READERS ON MEDIUM-WAVE'S FUTURE — Page 37

NewBay Media

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APRIL 9, 2014 | The News Source for Radio Managers and Engineers | $2.50 | RADIOWORLD.COM

INSIDE

Whatever Happened To the CFA?

Proponent says a fresh look at Crossed Field Antenna would help in AM radio's revitalization

Courtesy Robert Richer

Richer stands at dual CFA installation in Tanta, Egypt, with the late M. Khattab, director of Egyptian Radio & Television Union.

COMMENTARY

BY ROBERT E. RICHER

The Crossed Field Antenna has been the subject of discussion among radio engineers and management for at least 10 years.

The CFA was invented by Maurice Hately, a Scottish professor of electrical engineering, with the first patent granted in 1992. In 2006, Professor Hately transferred all intellectual, manufacturing and distribution rights to his invention to me.

With the recent FCC action on AM radio (*MB Docket 13-249 Notice of Proposed Rulemaking in the Matter of*

(continued on page 36)

"GatesAir" Supplants "Harris Broadcast"

New owner splits business into two, focused on OTA vs. software/networking

BY PAUL McLANE

Rich Redmond believes GatesAir's opportunities are strong, and he describes the global broadcast radio market in general as healthier than many observers in the United States might realize.

He's chief product officer of the company, which until mid-March

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RADIOWORLD
Vol. 38, No. 9 April 9, 2014

Next Issue of RADIO WORLD April 23, 2014
Next Issue of ENGINEERING EXTRA April 16, 2014

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To submit letters or story proposals, to request writer's guidelines, or for other editorial matters, email the editor at radioworld@nbmedia.com.

Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by NewBay Media, LLC, 28 East 28th Street, 12th Floor, New York, NY 10016. Phone: (703) 852-4600, Fax: (703) 852-4582. Periodicals postage rates are paid at New York, NY 10079 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 282, Lowell, MA 01853.

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WPR Explores Its PAD Options

How we deployed program data at our group of 33 stations, numerous streams

BY STEVE JOHNSTON

MADISON, Wis. — The rollout of Program-Associated Data service at Wisconsin Public Radio provides an interesting case study that might be of use to other radio broadcasters.

Program-Associated Data, also known as Program Service Data, is the metadata related to the audio programming that is generated for display on the front panels of FM RDS/RBDS receivers, HD Radios, Web players and other consumer devices.

As a 34-station, three-network operation, WPR's implementation of PAD is more challenging than a typical stand-alone station. WPR runs a variety of programs from live, recorded, network and remote sources. These shows are aired on an array of radio stations that come and go from the network at varying times — so it seemed a daunting task to figure out PAD for WPR.

Wisconsin Public Radio has a tradition of innovation beginning in 1917, so a new technology doesn't discourage us. WPR listeners tend to be actively engaged in the programming, often making contact to ask questions about what they have heard.

Clearly providing additional information along with the audio programming would be a helpful service for both radio and internet listeners, and Program-Associated Data is a natural. Emerging technologies such as FM RDS/RBDS, HD Radio on AM and FM stations, and Internet audio players stimulated WPR's interest.

DEFINE THE PROBLEM

Albert Einstein once said that if he had one hour to save the world he would spend 55 minutes defining the problem and only five minutes finding the solution. Following his advice, we laid out what we are and what we want to accomplish. Wisconsin Public Radio is a statewide radio service; in addition to our stations and networks, we also have programs airing on nine web streams.

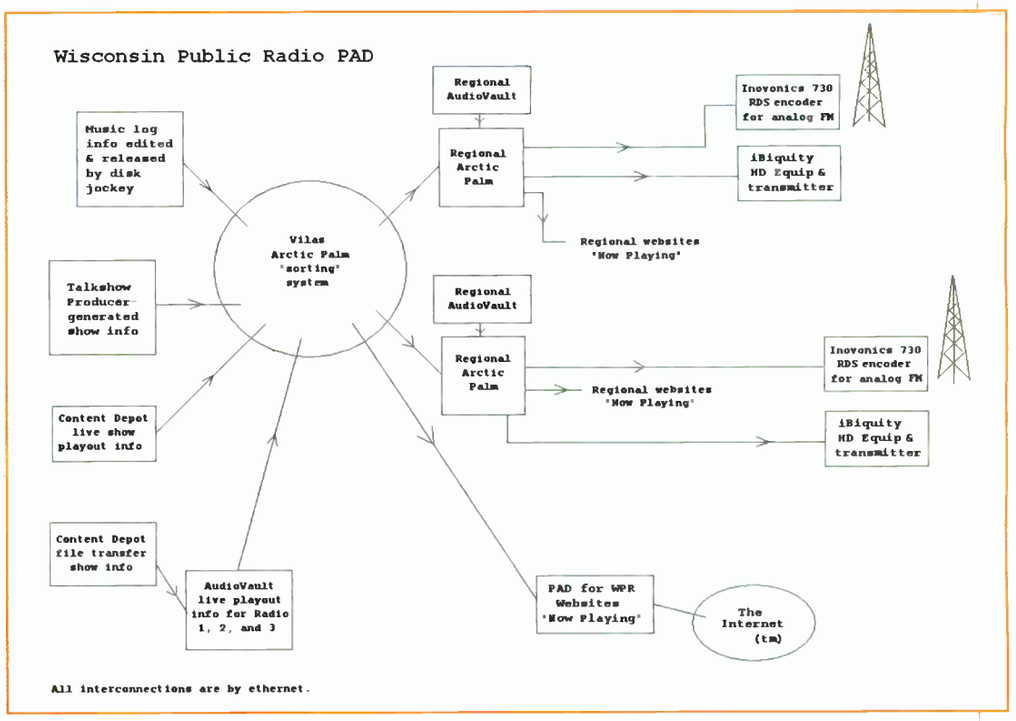
We would like PAD to be visible on FM receivers with RDS capability, as well as AM/FM HD Radios. We would also like to provide similar information for listeners to our internet audio services. The PAD data would include both static and dynamic information.

To keep it interesting, WPR airs programs from a large number of live, recorded, network and remote sources. Almost none of those sources have metadata available, but most promised it would be "soon." Our live music shows are all hand-crafted productions with hosts playing music from CDs. Music shows from outside network providers can only offer logs, no real-time data. NPR and other public radio programs do not as yet offer real-time metadata either.

WPR uses Broadcast Electronics' AudioVault system for audio storage and playback at the Madison headquarters and regional groups of stations. AudioVault has metadata transmission capabilities, but this may not be much help during live-assist conditions.

And the final aspect of the problem: WPR programs air on a variety of radio stations that come and go from the networks at times to broadcast their own regional and local shows. There is no end to the fun since every station seems to be a "special case!"

An important part of "defining the problem" was a series of drawings we used to visually describe the flow of information for PAD at WPR. See image below.



GETTING STARTED

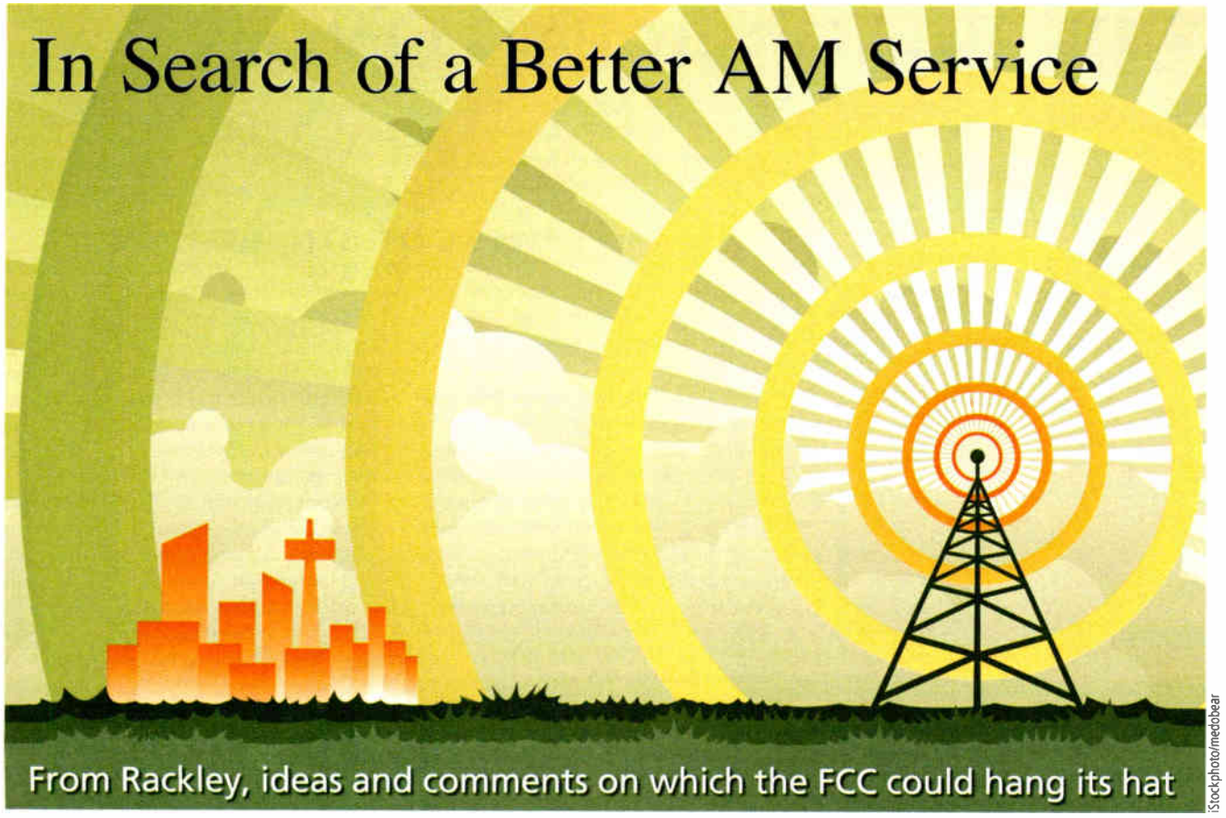
Wisconsin Public Radio's first steps in PAD were taken using the tool we had purchased with our HD Radio systems: Broadcast Electronics' TRE — The Radio Experience. Using this software, we created a rotating schedule of static information to display on our flagship station, WHA. This schedule transmitted items like "WHA AM-970," "Wisconsin Public Radio," "The Ideas Network" and the name of the show that was scheduled to be on the air at that time.

This worked quite well, but I found it difficult to see the path to move into display of more dynamic information. For our live music shows, how would we generate dynamic title/composer/artist information? An electronic music log is prepared by our music department for each show, presenting the possibility of harvesting the text about the music to be played.

But clearly a way would be needed for the hosts to indicate when a particular piece of music had been started ("releasing" the next song PAD to be displayed), as well as a mechanism for manual edits should deviation from the log be necessary. For talk shows, our producers already prepare "show notes," a paragraph of information used to promote their upcoming shows both on the air and on the Web. This

(continued on page 8)

In Search of a Better AM Service



From Rackley, ideas and comments on which the FCC could hang its hat

iStockphoto/medobear

Radio World has been providing coverage of the industry's AM revitalization discussion. With so many comments filed to the FCC, a lot of ideas have been floated.

Ron Rackley at the engineering consulting firm du Treil, Lundin & Rackley Inc. is a highly visible AM proponent. It's reasonable to assume that his will be among opinions to which the FCC will listen carefully, given his knowledge of the band's technical history and limitations.

Writing for the company, Rackley laid out a number of ideas around which FCC action could coalesce. We noted several in our March 12 cover story about the AM comments.

DLR say the AM band is mature, and so the FCC should not allow more applications for new stations, given the numerous delivery options available. It also laid out numerous ideas to help AMs improve service with more flexibility in choosing transmitter sites and building technical facilities.

The engineers offered a plan to revise daytime protected contour levels to help with AM's noise headaches. They recommend 2.0 mV/m, up from the current 0.5 mV/m, for Class B, C and D stations, while for Class A stations the 0.1 mV/m daytime protected contour should be raised to 0.5 mV/m.

Also, FCC rules should be changed "to make the protected contour for daytime co-channel overlap, daytime first-adjacent channel overlap, daytime critical hours protection and nighttime overlap from co-channel skywave signals the 0.5 mV/m groundwave contour for Class A stations. In the daytime, this will replace the presently protected 0.1 mV/m contour ... At night, it will replace the 0.5 mV/m skywave contour — which we believe to be obsolete."

Regarding skywave protection, DLR says the radio industry must acknowledge the uncomfortable fact that Class A station 0.5 mV/m nighttime coverage has become obsolete.

DLR says the FCC can do as it wishes with FM translators but does not believe there will be enough channels to satisfy all AM stations, so it focused its comments on "actual AM band matters." Daytime community coverage standards should be eliminated, and AMs should not be licensed to cover communities (Rackley and team call this requirement "an obsolete relic").

The FCC should eliminate the so-called "Ratchet Rule," a change Rackley has advocated for some time, and encourage wider use of Modulation Dependent Carrier Control technologies.

The consulting firm favors killing off the minimum AM antenna efficiency requirements, saying that a 1930s-era argument for ensuring a minimum amount of service was provided for scarce AM channel assignments is no longer enough to justify impairment for flexibility in choosing antenna locations.

"AM stations should have complete flexibility in choosing tower height and ground system dimensions and normal business forces can be relied upon to influence their owners to seek optimum locations for serving their audiences," states DLR.

DLR's filing on AM revitalization — with its 20+ proposals and detailed discussion — can be found via a link in our article at *http://bit.ly/1kFhhbx*.

SYNCH IT UP

Rackley then reviewed what other commenters told the FCC and put together a set of further recommendations based on what he saw. Among items that caught my eye in his reply comments:

Authorizing Synchronous Boosters — Rackley wrote that du Treil, Lundin & Rackley Inc. "strongly" agrees with the position of Wifredo G. Blanco-Pi to authorize synchronous transmission by AM stations permanently.

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FROM THE EDITOR

Paul McLane

THIS ISSUE

APRIL 9, 2014

NEWS

FEATURES

Maro Hagopian

BUYER'S GUIDE

OPINION

NEWSROUNDUP

PANDORA: A federal judge left unchanged the rate that Pandora pays songwriters to license their music. The judge set a rate of 1.85 percent for each of the five years of the license term, which is retroactive to 2011 and continues through 2015. Pandora had sought to lower the figure to 1.7 percent, the Radio Music Licensing Committee rate for broadcast radio.

The American Society of Composers, Authors and Publishers had proposed an escalating rate structure. ASCAP Chief Executive Officer John LoFrumento said the group is "pleased the court recognized the need for Pandora to pay a higher rate than traditional radio stations," however, "streaming is growing in popularity — and so is the value of music on that platform." The decision "further demonstrates the need to review the entire regulatory structure, including the decades-old consent decrees that govern ... licensing, to ensure they reflect the realities of today's music landscape," said LoFrumento. The case stemmed from a lawsuit Pandora filed against ASCAP in 2012 over music licensing fees.

PURE: SiriusXM Internet Radio is now available on several streaming receivers made by Pure, including the new portable Evoke F4, as well as the One Flow and Sensia 200D Connect. Pure is a U.K.-based company that now has a U.S. presence. Compatible with Pure's Jongo multiroom speaker system, Evoke F4 is an Internet and FM radio with Bluetooth

that enables listeners to enjoy synchronized music throughout their home. As with other members of the Jongo family, Evoke F4 can be used on its own or grouped with other Jongo speakers as part of a multiroom audio system. Evoke F4 features include recording live Internet to USB memory stick; instant and timed recordings; touch-sensitive controls; large clear graphical OLED display; multiple alarms; a sleep and kitchen timer; input for an iPod or MP3 player; and headphone socket. There's support for an optional matching stereo speaker and rechargeable F1 battery pack that gives 12 hours of portable listening per charge. Evoke F4 lists for $229 U.S. and is available on *amazon.com* and *pure.com*. Users need a subscription to SiriusXM to receive its Internet radio service.

