roberts came up with a handy solution after he lost the power supply to his BE FM1C, a 1 kW FM solid-state transmitter.

**WORKBENCH**
by John Bisset
Read more Workbench articles online at radioworld.com

He writes that BE makes a conversion kit for the FM500/FM1C but its cost was outside of his budget, so he ended up removing the transmitter from service, sticking the unit in a corner and using something else.

From time to time Bruce did an online search for a 48V 50 amp supply but couldn't find a suitable candidate. Finally, he discovered the right substitute supply at TRC Electronics for $438.60. (I posted the link at *radioworld.com/links*.)

The supply is a Mean Well Enterprises model RSP-2400-48, seen in Fig. 1, and the installation procedure was pretty simple. The hardest part was removing the old supply. After removal, Bruce drilled the side of the transmitter to mount the new supply, as seen in Fig. 2. A template for mounting screws can be found on the supply PDF from AllDataSheets.com (again see *radioworld.com/links*).

Fig. 1: The Mean Well replacement power supply for a BE FM1C1.

Fig. 2: Drilling holes in the side of the transmitter to mount the new supply.



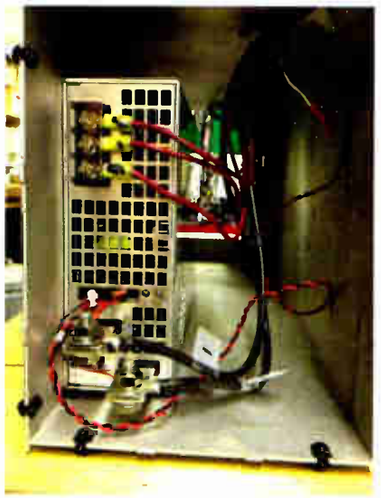

Fig. 3: The new supply is mounted in the transmitter.


Fig. 4: Up and running on the new supply.

The other issue was finding a plug to connect to the new supply in order to "mute" the voltage when transmitter is off. The old supply had a small white wire that supplied +12V to mute the power supply when the power is turned off on the front panel.

To accomplish the mute function on the new supply, plug CN1 pin 1 gets grounded, and the white wire connects to pin 2. You'll find these pins identified on the supply PDF described above.

Fig. 3 shows the supply mounted and wired up. Note the aforementioned "white wire" in the upper corner, which has been extended to reach CN1.

Fig. 4 was taken after the transmitter was returned to service.

Reach Bruce Roberts at *bruce@apexbroadcasting.com*.

Hall Communications Vice President of Engineering Edd Monskie commented about our description of Alan Peterson's antique radio that played holiday carols in the station lobby.

When Edd was in college at Ball State University in Muncie, Ind., he and some friends took an old antique Zenith cabinet radio, got it working, tubes and all, and placed it in the lobby of the college station, WBST(FM). They then took an old FM receiver and, using the proper coupling, connected the FM receiver to the shortwave input of the radio band selector switch.

They had the air signal of the FM

(continued on page 14)

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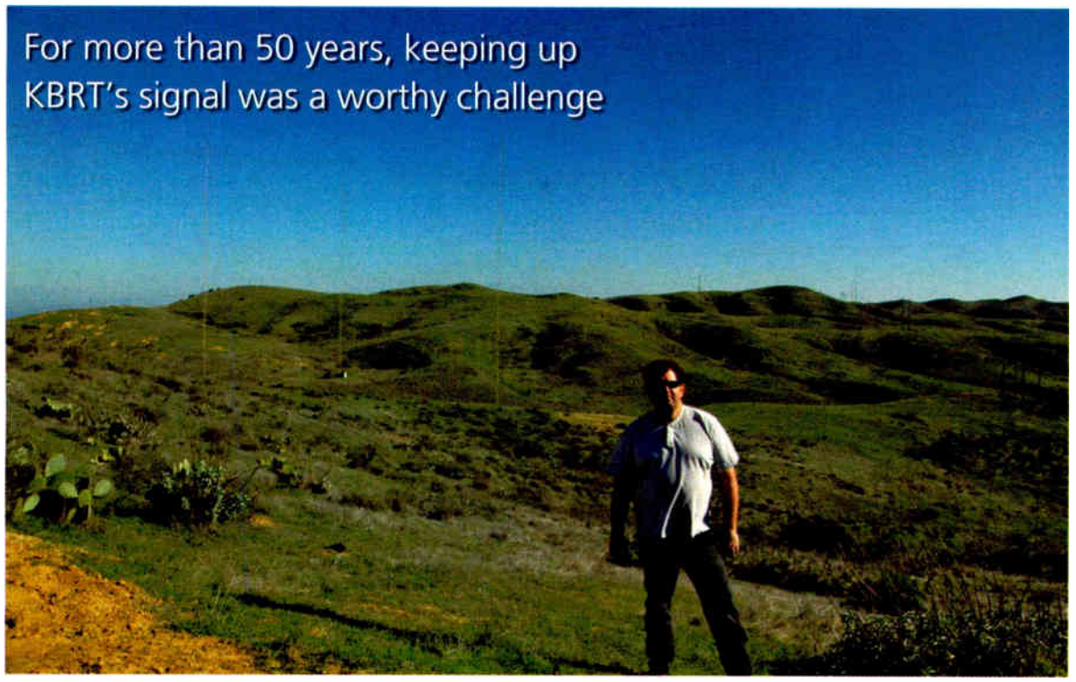
# One of America's Most Remote AM Sites Is Signing Off




**KBRT chief engineer Bill Agresta stands in front of the station's island transmitter site.**

BY SCOTT FYBUSH

*"Twenty-six miles across the sea, Santa Catalina is a-waitin' for me ..."*

The Four Preps didn't quite get the distance right — it's only about 20 miles from the nearest point on the southern California mainland to the ferry dock at Avalon on Catalina Island — but their 1958 hit record was right on the money when it pinpointed "the island of romance."

However, the romance of Catalina dissipates quite a bit when you're trying to keep an AM directional array running at an island location that's not only a long ferry ride from mainland United States but which is remote even by Catalina standards.

That's the challenge the operators of what's now KBRT(AM) have faced for six decades, and it's the challenge the station's current owner, Crawford Broadcasting, is giving up as it moves KBRT to a new site in the hills of eastern Orange County.

That site is an engineering marvel in its own right, as you'll be reading about shortly in the pages of RW; but the island site deserves a full accounting of its own as it heads into the sunset of radio history.

*"Water around it everywhere, tropical trees and the salty air ..."*

KBRT's Catalina story begins with John H. Poole, one of southern California's most colorful broadcast owners.

Poole built his own ham radio station at age 14, shipped out as a Merchant Marine radioman before World War II, then spent the war serving in the Army Signal Corps. Afterward, he bought stations in Santa Maria (KSMA) and Pasadena (KALI) before turning his attention to Catalina in the late '40s.

While conventional wisdom said there was no room for another new signal on the already-crowded Los Angeles-area AM dial, Poole quickly figured out that by locating offshore, he could blast out a 10,000-watt daytime signal at 740 on the dial that would carry over the Pacific salt water to blanket the coast from Santa Barbara to San Diego.

When Poole signed KBIG on the air in 1952, it wasn't the first offshore broadcaster in the region. Major Jordan L. Mott had run 250-watt KFWO ("Katalina For Wonderful Outings") from his home in the island town of Avalon from 1925–1928, using the station to promote tourism to a mainland audience.

A few years later, a Panama-registered ship hosted its own high-powered unlicensed station, "RXKR," targeting coastal listeners in southern California. Poole, too, took advantage of his exotic offshore location to build an audience.

Operating from studios in downtown Avalon, a few blocks from the ferry docks (with additional mainland studios and sales offices in Hollywood), Poole's KBIG billed itself as "The Island Station," and he boasted to Broadcasting magazine in 1953 that his new station was operating in the black within four months of sign-on.

By then, Poole was off to a new challenge. He'd already dabbled in UHF television with an experimental transmitter on Signal Hill in Long Beach. In 1953, Poole was granted a commercial construction permit on Mount Wilson for what would become KBIC on Channel 22 — and while KBIC never broadcast more than a test pattern, the "John Poole Building" on the mountain became home by 1959 to a new KBIG-FM, with a massive signal on 104.3 that reached all of southern California not only by day but also after sunset, when the KBIG(AM) daytime signal yielded to 740's clear-channel occupant, KCBS from San Francisco.

By the 1960s, KBIG-FM's fulltime signal had outpaced its AM sister in the ratings. The downtown Avalon studio was closed, and whatever limited Catalina-produced programming on the AM station remained was originating from a small studio at the three-tower transmitter site up in the hills.

Poole exited the broadcasting business in 1969, starting yet another new career as a winemaker. (After his death in 2003, Poole's son took over operations of the Mount Palomar Winery, which continues in operation.)

Bonneville took over the KBIG radio stations, and 740 began a slow transition to a mix of music and religious programming. In 1980, Bonneville sold KBIG(AM) to Crawford Broadcasting, which renamed the station KBRT ("K-Bright") and moved to new mainland studios in Costa Mesa, Orange County.

Under Crawford, KBRT's programming went entirely to religion, still using that big signal from Catalina to reach listeners up and down the coast. The breakdown of the clear channels in the 1990s landed KBRT a limited night authorization, but with a measly 113 watts, KBRT after dark couldn't overcome the big KCBS signal anywhere on the mainland, and so it continued to operate daytime only.

KBRT's next big brush with the headlines was an unfortunate one: In the spring of 2007, a contractor working on replacing the station's guy wires was using a circular saw to cut up the scrap metal from the project. Sparks from the saw ignited the dry brush around the site, touching off what would turn out to be a 4,200-acre blaze that scorched much of the central part of the island, destroying power and electric lines and stopping just short of the edge of Avalon itself.

The towers and transmitter building remained standing, and KBRT was back on the air within days on generator power, first playing CDs from the on-site studio and then establishing a satellite link to the mainland. The fire's aftermath brought lawsuits that weren't settled until just last year, and helped to push Crawford to seek out a more accessible site off the island.

*(continued on page 16)*

## WORKBENCH

*(continued from page 12)*

station playing in the lobby, through that beautiful, 1930s walnut cabinet. It sounded fantastic.

Edd adds that as long as he worked there, no one commented on the fact that FM had not even existed when the AM/shortwave radio was manufactured.

Thanks, Edd, for a neat memory. Reach Edd Monskie at *emonskie@hallradio.com*.

