



RADIO WORLD

DECEMBER 16, 2015 | The News Source for Radio Managers and Engineers | \$5.00 | RADIOWORLD.COM

Will FM Band Grow More Congested?

Translators, LPFMs, more translators —
How much more can the FM band take?

BY RANDY J. STINE

A key element of the FCC's AM rescue plan released in late October is expected to boost the number of FM translators in this country. Some industry observers wonder if this could lead to congestion problems in the FM band.

The FCC's action on AM revitalization presents AM broadcasters the opportunity to move pre-existing FM translators that are purchased on the secondary market or wait to apply for a new FM translator in an upcoming filing window in 2017.

While there won't be a net gain of translators until at least 2017, observers think the reshuffling of existing translators beginning next year is likely to bring more translators into more densely populated areas. That could likely mean additional interference affecting FM stations even before the translator filing window, they said.

jumping in the past decade. There are 6,422 FM translators and boosters today compared to 3,920 in 2005, according to FCC data.

The methods with which the FCC has awarded FM translator licenses has

been controversial at times. A notorious 2003 filing window received 13,377 FM translator applications and was plagued by authorization delays. The commission at one point froze the whole process.

Six years ago, the commission began allowing some AM stations to use FM translators to rebroadcast programming as a means to enhance radio service to the public. The power level may not

be great, but cross-service translators can provide AMs with access to valuable FM spectrum as well as enhanced nighttime presence.

The FCC says more than 900 AM stations now are rebroadcasting their signals over fill-in FM translator stations. But there are roughly 4,690 AM stations, which is why some experts expect a glut of applications from AM licensees during the translator application windows.

There are 6,688 FM commercial and 4,090 education FMs licensed, according

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FEMA Sends Bilingual EAS Message

It was part of a series of regional tests; information sent in English and Spanish

BY SUSAN ASHWORTH



The Federal Emergency Management Agency sent the first bilingual alert message via Emergency Alert System on Nov. 17, and according to insiders, it went off without a hitch.

The message was sent as part of the fourth in the series of regional IPAWS tests conducted by FEMA, and contained fully populated information blocks in English and Spanish. These test sequences were sent to stations in

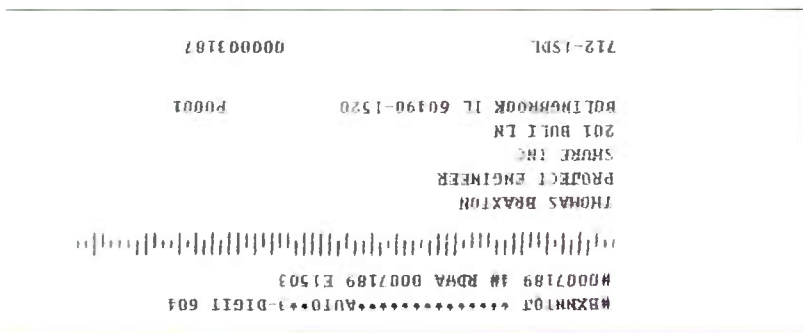
Wisconsin, Minnesota, Arizona, New Mexico, Utah and Nevada.

According to test organizers, full message text and true voice spoken word audio messages were sent, received and broadcast by the participating test partner stations. Broadcasters used the Digital Alert Systems DASDEC-II emergency communications platform to conduct the multilingual EAS test, said

(continued on page 3)

IN TRANSLATION?

The commission first authorized FM translators in 1970, with the number



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Next Issue of RADIO WORLD January 6, 2016
 Next Issue of ENGINEERING EXTRA February 10, 2016

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Radio World Founded by Stevan B. Dana

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 3079 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 282, Lowell, MA 01853.

For custom reprints and eprints please contact our reprints coordinator at Wright's Media: 877-652-5295 or newbay@wrightsmedia.com

Image graphic ©iStockphoto.com / Edward Grajeda

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 Printed in the USA



NEWS

BILINGUAL EAS

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Edward Czarnecki, senior director for strategy and global government affairs for Monroe Electronics, the parent company of Digital Alert Systems.

"The successful completion of this test gives us and our broadcast partners confidence that we have a flexible and workable path forward to support multilingual public alert and warning in this country," Czarnecki said.

BILINGUAL CAP MESSAGE

The test represents a number of firsts for the nation's EAS system, including the first transmission of a multilingual alert message by FEMA and the first use of multilingual alerting as part of a live regional test.