NAB ENGINEERING ACHIEVEMENT AWARD

LITTLEJOHN HONORED

In our next issue we'll feature Jeff Littlejohn, executive vice president of engineering and systems integration for Clear Channel Media & Entertainment. He is the radio honoree for NAB's Engineering Achievement Award.

In his 20+ years in radio engineering, he has been a leader in technical improvements for broadcast radio and active on many industry committees, according to NAB. We'll feature his thoughts on the current state of radio engineering and the industry's future, among other things.

Radio World honored Littlejohn in 2008 with its Excellence in Engineering Award.

RACKLEY

(continued from page 4)

Blanco-Pi is a licensed professional electrical engineer, now 82, a naturalized American citizen born in Cuba who has broadcast for most of his life, first in Cuba, later in Puerto Rico.

Rackley writes: "It is a very odd situation where existing synchronous transmission facilities continue to exist because they are authorized for experimental operation over and over again, even though no experimentation is needed to know that the technology works and can be useful for providing improved service.

"This results, frankly, from the FCC 'dropping the ball' and never following through with a rulemaking to authorize synchronous transmission long ago. The time has come to rectify this situation."

He provided a detailed history of synchronous transmission, back to the 1920s and Dr. Frank Conrad at WBZ, through discussions in the 1980s.

"It became clear that synchronization was not only possible, but very practical," he continued. "Two schools of thought developed on synchronization: the absolute synchronization of carrier frequencies, such as through use of satellite GPS technology, and precision offset of frequencies using very high stability frequency generators — the advantage of the former being to completely eliminate any time-varying signal beat product, and the advantage of the latter being to replace a constant groundwave standing wave pattern with one where signal outphasing occurs at a more acceptable interval at any given point in the interference zone."

Digital delay equipment can be used to synchronize program audio and minimize delay distortion effects where signals from two transmitters are close together in amplitude, he said. The problem of fading zones can be minimized.

"It clearly is time to recognize the usefulness of modern synchronous transmitter technology to improve service to the public in the AM band and for the experiments to end." He set out suggestions to allow existing experimental AM synchronous stations to become permanently licensed and new systems to be built (including a stipulation that a synchronous set of transmitters should count as one station, for FCC ownership purposes).

Short Antennas and Interference Protection — Rackley noted that Clear Channel Communications had written: "Any modification of AM antenna efficiency standards must be carefully designed to prevent additional signal from entering the nighttime skywave."

He agrees that nighttime allocations should be based on the high-angle radiation characteristics of all antennas, no matter what their height or horizontal plane radiation efficiency. However, he said, "High-angle radiation will not present any particular problem with short antennas."

He provided data in support of that, and continued: "Although very short antennas do not provide high-angle skywave suppression like antennas on the order of one-half wavelength do, the fact is that, as height approaches zero, the vertical radiation pattern approaches that of an elemental dipole in half space — the cosine function for the angle above the horizontal plane. Far from 'blowing up' at high vertical angles, the vertical radiation pattern of a short vertical antenna conforms closely to that of a quarter-wave tower as its height is decreased even to zero, although the practical limit of having useful radiation efficiency will be the limiting factor for height.

"Using the calculated vertical radiation pattern for the actual antenna height in allocations will ensure protection of other stations from interference, even with short antennas."

Ron Rackley

It clearly is time to recognize the usefulness of modern synchronous transmitter technology to improve service to the public in the AM band ...

– Ron Rackley

Relaxing Urbanized Area Relocation Restrictions — Rackley thinks it is "very unfortunate that AM radio stations have been 'caught in the net' of the *Rural Radio* proceeding that was created to deal primarily with the issue of commercial FM station relocation from more rural to more urban communities."

In his experience, AMs that want to change city of license generally do so out of necessity, "to deal with coverage requirement issues of the FCC rules when transmitter site changes are made and not out of any other motivation to change the communities with which they identify."

In Rackley's view, it's "striking" how the FCC handles station allocations for AM vs. those of commercial FM radio.

"Commercial FM stations are licensed to the communities where their channels are assigned, based on distance spacings toward other assignments, and hold classifications specifying discreet height and power combinations that result in relatively few different coverage area sizes that are pretty much standard for each class of station," he said.

"AM stations are licensed to communities that were chosen at the time their applications were filed based on the FCC's coverage requirements, once their power levels were selected and their antenna patterns were designed to avoid interference with other stations."

He said AM coverage areas vary from station to station in ways that commercial FM coverage areas do not, with essentially every one having a unique shape and size.

"AM station coverage areas are very different at night from what they are in the daytime, while FM coverage areas remain constant day and night. AM stations, in general, are up against the coverage areas of other stations located around them with which protection contours touch, or even overlap, service contours — making even small changes in location often impossible without significant alteration of the antenna pattern and, hence, coverage area. Commercial FM stations are situated according to a table of assignments based on spacing between transmitter sites and changes in location are possible by amending the table of assignments."

Rackley asks us to imagine a board game called Radio Allocations:

"The commercial FM coverage area pieces would for the most part be circular and of only a few sizes to move around on the board with spaces around them, while the AM pieces would look more like interlocking puzzle pieces that change shape every time they are moved or the sun sets or rises."

AM stations do not lend themselves to moving around between cities of license as easily as commercial FMs can, and so should not be treated the same. "AM radio stations need flexibility to be able to make transmitter site location changes based on need, with the objective of optimizing coverage of the populations they serve, and should not be saddled with regulations designed to limit city of license changes by FM stations."

This is a huge topic, and between his original and reply comments, Rackley takes it all on. He also commented about foreign interference STAs; rule modifications to avoid "overprotecting" nighttime groundwave or over-estimating the potential for interference; and the elimination of short-form applications — a process he calls "absolutely toxic" for AMs that want to improve facilities.

I've posted a link to Rackley's reply comments at *http://bit.ly/1g618wn*. Both are worth reading in full if you are interested in AM revitalization.

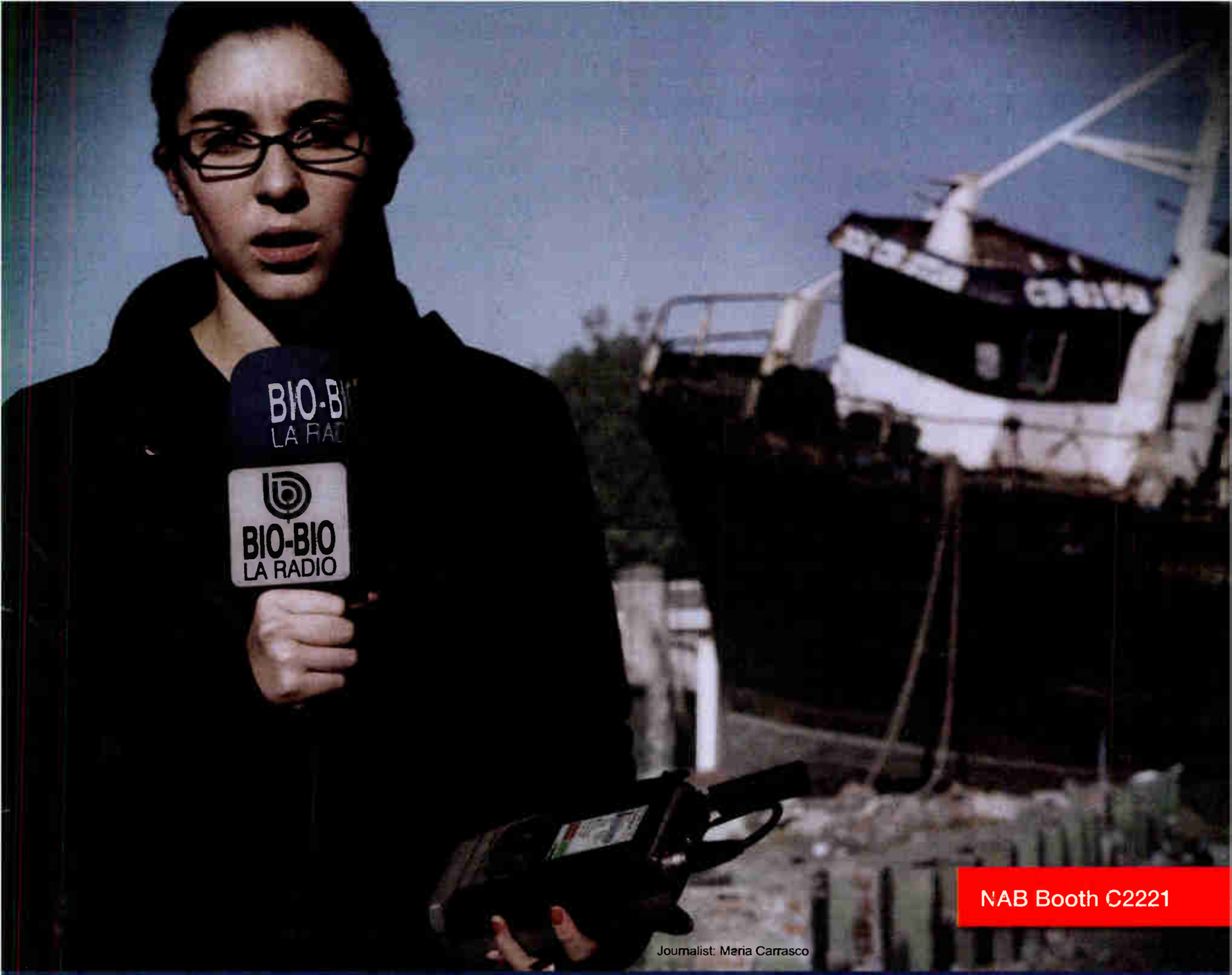
"We believe that strong support for many possible changes to the FCC rules that could help revitalize the AM radio service has been expressed in the comments of this rulemaking," Rackley concluded. "We urge the FCC to act on them, without delay."

NEWSROUNDUP

AM: NAB thinks it's a good idea for the FCC to open an application window for AM stations owners who wish to apply for an FM translator. The idea was floated by then-Acting Chair Mignon Clyburn at the fall NAB/RAB Radio Show and has gained much support as something the agency could do fairly quickly to help owners of struggling AM stations.

"While translators obtained in this window should generally remain linked to the acquiring AM station, NAB submits that it would be reasonable to allow such translators to be transferred under certain limited circumstances, such as financial hardship," the NAB told the FCC, which has been taking comments on the effort to relax some transmission and/or equipment regulations governing AM.

The broadcast lobby also supports relaxing the proposed limit of one FM translator per AM, to accommodate stations that have unusually large or irregularly shaped service areas, as well as opening the filing window to all AMs equally, regardless of station class or ownership structure. NAB also called on the commission to consider ways of handling the potential displacement of FM translators and agrees with many of the commenters supporting proposals to relax both daytime and nighttime community coverage standards for AM stations.



Journalist: Maria Carrasco

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METADATA

(continued from page 3)

suggested there might be a way to gather up-to-date information about show topics, hosts and guests, but would require some changes in data entry to provide text that would fit into the field restrictions present in the various display technologies. We would also need a way to manually enter data for specials.

Photo by Steve Johnston

A Boston Acoustics Recepter Radio HD tabletop receiver in Johnston's office displays a scrolling weather forecast for an AM HD station.

FINDING A VENDOR

As we considered these factors it seemed necessary to have our PAD organized at several levels — network, regional and individual stations. This would mean many instances of the software, so we consulted with several PAD software vendors as to the costs we could expect for such an extensive installation. The way the companies chose to license their products would be important to figuring the total project cost. We were also interested in whether or not the various software packages offered a user-friendly interface for system management and producer data editing and release.

WPR ultimately selected the Arctic Palm software product known as "Center Stage Live" which offered the flexibility we needed through add-on modules:

CSScheduler is used to schedule static messages by station, date, day-of-week, time-of-day or to trigger the release of a message based on what is playing in the automation system.

CSWeather can capture information from websites. Local weather forecasts and alerts can be downloaded from the National Weather Service.

CSRDS is the actual metadata handling module. This program captures and merges data from a variety of input sources and sends it to any combination of RDS encoders, websites and HD Radio systems, online streams or other applications. Music metadata and "triggered" events will be sent to all configured outputs but promotional messages, weather forecast, etc may be blocked from any one or more outputs.

CSLogIt allow us to use our music scheduling software to provide a daily "PAD playlist." Since we use CDs during our live music shows, this allows the host to easily indicate when a scheduled piece begins, "releasing" the data about the music into the PAD channels. A module was also created to harvest "Now Playing" information from the satellite music source Web playlist, and parses it to become PAD information.

CSRAS is a "Radio Automation Simulator" that will send PAD data based on a pre-defined playlist. If you are recording a live broadcast that will be re-broadcast at a later date and/or time, one can schedule the repeat broadcast using the CSScheduler module. At the desired date and time, the metadata provided during the original broadcast will be resent for the repeat broadcast. Different messages can also be used during the repeat broadcast.

PROGRESS SO FAR

The actual deployment followed the path of least resistance, leveraging opportunities for some elements to be incorporated sooner, others later in the project. We first got things running well on our AM and FM stations in Madison, then on our other stations around the state. The information displayed includes station call signs and slogans, current weather, name of the show now on the air, local host names, guest, topic and call-in information for local shows.

Some of our automated music shows are operating smoothly with PAD, but we are still working on the live music log import and "release" system. We are also awaiting the beginning of PAD transmissions for our various satellite programs. The new Public Radio Satellite System receivers recently placed into service have PAD transmission capability but it has only been tested for basic functionality. Most shows that use the ContentDepot system are not sending any real data yet.

The next phase of the project is to begin tackling the regional and local PAD for our stations. Our recent transition to an audio-over-IP method of statewide program delivery has meant a huge expansion of our computer networks. This, in turn, provides plenty of bandwidth and access points for transmission of PAD by IP.

Decisions remain as to where best to locate the regional Center Stage systems. Should the machines be located at our headquarters in Madison, or at each of our regional bureaus around the state? How can we best incorporate EAS and Amber alerts for the regional stations? There's a lot of work remaining, but this practical, step-by-step approach to the task has allowed us to provide a real improvement in service. And the listeners have started to notice — our Audience Services Department has been receiving appreciative and positive comments.

Examples of Static PAD

- Call sign, frequency, slogan
- "Wisconsin Public Radio"
- Network Name

Examples of Dynamic PAD

- Current weather information
- Name of show on the air
- Name of the host now on the air
- Music title/composer/artists
- Talk show topic and guests
- Request and call-in numbers
- Special pledge drive information
- Emergency Alerts

Steve Johnston, director of engineering and operations at Wisconsin Public Radio, started taking apart radios as a youngster and became a ham radio operator at age 13. His career includes 20 years in engineering management with Susquehanna Radio Corp. For eight years he has been director of engineering & operations of Wisconsin Public Radio. A long-time member of SBE, he is certified as a Senior Radio Engineer.

GATESAIR

(continued from page 1)

was part of the former Harris Broadcast. Its owner, The Gores Group, having recently acquired the business, now has split that entity into two.

Redmond, who reports to CEO Charlie Vogt, told Radio World that GatesAir will be point of contact for most of what radio station managers will want from the old Harris, though there will be some overlap with Imagine.

"Over time, the companies will become more independent under the Gores umbrella," he said. GatesAir and Imagine Communications will have separate booths at this month's NAB Show.

This story expands on a brief item posted earlier online.

FOCUS ON OTA

The new Imagine Communications is described as a provider of media software and networking solutions, with a "commitment to IP and cloud-based, software-defined networks and workflows." Harris Broadcast adopted the Imagine name from a digital video company it had acquired recently; at that time it emphasized Imagine's capabilities in "over the top," mobile video and multiscreen TV Everywhere platforms.

The new GatesAir will focus on "solutions for over-the-air radio and television broadcasting, leveraging wireless spectrum to maximize performance for multichannel, mission-critical services," according to a business summary. The term "over-the-air" is a recurring theme in the descriptions of the company's mission.

Redmond boiled this down further to mean products that help broadcast customers "create, transport and transmit" their content.