Cumulus Youngstown's Wes Boyd found a YouTube video that anyone dealing with EAS and weather-related radio will appreciate. It's the voice of NOAA Weather Radio singing "Deck the Halls." Gotta love the fa-la-la!

Find it at *radioworld.com/links*.

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

*Author John Bisset has spent 43 years in the broadcasting industry and is still learning. He is SBE Certified, and is a past recipient of the SBE's Educator of the Year Award.*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# KBRT

(continued from page 14)

*"Forty kilometers in a leaky old boat,*
*Any old thing that'll stay afloat ..."*

If you set out, as we did, to visit KBRT's island home, you most likely begin your trip on the water. Unless you're chartering a plane or helicopter, the route to Catalina starts on the mainland at either Long Beach/San Pedro, just south of Los Angeles, or Dana Point in Orange County. After a little more than an hour on the ferry, you arrive in Avalon, the island's main town.

For most visitors, Avalon itself is the main tourism destination: There's a quaint shopping district on the water just a few blocks from the ferry landing, an assortment of bed-and-breakfasts and small inns, and if you're adventurous, you can rent a golf cart for the day and drive up into the hills to look down on the pretty little town tucked into a cove.

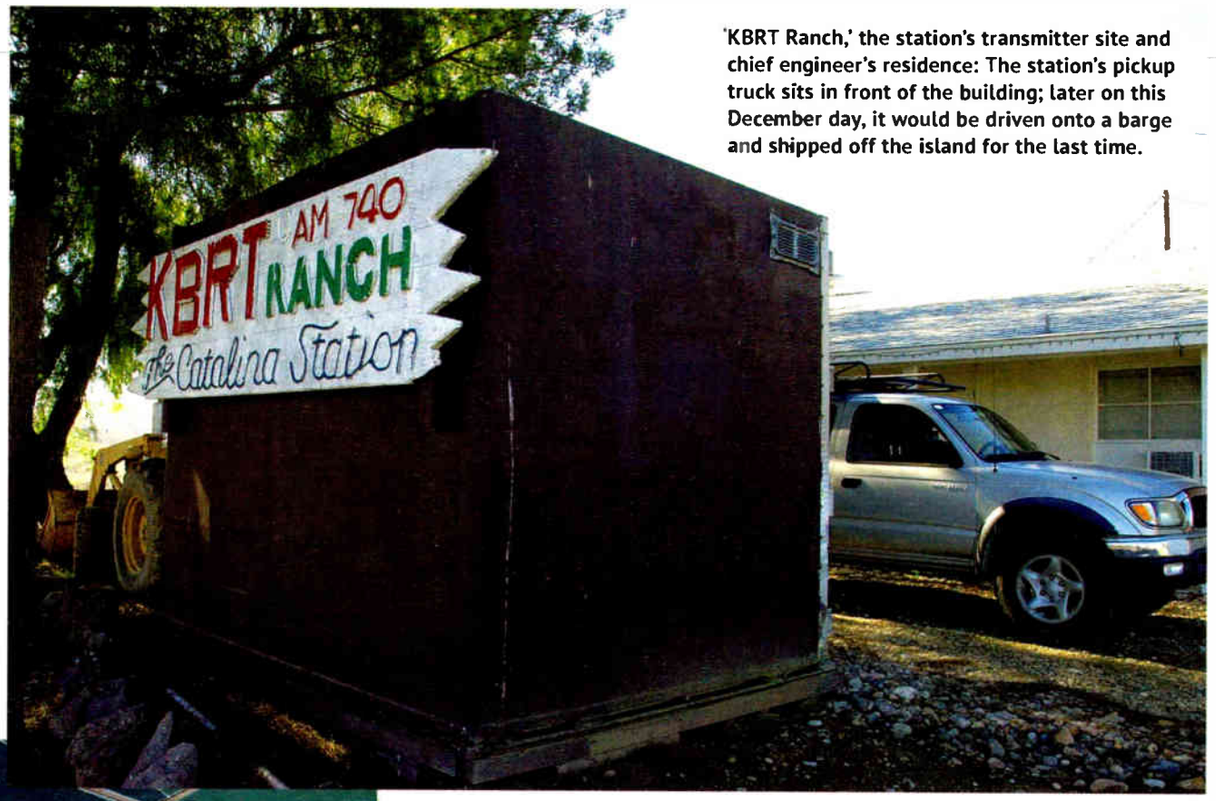

**Detail of a mosaic map of the island outside the 'Airport in the Sky,' a few miles north of KBRT. For more than half a century, the 'Island Station' has been a prominent Catalina landmark.**

A golf cart can even take you up to the low hill overlooking the ferry dock that's home to the antenna for the island's community radio station, 100-watt KISL (88.7). But if you're hoping to go see KBRT's transmitter site, you'll need something heftier than a golf cart, because carts can't go beyond the gate that blocks access to Airport Road as it heads up into the hills going north from the city.

The gate, and most of the rest of the island, belongs to the Catalina Island Conservancy, established 40 years ago by the two families that had owned most of the island's land for more than half a century. (One of those families was the Wrigley family, heirs to the chewing gum and baseball fortune; the Wrigleys' Chicago Cubs held spring training on Catalina from the 1920s until the 1950s.)

Private vehicles are a rarity on Catalina, with a waiting list for the island's 3,600 residents that can last years. Most of those vehicles aren't allowed into the wild part of the island north of the gate, and so the half-hour drive up to the "KBRT Ranch" finds us passing only a handful of other trucks on the paved, but bumpy, road that ascends into the hills over some tight switchbacks.






**'KBRT Ranch,' the station's transmitter site and chief engineer's residence: The station's pickup truck sits in front of the building; later on this December day, it would be driven onto a barge and shipped off the island for the last time.**

*"A tropical heaven out in the ocean,*
*covered with trees and girls ..."*

The Four Preps' search for "romance, romance, romance, romance" would not have ended very happily up at the KBRT site, where both trees and girls are in notably short supply. But for those of us enamored of the romance of AM radio, it's here in abundance.

The "Ranch" sits nestled in a clearing up among the hills, some 1,500 feet above sea level along the winding road that runs from Avalon north to Catalina's famed "Airport in the Sky."

From the airport road, a short driveway leads past the gate to the low-slung building that serves as KBRT's transmitter facility, backup studio and for many years now as the home of the station's resident engineer, Bill Agresta.

Our visit in early December is actually something of a homecoming for Agresta; for several months now, he's been spending all his time on the mainland ("America," as the islanders call it) working with Crawford's corporate engineering team, led by Cris Alexander, on the construction of the new KBRT.

The impending move explains why the transmitter room isn't quite as pristine as Agresta kept it when he was living here. It's full of gear that will be shipped off the island in the months to come, once the new site in Orange County is up and running.

In the meantime, we get a brief opportunity to see what's involved in keeping an offshore transmitter site running. Like most Crawford properties, the transmitter of choice here — as at the new site — is Nautel: There's an XL12 running as the main transmitter and an AMPFET as the backup.

There's already floor space blocked off at the new transmitter site for the XL12 to be shipped over to become a backup itself to the new NX50 already in place there; the AMPFET will be sold, probably to start a new life in some other country.

The rest of the plant is simple but very functional. To the side of the transmitter room, there's a small studio, filled with dusty cassettes and reels of the "Island Talk" public affairs show that once met the community service requirements out here.

Behind the transmitters, a workshop contains every part imaginable, a necessity when the nearest Radio Shack is half an hour away in Avalon and anything more extensive must be procured from the mainland.

There's a small apartment out here where engineers resided for more than half a century, and next to that a set of covered bays where KBRT stores its lawn mower and its generator, also a necessity when shore power can be an iffy proposition. (While there's been talk of a power cable from the mainland to Catalina, Southern California Edison generates all the island's power from a diesel generator plant on the coast just outside Avalon, right next to the terminal where barges bring in all the island's commercial needs.)

Back in KBRT's early days, there was even a backup antenna here, a longwire stretched between two poles on the hill that rises behind the building. The antenna is still there, but the ATU is gone, though Agresta points out the passthrough

(continued on page 18)

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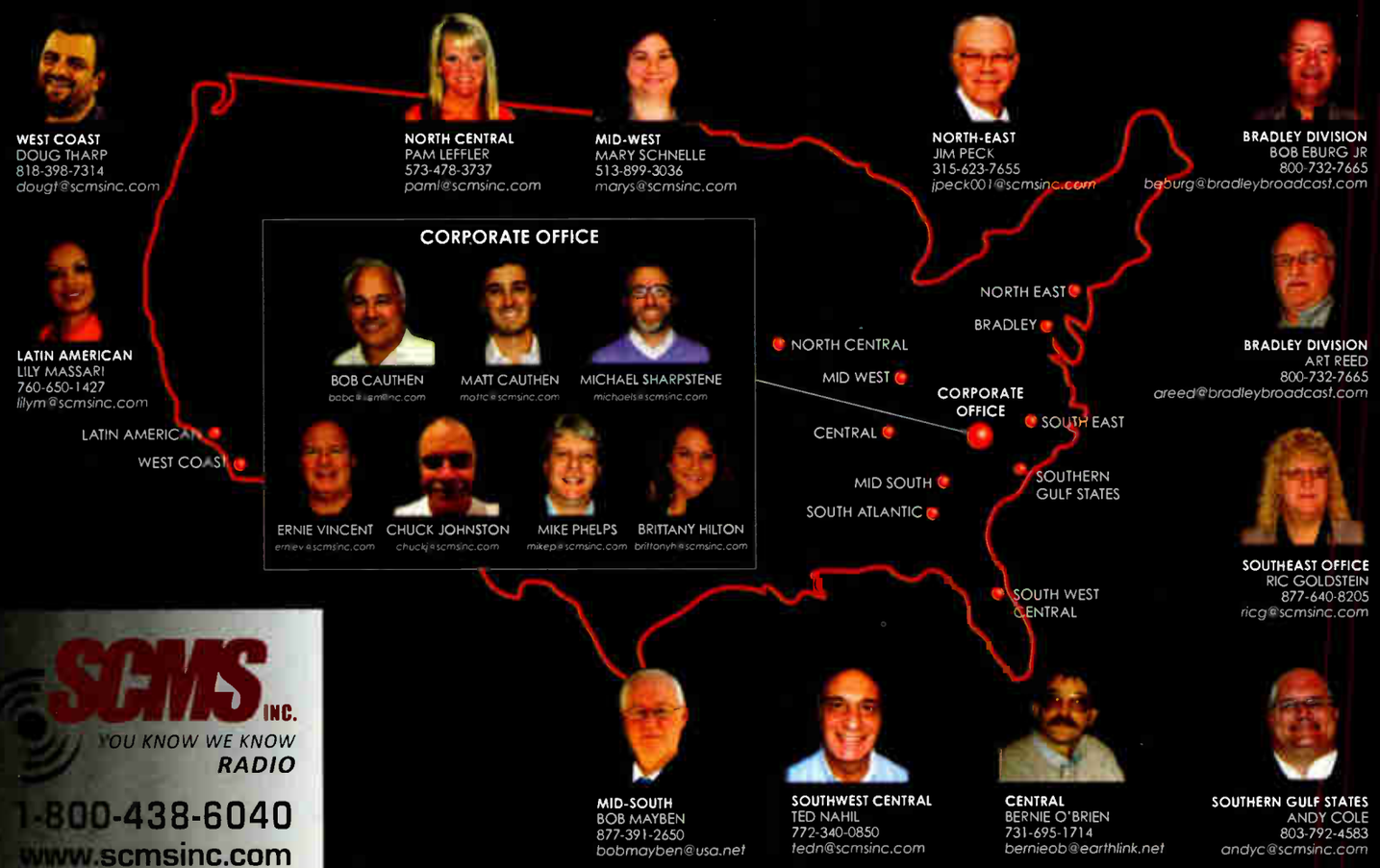