During the live test, FEMA initiated a National Periodic Test through Monroe's DASEOC emergency communications platform as a Common Alerting Protocol message in English and Spanish. The bilingual EAS test message was sent at 1:20 p.m. (PST) at the FEMA demonstration booth at the International Association of Emergency Managers conference in Las Vegas.

FEMA notified EAS device manufacturers ahead of time of the intent to originate a CAP message containing two fully populated information blocks to ensure that there would be no adverse reaction, said a source familiar with the inner workings of the test. FEMA also conducted tests in the IPAWS Lab to see if the dual-language message would cause problems with equipment in the field.

Multilingual alerting has been sup-

ported by the EAS CAP Industry Group, and multilingual capability was included in the Common Alerting Protocol v.1.2 standard that was adopted by an international standards body in October 2006. Software upgrades for those EAS devices capable of selecting a preferred language from a CAP alert have also been made.

MAKING IT HAPPEN

During preparation for the November IPAWS test, Al Kenyon, IPAWS test technical lead, struck up an email conversation with Tommy Balli, regional engineer for Entravision, which operates

The test itself was initiated by Rusty Russell, International Association of Emergency Managers. Afterward, Joseph Nimmich, deputy administrator of FEMA, briefly addressed an assembled group, including representatives of the participating state broadcast associations, state emergency communications committee chairs, state emergency management officials and representatives of National Weather Service Offices, a person in attendance said.

A minute after initiating the test, more than 1,400 EAS devices in the six-state area retrieved the message. "We [demonstrated] a new joint government/industry

It was the first EAS transmission of a multilingual alert message by FEMA and first use of multilingual alerting as part of a live regional test.

radio and television stations within the six-state test area. It was revealed that the EAS devices installed at the Entravision television stations could be made multilingual-capable and that Entravision was eager to test out the capability, one source told Radio World.

FEMA and Entravision contacted the EAS device manufacturer to ensure that both the FEMA CAP origination tool and the EAS boxes at the stations could be made to handle multilingual CAP alerts. The EAS boxes in the FEMA IPAWS Lab received the updated software and were tested for both functionality and compatibility with existing EAS devices.

capability in front of an audience that can make a difference," the source said.

Broadcast stations using the DASDEC systems equipped with OmniLingual Alert Module software were able to display the alert in the language of their choice: English, Spanish or both. Information included the expanded alert text, plus audio in both languages. Some stations automatically aired the Spanish version of the FEMA NPT, followed by the English version, while others stations coupled the OmniLingual software with DASDEC MultiStation software to enable different language selections for

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More Radio, More Voices

Make Radio World part of your day every day. Visit our website for great Web-only Radio World content, including the following recent posts and stories:

Dear Mr. Kozol: The FCC Has Bad News for You — So writes attorney Mitchell Lazarus of Fletcher Heald & Hildreth, paraphrasing the FCC, in an informative and amusing post about residential interference.

"Maybe you weren't home — they left a notice on your front door." See radioworld.com/kozol.



Photo by Bob Kovacs

Museum Adds Vuolo DJ Items — For nearly 40 years, Art Vuolo traveled the country visiting stations to interview and record jocks on his old Sony Betamax camera. He captured 700 DJs and more than a thousand hours; now those will be public through the Museum of Broadcast Communications. Learn about the effort to share his collection at radioworld.com/vuolo.



NPR's Riksen: Incremental AM Approach Provides Flexibility But Falls Short — One in a series of interviews with tech and regulatory experts on the FCC's revitalization actions. Mike Riksen is vice president of policy and representation for NPR, responsible for policy development, advocacy and station and community engagement plans. radioworld.com/rikxen



Lipp: Diversity Will Not Benefit From This Process — "AM licensees have been finding out that the FCC did them no favor with the upcoming 250-mile waiver window because FM translator owners are increasing their prices significantly." Mark Lipp is a partner with law firm Wiley Rein LLP. Visit radioworld.com/lipp.

Radio, Taking Care of Its Own

Guardian Fund helps those overtaken by poor health, debilitating ailments and need



BY PHIL LOMBARDO, DICK FOREMAN AND DAN MASON

The authors are the chairman and vice chairmen, respectively, of the Broadcasters Foundation of America.

What is it about the Broadcasters Foundation of America that makes it so

special and altogether unique?

Well, for one thing we do have a clear and definite *bias*. To that we have to plead guilty. You could also say we are prejudiced. We help ... *only* our own.