The Gates Radio Company is a linear predecessor, and the name was a familiar one throughout the industry at one time. Redmond said adoption of that name is a nod to "a great legacy of innovation and contribution to the broadcast industry." He said he'd heard from customers who "wanted to make sure that their new transmitter was going to ship with the new logo."

Main facilities are in Cincinnati and Quincy, Ill., with other smaller offices. Redmond estimated that the GatesAir business employs around 300 people; according to the Quincy Herald-Whig newspaper, the Quincy plant employs about 200 of those.

Imagine Communications, meanwhile, is headquartered in Dallas. Charlie Vogt is CEO of both new companies.

Vogt had indicated the direction of his thinking in a blog post after his first 100 days on the job: "Our industry is poised to undergo transformational change as baseband is increasingly carried on IP, business management tools move to the cloud, and playout and networking solutions benefit from virtualization and both linear and nonlinear/VOD delivered everywhere," he wrote then.

(continued on page 10)

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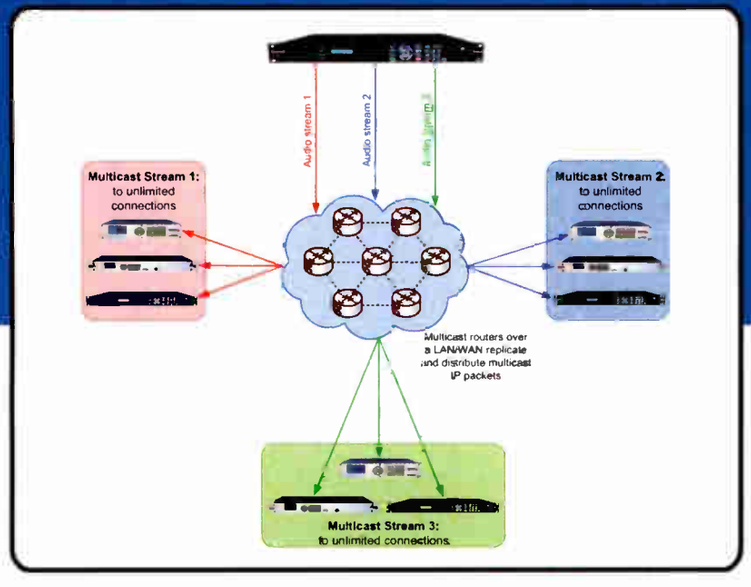

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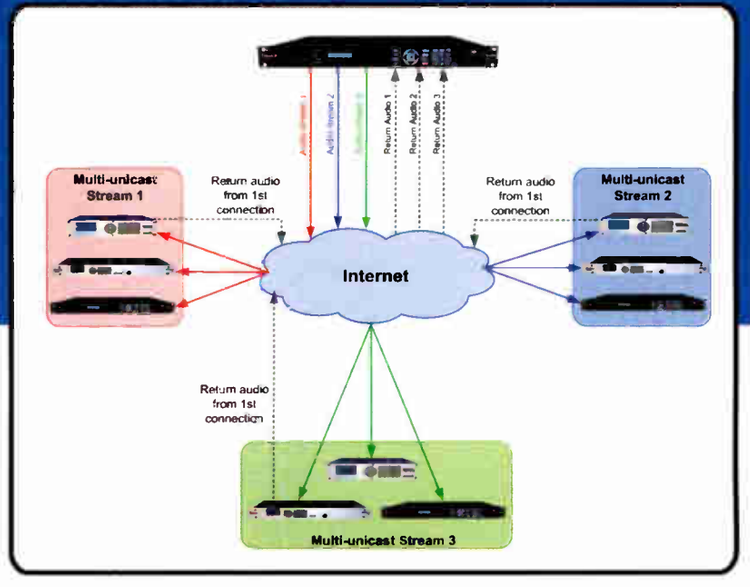

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GATESAIR

(continued from page 8)

"BULLISH"

The separation into two entities raised the question whether Gores might be preparing GatesAir for sale. One RW reader posted a comment speculating that the company was splitting "to polish the big iron for a sell-off." As Radio World reported last year, at least one other transmitter manufacturer had expressed interest in part of the company when Harris Corp. had it on the market, and industry observers started speculating again with the name change.

However, Redmond said a sale seems unlikely from his chair. "I think you'd be more likely to find us to be buyers than sellers. Gores and our management team are both bullish on our opportunities. Charlie's been clear that it's absolutely not the plan to create a spinoff, but to create two independent companies focused on two different parts of the technology spectrum."

Redmond said the latest developments are a welcome step in a "transformation" of Harris Broadcast. Although the manufacturer considers itself the world's largest provider of radio transmitters and among the biggest providers of TV transmission, it nevertheless had been a relatively small part of Harris Corp., a company with an emphasis on defense contracts. "You're going to see us be a lot more nimble, focused, approachable, with a customer-first culture," he said.

As to opportunities, the pending U.S. TV spectrum reallocation is one. Further, Redmond cited data indicating that growth in television households around the world exceeds 10 percent a year, and that digital TV households are growing at almost double that rate. "Only about 55 percent of TV viewership has transitioned to have digital; so 45 percent of the market around the world is still analog and in a transition mode.

"These are TV data points but they're relevant to radio," he said. "Generally, everywhere, digital radio follows digital TV. In the U.S., it's not as obvious, because there isn't a mandate and ownership is not as tightly interknit; but where they've had mandates for digital TV, as in parts of Europe, they are well on their way."

He noted radio expansion or digital conversions in Norway as well as India, where "it's astonishing how little of the country is covered by FM right now. ...

> **I think** you'd be more likely to find us to be buyers than sellers.
>
> – Rich Redmond

We continue to see significant opportunities in new FM frequencies, people upgrading AM, digitization with DAB; and there's a digital radio initiative in China."

REALIGNED

Harris Intertype Corp. purchased Gates Radio in 1957 and entered the TV transmitter market in 1969. It later added Intraplex's STL business and Pacific Research & Engineering consoles.

Prior to the spinoff from Harris Corp., the broadcast division had consisted of four units: transmission; media software; workflow, infrastructure and networking; and digital out-of-home. The transmission unit included both RF and studio gear in support of radio and TV.

Rich Redmond

Harris Corp. last year sold the broadcast business for a package worth up to $225 million to Gores, a private equity firm with a variety of holdings, including a partial stake in syndication giant Dial Global. The price included $160 million in cash at closing.

According to a subsequent report in our sister publication TV Technology, Harris Broadcast then went through a "post-acquisition realignment" that included staff reductions and management and operational changes. In July, CEO Harris Morris, who had joined in 2010 and seen the business through its transition, left.

Tim Bealor, president of Broadcast Electronics, a competitor to GatesAir in many market sectors, told RW in March that he wasn't surprised by the business move to separate GatesAir and Imagine Communications; he called it consistent with a shift in focus highlighted by Harris' earlier acquisitions of video software companies.

Bealor said his own company combines RF and radio software segments. "We have gotten to the point where we run them as separate business units. There are different costs involved, different processes involved," he said, and "it's not a big leap" for the former Harris Broadcast to recognize that.

"In general the manufacture of RF transmission products is a tough business right now," Bealor continued. "It doesn't matter who you are, whether you operate here in the U.S. or internationally, it's tough out there." This pressure influences all decisions that manufacturers are making in how they run their businesses and control expenditures.

What the Gores Group appears to be doing, he said, is "taking a business they've bought and structuring it in such a way that they can get it to be profitable, show some growth and be a viable candidate to sell." He saw nothing unusual in that, given that Gores — like BE's own ownership — is a private equity investor.

"What private equity companies do is buy and sell. ... I don't think anything they're doing is a statement about the state of the industry. It's about managing a company that's in their private equity portfolio, and doing what private equity companies do."

"NICE TRIBUTE"

Broadcast engineers tend to be wary about supplier ownership changes because they want assurance that their own investments in specialized transmission and studio systems will be supported later.

Michael Everhart, director of engineering for L & L Broadcasting and Alpha Broadcasting, is based in Portland, Ore. He likes the return of the Gates name and said he's pleased that, in general, industry suppliers seem to have come out of the recent recession OK.

"I was concerned when the economy first took a downturn, seeing the hard times people were having and the difficulty [for companies] of getting financing. My team and I thought some major vendors wouldn't survive that; but most everyone seems to have come out of it pretty well, and if anything, leaner and stronger; and now the economy seems to be in a slow recovery.

"My biggest worry in the last couple years was the closure of Dielectric," Everhart said. Last year, the antenna manufacturer was closed by its then-owner, SPX Corp., then sold. "The subsequent acquisition by Sinclair [Broadcast Group] caused many of us to breathe a sigh of relief. The knowledge that that would continue to be supported was good news."

Another Harris user, Alex McKenzie, chief engineer of The Praise Network, recently purchased two transmitters. He said he's heard engineers worry that "too much change" at the company could end up leaving users abandoned, but he doesn't share those concerns; he saves such worries more for smaller "mom and pop" manufacturers.

"It's a difficult industry. What's required to maintain support of products for 30 years while innovating and moving forward and trying to make enough profit to stay in business must be pretty demanding." He said his employer chose Harris because he comes across its products often in his contracting work, the company has good references and its support is strong.

As to the GatesAir name: "It's a nice tribute to the history of the company, I just hope to get some updated decals for my FAX series so they all match one day."

Comment on this or any story; email radioworld@nbmedia.com.

NEWSROUNDUP

ALERTING: Americans tune to TV, the Internet and *then* radio for emergency alerting information, according to a survey from Mark Kassof & Company. Researchers asked where participants would go first for information about emergencies like a gas leak or a fire, and gave them six choices: AM or FM radio, the Internet, newspapers, television, smartphone apps or something else. The majority said TV (37 percent), followed by the Internet (25 percent) and radio (17 percent). Smartphone apps came in fourth at 13 percent, followed by police/fire/911 at 2 percent. Four percent chose "other" and 1 percent either said they didn't know or refused to answer.

"Demographically, we find a huge divide between 18–44s and 45–64s, but relative to TV and new tech, not radio. Half of 45–64s would turn first to TV, while only 28 percent of 18–44s would," according to Kassof. A third of 18–44s would go to the Internet, while only 14 percent of 45–64s would. Fifteen percent of the 18–44s chose radio, compared to 18 percent of the 45–64s. And use of smartphone apps among the younger group (17 percent) is almost double that of the older group (9 percent), according to the research. Radio's demo divide is based on gender, not age. Men (20 percent) are more likely to turn to radio during emergencies than women (12 percent) are. "Most likely to turn to radio are 45–64 men ... 24 percent say they would go to radio. But, that's still half of the 45–54 men that would turn to TV," according to Kassof.

SATELLITE SIGNAL LEVEL METER AND SAT IDENTIFIER

Our TURBO-S2 meter makes satellite antenna aiming fast and easy. Now you can perfectly peak all your dishes, to achieve maximum performance and reliable reception of "finicky" new digital channels. The unit powers the LNB for convenient work at the dish site. The TURBO-S2 shows the name of each satellite, plus displays key signal quality specs for all

MPEG2/MPEG4/DVBS/DVBS2/QPSK/8PSK channels. Adjust to perfection when viewing readouts for carrier-to-noise (C/N), signal quality (EbNo), and Bit Error Rate (BER). This USA-built unit comes with English speaking tech support, and our customers widely praise the unit for its features and reliability.

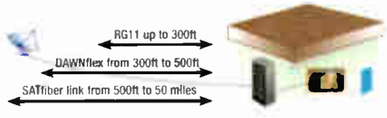
SURGE SUPPRESSOR FOR LIGHTING NEAR SATELLITE ANTENNA

Place "LNB-Zap-Stop" in the coaxial cable line that runs from the dish, to the satellite receivers. Think of it as an "insurance policy" to protect expensive indoor equipment from lightning hits. Transient

Suppressing Diode technology works to block high voltage lightning surges. The lightning protection units can take multiple hits, with no need for reseting or replacing.

CHOOSE THE BEST LNB SIGNAL CABLE

On long satellite signal cable runs, avoid using "noisy" amplifiers, so that you maintain the maximum C/N performance that your dish can deliver. Choose DAWNflex low-loss coaxial cable for dish-to receiver distances from 300 to 500 feet. This flexible cable passes satellite L band signals with very little loss. It is flooded for direct burial, and the quad shielded design



offers the best protection from signal ingress. Choose the SATfiber link for dish-to-receiver distances from 500 feet to 50 miles. Eliminate long distance signal attenuation, and lightning surge problems, when you install SingleMode fiber running out to the dish. Place our SATfiber Transmitter and Receiver units on both ends of the fiber, and pass 45 to 2800 Mhz with perfect quality. Call DAWNco to hear about our easy-install fiber, and for help choosing the best SATfiber system for your needs.

HD GRADE LNB AMPLIFIERS ARE NEEDED FOR NEW SAT CHANNELS

Several networks have made the switch to DAWNco's new "L series" of C and Ku band LNB amplifiers, to accommodate the "finicky" nature of new HD satellite receivers. This new generation of LNB has improved specs that can make a real difference in the reception of high-definition and 8PSK satellite channels. These new LNBs feature best-in-industry specs for "1dB gain compression point" and "phase noise." Internal circuitry has been completely redesigned for reduced power draw, so that indoor receivers and power supplies will never be overtaxed. In order to prevent video picture tiling and signal outages, when outdoor temperatures fluctuate, DAWNco's best LNBs feature a highly stable +/- 2 Khz rating. Make sure to upgrade to the new DAWNco "L series" LNBs, and watch for improved EbNo readings on your digital satellite receivers.

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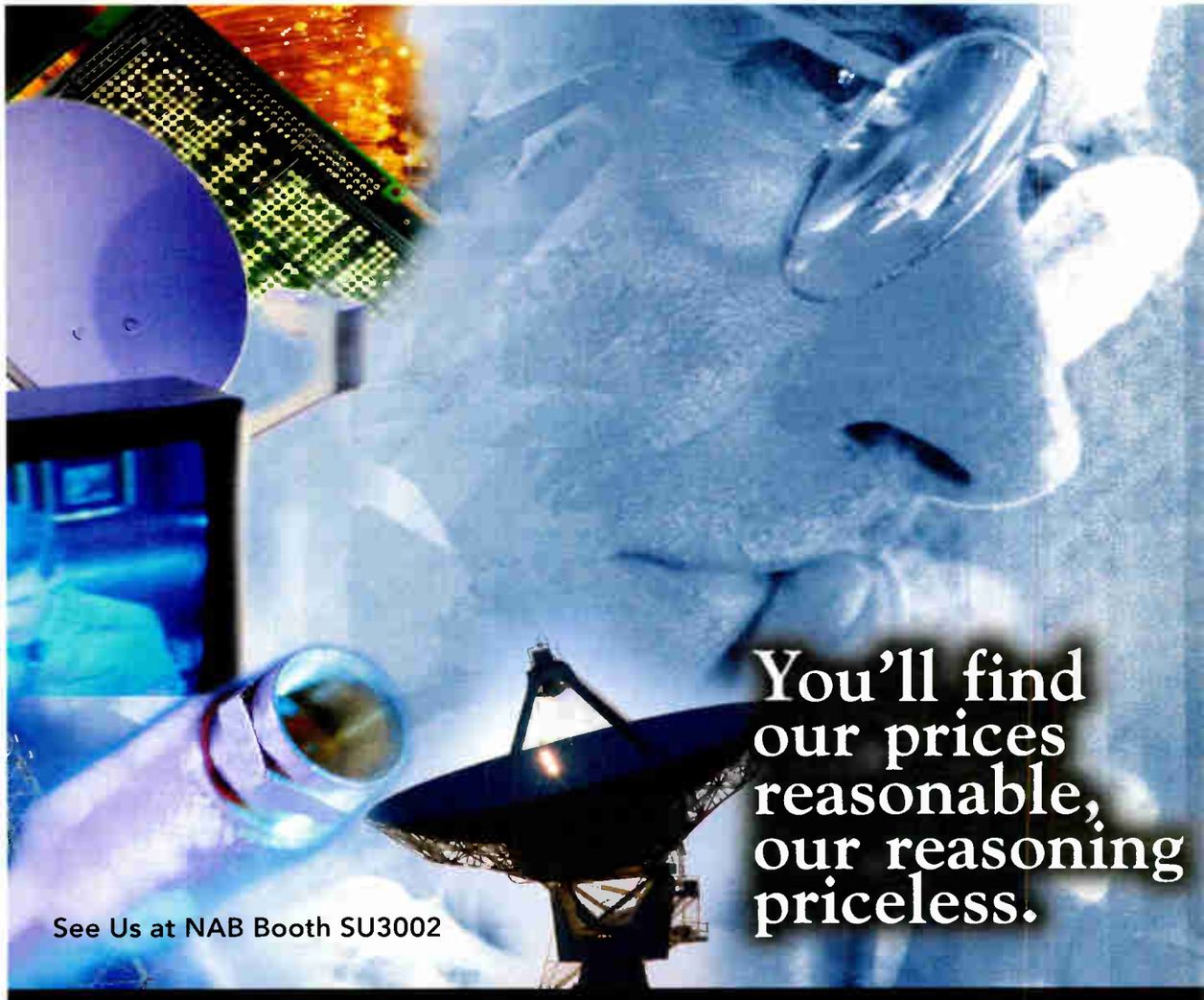