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# KBRT

(continued from page 16)

where the RF came out of the building.

Two satellite dishes just outside the building are relatively recent additions, put in place quickly after the 2007 fire to provide a more reliable signal path from KBRT's Orange County studios after the flames destroyed the AT&T line that ran up the hills from Avalon.

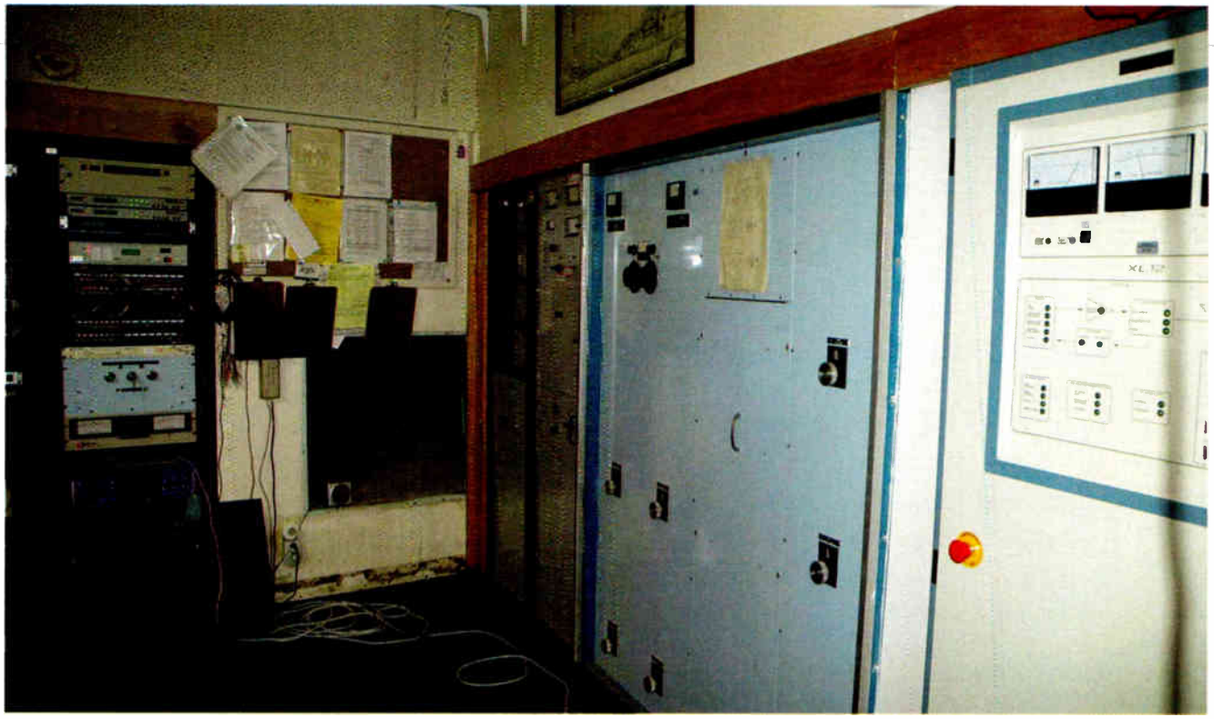
Five years later, the effects of the fire are hard to see. Hard work by Agresta and his family kept the flames away from the transmitter building, where the roof was kept wet and foliage carefully trimmed back. (Agresta was injured during the fire when an overly-eager worker at the site commandeered a tractor and accidentally hit him, breaking three ribs.)

The three towers out back survived as well, though Agresta says it was touch-and-go at points when the fire neared the guy wires.

Sometime in February, according to the latest schedule, KBRT will have moved from these three 285-foot towers to its new home more than 50 miles away "in America."

With the move complete, things will begin to wind down. Agresta and a hired crew will return to the island to finish packing up whatever's left in the building that's worth keeping, and it will all make its way down the hill and on to a barge bound for the mainland. The land up here at the Ranch will go back to the conservancy, which will also figure out what to do with the towers.

When it's all gone, now we — and you, at least virtually — can at least say we saw "The Island Station," and experienced a little bit of the "romance, romance, romance" of Catalina Island's radio days.



**Transmitter room at 'KBRT Ranch' seen in its final months. Processing and STL racks are at far left. In the main bay, from left, are the Nautel AMPFET backup transmitter, the Kintronics phasor and the Nautel XL12 main transmitter, which will become a backup at the new mainland site.**

*Scott Fybush, a longtime RW contributor, is the editor of NorthEast Radio Watch* (www.fybush.com) *and a broadcast journalist based in Rochester, N.Y. All lyrics are from the song "26 Miles (Santa Catalina)" written by Bruce Belland and Glen Larson.*

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# Time Changes Everything

## Technology is like energy; it can't be created or destroyed, only changed

**WIRED FOR SOUND**

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BY STEVE LAMPEN

When I was 13, I became enamored of sound and all things electronic. I think one of the reasons I went in this direction was that this was one profession my Dad knew *nothing* about and therefore could not tell me why I didn't want to do this for a career. So here I am.

About a year later, after sending in 100 reader response cards, I got a real treasure in the mail. It was the Gates Radio catalog. This was a hardbound book in an orange cover. Ugly, but a thing of beauty in my eyes.

How many rainy days I would thumb through this catalog reading every word about the Gates "Yard" console (which I later knew personally) and the Gates "Executive" console, with its giant knobs and giant meters (which I also worked on at a few stations).

But the one thing I would stare at more than anything else in that catalog was the Ampex 351-2 tape recorder. Oh, was that ever a thing of beauty! How I would have loved to own one. What amazing things could I record with that monster.

I happened to casually mention this story at an SBE lunch in San Francisco. A few days later, my friend and mentor Art Lebermann, Chapter 40 chair and transmitter engineer for KGO(AM), gave me a call. He's the one who got me into broadcasting back in the 1970s, and he wanted to know if I was serious about the Ampex 351-2, because they had one they were ready to throw away.

What a difference a few decades make! Now I was married; and while I have a very understanding wife, I thought that this would probably cross the line; so, with a tear in my eye, I passed on the opportunity.

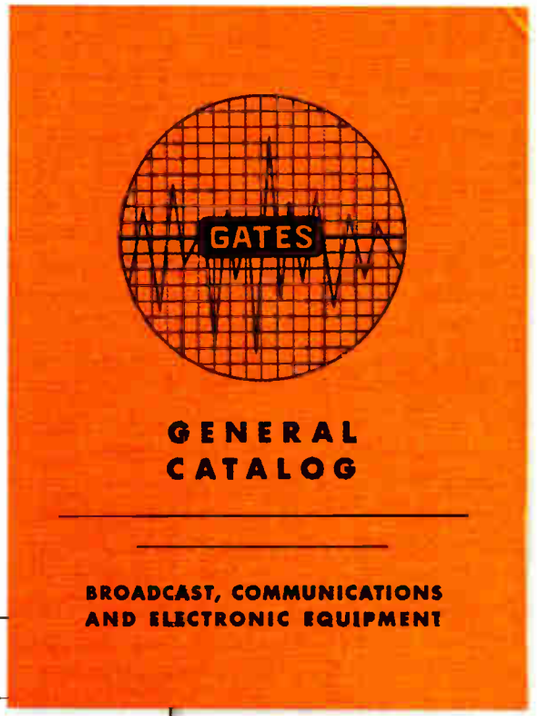
### CONSERVATION OF TECHNOLOGY

You will note I spend a lot of space in this column talking about the "death" of technology. But believe me, technology is like energy: It can't be created or destroyed — only changed.

We still want to record sound today, but we don't need an Ampex 351-2. In fact, you probably aren't even using tape anymore. It's all digital audio and server-based recording. And the quality has gotten better and better, so these days I rarely hear anyone talk about how "bad" digital is, or talk misty-eyed about analog tape.

Unless you are living under a rock, you realize that Moore's Law continues, and our stuff gets better and faster and smaller and cheaper. And different forms of memory are coming down the pike, to put a terabyte on your fingernail.

I think this, too, is a dead-end, though, because all we really need is a giant memory somewhere, a "yottabyte" server — $10^{24}$ bytes (1,500 terabytes for everyone on earth). Then all you need is access. Your home video, your audio clip, your data bit stream, will all be there. You don't care where it is stored as long as when you push the "play" button, the stuff comes back.




GATES

## AMPEX PROFESSIONAL TAPE RECORDERS

Series 351

The Ampex Model 351 sets the highest standard in professional tape recording performance. Completely new inside, it combines the latest in circuits and electronics with Ampex superior tape handling characteristics.


Console, One Channel Only.

### SPECIFICATIONS

TAPE SPEEDS: 7½ and 15 ips. or 3¾ and 7½ ips.

FREQUENCY RESPONSE: All versions: 15 ips. ±2 db 30 to 15,000 cps.