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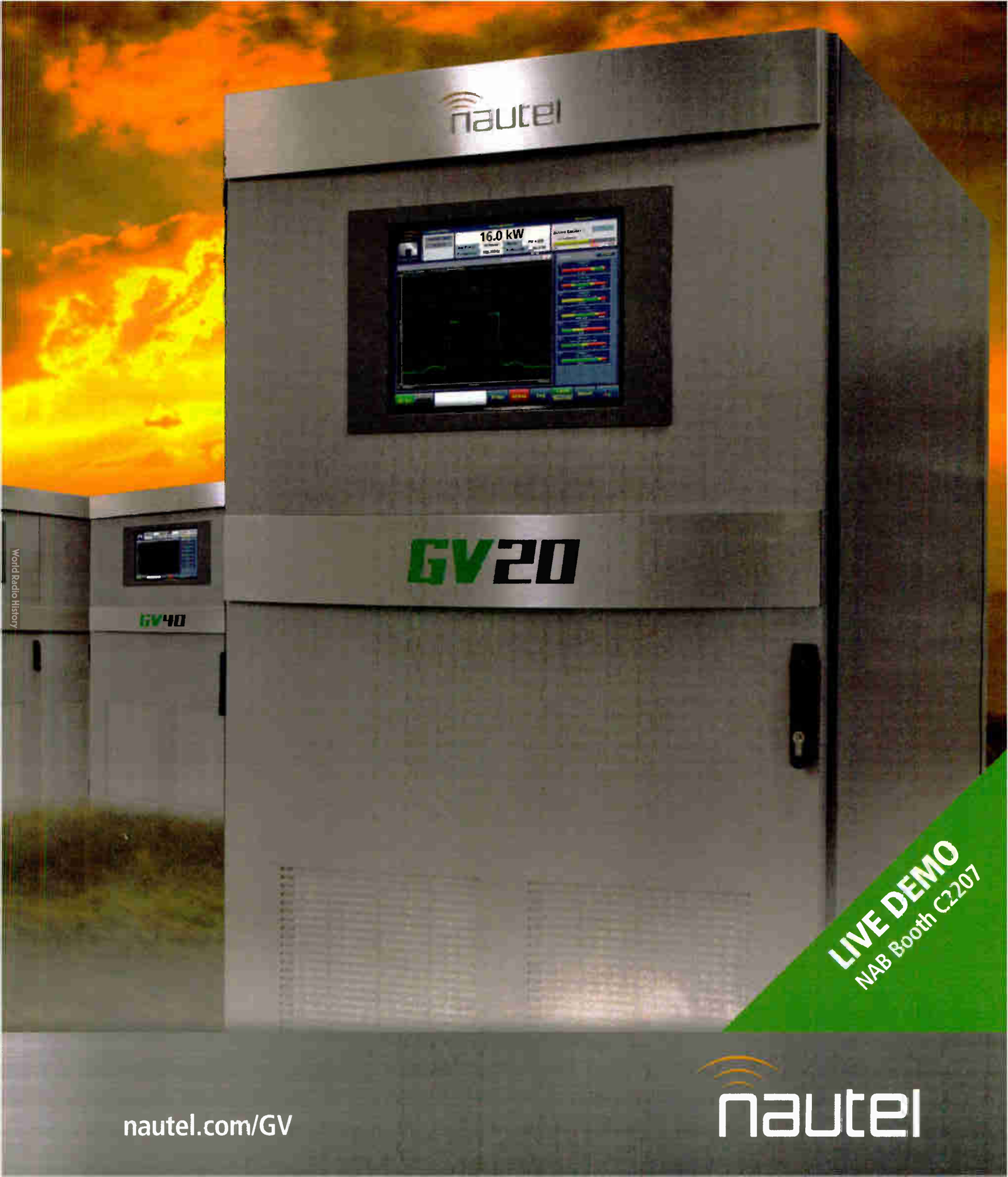

These "Thingies" Make Things Neater

Lesson of the day: Take advantage of little-used features whenever possible

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

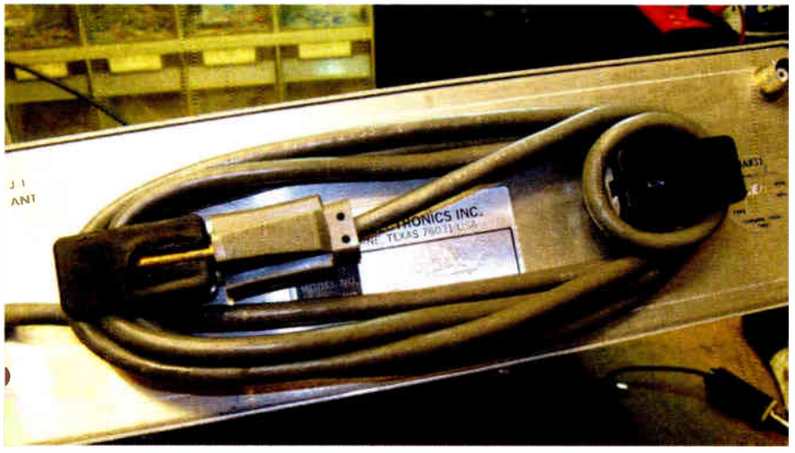

Fig. 1: Frank Hertel finds these "thingies" useful.

Consultant Frank Hertel has noticed that almost no one ever uses a feature designed into the "thingies" mounted on the back panel of equipment.

Frank says he could have looked up the proper name for these "thingies," but he likes calling them "thingies." We like saying it, too.

The thingies serve as feet when a piece of equipment is standing on its back during field service, with its front panel facing skyward. They also can protect connectors on the back panel when you set the box on the floor, again facing skyward. Yet again, the rubber or plastic thingies serve as a place to coil a power cord when the equipment is not in use.

They were also designed for capturing and holding the power *plug*, to keep it from dangling in the air while the equipment is in storage or being moved from place to place.

Note that the power cord may not be exactly the right length. Finding the right procedure for winding the power cord on the thingies can take a bit of an effort, if you want to use the thingies for this purpose.

The process can be simplified by coiling the extra length of the power cord to provide just enough cable to insert into the thingie. Give it a try and see if it doesn't work.

Reach Frank and Dave Hertel of Hertel Engineering at *frankh@twc.com* and *dthertel@gmail.com*.

The Internet is a wonderful resource but sometimes referring to longer Web addresses can be a pain.

Project engineer Clif Groth was trying to put his hands on the link we published to the online e-book "Practical Antenna Design." The Bitly link is *http://bit.ly/1irFrVh* and here's the full URL: *http://files.radioscanner.ru/files/download/file311/practical_antenna_design.pdf*

It points to a basic workbook offering a variety of tutorials on various antenna types; it is a good resource for engineers wanting to learn more about antenna design and performance.

Clif is at *clifgroth@gmail.com*.

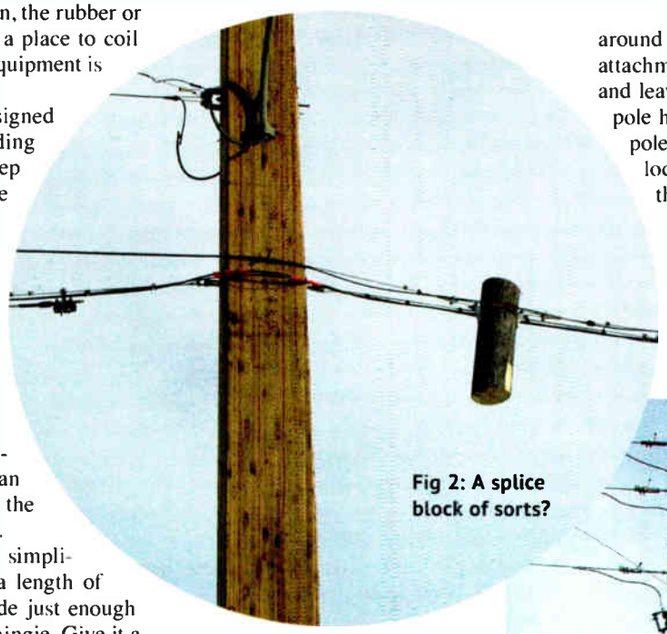

Fig 2: A splice block of sorts?

When I first saw Fig. 2, I thought it was some kind of splice block or filter on the lines.

Greg Muir is with Wolfram Engineering in Montana. When the local power utility replaces an existing power pole, they seldom coordinate with the other utilities, such as the telephone company and cable TV provider. The result is that the power company carefully cuts around these non-AC power attachments to the old poles and leave a section of the old pole hanging until the other pole tenants can get to the location and re-mount things.

In the meantime, one often sees a chunk of old telephone pole hanging in midair (Fig. 3).

Notice that the power company did take the time to attach the other lines temporarily to their new pole.

Greg reports that many of the old conventional end-span poles are starting to warp and bow, so the utility is replacing them with much stronger laminated products. The strength required of the cables is amazing, to be capable of holding that piece of phone pole.

Thanks, Greg, for sharing what appears to be an optical illusion. Greg Muir can be reached at *engineering@mt.net*.

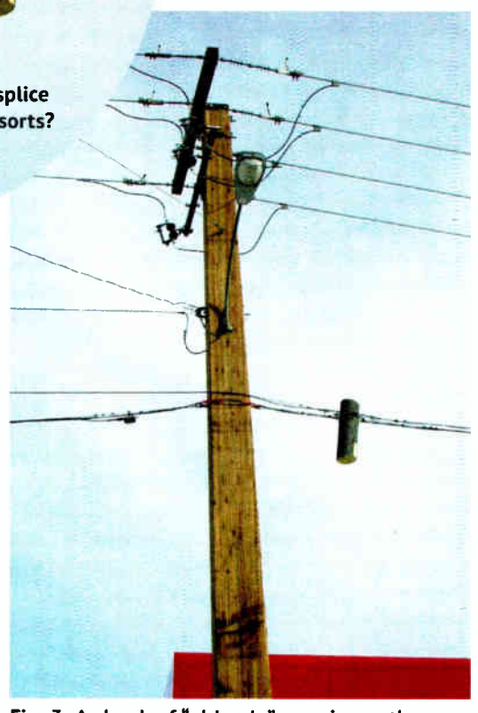

Fig. 3: A chunk of "old pole" remains as the cables must be remounted.

When looking for deals, readers of this column know to turn to Charles "Buc" Fitch, PE, for ideas. Buc has amassed a knowledge base of unbelievable resources over the years.

The latest is a combination AC voltage and current meter for under $20 from Marlin P. Jones and Associates in West Palm Beach. The snap-in LED meter contains both a three-digit AC digital voltmeter as well as a three-digit AC ammeter. An external current transformer can be mounted remotely using 18AWG twisted pair.

Fig. 4: MPJA's Digital Panel Volt/Ammeter

This panel meter would match nicely with the dual 24V supply that Buc wrote about in the Jan. 15, 2014 *Workbench*. Visit *www.mpja.com* and type "30301 ME" into the search field. There are over 100 in stock at this writing.

Reach Buc at *fitchpe@comcast.net*.

I hope you'll look for me at the NAB Show, at Wednesday's "RF Boot Camp" in the Broadcast Engineering Conference or at the Telos Alliance booth. It will be a pleasure to meet you and talk radio broadcasting.

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

Author John Bisset has spent 44 years in the broadcasting industry and is still learning. He is SBE certified and is a past recipient of the SBE's Educator of the Year Award.

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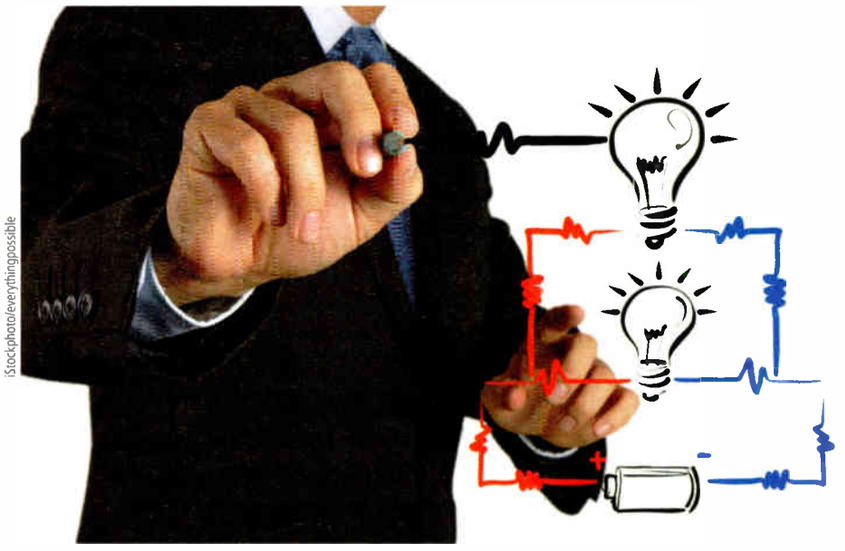
Current Events

Gustav Kirchhoff focused on current and voltage to expand on Ohm's Law

ELECTRONICS

BY JIM WITHERS



iStockphoto/everythingpossible

As I wrote in the Jan. 1 issue of Radio World, a German physicist named Georg Ohm published a paper in 1827 that described the interaction between voltage, current and resistance in an electrical circuit (see *radioworld.com/ohmslaw*). His findings were revolutionary and became a scientific "law" that today bears his name.

The law states that when an applied voltage of 1 volt causes a current of 1 ampere to flow in a circuit, the circuit's resistance is 1 ohm.

All well and good back in the buggy whip days of 1827, but circuits found in the real world are much more complex than Ohm's simple Law described.

Gustav Kirchhoff, another German physicist, took up that issue in 1845. He ended up expanding on Ohm's Law, and in the process got his own name attached to a law that, like Ohm's, is known and used by electrical and electronic engineers and technicians.

IT ALL ADDS UP

Kirchhoff's Law builds on Ohm's principles to describe current and voltage in *all* resistive circuits, and had two interrelated parts.

The first part of the law states that the voltage drops across all of the various resistances of a series circuit are cumulative and total. That is, if you apply a known voltage from a power supply — like a battery — to a series of resistors connected end-to-end, it doesn't matter if there are one, two or a thousand individual resistances, the entire applied voltage will be "dropped" across those resistances so that, at the other end of the battery, there will be nothing left over.

The law's language is a bit different, but that is the gist.

Using Ohm's Law, we can calculate the current in the circuit by adding up the total resistance and dividing it into the applied voltage ($I=E/R$).

Part two of the law speaks to the current created by that applied voltage. It states that the current flow in all parts of a series circuit must equal the total current flow in that circuit. It further states that in a parallel circuit (Kirchhoff called such circuits "nodes") the current in each node would be cumulative and *must* equal the total current coming from the voltage source.

To understand this second part of the law, think of the battery in your car. The 12 volts pushes current out to the headlights (drawing, say, 20 amps of current), taillights (5 amps), the ignition system (another 10 amps) and most important for us, the radio (an amp, maybe, unless it's in an 18-year-old's hotrod; then it might go 50 amps or so). Kirchhoff's Law demands that all of those currents must add up to the current being drawn out of the battery; 36 amps for those of us with small radios; 85 amps for the Turbo-Dynamic-Extreme-Density Powered Subwoofer crowd.

Each "branch/node" of the circuit is connected across the battery, rather than being "daisy chained" one to the next, to the next. This is known as a "parallel" circuit configuration because the various circuits are connected one after the other to the battery, much like railroad ties parallel each other as they connect across rails.

This idea — that if you add up the current flows in each of those parallel circuit branches, they must equal the total current flow coming from the battery — might seem intuitive to us; but in 1845, it was not well understood. In fact, Ohm had used heat conductance to explain electrical conductance and so thought electrical current remained latent in a conductor even after the voltage was removed, just as heat would remain in a piece of metal even after it was removed from a flame. Kirchhoff's Law showed that this was impossible.

One point to add here: Both Ohm's and Kirchhoff's Laws deal with voltage, current and resistance in purely resistive DC circuits, like those using a battery (or the DC voltages in broadcast transmitter power supplies). AC circuits, on the other hand, contain components that react to applied voltages differently from what happens in DC circuits (those components are capacitors and inductors and are said to have "reactance" characteristics). Even in AC circuits, though, both laws give results that are fairly accurate approximations of the real world.

THE CURRENT CALCULATION

Like Ohm's Law, Kirchhoff's Law is absolutely critical to understanding how electrical circuits work and to

(continued on page 18)

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Lily Massari	Doug Tharp	Bernie O'Brien	Pam Leffler	Andy Cole	Jim Peck	Bob Mayben	Ric Goldstein	Art Reed / Bob Eburg

KIRCHOFF

(continued from page 16)

troubleshooting those circuits. For example, suppose you have four resistors connected one to another in "series," and they all have equal amounts of resistance; in this case, let's assume 50,000 ohms each. But let's also assume that on the end of this "daisy-chained" series of high-value resistors, there is a much smaller resistor — something on the order of 5 ohms. Finally, assume that we apply 10,000 volts across the whole series circuit. This is what is drawn in Fig. 1.

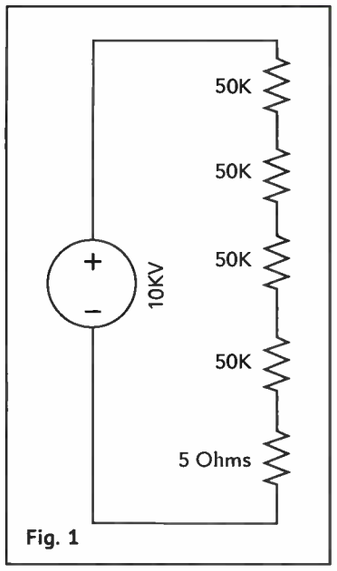

Fig. 1

What can we say about this circuit? Well, using Ohm's and Kirchhoff's Laws, quite a lot!

Using Ohm's Law, we can calculate the current in the circuit by adding up the total resistance and dividing it into the applied voltage ($I=E/R$). A total resistance of 200,005 ohms, divided into 10,000 volts, equals a circuit current of 0.04999 amps.

Once we know the current flow (and remembering Kirchoff's requirement that the current flow through each resistor in the series circuit must be the same as the current flow through every other resistor, and the circuit as a whole), we can calculate the voltage drop across each resistor.

A resistance of 50,000 ohms that has a current flowing through it of 0.04999 amps, drops the applied voltage by 2499.5 volts. If that is the case (and it must be, because the laws demand it), the total voltage drop across the four large resistors is 2,499.5 times 4 or 9,998 volts.

Hmmm. Two volts are left over, but Kirchhoff tells us that cannot be, so we have to assume that the final, very small 5-ohm resistor has dropped that leftover voltage, thus accounting for all 10,000 volts. And that is exactly what happens.

The above circuit exactly describes the high-voltage bleeder and voltage divider circuit in a tube-type broadcast transmitter. Those circuits are used not only to "bleed" off the high voltage when the transmitter is turned off, but by adding the little 5-ohm resistor on the end of the daisy chain, they also provide a convenient (and non-lethal) way of measuring the high voltage. Both laws state that as the applied voltage goes up and down, the drop across each resistor in the circuit will go up and down proportionally.

A perfectly acceptable way to monitor high voltage by remote control is to measure the two volts across the 5-ohm resistor with a very sensitive meter, and then multiplying the reading by the appropriate factor; this is, in fact, how that is done.

DOUBLING DOWN

But suppose that instead of just a daisy-chained series circuit, we have a second parallel circuit, as shown in Fig. 2. Two parallel branches with two 10,000-ohm resistors in each circuit, and an applied voltage of 1000 volts.

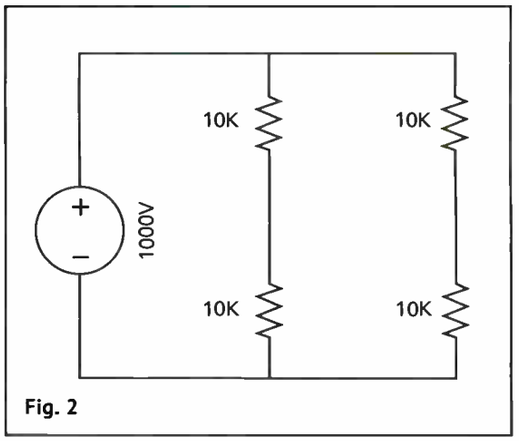

Fig. 2

Ohm can't help us in this case without Kirchhoff's assistance. Kirchhoff says that the applied voltage across the second parallel branch is the same as the first. Once we understand that, we can begin: 1,000 volts across 20,000 ohms of resistance gives us a current of 0.05 amps, or 50 milliamps (50-one thousandths of an amp).

The second part of Kirchhoff's Law says that the 0.05 amps of current flowing through branch one and the 0.05 amps of current flowing through branch two must add up to the total current flow in and out of our 1000 volt power supply. So our total current flow is 0.1 amps, or 100 milliamps.

If we think about the current flows in both the series and parallel circuits described above, we realize two more facts: daisy-chaining resistors end-to-end in a series circuit increases the circuit's resistance. But if we add resistance in parallel to an existing circuit, the overall resistance goes down.

In this case, since the current doubled, we know the resistance was halved. We can prove that with Ohm's Law. Since $R=E/I$, we can divide 1000 volts by 0.1 amperes. The result is 10,000 ohms.

Very exactly one half of one of the branch circuit resistances. If you think about that, it makes sense. If you plug a 100-watt lamp (filament is nothing more than a short, very thin piece of resistive wire) into a wall socket, you get a nice bright light. If you plug in a second, more light. A third, and then a fourth, and finally, at some point, the circuit breaker in your basement trips.

Blame Kirchhoff. He said that as you add more and more parallel resistances (light bulbs, in this case) to a circuit, the current flowing through each resistance adds up, and the total current flowing through the circuit breaker must equal all of those branch currents. At some point, the current flow will exceed the circuit breaker's capacity and you are left trying to read this in the dark.

Like Ohm, Gustav Kirchhoff lived and died well before his law was used by broadcast engineers. But also like Ohm, he added immeasurably to our understanding of how circuits work in every piece of equipment we use.

Next time, we'll tackle the capacitor and see how it evolved from the Leyden jar to one of the most basic components of a radio transmitter.

Jim Withers is owner of KYRK(FM) in Corpus Christi, Texas, and a longtime RW contributor. He has four decades of broadcast engineering experience at radio and television stations around the country.

PEOPLENEWS


Ted Nahil

GatesAir, formerly Harris Broadcast, named **Ted Nahil** business development manager for Intraplex products, Americas; he'll report to Mark Goins, director of transmission sales, Americas. Nahil had worked for the company when it was part of Harris Corp.

The **North American Broadcasters Association** has a new president, CBS SVP East Coast Operations **Robert Ross**. NABA also honored **Robert Briskman** and **Mike Starling** for their contributions.


Felix Krückels

Broadcast equipment maker **Lawo** named **Felix Krückels** to the newly created position of business development director.

The **Audio Engineering Society** appointed industry executive **Graham Kirk** to the position of international sales manager.


Will McLean

Tieline Technology appointed **Will McLean** as its new CEO. McLean has served as manager of corporate operations for the company since 2011.

Rich Parker accepted the director of engineering position for **Coast Alaska**, a partnership of public radio stations in Southeast Alaska. He's has been at **Vermont Public Radio** for 17 years. For much of that time he was director of engineering. Most recently, he was appointed senior broadcast strategist and engineer, working with VPR Development and Engineering to lead optimization of coverage and effectiveness for the two statewide networks.

Clear Channel Media and Entertainment promoted **Michele Laven** to president of Partnerships and Local Activation. Clear Channel also chose **Clay Hunnicutt** as its new executive vice president and general manager of national programming platforms. It has also formed a new operating group to run its major-market stations. The Major Markets Operating Group has four divisions led by managers who report to Chairman and CEO Bob Pittman. They are EVP **Hartley Adkins**, EVP **Tom McConnell** and SVP **Kelly Kibler**.

Greg Ashlock, formerly president of Clear Channel Los Angeles, expanded responsibilities to become president of Clear Channel Southern California. **Matt Martin** remains president of Regional Markets. **Tom Schurr**, president of Operations for Major Markets, has left the broadcaster.

The **Mentoring & Inspiring Women in Radio Group** chose four candidates who will participate in the 2014 Mildred Carter MIW Group Mentoring Program. They are **Elisabeth Logan**, general sales manager, **Radio One**, Cleveland; **Stacey Kauffman**, local sales manager, **Hubbard**, Chicago; **Noelia Santelli**, national sales manager, **Salem Communications**, New York; **Angela Hampton**, on-air personality, **Cromwell Radio Group**, Effingham, Ill.

Pacifica Foundation Radio named **Summer Reese** as its executive director. Reese had been the interim executive director for 18 months. She has also been chair of the board of directors.


Beverlee Brannigan

Jules Riley has been hired as operations manager for **Journal Broadcast Group's Tulsa** operations. **Beverlee Brannigan** has been named vice president and general manager of the group's **Wichita** operations.

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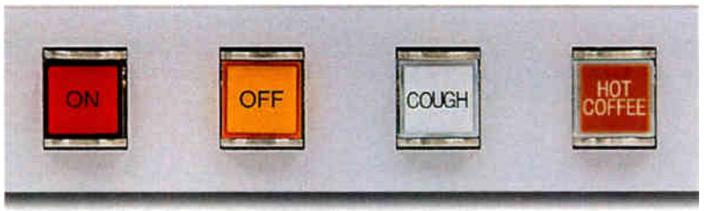
Click here for a link to download your guide: INN9.wheatstone.com



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Fresh for 2014, the E-6 has gotten a brand new look

With the LX-24, L-12 and L-8 sporting black and charcoal looks, we thought it time to revisit the E-6 - the console that launched the whole networking thing. Now it looks right at home in the Wheatstone lineup.

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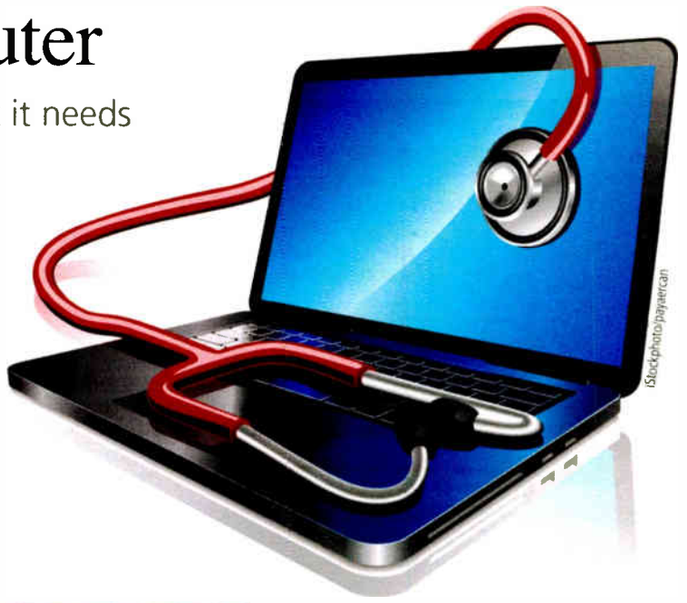
Five Ways to Help Your Computer

Whip your PC into fighting shape and give it the corner support it needs



RADIO IT MANAGEMENT

BY TODD DIXON

Fondness. That's how you remember your new computer. It was set up just the way you like it, programs loaded in a snap, and your Web browser blitzed through the Internet.

Those were the days.

Now you plan your staff meetings early in the day to give your computer time to boot up. Where has the raw performance power you once enjoyed gone?

Before you toss the old girl to the curb and try to justify a new computer to your accounting office, see whether some of these IT tricks breathe new life back into your beloved computer.

START WITH STARTUP

Most programmers live under the faulty notion that you have purchased a computer just to use their program. So you end up being "that" person — one of those who, my boss Stephen Poole would say, "never met a task bar icon they didn't like." Those icons represent programs that are holding space on your RAM for programs you may never use.

Type in "msconfig" into the run bar above your Start button, hit enter and choose the Startup tab. You can go through the list and uncheck any of the programs that don't need to be available. Be sensible; don't untick a program if you don't know what it does. You'll have to reboot for the changes to take effect, and you'll get a warning that you've changed your startup settings, but your boot up times and computer responsiveness will likely increase with just this action alone.

ANTIVIRUS/ SPYWARE/ MALWARE SOFTWARE

Even the most careful computer user cannot outsmart the armies of hackers that besiege your computer on a daily basis. Malware and spyware rob your computer of memory, CPU cycles and Internet bandwidth. Gathering information about your habits and behaviors has become big business, which is why it is so important to regularly update and run *complete* scans of your computer.

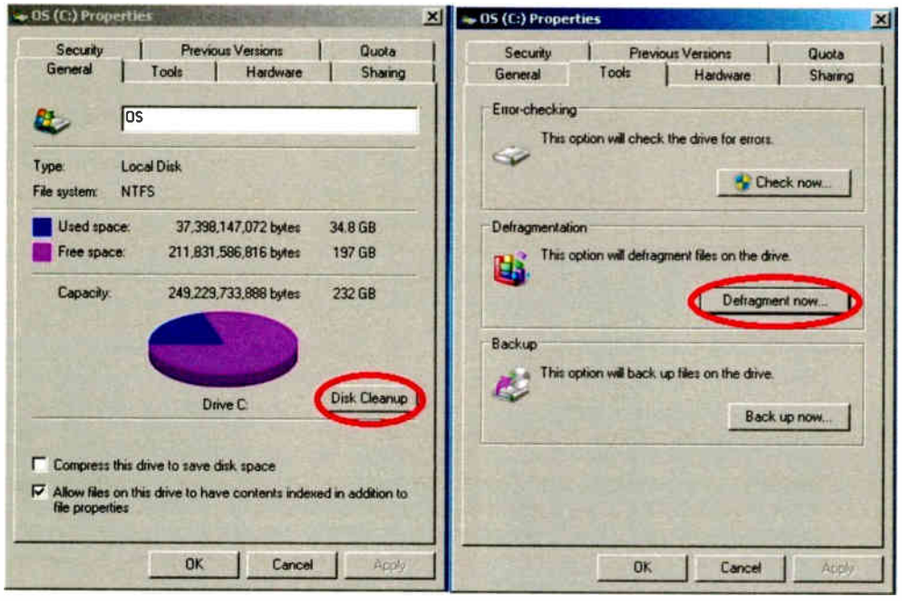
Programs like Bitdefender, Norton, Webroot and Kaspersky get pretty high marks from independent labs and run anywhere from $19 to $49 for a single license. AVG, Avira and Forticlient are free and perform admirably as well, but may only be available for personal use.

For malware and spyware detection, I prefer free solutions like Microsoft's Security Essentials or Malwarebytes.