FREQUENCY RESPONSE: 7½ ips. ±4 db 30 to 15,000 cps. (−2 db 40 to 10,000 cps.)
3¾ ips. ±2 db 50 to 7,500 cps.

SIGNAL-TO-NOISE RATIO:

| Speed | Max. Record Level to Unweighted Noise | Peak Record Level to Unweighted Noise |
|---|---|---|
| 15" | Full track 70 db<br>Half track 65 db<br>2 Channel stereo 65 db | Full track 60 db<br>Half track 55 db<br>2 Channel stereo 55 db |
| 7½" | Full track 70 db<br>Half track 65 db<br>2 Channel stereo 65 db | Full track 60 db<br>Half track 55 db<br>2 Channel stereo 55 db |
| 3¾" | 60 db | 50 db |

FLUTTER AND WOW:
15 ips. Well below 0.15% RMS.
7½ ips. Well below 0.2% RMS.
3¾ ips. Well below 0.25% RMS.

PLAYING TIMES:

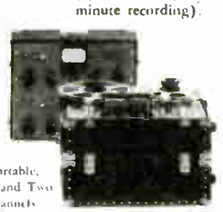
| With NAB Reels (2400 feet of tape) | Speed | Half Track | Full Track |
|---|---|---|---|
| 10½" | 15 ips. | 64 min. | 32 min. |
| | 7½ ips. | 2 hrs. 8 min. | 64 min. |
| | 3¾ ips. | 4 hrs. 16 min. | 2 hrs. 8 min. |

STARTING TIME: Instantaneous (tape accelerates to full speed in less than 1/10 second).

STOPPING TIME: At 15 ips. speed, tape moves less than two inches after pressing "Stop" button.

PLAYBACK TIMING ACCURACY: ±0.2% (±3.6 seconds in a thirty minute recording).


Unmounted (Rack), One and Two Channels


Portable, One and Two Channels

REWIND TIME: Approximately one minute for 2400-foot NAB reel; 30 seconds for 1200 foot EIA reel. Rewind times for thin base tapes proportionately longer.

CONTROLS: Tape motion controlled by four pushbuttons: Start, Stop, Fast Forward and Rewind. Separate Record button energizes record circuits, which drop out when machine is stopped. Individual Record button control for each channel in 2 Channel stereo machines. Motor speed and electronic equalization for various tape speeds are controlled by separate switches. Reel Size Switch provides proper tape tensions for NAB 10½" reels or EIA 5" and 7" reels.

RECORD INPUT: A switch allows recorder to accommodate either microphone level low impedance input or to bridge a 600 ohm line, balanced or unbalanced. Minimum input signal for recommended record level is −10 dbm balanced bridge, or −13 dbm unbalanced bridge. Levels as low as 150 microvolts on the microphone input will produce the recommended record level.

PLAYBACK: Plus 8 VU output into 600 ohms, balanced or unbalanced. Will feed a high input impedance amplifier directly with approximately two volts. Can be connected for +4 VU by restrapping.

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**The Ampex 351 of Steve's memory, as seen in a Gates Radio catalog from the early 1960s. These images are courtesy *www.americanradiohistory.com*.**

So where do we build this server? I think the perfect place, where it is cold and empty (this monster will be hot!) should be in Antarctica. A second one would go well in Siberia, where there are already a lot of computer programmers from the good old days of the Gulag.

And we'll need a third yottabyte server. Since this is a RAID array, all three will constantly be writing all the data from one to the other. (That's the only way not to lose anything.) So the third one has to "see" the other two.

The only place that would be possible is a Lagrange point in outer space above the equator. A Borg Cube in outer space. But since it would be really boring to work out there, I think that's where we should send all of the criminal programmers/the hackers. It would be very easy to tell how well they are doing, and they'd develop some marketable skills for when they return.

*Steve Lampen is multimedia technology manager and product line manager – entertainment products for Belden. His book "The Audio-Video Cable Installer's Pocket Guide" is published by McGraw-Hill. Read past Wired for Sound articles under the Columns tab of* radioworld.com.

# OP-X AUTOMATION

## SIMPLE • POWERFUL • REDUNDANT


- Modular Operation in Op-X allows for a tiered system at a fraction of the cost of its competitors.
- Each studio client is capable of accessing all Audio Server modules on the network.
- Remote voice-tracking allows for creation of content for remote studios also running Op-X.
- The revolutionary design of Op-X's clock builder turns the previous task of scheduling satellite programming into a few simple clicks.
- Share serial devices from any machine using the Op-X Serial Server.
- Importing logs now gets its own module that takes confusion out of the process.
- Engineers will enjoy Op-X because it's easy to install, maintain, and has automatic backup features.

## iPad app Features

- Live show real-time control from almost anywhere
- A powerful tool for remotes or voice tracking
- Take a show on the road
- Start, stop, copy and paste functions from the log
- Insert audio items into the log
- Initiate audio playback from hot buttons
- Run macro command from hot buttons
- Secure access to your system

# Your Scope Is a Tool for All Seasons

## An oscilloscope remains an important and useful test instrument for many purposes

**TECHTIPS**

BY MARK PERSONS

There was a time when every broadcast engineer had an oscilloscope for troubleshooting and aligning equipment, from a microphone input to the antenna. It is true that the nature of our plug-and-play world has reduced the requirement for this kind of instrument, but using one can be very helpful in solving problems.

You can literally "see" what an audio circuit is doing wrong on an oscilloscope, while your ears tell you the audio has a problem. My favorite is the Tektronix model 2213A, which is no longer being manufactured. They are sometimes available at hamfests for around $100. There are many new oscilloscopes available on the market for more money.

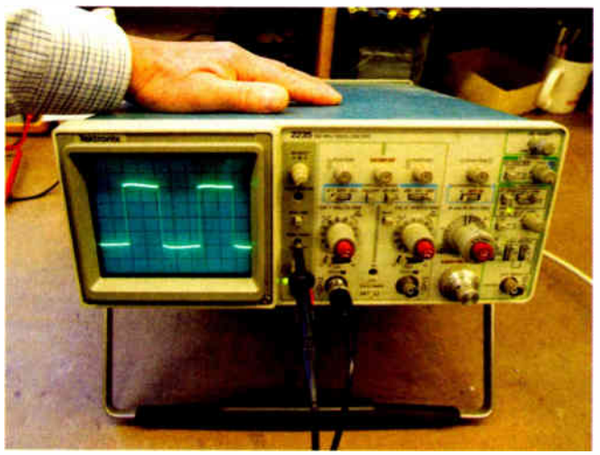
For those who do not understand or use an oscilloscope regularly, let's look at the basics.

### FOLLOW THE TRACE

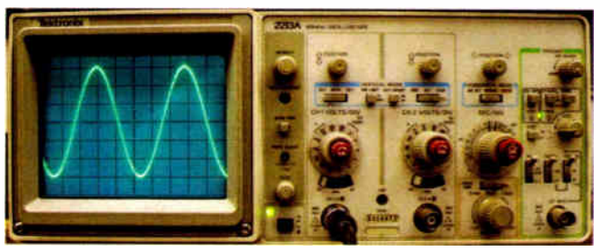
An oscilloscope has a display screen, usually a cathode ray tube, with a dot that travels from the left side to the right side and then starts on the left again. This is called the trace.

You can control the speed of this dot with the sweep speed control. There is at least one vertical input to deflect this dot up or down by how much voltage the oscilloscope sees at that instant. My oscilloscope has a 3-by-4-inch screen and is just right for the job.

Let's start with looking at a 1 kHz audio sine wave. By setting the sweep speed to correspond to that frequency, we can see an audio wave standing still on the screen as you do in the photo of a complete oscilloscope. At that point, you can look for distortion and oscillations riding on the wave. The screen has graticules to divide it into equal parts left to right and up to down.



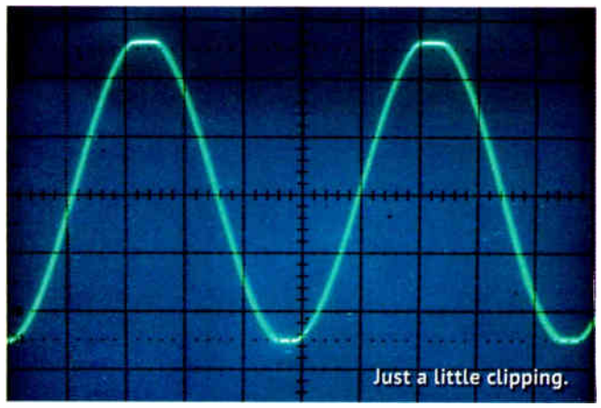
Oscilloscope on the bench

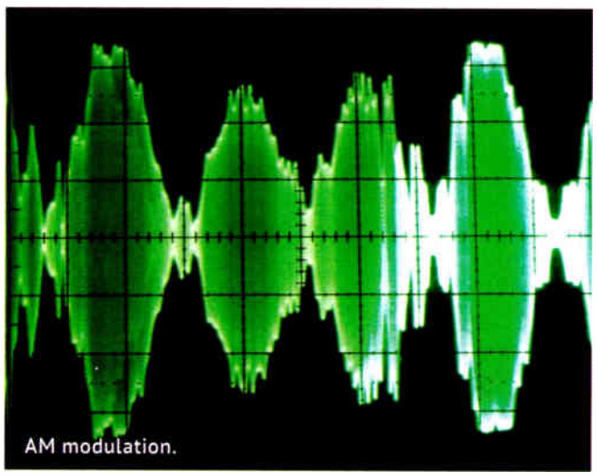


Sine Wave on Tektronix 2213A

Most oscilloscopes are calibrated so you can use these marks for measuring peak-to-peak voltage on a waveform. Sweep speed is calibrated, too, and can be translated into frequency. The higher the frequency, the faster the dot needs to go to follow the waveform.

When I work on an analog audio console, I head straight for the calibration controls. Often, announcers hoping for better sound quality on the air have accidentally or mysteriously misadjusted them. I put a 1 kHz tone into a microphone input and adjust the input level followed by the console program amplifier gain until there is just a tiny bit of clipping on the top and bottom of the waveform at the console output terminals.




This is the limit to how much audio the console can produce. Then I reduce the audio input by 20 dB and set the console VU meters to read 100 percent, just before the red 0 to +3 dB portion of the meter display. This gives the classic 20 dB of headroom from 0 VU before clipping starts to occur.