CLEAN UP AND DEFRAG YOUR HARD DRIVE

Even with regular usage, Windows creates temporary files, which it will never use again, and program data gets fragmented all over the hard drive platters and makes the drive heads work like the pens on a polygraph machine. In order to decrease those seek times, it is important to clean up temporary files and "defrag" the drive.

Go to My Computer, right click on your C: drive and then click properties. The first tab has a pie chart of your hard drive with a Disk Cleanup button. Cleanup will search the file system for places where you can remove files and save hard drive space. In the same properties window mentioned earlier, the next tab, labeled Tools, has a defragmentation tool, which analyzes the drive and determines how fragmented it has become. Defrag will then move files so that they are closer together on your drive.



After a right click on the C drive and choosing properties, the Defrag and Cleanup tools are readily available.

A pro tip here is to automatically schedule these two maintenance items. In your Control Panel, choose the Scheduled Tasks icon and run through the program. The hardest part is browsing for the program titles. Both tools are found in the *c:\windows\system32* folder. Disk cleanup is called *cleanmgr.exe*, and the defragmentation tool is called *defrag.exe*. Set the programs to run monthly. Disk cleanup generally takes 10 minutes and defragging a hard drive takes an hour or so.

UPDATES, UPDATES, UPDATES

Can you imagine the difficulty of trying to create a piece of software that will run on so many different computers and hardware environments? Neither can I. So it goes without saying that most software will have security exploits. It is a matter of when, not if, they will be found by normal users and/or hackers.

My rule is that if the software touches the Internet, it needs to be updated regularly. This list is by no means exhaustive, but any operating system (Windows, Apple or Linux), Java, Flashplayer, Internet Explorer, Mozilla's Firefox or Google's Chrome or any email clients should be done whenever a new update is available. Most of the programs above will auto update if you allow them.

Specialty software and office suites are not exempt from security patches, either, so you may want to check those on a semi-annual basis, too.

YOUR OPERATING SYSTEM

As of December 2013, it is believed that nearly 30 percent of all computers are still running Windows XP, according to a February 2014 Net Marketshare report. Wow! Windows XP came out in August of 2001. Microsoft has announced that support for Windows XP expires April 2014.

Windows 7 is my suggested upgrade path, if you want to remain in the Microsoft ecosystem. Do yourself a favor and setup an admin account and a limited user account. The admin account is for things like adding devices or programs, and the limited account is for the rest of what you do on the computer. This alone is one of the biggest reasons why operating systems like Linux and MacOS are less prone to virus attacks and security issues as a whole. Nobody likes to be limited, but trust me, neither do hackers when they get access to your computer through a limited account.

Most of these proactive solutions are easily achievable, the exception being upgrading your operating system. Doing the actions prescribed above will not only keep your computer tidy, but may also lengthen the time between computer purchases.

Todd Dixon, CBRE, has been an assistant engineer with Crawford Broadcasting's Birmingham radio group for nearly 13 years. His IT duties include radio automation, studio and tower site network infrastructure and general staff computer support. Dixon's primary OS is Fedora linux.

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AWM Honors Two From Satellite Radio

SiriusXM's Cunningham and Mason win Gracie awards

PROGRAMMING

BY KEN DEUTSCH

More than 45 personalities, producers, writers and newspersons from TV, the Internet, film and radio are set to receive awards from the Alliance for Women in Media. Among the terrestrial and satellite radio honorees are two from SiriusXM.

Former print journalist Julie Mason served for 10 years as a White House correspondent before moving to SiriusXM's POTUS Channel 124 to host a weekday afternoon radio show called "Press Pool." "POTUS," as any fan of movie thrillers knows, stands for "President of the United States."

"I was repurposed," she said, joking about her switch to broadcast after decades as a blogger and newspaper columnist.

"The transition was so much fun. It was great to learn a whole new skill set. It scared me, which made me want to try it even more. Now I run my own board, which took me forever to learn. I have a terrific producer in Patrick Ferrise, and we work as a team."

Mason believes she offers something different from the other political commentators around the dial.

"Most political talk radio today is stuck in a partisan rut. I'm nonpartisan and an equal-opportunity offender. I call people out on both sides."

Before joining SiriusXM, Mason used her platform as a board member of the White House Correspondents Association to push for reporters to have better access to the president.

"It's important work, and is an ongoing process," said Mason. "The trend has been for the White House to give less access with each succeeding administration. Obama is the biggest offender so far, but the next president will be even worse."

Julie Mason. "I'm nonpartisan and an equal-opportunity offender. I call people out on both sides."

In spite of this frustration, Mason enjoyed the camaraderie of her fellow reporters.

"I knew the way journalists talked among themselves was interesting and smart, and I always thought there should be a better venue for these conversations, but without the profanity. Now I have that with my radio show. We want to bring on people who have access, and that brings the immediacy of politics to the listener. We keep it pretty informal. We're all delighted with our jobs, and you can hear it in our voices. And from what we hear back, the listeners enjoy it as well.

"I'm saving those for my memoir," she said, referring to her favorite funny stories about politicians.

YOUNG AND EARNEST

Fellow Gracie award-winner Julia Cunningham is 29 years old, and SiriusXM is her first paid gig in radio.

"I had almost no radio background," said the host of Entertainment Weekly Radio's daily three-hour "News & Notes," on Channel 105. "I started out at the University of Notre Dame, and they don't even have a communication department. A resident adviser in my dorm did a classical music show on the student station, and she said they needed more people there at WSND(FM).

"I ended up doing a classical show, and I knew nothing about classical music. I really messed up the song titles

Julia Cunningham. "Everyone contacts us to get on our show, publishers, stand-up comedians, all sorts of celebrities. They are all passionate about what they do and we don't say 'no' to anyone."

because I'm more into indie rock. Then I did a late-night rock show for a while, but after that my sister encouraged me to try for an internship at SiriusXM in New York City, which I got. That was in 2006. I moved up, and eventually, they gave me a paying job. I've been there ever since."

Cunningham confessed there is much that she doesn't know about radio.

"We get a lot of assistance on the show from Entertainment Weekly, which runs our channel. They have a wonderful staff that we can reach out to. Sometimes at our meetings we decide to try something, and if it works, great. Everyone there is very creative."

As a radio newcomer, Cunningham has been understandably nervous when meeting some of the stars she was asked to interview.

"When Ron Howard came on, I called him 'Mr. Howard,'" she said. "He said to just call him 'Ron,' and he was very down-to-earth. Everyone contacts us to get on our show, publishers, stand-up comedians, all sorts of celebrities. They are all passionate about what they do, and we don't say 'no' to anyone."

Cunningham has an unassuming personality on the phone, but she is aware that she is now a public figure.

"So far I haven't gotten any negative email from listeners, but if it happens, I will have to just remember that not everyone will love you."

What would Cunningham advise her listeners to do if she knew that the movie her guest was promoting was a turkey?

"I guess I'd say it's okay to wait for the DVD on that one."

Cunningham admitted that while she had interviewed many people for "News & Notes," our call was the first time someone had interviewed *her*.

AWM's 2014 Gracie winners will be introduced at the Beverly Hilton Hotel in May and will receive their prizes June 11 at a ceremony at the Hilton Hotel in New York City

"We're all delighted with our jobs, and you can hear it in our voices."

– Julie Mason

For 39 years the AWM Foundation has been recognizing and celebrating women who have made contributions of exemplary programming in all facets of media. For more on the Gracie Awards, visit *www.thegracies.org*. You can learn more about AWM at *http://allwomeninmedia.org*.

Cunningham's Twitter handle is @juliasiriusxmu. Mason has a website, *http://juliemason.co/about-julie*.

Ken Deutsch was ineligible for the Gracie awards because he is the wrong gender, but that was only one among many reasons.

C. Crane, Still Pumped About AM

"I believe that this technology has a future, particularly when you look at the numbers"

Photos: C. Crane Company

Bob Crane listening to distant stations on the CCRadio-SW AM/FM/SW Radio.

NEWSMAKER

BY JAMES CARELESS

Is making radios a growth business? It has been for C. Crane Company.

The U.S.-based radio designer/retailer C. Crane Company is noting its 30th anniversary. Operating out of a shingled 5,000-square-foot bungalow in the northern California town of Fortuna, C. Crane has earned a reputation for highly sensitive AM/FM receivers and antennas. Flagship products include the CCRadio 2E AM/FM/2 meter/WX portable receiver, CC SW Pocket AM/FM/SW pocket-sized receiver and CC WiFi Internet Radio.

Over the years, C. Crane has grown from a backroom hobby shop run by Bob Crane and his wife Sue, to a full-time company that employs about 40 people and sells products worldwide via *www.ccrane.com*.

Its success is the result of a happy accident: Bob Crane's passion for AM radio.

A PROBLEM OF RECEPTION

Three decades back, the couple moved from San Francisco 300 miles north to Fortuna. "At this distance, I couldn't pick up my favorite San Francisco AM stations," Bob said. "I just had to be able to get them, so I started searching around for an antenna to help me out."

Crane's salvation came in the form of the Select-A-Tenna 541 loop antenna built by Dick Mercier of Intensitronics in Hales Corners, Wis. Basically a tunable plastic-encased loop antenna standing 11 inches tall, the Select-A-Tenna can add up to +30 dB signal gain when paired up with AM receivers that have internal ferrite rod antennas. The Select-A-Tenna doesn't even plug in; you just sit it beside the radio, and turn the Select-A-Tenna's tuning knob until signal strength is maximized.

Crane, who had been earning a living by designing and constructing woodworking projects in the Bay Area prior to this business inspiration, was so blown away by the Select-A-Tenna's AM performance that he arranged to sell it himself from his home. He's holding one in the photo, above right. (C. Crane later added a few improvements to the Select-A-Tenna, with a remote ferrite connection to a radio and the ability to be hardwired to a stereo.)

As for advertising, the Cranes paid for ads on KGO(AM) in San Francisco, followed by placement on KDWN(AM) in Las Vegas. "There was this guy named Art Bell who had started a show

Sue and Bob Crane are dressed up and ready t

there," Crane recalls. "We started with him on this one station, and stayed with Bell as his network grew."

STEADY GROWTH, UNEXPECTED CONSEQUENCES

C. Crane began by selling others' products; first the Select-A-Tenna, then the legendary GE Superadio II AM/FM (known for its distance signal sensitivity) and the affordable digital/direct entry Sangean ATS-803A AM/FM/SW receiver.

"During this time, we wanted to find a way to incorporate the Select-A-Tenna's gain boosting ability with an actual radio," Crane said.

"It took us from 1989 to 1998, working with Taiwanese manufacturer Sangean, but we finally achieved this goal with the twin ferrite-bar CCRadio in 1998."

In creating the that model, Crane and his team found themselves struggling with noise generated by the radio's digital circuitry.

"Since noise is exactly the thing that can ruin distant AM signal reception, we tinkered with this set, finding ways to shield critical components with bits of metal and soldering," said Crane. "It was just a matter of hands-on work combined with luck. We had to keep at it until the noise had been reduced."

Such was the demand for C. Crane's products that Crane and his wife were able to quit their day jobs to work on radio sales full-time.

But success brought an unexpected problem. "One day in 1992, I looked down our long gravel lane at home, and noticed that cars were backed up 500 feet to our front door," he said. "That's when I said to my wife, 'Sue, I think we

elebrate C. Crane's 30th anniversary.

need to get a store for the company.'"

The advent of the Internet opened C. Crane to the world. "We were already publishing a full-color catalog, so using this information to create a website was easy. The downside was handling the uploads, and the traffic. After all, we're in rural California; we were on dialup for a long, long time."

A PASSION FOR THE NEW

Bob is an engineer-designer by trade, someone who loves to come up with new ideas. He has helped developed pioneering audio products over the year, including the CC Witness digital audio player/recorder/radio receiver (an "iPod" on steroids that can record AM/FM radio on the fly) and the CC WiFi Internet receiver.

C. Crane had developed a digital recorder and player two years before Apple, but the hard drive was clunky and the resources needed to mainstream the product were beyond their means. Too bad!

At $99.99, the CC WiFi was an early, affordable and reliable WiFi radio. It remains in production, although Crane is planning a second version with better sound and less utilitarian looks.

"We've also been happy to sell good third-party radio products, such as those made by Sangean, Sony and Uniden," Crane said. "We've also diversified into energy-efficient LED lighting, and WiFi antennas that can connect to networks a mile away. But AM radio remains our passion."

Crane does not offer HD Radio products on its site. "I'm no fan of HD Radio, particularly HD AM," he said. "Frankly, I fear that HD AM could be the death of AM radio, simply because it will compromise its big advantage: Its ability to cover long distances to provide listeners with free content. That's why C. Crane does not promote this technology."

Regarding current industry comments about AM "revitalization," he said, "There has recently been some great discussion in Radio World with interesting ideas, and these should be seriously considered," he continued. "I would also look at Silicon Labs' new low-cost integrated AM/FM radio chips with brick-wall filters. Add some simple creative noise cancelling that can be available with new DSP chips and you have an easy, relatively low-cost solution. The changes on the broadcast end would be minimal, if any."

LOOKING AHEAD

"I remain as pumped as ever about AM radio and its unique content," said Crane. "I believe that this technology has a future, particularly when you look at the numbers. After all, the Internet has cut TV's audience by 50 percent and FM by 30 percent, but AM by only 20 percent. So if you want to know which medium is the most robust going ahead, I would have to say AM."

As a result, Crane will continue to design and build highly sensitive AM/FM receivers, at a time when many manufacturers treat radio as a technology whose day has past.

"Say what you will, but nothing tops radio's unique ability to be a companion, rather than something that demands your full attention. Radio allows you to see another person's soul better than most other media," Crane said. "That's why I love this medium, why others still love this medium, and why I will keep building the best AM/FM radios that I can."

FM Inventor Recognized in Yonkers

Six decades after death, Major Armstrong has his plaque

ROOTS OF RADIO

BY SCOTT FYBUSH

When the inventor of FM radio stepped out a New York City window to his death 60 years ago this winter, he was despondent about the fate of his invention amidst a pitched legal battle with the giant Radio Corporation of America.

We can't get inside the Major's mind on that frosty Upper East Side night, but it's easy to imagine that he believed his work developing FM would fade into technological obscurity.

What would Maj. Edwin Howard Armstrong have made, then, of the crowd that gathered last summer to dedicate a plaque in his honor at one of the spots where he was happiest, his native Yonkers, N.Y.?

Armstrong was born in 1890 in a huge Victorian home just across Warburton Avenue from the site of the bronze plaque in Hudson-Fulton Park. Much of his early work in radio, including the development of the superheterodyne system in the early years of the 20th century, took place in the attic of the Warburton Avenue home. And after Armstrong's feud with RCA chairman David Sarnoff pushed his early FM experiments out of RCA's space in the Empire State Building, the Major looked just across the Hudson River from Yonkers to build his unique three-armed tower in Alpine, N.J., in 1937–38, easily visible then and now from Warburton Avenue (shown below).

Armstrong relatives remained in the home on Warburton for decades after the Major's death, but the property was sold in the 1980s. The house eventually was razed and replaced with a blocky apartment building, leaving nothing at the site to tell visitors the story of the remarkable man who'd once lived and invented there.

Steve Klose, who conceived of the plaque and oversaw fundraising and installation, celebrates at completion of the project.

Enter Steve Klose, a New Jersey resident who knew little about radio history but learned of Armstrong because of their shared interest in fast motorcycles.

Klose became fascinated by Armstrong's story and increasingly convinced that his legacy needed to be remembered with a plaque on Warburton Avenue. Beginning in 2012, Klose led a fundraising campaign that generated more than $4,000 in contributions to pay for the plaque. Working with Yonkers officials, he considered several sites for the plaque, eventually moving from the actual site of Armstrong's home across the street to the park, where a viewing platform extends from the edge of the steep cliff overlooking the river.

With a picture-perfect view down to the Hudson and across to the Alpine tower, the wall of the viewing platform proved to be an ideal spot for the memorial.