Exact audio output level is usually irrelevant, although it usually comes out to be about +4 dBm active balanced, which is –2 dBm (1.74 Volts peak to peak) on each of the positive and negative audio outputs. With a dual-trace oscilloscope you can see left and right

(continued on page 26)


# MEET AXIA'S NEW, SMALLER IP CONSOLES.

## THEY'RE BIG WHERE IT COUNTS.


The more you saw, the more convinced you were that IP consoles made sense for your station. Problem was, you had small spaces to work in. Some behemoth board that looks like a '78 Oldsmobile just wouldn't fit. But there was no way you'd settle for some cheap plastic PA mixer that looked like a refugee from the church basement. "Wouldn't it be great," you thought, "if someone made an IP console that didn't take up a whole room?"

Then you saw the new RAQ and DESQ consoles from Axia, and your problems were solved. With the power and features of a big console, but minus the ginormous space requirements. RAQ will drop right into those turrets in your news station's bullpen – the reporters can send their finished stories right to the studio. And DESQ is perfect for the auxiliary production rooms.

But what sealed the deal was finding out you could run two RAQ or DESQ consoles with just one Axia QOR.16 mixing engine — you know, the one with all of the audio I/O, the power supply and the Ethernet switch built in. That brought the cost down so low that when you told your GM the price, he actually didn't swear at you (for once). Make another decision like this, and you might just be changing the sign on your door from "Chief Engineer" to "Genius."

AxiaAudio.com/RAQ | AxiaAudio.com/DESQ

Available in the U.S. from BGS: (352) 622-7700

# OSCILLOSCOPE

(continued from page 24)

audio channels simultaneously. This is good for setting equal console gain on both channels.

You can watch audio with sine waves or with actual program audio. Follow audio from section to section in an amplifier or place to place in a radio station. You might see the left channel going in the positive direction on the screen while the right channel goes in the negative direction. This is a clear indication that there is a phase reversal in the system that might sound acceptable when listening in stereo, but will sound low level and terrible in monaural.

The key here is that you can actually see what the audio is doing.

### AM USE

One great use of use an oscilloscope is to set modulation on an AM transmitter. A photo shows about 90 percent negative modulation when voice program audio has depressed the carrier to almost zero at times. You can also see that positive modulation at the top and bottom of the display is being limited or clipped.

Modulation monitors can and do go out of calibration. The display on an oscilloscope cannot lie. If an oscilloscope shows 100 percent negative modulation with the carrier going to zero along the horizontal centerline, you should believe it.

I employ an oscilloscope on the service bench when adjusting an RF generator for 100 percent AM modulation and then use that RF to calibrate modulation monitors. No laboratory standards are required. The method is simple and doesn't get any better than that.

In conclusion, an oscilloscope always went with me on the road to radio stations when doing updates and repairs. It continues to be an extremely important test instrument on the service bench. I couldn't do the job without one.

*Mark Persons, WØMH, is certified as a professional broadcast engineer by the Society of Broadcast Engineers and has more than 30 years experience. He has written numerous articles for industry publications over the years. His website is* www.mwpersons.com. *Read past Tech Tips articles under the News & Technology tab of* radioworld.com.



# PEOPLENEWS

**Nautel** founder **Dennis Covill** has been honored as a member of the **Order of Canada**, which is one of the country's highest civilian honors, to "recognize a lifetime of outstanding achievement, dedication to community and service to the nation." Covill was recognized for his contribution to engineering and science as a pioneer in the transmitter industry.

Dennis Covill, circa 1987

FCC Chairman Julius Genachowski has tapped **Steven Wildman** to fill the **FCC chief economist position** opening starting this month.

Mignon Clyburn

The Senate has confirmed **Mignon Clyburn** for another term as an **FCC commissioner**. Since 2009, the former South Carolina public service commissioner had been filling out the remainder of the term for former commissioner **Jonathan Adelstein;** Clyburn's new, full five-year term is retroactive to July 1, 2012.

**Francis Freihuber** has been promoted to vice president of the management board at software solutions provider **Netia**.

**Radio Free Europe/Radio Liberty** President and CEO **Steven Korn** is resigning from the international broadcaster. The Broadcast Board of Governors has accepted his resignation, effective Jan. 25.

**Clear Channel Media and Entertainment New York**, which owns and operates WAXQ(FM), WHTZ(FM), WKTU(FM), WLTW(FM), WWPR(FM), has announced two additions to its senior leadership. **Thea Mitchem** will serve as vice president of programming, and **Bernie Weiss** will take on the role of vice president of sales. **Clear Channel Washington/Baltimore** named **Dennis Lamme** its new market president, and **Clear Channel Philadelphia** has tapped **Richard Lewis** to fill Lamme's shoes as market president for its six-station cluster. **Rich McLaughlin** has been named director of digital music programming for the Clear Channel National Programming Platforms team.

Thea Mitchem

**SiriusXM** has an interim chief executive officer. The satcaster appointed **James Meyer** to replace **Mel Karmazin**, who had previously announced his intention to step down. Karmazin has left the board as well. He had been chief executive officer since 2004, and oversaw the merger between Sirius and rival XM Satellite Radio.

© 2010 NPR by Doby Photography

Audie Cornish

**NPR News** has new appointments for three of its hosts: **Michele Norris** returns from a leave of absence to become a host and special correspondent starting in February; **Audie Cornish** will become a permanent co-host of "All Things Considered"; and **Rachel Martin** will transition from interim host to official anchor of "Weekend Edition Sunday."

Bernie Weiss

Richard Lewis

© 2010 NPR by Stephen Voss

Michele Norris

© 2010 NPR by Doby Photography

Rachel Martin

Congress has renamed a post office in Guam after a local radio personality. Rep. Madeleine Bordallo of Guam proposed the name change for the Barrigada post office in order to honor **John Pangelinan Gerber**, a lifetime resident of the island. He was a former Marine and disc jockey who died in 2010.

# WHO'SBUYINGWHAT

**KXLI's studios feature a Harris Oasis console, Wideorbit automation monitors (top) and a talk table with three guest positions (below).**

Las Vegas-based contemporary hit radio station **KXLI(FM)**, which was acquired in June by the Spanish-language **Exa-FM network**, purchased the **SCMS Desktop Radio Package** for its new studios. The station opted to upgrade the package from the standard **Harris** PR&E Oasis 8-channel audio console to a 12-channel. They also added three guest positions in addition to the standard host. It also includes **WideOrbit** Automation for Radio package and the peripherals.

**Global Security Systems** said its GSSNet/ Alert Studio has been installed as the state of Mississippi's new Emergency Alert System.

**WWLL(FM)** in Sebring, Fla., is using an **Omnia One** FM processor. Jeff Crews is chief engineer of the station, owned by Cohan Radio Group. The station is at 105.7 MHz. Crews told the manufacturer that Cohan also uses an Omnia One at sister station **WWOJ(FM)** in Avon Park, at 99.1.

**OMT Technologies** listed notable sales of its iMediaTouch radio automation and iMediaLogger systems. Recent iMediaTouch buyers in the United States include **KCWA(FM)** in Boulder, Colo.; **KKWE(FM)** in Callaway, Minn.; **WBTO(FM)** in Vincennes, Ind.; WBZJ(FM) in Raleigh, N.C.; and **WBTN(AM)** in Bennington, Vt. New users in Canada include **CKEE(FM)** in Whistler, British Columbia, and **CKYR(AM)** in Jasper, Alberta. Acquiring new iMediaLogger are **Premiere Radio Networks** in Sherman Oaks, Calif., and **Entravision/ KXPK(FM)** in Denver.

*Send your news to* radioworld@nbmedia.com.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# Digging Deep Into AM Revitalization

## Fundamental problems with the AM band should be addressed as part of efforts

**COMMENTARY**

BY CHRIS IMLAY

Courtesy of SBE

Chris Imlay

I have watched intently as the latest round of arguments about how to improve AM broadcast stations have become a hot topic in these pages and elsewhere.

I would like to add a somewhat different perspective: I was raised in the 1960s in the suburbs of Washington — by two parents, and by WINX, WHMC and WPGC — and am now a student of spectrum management.

Though I, like many others, cheered on FCC Commissioner Pai's remarks about the AM Revitalization Initiative at the NAB Radio Show in September, and while I find his enthusiasm refreshing indeed, I think we need to dig down and address some fundamental problems with the AM band as part of this revitalization effort.


Unless the commission is prepared to move AM station licensees to a new band above 30 MHz (an option that will take many more years than AM broadcasters have available, and well beyond Commissioner Pai's suggested 2014 deadline for AM improvement), it seems to me that AM will never get better in the worsening RF noise environment in the bands below 30 MHz. Some regulatory relief is necessary.

The current commission and its recent predecessors have focused their attention on maximizing efficiency in use of the fully deployed radio spectrum by such regulatory concepts as spectrum overlays, receiver noise temperature and authorizations for unlicensed, "Part 15" RF devices and systems that neither demand interference protection nor are permitted by rule to cause harmful interference.

All of these concepts have their place. But the commission does not have a good handle on ambient RF noise levels and trends over time; it has uneven regulations governing noise-generating intentional, incidental and unintentional radiators; and its enforcement efforts in this context are both impractical and insufficient.

AM listeners have media options. RF noise will make them exercise those options. They are not like radio amateurs, who will complain vocally when a power line causes interference to their receivers. When an AM listener receives interference, he or she will not suffer it but simply utilize different media. FCC interference resolution is premised on complaints, so AM broadcast band interference is not well-documented.

Even if AM interference complaints were to be lodged, the FCC's Enforcement Bureau is not equipped to deal with them. Adequate staff does not exist, and attrition through retirement and hiring freezes has left FCC District Offices understaffed. Nor is interference from Part 15 devices to AM receivers addressed at the manufacturer level.

It is the *user* of the device who is required to adhere to the non-interference requirement in the Part 15 rules. That simply doesn't work. Part 15 device users typically are non-technical persons with no interference resolution capabilities and no incentive to assist in resolving the problems, even if any might happen to be reported to them by an AM listener.

Add to that the inherent difficulty in finding the source of RF noise from

(continued on page 30)

IP • 3G • Wi Fi • 4G • BGAN / VSAT • PSTN • DSL

ACCESS 2USB

# COMPLETE REMOTE STUDIO ON TWO WHEELS

We are pretty sure this is a first – an open-air moving studio broadcast on two wheels (well, six, technically).

All audio was fed to a Comrex ACCESS Portable, complete with optional mixer, which Dan used to mix the live on-air feed as the trio traversed the winding roads of Perth. How did it all work out? Absolutely flawlessly – the show went on without as much as a speed bump!

Dan Jackson, engineer for 92.9 FM in Perth, Australia was faced with a unique challenge. Breakfast hosts Paul Hogan and Lisa Fernandez would be cycling for hours in strong winds and pouring rain as part of the 92.9 Kids Appeal for Telethon.

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


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

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remotes.comrex.com

# IMLAY

(continued from page 28)

unlicensed (or licensed) RF devices, and it becomes painfully apparent that RF noise from unlicensed Part 15 devices (and Part 18 Industrial, Scientific and Medical devices) is a large and — in the field — unmanageable problem.

Commissioner Pai asked what *deregulatory* efforts can be implemented to help AM revitalization. Respectfully, I think the better question is what regulations can be added, and what existing regulations can be better enforced, in order to improve ambient noise conditions in the existing AM band.

It is obvious that any interference management plan for the AM band has to be based on rules which limit RF noise before it becomes an issue, not *post hoc*, and those rules have to be enforced. A few options come to mind immediately, and surely this is just a sampling.

## KEY POINTS

**1** *Radiated emission limits below 30 MHz in FCC Part 15 rules for unintentional emitters such as plasma TVs:*

At present, there are no radiated emission limits below 30 MHz for most unintentional emitters. Only conducted limits exist now. This has become a short-range problem with respect to interference from some emitters, such as plasma TVs. Direct radiation at MF and HF from a plasma display can be problematic and difficult to fix.

The commission should consider establishing limits on the amount of noise that can be radiated directly from such devices.

**2** *Lower limits in Part 15 for LED light bulbs, harmonized with the lower limits for fluorescent bulbs in Part 18 rules:*

Part 18 rules govern fluorescent bulbs. Those Part 18 limits are lower than the Part 15 limits, which govern LED bulbs. The Part 15 LED bulbs typically operate at levels 12 dB higher than Part 18 fluorescent bulbs.

All of the reasons that caused the commission to establish reasonably low limits for fluorescent bulbs exist for LED bulbs. There are apparently very few, if any interference reports involving fluorescent bulbs that meet Part 18 consumer limits. There are, however, substantial numbers of complaints of harmful interference to amateur radio stations from LED light bulbs on an annual basis.

This is a good example of an RF management problem that must be addressed *before* the devices are marketed. There could be dozens, if not hundreds, of RF light bulbs in range of a typical AM broadcast receiver in a typical residential neighborhood. If harmful interference occurs and is reported, there is no real *post hoc* solution.

Filtering of the bulb is not an option. They couldn't all be found, even if someone with the authority to regulate these was to be willing to try. Even if they were, would the user of an RF light bulb that contributed to AM receiver interference be ordered to stop using it? Surely not.

**3** *Better external labeling on packaging for Part 18 fluorescent bulbs and ballasts:*

Part 18 rules have separate limits for consumer and commercial fluorescent devices. A number of box stores and large hardware and consumer retailers, including some well-known nationwide chains are openly selling commercial fluorescent bulbs and ballasts to residential consumer users.

Currently, there is no information on the outside of the packaging for these devices indicating that they are not legal to use in residential environments. These same big box stores are all selling Class A industrial lighting ballasts. There is material in the FCC's "knowledge database" (KDB) that makes it clear that such marketing is not legal and that the labeling, or even signage and warning is not enough.

If this policy (it is not a specific rule) were to be enforced, the big box store would claim that they can sell commercial environment ballasts because they also sell them to buyers for that market, but the devices are on display and the general public is not informed of the proper environment to deploy them.

**4** *Specific radiated and/or conducted emission limits for incidental emitters such motors or power lines:*

Under present FCC rules, there are no specific emission limits for incidental emitters such as power lines and non-pulsed motors. There are requirements for manufacturers of incidental emitters to use good engineering practice and a requirement that the operator of an incidental emitter use them in a way that does not cause harmful interference to licensed users of spectrum.

Those rules are neither enforced, however, nor practically enforceable. Specific emission limits would set an upper level on the worst of the power-line noise cases and would require manufacturers to pay at least minimal attention to design and utilities to evaluate their entire systems at least sporadically, assuming that they perceive that there is a risk of actual FCC enforcement.

Although conducted-emission limits could be established for motors and similar 120- or 240-volt devices, only radiated limits would be practical for medium- or high-voltage power lines.

**5** *Establish conducted emission limits on pulse-width motor controllers used in appliances:*

Under Part 15 rules, "digital devices" used in appliances are exempt from specific emissions limits. There are instances of interference from pulse-width motor controllers in washing machines, air conditioners and pool pumps.

If pulse-width motor controllers are digital devices, then these 500- to 1500-watt digital devices would be exempt. Most digital devices that are used in appliances are very low power display units, microprocessor control circuitry and similar devices which have a much lower interference potential than 1,500-watt motor controllers.

**6** *Increase and enhance the visibility of FCC enforcement in power line interference cases:*

There are numerous complaints from amateur radio operators of severe interference from power line noise annually. The commission has relied almost completely on the good-faith efforts of electric utilities to resolve these, and in some cases those efforts have been successful.

However, more often, utilities do not have available to them or are not willing to retain persons skilled in RF interference resolution and the cases at FCC are allowed to languish unresolved for years, and in some cases more than a decade, without any enforcement action at all. As discussed, AM radio interference will inevitably go unreported by listeners.

A few visible enforcement actions by the commission would get the attention of the utility industry and perhaps lead to the development of effective industry programs to address the burgeoning power line interference problem.

These are but a few suggestions for improvement in the noise environment in the AM broadcast band now. Before (or while) considering across-the-board power increases for AM stations (with attendant interference problems during sunspot minima), migration to TV Channel 5, increased use of FM translators for AM stations, or other major initiatives, it would be well to get to the root of the AM problem, which is down in the noise.

*Chris Imlay works at the law practice Booth, Freret, Imlay & Tepper P.C. and serves as general counsel for the Society of Broadcast Engineers. The views expressed are not necessarily those of the SBE board of directors.*

**Commissioner Pai asked** what deregulatory efforts can be implemented to help AM revitalization. Respectfully, I think the better question is what regulations can be added, and what existing regulations can be better enforced, in order to improve ambient noise conditions in the existing AM band.

# Audio Sentinel Works Over the Web

## Broadcast Tools' handy offering builds Web-controlled remote equipment networks

**USERREPORT**

**MICHAEL BRADFORD, CPBE**
**Owner**
**Broadcast/Audio Services**

**JACKSON, MICH.** — I am an "old timer," having started in broadcasting in 1962, working part-time after school and on weekends at WCCW(FM) in Traverse City, Mich.

I was slow to accept the Internet as anything more than a convenient method to find equipment, parts and an occasional article that piqued my interest. Several years ago, however, I started to realize that the Internet offered an amazing alternative method of program delivery, remote control and monitoring for broadcast.

The one area that had previously kept me from plunging headlong into this realm was reliability. Now, after installing and programming numerous Internet and Web-based products, I have to admit that reliability is no longer an issue. And after reading many articles about other engineers' experience, I know what to demand from the IP provider.

### REVERSE ENGINEERING

I began studying and field-testing numerous products from many manufacturers and vendors relating to IP-based equipment.

From the start, Broadcast Tools has embraced the IP network and offered many of their famous "tiny tools" that utilize that method of operation.

I learned many years ago to approach a project from a "reverse engineering" strategy — that is, study, analyze and determine what one piece of equipment should provide to fulfill the requirements of a project, then search out the piece of equipment that fits those requirements. In this fashion, I can eliminate buying several pieces of equipment to respond to a future need that was overlooked in the initial analysis.

This is how the Broadcast Tools Audio Sentinel came to my attention.

I had a client with a microwave system for primary program delivery and an ISDN circuit for emergency audio feeds. Ownership wanted the ability to switch the ISDN audio feed manually to "on air," along with maintaining the automatic changeover via the STL's squelch relay. Having recently installed a DSL circuit at the location, access to the Internet was now available.


Then came news from the ISDN provider that their new rates would be three times' the previous. Plus, there had been ISDN failures several times over the course of three months, with response measured in days, not hours. To top it all off, this "provider" had petitioned the FCC to abandon ISDN service altogether.

As I sat and compared my "reverse engineering" chart and the features of the Broadcast Tools Audio Sentinel, the solution became clear. Here is a Web-enabled, two-channel silence monitor with an integrated stereo switcher and the ability to send logging emails, along with up to eight email recipients should any alarm situation occur.

It has three internal relays that are user-programmable for manual operation and/or automatic sequencing. The Audio Sentinel can be controlled and monitored locally, remotely over any IP network, including private networks, IP-based industrial control networks or, of course, the Internet.

If you have one of the spanking-new handheld devices that uses a Web browser or is Web-enabled, you can receive reports and alarms as well as manually control the Audio Sentinel from anywhere you have Internet access. The Audio Sentinel also can be programmed to send a special sound effect to play on your PC speaker when an alarm is received.

One SPDT relay is dedicated to indicating which stereo audio source is connected to the main stereo output. Two more SPDT relays can be configured to perform numerous use-defined tasks, including action-sequences related to an alarm situation.

SNMP capabilities provide for multiple units to be monitored with any SMNP manager software. SMTP username and passwords are supported too.

### SETUP

Audio and relay connections are via the Broadcast Tools standard Euroblock screw connectors. The Internet NET connector is the standard RJ-45 port, and power is provided by included 7.5 VDC external supply.

Front-panel indicators show valid audio present, while the "PWR/Heart Beat" indicator slowly flashes to indicate processor operation and power. Separate indicators show which input is selected and there is a manual "select" button for local operation of the Audio Sentinel that duplicates the rear-panel "remote/ext" connection.

Because the Audio Sentinel comes with both straight-through and crossover Cat-5 cables, you don't need to check your goody box for these cables for programming and normal connection to the Internet. Connection to your PC and programming are straightforward, with instructions provided on an included CD. You can obtain the necessary IP address data from your IT manager for your site.

In my case, the gateway, broadcast ID, subnet mask and specific IP address data were supplied by the IP provider prior to the installation. Again, instructions are included for customizing your Audio Sentinel as much or as little as you require.