Yonkers mayor Mike Spano and several city councilors were on hand for the dedication ceremony, joined by two Armstrong descendants. The ceremony even had a live broadcast, though few contemporary listeners could hear it. The line-of-sight across the river made for an easy Marti shot to the Alpine tower, where the ceremony was simulcast on WA2XMN. That's the experimental "Armstrong memorial station" that transmits on Armstrong's old 42.8 MHz frequency from the tower in Alpine using a replica Phasitron transmitter lovingly hand-built by Pennsylvania engineer Steve Hemphill, who hosted the live coverage from a corner of the park.

"He changed the world with his inventions, and it all began right here," said Armstrong relative Adam Brecht, who read a letter from Jeanne Hammond, Armstrong's great-niece and, at 92, the inventor's oldest living relative. Her letter shared stories of Armstrong's family side, recounting the tight bonds among family members who lived in a cluster of adjoining homes on Warburton Avenue and the neighboring streets that climb steeply uphill toward downtown Yonkers.

A vintage radio (with modern external speaker) is tuned to the WA2XMN test transmission before the event starts.

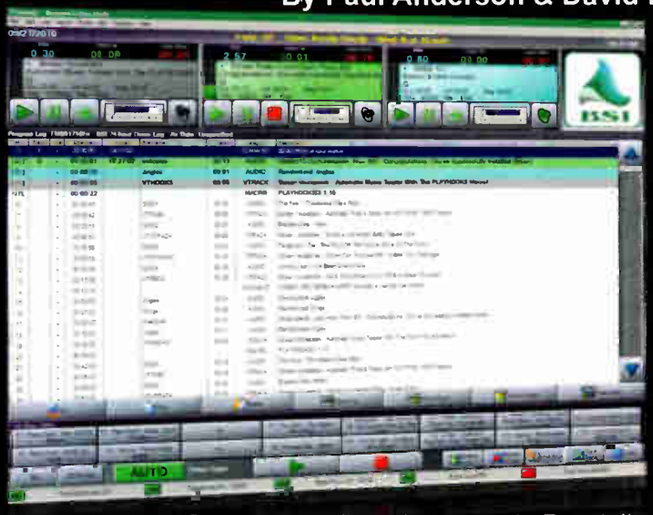
After the half-hour ceremony on a warm, sunny afternoon, guests were treated to a cake displaying an image of Armstrong.

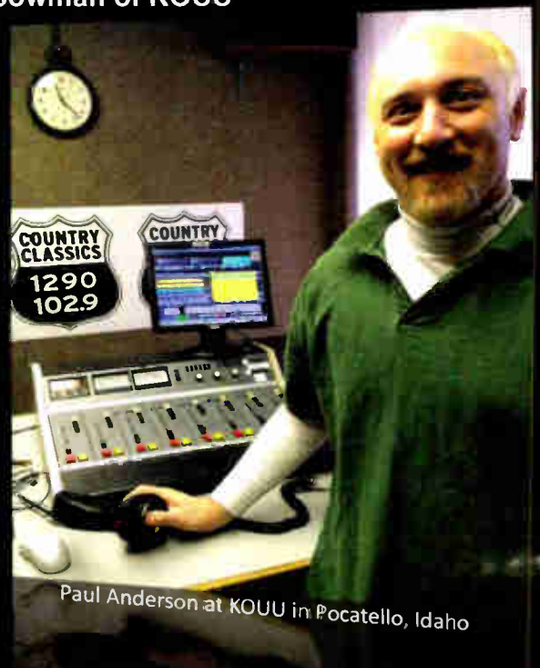
With the 2018 centennial of Armstrong's superheterodyne patent approaching, the plaque may not be the last commemoration of Armstrong in his native Yonkers. City officials are working to get a replica made of a bust of Armstrong now on display at Columbia University, and there's talk of renaming part of Warburton Avenue in the Major's honor.

Scott Fybush is a longtime contributor.

Streaming Made Simple! With Simian 2.2 Pro & Lite

By Paul Anderson & David Bowman of KOUU





Paul Anderson at KOUU in Pocatello, Idaho

Idaho Wireless Corp is a small market group in Pocatello, Idaho, and we're the only independently owned and managed radio group left in our market. As technology evolves we evaluate the costs and benefits of each change, and streaming was one of those projects.

When we changed the format January 1st on our 50,000 watt AM KOUU to Country Classics the response was immediately positive, but our audience wanted to listen in their offices and on their smart phones. We had considered streaming KOUU in the past, but the expense and complexity meant it was always a project that got pushed back to "later".

In 2009 we installed our first Simian system, replacing a beloved but tired Scott Studios system. We were ready for the benefits of a Windows based system that had more features, and we found that Simian is easy to use, powerful, and installation was a breeze. Since then we've converted all of our stations from Scott to Simian.

Simian offers many options to set up streaming. Country KOUU audio streaming is being outsourced to a third party (Crystal Media Networks) using data provided by Simian. Using the Metadata tab in Program options is where all the set up takes place. Crystal Media Networks required certain parameters to interface with their streaming player. The majority of the setup is all contained in an .xml file.

To create an .xml file, use Notepad and type in the syntax for each parameter required by the streamer (Syntax for Artist is <artist><![CDATA[%ARTIST%]]></artist>). Simian support can help with this, or a template is pictured in the Simian Pro Manual. In the case of KOUU, Artist, Title, Filename, Category, and Length of each piece of audio was provided to Crystal Media Networks. This file becomes the Template File.

Some final setup is required. The template file is loaded in the Metadata tab in Program Options in Simian. The IP Address corresponds to the computer that will be accessed by the streaming software. This computer needs to be networked to the on air Simian computer. The port and TCP/UDP address is set up with information provided by the streaming company (in the case of KOUU, Crystal Media provided this information).

All of the programming for KOUU is played by the Simian Pro system. In order to stream with more than one source (i.e. switching from local audio to network audio like a satellite receiver) Data Repeater-available from BSI-can handle multiple metadata sources and destinations.

Our streaming project for KOUU was easier than we imagined. The support team from BSI and the streaming features of Simian made it simple.

Paul Anderson is the General Manager of KOUU, KZBQ and KORR. David Bowman is the Operations Manager. KOUU uses Simian Pro, though the metadata output features of Simian Pro are also available in Simian Lite. Simian Pro & Lite contain built in metadata output templates for Windows Media Encoder, ShoutCast, IceCast, SAM Cast, Live365, Orban Optimod, and Omnia A/XE. Metadata output in Simian Pro & Lite is template based, so most stream encoders not listed are compatible.

Wheatstone AirAura X3 Serves Entercom

Processor supports two stations in a market that's competitive on quality

USERREPORT

BY DAVE MATYIS
Director of Engineering
Entercom — Austin

AUSTIN, TEXAS — I have been impressed with Wheatstone products for some years. We have been using D-4000 consoles for nearly a decade in some of our rooms at the Entercom Austin cluster, and they are still operating well and maybe more importantly, are well-supported. They continue to integrate well with our newer IP control surface consoles, too, with the use of WheatNet-IP Blades, which are similar to network node units but have more functions.

With that thought of integration, the new Vorsis AirAura audio processor by Wheatstone was our next logical step for replacing some older on-air processors for our two Entercom market-leading FMs, KAMX(FM) Mix 94.7 and KKMJ(FM) Magic 95.5.

FLEXIBILITY

Austin, with its claim of being the "The Music Capital" is, of course, competitive on quality. Our existing processing had fallen behind what some others in the market were doing. So we researched and decided on Wheatstone.

We were early adopters of the AirAura, one the first handful of stations in the country to have one. I would never have done such a thing without a lot of confidence in the company. I was OK with it, though, as I had listened to the processor intently at their NAB demo and witnessed the very first installation at the Beasley Broadcast cluster in Las Vegas. The "try it before you buy it" demo with our programming at our stations sealed the deal.

Although the initial learning curve is a little high and the user's manual was not yet finished, the results have paid off.

Our first unit was version 2.6, and in recent months, we updated to the latest software version, X3, to add a few more features. It needs to be noted that the hardware is the same for both the earlier V2.6 and newer X3, only the firmware programming of the DSP was changed. Because our unit was one of the first to upgrade to X3, we needed to make adjustments to our presets with the upgrade. That isn't a problem for anyone buying an X3 now. With this change to the X3, the processor is so much more flexible. It's louder and more open than ever, and the advanced technologies of WheatNet-IP and baseband192 make the X3 version of AirAura stand out, not only against its previous version but against other offerings on the market.

In that light, increased control of existing features plays a big part in what this new update is all about. The improved Bass Tools (previously VBMS) have greatly increased the ability for a station to fine-tune the bottom end for a solid punch on multiple types of speakers and listening environments and yet not have that dreaded muddiness or distortion that often follows. Bass Tools adds coupling with the limiter and filter options not available in our previous version of the AirAura.

The processor has separate processing for analog and HD Radio, Wheatstone's multipath limiter that helps manage stereo enhancement, Sweet Spot Technology that manages audio on the front end of the processor and even more factory presets than in any previous version. The list goes on and on.

I am also looking forward to the implementation of WheatNet-IP throughout our facility with the installation of our new automation system. The AirAura X3 can accept analog, AES or WheatNet audio inputs for what can now be a totally digital pipeline throughout the entire facility right through to the exciter via Wheatstone's baseband192 digital interface. This will eliminate the final analog composite feed to the exciter and the limitations with overshoot and composite cable characteristics, especially if you are forced to have a long run because of your physical transmitter plant layout. Our Nautel exciters now have the capability to do this, so this will be an imminent update.

OK, HOW DOES IT SOUND?

I have a music as well as engineering background and have always been an audio fanatic, but have learned over the years that it is not always practical to obsess over it given the realities and limitations of broadcast technology. Well, those days are numbered.

This new AirAura X3 has been enlightening, especially if you are able to feed it from a digital plant with high-quality source material, as more and more stations are doing.

Although we don't care about being the loudest thing on the dial in favor of a long-term listenable signal that actually has some dynamic range, we do want to be competitive.

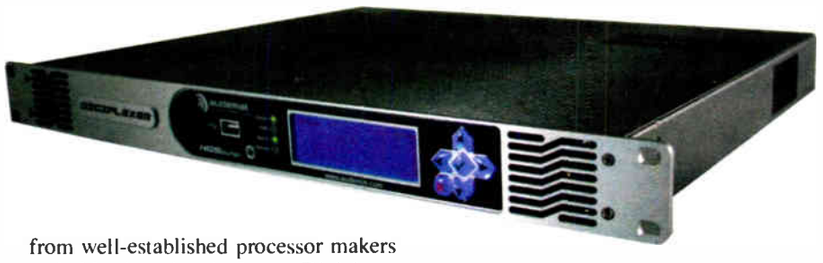
For information, contact Jay Tyler at Wheatstone in North Carolina at (252) 638-7000 or visit wheatstone-processing.com.

Atresmedia Adopts Audemat Digiplexer

Spanish broadcaster likes built-in RDS encoding along with the sound

USERREPORT

BY FELIPE MATEO LOPEZ
Technical Maintenance Manager
Atresmedia Radio



MADRID — Atresmedia Radio is the second-largest commercial radio network in Spain and operates three national radio stations: Europa FM, Melodía FM and Onda Cero, the second-most-listened-to station in the country. When it comes to audio processing, here at the network, we have selected the Audemat Digiplexer units for several purchases in the last six years and have been pleased with their performance.

We installed some Digiplexers in Europa FM when we were looking to improve the sound performance of the station. As technical maintenance manager, I am in charge of a team of technicians who are responsible for introducing new technologies and frequencies, as well as managing the preventive and corrective maintenance for our broadcast equipment. As such, I want to make sure that any new system not only meets our specifications with regards to price and technical aspects but also will ensure that it comes from a reliable company with a reputation for reliability and responsiveness.

When sourcing a new audio processor for Europa FM, we evaluated systems from well-established processor makers and felt that the Audemat Digiplexer offered the best all-around solution in terms of technical characteristics and the investment required. Critically for us, it delivered the sensation of much greater volume with the same level of modulation. Also, as the system featured RDS encoding capabilities, it meant that we did not need to purchase a separate unit to incorporate RDS messaging into our broadcast signal and only had to train our engineers on one device.

We have a mono channel link from the studio to the transmitter site so we prefer to install the audio processor at the studio. This way, we also have complete control over the unit. As the RDS encoding is integrated into the unit, the installation process was streamlined and simple for us to achieve.

We worked with WorldCast Systems in the early stages to establish the best sound processing schemes for our stations. These are now predefined presets which are easily copied to additional units purchased. In 2013, we purchased 20 additional Digiplexers to establish our newest station, Melodía FM, and we have recently taken delivery of 10 others for new frequencies within Onda Cero and Europa FM. In total, we have close to 50 Audemat audio processors operational in our network.

All in all, the Digiplexer is a powerful unit with great sound quality that provides our broadcasts with a sense of "volume."

For information, contact Tony Peterle at WorldCast Systems in Florida at (305) 249-3110 or www.worldcastsystems.com.

TECHUPDATE

DAYSEQUERRA GETS HD RADIO ON TIME

Having time-alignment problems with your HD Radio? Perhaps the DaySequerra M4DDC might help.

The M4DDC is a diversity delay control that runs the company's proprietary TimeLock algorithm to maintain time alignment of the HD Radio MPS and HD-1 audio streams automatically.

The M4DDC can email alerts for loss of TimeLock, Level-Lock (optional), program audio, carrier or OFDM HD Radio Lock. There are five rear-panel alarm tallies. The unit is compatible with PPM codes, protecting them while rebuilding audio. Delay can be up to ±7 seconds.

An onboard Web server allows for remote operation and updating. A front-panel lockout provides security.

For information, contact DaySequerra in New Jersey at (856) 719-9900 or visit www.daysequerra.com.

BROADCAST EQUIPMENT EXCHANGE

Submit your listings to: minderrieden@nbmedia.com

CONSULTANTS

ACOUSTICS

ANTENNAS

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 SELL

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

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 or ilg821@aol.com.

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

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.

DISTRIBUTOR DIRECTORY

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

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.

STATIONS

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.

TRANSMITTERS/ EXCITERS/TRANSLATORS

WANT TO SELL

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

TRANSMITTERS/EXCITERS/TRANSLATORS

TUBES

EMPLOYMENT

HELP WANTED

WANTED: Engineer w/good background in analog (NTSC) TV, associated studio equipment, microwave (7GHz), cameras, FM stereo, etc. This will be a volunteer position for a mission in the country of Haiti. We have a Larcan solid state TV transmitter, 30KW on Ch 6 and a McMartin 3.5KW FM on 107.1. 3 Ikegami studio cameras, Grass 100 switcher and a "home entertainment" switcher. 2 stereo boards, one TV, the other FM. A bunch of DVC Pro decks (yet to be shipped) teleprompter, uA microwave to be replaced this year with a newer Harris 7GHz. 80KW diesel prime power at the transmitter site(new in 2012), ERI 6 bay roto-tiller antenna and an RCA TF-6BM batwing , 6 bay for TV, no null fill on either. A stand-by transmitter, RCA TT-6, mostly tubes. The next trip should be in late March. The main purpose will be to finish repairs on the TV antenna, paint it with primer and then a second coat of aviation orange. The tower crew will be there for a week and I'll be there for probably 3 weeks. The last two for me will be to finish the camera install and set up, replace the microwave TX and RX, teach the Haitians how to run it all and what to expect from the equipment. If interested, you will need a valid US passport and a good Christian ethic. Then contact me wb0cmc@cox.net and I'll be happy to fill in any questions you may have. It has been rewarding for me to be able to put my faith to work in an occupation I love and seeing how it changes lives. My tower guy says the same thing. The pastor puts us up while there and provides transportation, translation and meals. We buy our own air fare. I can also be reached @ 402 932 3443 here in Omaha. We're ecumenical though owned by the Lutheran church of Haiti.

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.

Experienced radio station manager seeks new management opportunity. More than 39 years experience in radio. Willing to relocate. Family-friendly format(s) preferred. Send details about your management opening to: radiogm@hotmail.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.

Let the good times roll! DejaVu here, looking to fulfill and spark up your station. Lively, with a smile you can hear. 817-691-1698 or dejavurobinson@gmail.com.

Embrace New Platforms and Follow Your Audience

NAB's chief operating and strategy officer urges NABA to consider opportunities

NEWSMAKER

BY CHRIS ORNELAS

The following is excerpted from a transcript of Chris Ornelas' keynote address at the Annual General Meeting of the North American Broadcasters Association in New York in February.

Ornelas is the chief operating and strategy officer of the National Association of Broadcasters in the United States. He told his international broadcast colleagues about the NAB's mission and current issues.

My boss, a former two-term senator from Oregon, gave me some speech-making advice before I left Washington. He said, "Be sincere, be brief, be seated." That is my intention today. But I do want to take our time together to address what I see as the challenges and opportunities ahead for broadcasting, both in Washington, where I make my daily bread, and in the marketplace where each of our member companies at NAB compete every day.

Every morning, it seems, presents a new challenge for us as broadcasters both in Washington and in the increasingly fragmented marketplace for eyeballs, ears and advertising dollars. But in each of these challenges, if you look closely, lies a kernel of opportunity.

So it is with regulatory and policy issues in D.C. where we engage in hand-to-hand battle daily with competitors that are attempting to use lawmakers and regulators to liberate broadcasters from their spectrum, diminish the value of the content we carry into every living room, and tax the music we provide for free to 250 million listeners every day.

WE ARE BROADCASTERS

Working in unity with TV and radio broadcasters, the NAB has led the charge on Capitol Hill and at the Federal Communications Commission, stopping performance tax legislation that we deemed harmful to our listeners, and shaping spectrum legislation to advance and protect the interests of broadcasters.

To augment our efforts in Washington, radio and television stations united to remind lawmakers and every American of broadcasting's integral role in every local community through our "We Are Broadcasters" ad campaign. This video ad and its accompanying radio spot ran over 700,000 times on over 1,200 stations this past year. It reintroduces Americans to their local broadcaster and drives home the important public service we provide in communities large and small across the country.

Chris Ornelas

Again, in December of 2012, our country watched in horror and disbelief as unthinkable violence was perpetrated on an elementary school in the small town of Sandy Hook, Conn. A few weeks later, the White House summoned the NAB and leaders in the media industry to discuss violence in the media and its role in these increasingly all-too-common tragedies.

American broadcasters responded this past year by launching a nationwide multiplatform public service campaign to increase understanding and awareness of mental health issues, which underpin every recent act of violence.

The campaign directs people to OK2TALK, a Tumblr-based community where teens and young adults struggling with mental health problems can share personal stories of recovery, tragedy, struggle or hope. By inviting young people, their families and friends to add their voice in a safe, moderated space, the campaign encourages an organic conversation about mental health challenges and recovery stories. The site also includes resources for those seeking help.

Local radio and TV stations across America donated airtime valued at over $35.5 million for this mental health public service announcement campaign. This includes more than 293,000 TV and radio airings, with nearly 1 million Web page views, where the site has seen more than 100,000 clicks on the "Get Help" button, which takes visitors to *www.mentalhealth.gov* and suicide prevention resources.

Broadcasters met the challenge, found an opportunity to leverage their platform and made a difference on an issue of profound importance to the American public. At NAB, we try to find the kernel

(continued on page 38)

CROSSED FIELD ANTENNA

(continued from page 1)

Revitalization of the AM Radio Service), it would seem that the CFA's time finally has come.

Crossed Field Antennas Ltd. filed its comments Jan. 13 (*http://bit.ly/1oTPWnG*), and since that filing, we have had several inquiries about the antenna from broadcasters who are interested in how the CFA can benefit their companies.

SMALL WONDER

Perhaps the most important aspect of the Crossed Field Antenna is its small size. Typically, a CFA is no larger than 4 percent of the wavelength of a comparable 1/4 wave driven or mast antenna. In addition, the CFA requires no ground system or earth mat. The combination of these two factors means that a Crossed Field Antenna needs almost no land, and in many instances can be mounted on the roof of the transmitter building.

Thus, for the first time, a station operator can monetize or liquidate the land previously used by the tower and its ground system.

In addition, the CFA is able to minimize or eliminate skywave radiation. Doing so will allow an operator to put all of that wasted skywave energy into the ground, giving a far stronger local signal, and in many cases, allow the operator to go from a directional pattern to omnidirectional, or a daytimer, to serve its local area on a fulltime basis.

In many cases, a CFA can be purchased out of the profits generated by the sale of the existing AM tower property.

There have been CFAs operating in Egypt with power up to 100 kW for at least 10 years (see the cover photo).

WHAT'S THE CATCH?

At about this stage, a typical engineer will ask: "What are the drawbacks?" My answer always is the same: There are none. In my judgment, if there is a drawback, it is that the technology is so unique and radical that many otherwise qualified radio engineers simply refuse to accept that there might be another method to distribute a signal that, in effect, flies in the face of Marconi's original (and mostly unchanged) concepts.

Courtesy Robert Richer

10 kW CFA installed by RAI Radio, San Remo, Italy.

The CFA takes Maxwell's Fourth Equation, massages it and produces a small, broadband, highly efficient transmitting antenna.

We are at the stage where we need one final investment that will allow us to build a CFA at our test site in southern New Jersey, so that we can submit the results for approval by the FCC. We are using highly respected Project Engineer Ted Schober to help us build, test and submit the results to the commission, which has been supportive of our efforts.

This is a great antenna — a radical antenna. Allowing its use by AM broadcasters in the United States will go a long way to resolving the issues raised by the FCC in its latest rule making proposal.

It is my hope that broadcasters with a sincere interest in the future of AM radio will check our FCC filing and comment accordingly. Further, I hope that those with a sincere interest in strengthening AM, and who would like to profit by the growth of Crossed Field Antennas Ltd., will contact me to discuss the prospects of an investment.

Robert E. Richer is president and chairman of Crossed Field Antenna Ltd.

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

The Great AM Debate Rages On

If it's broken, how should we fix it? Readers weigh in

Share your thoughts. Write to **radioworld@nbmedia.com**

AM SIGNALS NEED CLARITY

Larry Langford hit the nail on the head with his article ("Improving AM: Some Tough Decisions Ahead") in RW's March 1 edition. As an old "boomer" who grew up listening to WLS on my six-transistor Zenith radio (which I still have), it is obvious to me that one of the big reasons for the decline in AM listening is that most radios made today can barely pick up even a local station on AM.

There are some exceptions. With the Delco radio (made in Indiana) in our '09 Malibu, I can listen to ESPN on 500-watt AM 1130, WFNF (Brazil, Ind.) all the way to Indianapolis or Bloomington, a 60-mile drive from Brazil, where I live. When I drive my '09 Kia, I can carry AM 1130 maybe 20 miles before static and noise drowns it out. Many people inside buildings with one of today's AM wonder boxes cannot pick up AM 1130 even here in Brazil!

I'm not sure that a federal mandate on making receivers better is a good answer. I'm not sure the public's interest in AM radio is strong enough anymore to support such action. But all the hoopla about AM transmission systems and IBOC will never work, unless people can listen to the AM signals with reasonable clarity, which will require a better receiver.

Mike Petersen
Consultant
Mid-America Radio Group
Bloomington, Ind.

SCRAP IT AND MOVE ON

Larry, thanks for taking the time to write an excellent commentary on this major issue, for which there is no simple answer. Your article was succinct and clearly "capped" the issue.

We know that AM IBOC does not work. Let's scrap it and move on to other possible solutions/options.

I still receive calls and visits from folks looking for good-quality AM receivers, as most are an after-thought for the manufacturer.

I even stock a few quality AM radios — GEs or C. Cranes (cannot afford Bose) — to give to AM listeners of my stations who are having issues with their garbage tabletops.

As an avid nighttime AM listener, however, I do want the higher-power (clear-channel) AMs to keep banging away.

With all the fancy receive filtering in my ham gear, one would think there would some method to increase selectivity in AM receivers without sacrificing sensitivity.

Allan A. Augustyn
Director of Network Engineering
Radio Results Network
Escanaba, Mich.

CORRECTION

AM COMMENTS

Our roundup of AM revitalization comments in the March 12 issue misquoted an FCC filing from Georgia-Carolina Radiocasting Companies. Discussing tax credits as incentives for AMs to give up their licenses, the broadcaster wrote: "GACA believes there are many hundreds if not thousands of AM stations which would be incentivized to relinquish their AM licenses if the commission would have Congress enact tax credits for the surrender of AM station licenses." Our published text misstated that as "hundreds of thousands." (There are approximately 4,700 AM stations in the United States.)

THESE AM "FIXES" FACE PROBLEMS

Big-market companies and big-market engineers such as Scott Clifton of WLS ("AM, You Want a Fix? I Got a Fix," Feb. 12) always seem to go down the same path of technical fixes.

Simply put, repacking and moving are complicated and expensive. Let's address a few of the problems with the "fixes."

Moving. All new radios are required if we go to Channel 5/6 or wherever. When the FCC let some go to the extended band 1600 to 1700, how did that work out? Not well. The public moves really slowly.

Digital. All new radios required. It has been shown by articles I've read in Radio World and by personal experience to be nothing but trouble and expense. As a licensed technology that just keeps taking cash, it is repugnant.

Quality of signal. Not scientific but real-world. Crossing Pennsylvania in the middle of the day in October, I ran across an AM/FM simulcast. In a 2004 PT Cruiser with a factory radio, I went back and forth between AM and FM to judge the audio quality. AM was different but not bad. It did lose quality more quickly than FM as you left the strong signal area. I was judging music.

I act as chief engineer only until I have to call in my contract engineer for complicated things, but I'm not stupid. When my signal goes past Lake City, S.C., and past Kingsburg where it doesn't normally [extend] because it's just a swamp out there, I understand ground conductivity. All our measurements are correct, so we are at legal 1,000 watts. With a car and a radio, and you can judge changes to signal propagation. I listen to see if my signal is correct so we are "good neighbors."

I know this stuff because I want to; but in small-town radio, you also really need to. It's amazing how good a signal you can transmit if you pay attention.

Talk to anyone anecdotally, and they will tell you what's wrong: Boring, tedious, repetitive programming. I asked a clerk in a running store, "Do you discover new music on the radio?" Answer: "No, there is nothing there."

Good, live, AM radio works. Plastic banana automated highly scripted radio — AM or FM — doesn't work.

One final question: If AM is such crap, why can't I buy a signal in a major market at a reasonable price? These revitalization articles have mentioned people paying 20 times earnings to arrive at a price. You're gonna die on that one.

Jim Jenkins
Owner/General Manager
WAGS Radio
Bishopville, S.C.

LET GREAT GRANDPA AM GO

An AM fix? Please, we may as well waste our time trying to bring back the steam locomotive. The Digital Dash will soon make obsolete both AM and FM. Why longtime radio professionals are so reluctant to embrace the new, superior delivery system that is the Internet is beyond understanding.

The Digital Dash will offer well more than 100,000 audio choices, with tens of thousands commercial-free. This changes everything in ways we can yet imagine.

When given a choice between 1920s/'30s radio technology and a 21st century, interactive, worldwide delivery system that provides high-fidelity audio, video, graphics, text and best of all, accurate analytics and precision targeted advertising, the choice should be simple.

Great engineers like Scott Clifton ("AM: You Want a Fix? I Got a Fix," Feb. 12) should be leading the way in helping make the argument that terrestrial broadcasters need to prepare for the incredible changes and challenges, the Digital Dash will offer; not making arguments for another "fix" for AM.

Everything has a beginning and an end. It's time to let Great Grandpa AM go. He enjoyed a glorious life; in his heyday he ruled the world, but his timed has passed. It's time to let go.

Frank A. Gagliano
Owner/President
ArcLight Media Group
Los Angeles, Calif.

FOLLOW YOUR AUDIENCE

(continued from page 36)

of opportunity in every challenge. But, we are, in the end, merely a reflection of the industry we serve.

WHAT IS OUR VISION?

Every day, in every community, whether by charitable acts, as a lifeline when all other forms of communication fail, or in helping to rebuild communities devastated by natural disasters, broadcasters are finding opportunities to make a difference in the face of every challenge.

In Washington, TV and radio, large markets and small have successfully unified in our advocacy and our work in securing broadcasting's important place in American life continues. As we continue our work in the nation's capital to secure laws and regulations that promote a healthy robust broadcasting industry it is wise to acknowledge that the sands around us are shifting. Cable companies are in telephony, traditional telephone service providers — wireless or otherwise — are in video, and everyone is delivering broadband. Broadband over cable, fiber, satellite and wireless platforms and its ability to deliver rich multimedia content to consumers has certainly blurred the lines in Washington.

And in the marketplace, broadband has historically demonstrated that it will disrupt existing media markets, deliver new products and services to consumers and destroy incumbent service providers who choose not to adapt. The time has come for us to unite in our embrace of the opportunities presented by new technology and to realize the consequences if we don't. We must ask ourselves, "What is our vision for the future of radio and television?"... and "How do we grow our businesses?"

Emerging technology presents a great opportunity for broadcasters to provide viewers and listeners with our highly valued content anywhere, on any device, anytime they want it. Whether we harness the power of broadband to stream our content or utilize our one-to-many architecture, to deliver content to consumers where and when they want it — one thing is certain, our future lies in our willingness to embrace new platforms, and to go where our viewers and listeners want to go. ...

RADIO'S OUTLOOK

The challenges confronting radio are no different. Have you seen the dashboard in automobiles today? In most cases, radio is competing with a streaming service, satellite, an MP3 connection and a CD player for listeners. And how about that line at Starbucks where seven out of 10 folks are wearing ear buds connected to their smartphones? How many of those folks are listening to local radio? I have no doubt we will we continue to retain our rightful place in the automobile, and that we'll be offering not just AM, not just FM, not just HD, but an interactive hybrid experience that gives our listeners more options than ever before, all for free.

The time has come for us to unite in our embrace of the opportunities presented by new technology and to realize the consequences if we don't.

We were reminded when Hurricane Sandy struck the Eastern Seaboard of the power of our platform. Radio is an indispensable lifeline to every local community. It was also a reminder that built-in radio in mobile phones is an effective way to inform people of pending danger. Up and down the Eastern Seaboard, we heard stories of cell networks and broadband connections being down for days, even weeks. But radio was always on ... always there for its listeners.

The late Sen. Frank Lautenberg of New Jersey said of broadcasters' response during Hurricane Sandy, "Local radio, especially, was a lifeline for those without power, and I applaud everyone who worked around the clock to make sure that residents received timely and accurate information."

Radios in smartphones that combine over- the-air and online content for a rich, "hybrid radio" experience provide interactive enhancements, along with potential new revenue opportunities for broadcasters. NAB Labs — our innovation team — has been working on this technology along with many radio broadcasters.

There is so much potential for this service. We just need to continue educating, and also incentivizing, our friends in the wireless industry about the benefits of voluntarily providing their customers with the instant emergency information broadcasters provide.

Thanks to many leaders in the radio business, like Jeff Smulyan of Emmis, Sprint customers now have a wide variety of smartphone options that receive local NextRadio stations without using a data plan — this is great news for radio listeners. There is no better or more reliable resource for information during times of crisis than broadcast stations.

But as consumers' media consumption habits change, how will you keep one step ahead of them? Is the future streaming, or is it OTA, or both? To be sure radio has its own set of challenges. But in those challenges lies opportunity, if we have the courage and foresight to embrace technology and invest in our future. Churchill once said, "A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty." I like that, and I believe that broadcasters are also a naturally optimistic bunch.

Even in a world of tablets, smartphones and digital dashboards, broadcast radio and television are as relevant today as ever. As Americans become dependent on new technologies, radio and television continue to thrive and prove time and again their dependability when all else fails. But we must keep our eyes focused on the new doors that open before us. The danger for any business that becomes complacent is its being left behind.

This transcript appeared in the March 2014 issue of NABAcaster and is used with permission. The North American Broadcasters Association is a non-profit association of broadcasting organizations in Canada, United States and Mexico. Visit www.nabanet.com.

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