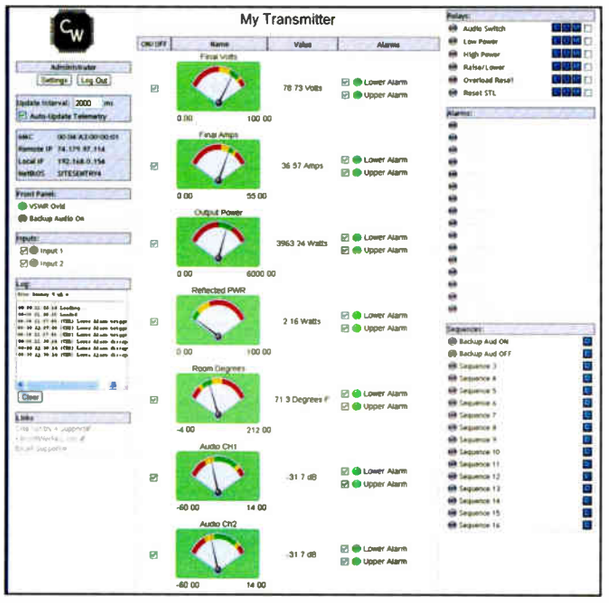
Password protection is standard and you can select the level of access for eight users; three levels include "monitor only," "full remote control" or "administration." The Audio Sentinel also will generate a show-log to display which input is active, what day and time an alarm was generated, the relative audio level for each input channel and other parameters. As noted, you can choose when or if to send show-log reports via email to up to eight recipients.

The audio switcher is programmable for level detection, time delay before switching, alarm generation and automatic or manual operation. In my case, the out-of-

*(continued on page 33)*

# TECHUPDATES

## CIRCUITWERKES RELEASES NEW VERSIONS OF WEB REMOTE CONTROLS




CircuitWerkes has upgraded and added products to its line of Web-enabled remote controls and monitors. The new products, like SiteSentry4, the redesigned SiteSentry2 and the WAM-2, are more powerful than previous offerings but retain the same price structure.

The internal Web servers let users monitor sites from any Web browser. An internal temperature sensor can respond to high- or low-temperature conditions. The audio monitor meters two independent channels of audio and can respond if either silence or overload is detected.

All units have six relays (two are DPDT) that can be latching or momentary. Two status inputs give a visual indication, via the Web server, whenever triggered. These can also trigger actions. Three levels of user control are available: Reader, controller and administrator.

When they detect meter-low, overload or external status changes, these products can perform user-programmed automated sequences and can also respond to user control via the network — or via external contact closure inputs.

Channels can be combined to create "if/or/and" alarm conditions. Alternate actions, or cancellation of previous actions, can be set to run when the conditions return to normal.

Email and SMS text (to a mobile phone) messages alerting users of alarm conditions are sent directly from the units. Online mail services like *mailhop.org* are supported.

Hardware support for dynamic IP redirect services like *dyndns.org* and *no-ip.org* allows users to employ a dynamic IP, instead of paying for a static IP.

Firmware's free upgrades can be found online.

The "S" option of the products includes the ability to decode Shoutcast/Icecast MP3 or Ogg Vorbis audio streams. Received audio streams may be routed through the DPDT relays, as backup sources when a main audio failure is detected.

The streaming option also includes the ability to encode Shoutcast/Icecast-compatible confidence monitor audio streams using the open source Ogg Vorbis format. Switching between transmit and receive is a one-button click.

**For information, contact CircuitWerkes in Florida at (352) 335-6555 or visit www.circuitwerkes.com.**

## DOUBLE-SIDED HANGING PLEXIGLAS LIGHT FIXTURES FROM TITUS TECHNOLOGICAL LABORATORIES

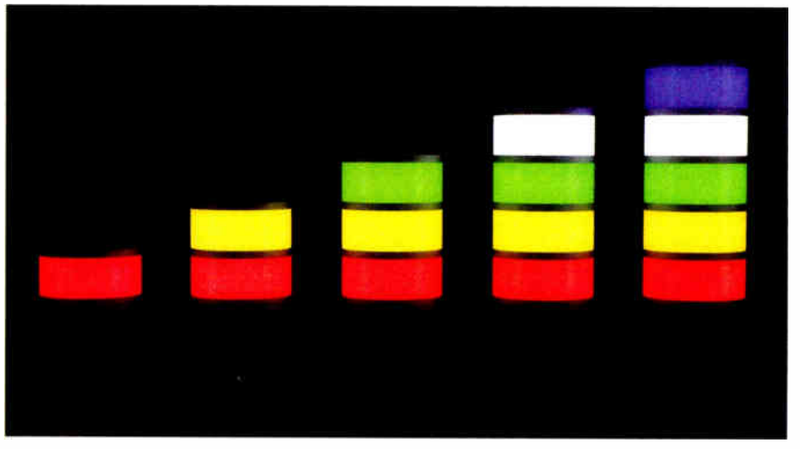
For several years Titus Technological Laboratories has been building and selling single-sided hanging Plexiglas light fixtures as a part of its HPL On Air Light series. This light fixture is one-sided and usually mounted on a wall either over or next to a studio door.

Titus Labs says it has now designed a double-sided hanging Plexiglas light fixture suitable for mounting in a hallway, visible with the correct orientation of the lettering from either side. The light fixture uses high power LEDs, red being standard (white, green, yellow or blue upon request). The standard text is either "ON AIR" or "RECORDING." Custom lettering as well as station logos can be engraved into the Plexiglas as well. The light fixture draws about 300 mA at 12 VDC.

**For information, contact Titus Technological Laboratories in Connecticut at (800) 806-8851 or visit www.tituslabs.com.**


## YELLOWTEC LITT IS A PROGRAMMABLE ON-AIR LED LIGHT

Litt from Yellowtec is an LED signal for broadcasters who require an on-air indicator compatible with the company's m!ka microphone arm system. The manufacturer emphasizes its programmable light and flash patterns, bright LED technology and sleek design.



Each Litt has its own microcontroller with flash RAM to store settings. Connect a computer to the USB port and use the Lighthouse software to configure lighting patterns, flash modes and brightness.

The unit uses LEDs at 50 percent of their rated power, for a promised 100-year lifetime at three hours of daily use. Each segment is equipped with two Philips Luxeon high-power LEDs. Its lens produces consistent radiance with 360-degree viewing angle.

With a voltage range of 12–24 VDC and inverse polarity protection circuitry, Litt is described as easy to install. Segments connect on a Phoenix low-insertion force connector and the bus controller unit comes with a choice of mounting adaptors.

Its anodized, durable aluminum matches brings a high-tech look to a studio.

**For information, contact Yellowtec in Germany at 011-49-2173-9673-0 or visit www.yellowtec.com.**

# RADIAL EXPANDS 500 SERIES WITH BROADCAST-READY SOLUTIONS

Radial Engineering says that its 500 series modular format is gaining acceptance in broadcast as it provides the engineering department with a solution that can be customized for the type of program material being presented.


Radial now offers a choice of six power racks that can house between three and 10 modules, depending on the hardware. This includes the Cube and Six-Pack for desktop use, the PowerStrip and PowerHouse for standard 19-inch rack mounting and the fully equipped Workhorse with integrated eight-channel mixer for total production flexibility.

With 18 modules to choose from, one can select the ideal preamp, EQ and compressor to suit the requirements.

The Radial range of modules include the PowerTube 12AX7 equipped tube preamp for a more vintage tone, the PowerPre for a traditional FM radio broadcast tone and the all new PreComp that combines a straight-ahead preamp with a compressor for voice over, advertising and news radio.

Special effects can also be created using the EXTC that lets users incorporate guitar effects into the realm of pro audio or the TankDriver to add real spring reverb. For production, the X-Amp Reamper lets users re-record tracks to improve the mix while the PhazeQ allows users to combine two sources for improved phase coherence and stereo imaging.

One can then choose the Q3 coil EQ for vintage type tones or add the Q4 Class A semiparametric EQ for exceptional clarity and tone. Already in use by some radio stations, the Radial range of 500 series racks and modules are sure to gain popularity as demand for improved audio continues.

**For information, contact Radial Engineering in British Columbia at (604) 942-1001 or visit www.radialeng.com.**

# SENTINEL

*(continued from page 31)*

state programmer can access the Audio Sentinel via Internet, enter the assigned security code and monitor parameters, check the alarm show-log and manually select the alternate audio source to feed the "on air" processing. This is great for EAS or weather emergencies, or special programs that can originate from anywhere in the world by an external, IP-based audio codec.

You can label each audio source as it will appear on the Web page for the Audio Sentinel, so operators can identify what they are monitoring. Setting up the email addresses for the alarm notification and show logs is a one-time event, but you can change data or add data anytime via the Internet once your Audio Sentinel is installed and operational.

Note that your new IP address data will not take effect until the Audio Sentinel has been powered down after programming. You can make changes and enter new data once you have made the final connection to the Internet.

Users can download the manual from the Broadcast Tools site and study it along with their own reverse engineering sheet prior to arrival.

Now when the STL burps during heavy fog or loss of power at the primary studio location, the switch-over to the auxiliary audio source occurs within the prescribed time and generates an immediate alarm email message to me, the studio and the network headquarters in another state. If there is a live, remote broadcast anywhere, it can be routed to the auxiliary source input on the Audio Sentinel and seamlessly switched to "on air" ... all handled over the Internet.

A special announcement during unmanned hours is no longer a problem. This can be handled by a single operator at the main ops center located in another state.

I could go on; but download the manual and check it out for your specific needs.

**For information, contact Don Winget at Broadcast Tools in Washington state at (360) 854-9559 or visit www.broadcasttools.com.**

# BROADCAST EQUIPMENT EXCHANGE

Submit your listings to: dcarson@nbmedia.com



## ACOUSTICS



## ANTENNAS/ TOWERS/CABLES

### WANT TO SELL

**600' Stainless, 42" face, broadcast tower, built in 1988 and maintained very well,** in use now supporting 5 FM station antennas. Will be available to dismantle and move in August 2013. Make a reasonable offer of a cash purchase. Buyer will be responsible for the cost of dismantling and transportation. Tower crew and workers must be insured to standard limits. Tower is located at Orton Plantation in Brunswick County, North Carolina near Southport, NC. Contact Paul Knight at paul.k@me.com or call 910-262-1570.

**Jampro 5-bay high power antenna** on tower, on 100.5 MHz, you take down and make offer; 3-1/8" rigid line, 500 feet of line, you take down and best offer. C Haynes, 601-218-5969.

## AUDIO PROCESSING (INCLUDES ON-AIR)

### WANT TO BUY

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

## AUTOMATION EQUIPMENT

### WANT TO SELL

**It's free and it has been expanded. The only cost is to keep us informed as to how the system is performing and let us know how you are using it.** DIY-DJ, is a Linux based radio automation system and now sports a record scheduler (DIY-DJ-RECORDER) which allows you to schedule the recording of a network or any other program for replay later as well as a basic logging system. Beside these additions the system schedules music, does voice tracking (ALWAYS hit the vocal), create a shell, live assist, exact time events, join satellite feeds, automated temperature announce, do unattended remote events and more. Call (406) 679-0527 or email krws@digitaldevelopment.net for a copy today.

### WANT TO BUY

**Wanted: old analog automation equip,** filters and EQ, tube amps, reel to reel, cart machines and parts. Pacific NW area. 503-493-2983.

## MICROPHONES/ HEADPHONES/ SPEAKERS/AMPS

### WANT TO BUY

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

## MISCELLANEOUS

### WANT TO SELL

**Radio broadcasts of Major League Baseball, NFL, and some college football games that are on cassette tapes,** approx 100 to 125 games, time period of entire collection os from the 1950's – 1970's, BO. Must purchase entire collection. Contact Ron, 925-284-5428 or ronwtamm@yahoo.com

### WANT TO BUY

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

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

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

**I'm looking for San Francisco radio recordings from the 1920's through the 1980's.** For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSFX, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

**Looking for a broadcast excerpt of a SanFrancisco Giant's taped off of KSFO radio from** 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a homerun by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

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

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

## RECEIVERS/ TRANSCEIVERS

### WANT TO SELL

**American Made SCA Decoders, 417-881-1846.**

## RECORDING & PLAYBACK HARDWARE

### WANT TO BUY

**Large or small collections** of 16" transcriptions or 12" transcriptions, not commercial LPs. Bill Cook, 719-684-6010.

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

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

## REMOTE & MICROWAVE

### WANT TO SELL

**Complete STL systems,** 2 antennas, cable, receiver and transmitter, BO. C Haynes, 601-218-5969.

## TAX DEDUCTIBLE EQUIPMENT

**Donations Needed: All Volunteer, Non-profit Low Power community radios stations need Equipment.** Will offer tax deduction letter, You determine donation value, We will pay shipping. Equipment shared between three Wisconsin stations. Looking for Mics, Mixers, field equipment, etc. You name it. Email: Dan@WIECradio.org.

# CONSULTANTS

## TRANSMITTERS/EXCITERS/TRANSLATORS



### WANT TO SELL

CCA AM 10,000 D – Call John KQSS 928-595-0263 between 10 & 6 PM Pacific Time.

QEI 30kW FM transmitter, in good condition, BO. C Haynes, 601-218-5969.

### WANT TO BUY

A used 500 or 1000 W AM xmtr in gd cond on or moveable to 1250 KHz. Dale Harry, Immaculate Heart Radio, 916-947-3431.



## TUBES



## DISTRIBUTOR DIRECTORY

The following distributors serving the broadcast industry would be glad to help you with any of your requirements.



# EMPLOYMENT

## POSITIONS WANTED

**Are you a small market station needing a good nuts & bolts engineer in the Los Angeles area?** I will make your station shine! CET, fully FCC Licensed. Available for Full/Part-time/Contract work. Available immediately. Mitchell Rakoff, 909-446-6820, mitchellrakoff@yahoo.com.

**Extremely knowledgeable and articulate racing writer/talk show host Adam Amick** is available for shows, correspondent, features, etc. Check out www.bleacherreport.com for samples. Call 214-384-5812 or email: adam@rubbinsracingshow.com.

**Great asset! My daily goal: to do a great job, impress employers.** Honest personal, and excited about the media broadcasting industry. Damion, 817-401-9268 or ddburch7@gmail.com.

**Smooth as silk, warm and sultry- the Diva with the Dimples tantalizes your earhole** while keeping you hooked. Don't let me get away! SMason772181@gmail.com.

**Young, passionate radio broadcaster seeking news, sports, on-air and production opportunities.** Prior experience in sports talk format and on-air DJ. Contact 315-653-7800 or 315-396-3230 or absdoug5690@hotmail.com.

**Fresh talent with strong production skills** and a voice as smoooooth as Nutella. Cas0389@yahoo.com.

# READER'SFORUM

## LIFE GOES ON AFTER RADIO SVOBODA

Congratulations on one of the most balanced articles I've seen on this subject ("RFE/RL Ends Radio Svoboda on AM," Dec. 19).

As a former Biblis shortwave site employee of RFE/RL (1992–95), I understand the importance of retaining the SW medium (it can't ever be totally jammed), but the medium-wave in Moscow is another matter.

The 20 kW AM transmitter that we used until Nov. 9 to air Radio Svoboda programs in the Moscow area is located in the northwestern suburbs of the city.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RFE/RL Ends Russian Service on AM

Radio Svoboda, America's broadcast voice in Russia, focuses efforts on digital platforms

BY RANDY J. STINE

WASHINGTON — A new Russian law that prohibits foreign-owned radio companies from broadcasting from Russia has forced Radio Liberty's Russian service Radio Svoboda from the AM band. The broadcast service remains available on shortwave and

Not only did it *not* provide nationwide coverage, but the interference that arose from all of the cables used to power Moscow's network of electric streetcars, ensured that the signal could not be reliably heard in the center of Moscow itself.

However, it was the only game in town — until the change in Russian law that required us to give it up.

Radio Svoboda's audio programs remain available throughout Russia via shortwave, and are broadcast from a variety of IBB and leased transmitters, and via the Internet.

The sizable expenditure for the medium-wave TX is being rolled back into our Russian service to expand and modernize our media efforts. Those efforts include TV and radio. As everybody knows, it is much more expensive to produce video than audio-only programming.

This is not just a technical equipment and software expense, but it requires much different technical and production skill sets. Cameras will be running on every program produced in the new Moscow bureau (and hopefully soon in the broadcast center in Prague), and the audio will be purposed for radio.

While our video production will be purposed initially for Internet video/audio streaming and on-demand, we are producing in a high enough quality to also distribute our video programming via satellite DVB-S transmission when/if that becomes available to RFE/RL.

A TV/radio program for our Radio Farda is already in production and broadcast via the VOA Persian Television's satellite channels.

Mobile distribution is also becoming much more important. I was recently in Moscow in connection with the new bureau build-out, and I can tell you that it seems everybody has a smart phone: Young, old … everybody.

Many kids were watching videos on their phones. They may not all have fixed-line Internet access, but it was clear they were accessing the Internet via their mobiles.

To make a long story short, we are heading in the right direction, and we're moving quickly.

*Chris Carzoli*
*Deputy Director, Technology Division*
*Radio Free Europe/Radio Liberty*
*Prague, Czech Republic*

## KUDOS TO TECH TIPS

To Mark Persons ("Avoid Hall of Shame: Don't Take Shortcuts," Nov. 21), just wanted to say thanks for another fabulous article. They are always a pleasure to read, and always contain such great, hard-learned tips.

*Christopher Johnson*
*Network Administrator*
*Midwest Communications*
*Duluth, Minn.*

## RURAL, SMALL-MARKET RADIO DESERVES MORE

I must respond to the letter from Rod Ziegler of the Nebraska Rural Radio Association ("On Speaker Wire, Save Your Dough").

Sadly, his reaction to my October 18 essay illustrates the on-going bitterness among too many of our citizens over passage of the Public Broadcasting Act of 1967.

His attempt to separate public from commercial radio issues is laughable and tragic, especially in today's world of radio station consolidation and homogenization. Without CPB-funded rural radio, too many people in rural places in search of a radio signal are usually subject to the dominance of talk radio hysteria (great learning tool for kids, eh?).

On the other hand (yes, we have a left and a right hand), rural folk with public radio signals don't want to return to the '50s.

Beyond the bitterness over the existence of a public radio system, the point of my essay is about small-market public stations being eaten alive by their larger public stations, some of whom have taken on the predatory mindset of Wall Street scavengers.

I am stating a case; that this predatory garbage has to stop if the soul of public radio is to survive. I am all for eliminating CPB funding to major-market stations, except when a station is involved in providing or developing programming for the entire public radio system.

It is way past the time when most large-market stations have needed the federal support they receive through annual CPB Community Service Grants — they have enough potential business underwriting and listener support to keep going.

It is funding for rural and small market radio that I'm defending, as an integral part of training and programming development. Delmarva doesn't have the market size to keep stations afloat without some CPB assistance, especially when major market stations in Norfolk, Va., Washington and Baltimore have barged in to this corner of the world.

The cavalier actions of WAMU(FM) and WHRO(FM) in Delmarva only illustrate that they have run out of ways to spend their money wisely and constructively for the entire system.

*Pete Simon*
*Public Radio Producer/Host*
*Denver*



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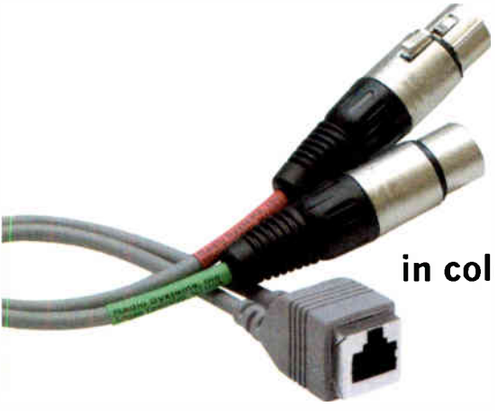

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THE INTELLIGENT NETWORK

# follow the gigabit road

Somewhere in this, the Emerald City, there is an Intelligent Network with more than a million crosspoints connected through a 1,232 x 1,232 audio matrix shared between 21 studios and seven stations, all via AoIP running at gigabit speed. The equipment tally so far: 77 Wheatstone IP88a BLADE access units with 15 Wheatstone control surfaces, 12 crosspoint controllers, three Producer Turrets, 43 Headphone Panels, 23 Mic Control Panels and 45 Mic Processors. Still to come are at least seven more IP88 Blades, 17 mics, 17 headphone panels and 17 mic processors.

Wanna know more about it? Learn how you can benefit.
Get the whole story here:
seattle.wheatstone-radio.com


Wheatstone

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