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We *do* have that "bias" ... toward

our own, toward the hurting and almost forgotten broadcasters who have fallen on hard times. We work only in our own industry ... among those who have labored in the profession *you* yourself have distinguished for so many years ... which provided a platform for your own dedication, creativity and genius.

With *your* help, we provide emergency assistance to those less fortunate in our broadcasting fraternity, restoring dignity and bringing life's necessities to many retired colleagues beset by misfortune.

SAFETY NET

And so we are asking again on *their* behalf. Once more we beg your forbearance for those in the profession who have been overtaken by poor health, sudden debilitating ailments and the unforeseen "diminishments" we all suffer.

Many were cut down in the prime of their lives by life-threatening illnesses or a sudden catastrophic episode for which their families were ill-prepared. And some of them were almost destitute. We've assisted widows struggling to hold shattered families together following the untimely death of a spouse.



EDITOR

At this festive season of the year, it is more than usually desirable that we should make some slight provision for those who suffer greatly. ... So Dickens told us; and so I feel. The Broadcasters Foundation of America is the only charity devoted exclusively to helping broadcasters in need. Its leaders recently sent the accompanying letter to its donors; I share it as a reminder at this holiday season of our colleagues who most need our support.

Paul Malone

And sadly we find that many of those who rely on your generosity are now left without any insurance or government assistance of any kind. And so we've been called their "safety net" and "foul-weather friend." Both appellations fit.

"Don't let us forget who we are ... and where we've come from." — Mario M. Cuomo

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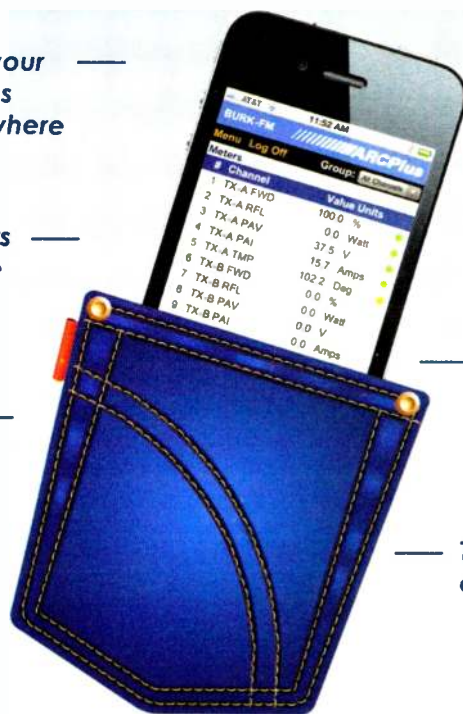
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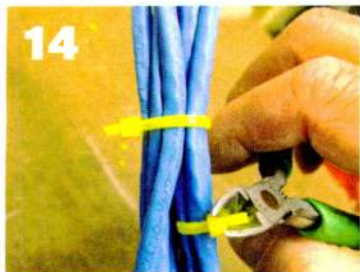


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Photo by Ursula Ruedenberg

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borhood. We know a great many of our well-off colleagues and successful broadcasting brethren *also* contribute in their community and are generous supporters of libraries, religious organizations, food banks, United Way or college and university endowments.

We, on the other hand, offer only the deep personal gratitude spoken quietly on the lips and etched in the grateful

a few well-intentioned dollars to well over \$50,000 from several benefactors. And while we realize not everyone is capable of such magnificent generosity, we acknowledge our hope that this year you will consider a significant gift.

In this, our annual appeal, we again hope and pray that you will consider mailing a substantial contribution for this year's Guardian Fund to the

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hearts of fellow broadcasters and their families who have been assisted by your foundation. Our president Jim Thompson has very discreetly over the years shared with you some of those heartbreaking expressions of gratitude from the recipients of your past generosity and beneficence.

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Last year, relying on your essential and vital contributions to the Foundation's Guardian Fund, we dispatched almost \$850,000 in life-sustaining grants. We need your urgent assistance to continue that mission.

In recent years, contributions to our Guardian Fund have ranged from just

Broadcasters Foundation of America, c/o our president Jim Thompson in our New York office: 125 W. 55th Street, Fourth Floor, New York, NY 10019. Or you can donate online at www.broadcasterfoundation.org by calling 212-373-8250. Please consider increasing your gift to help us be sure that no call ever goes unanswered.

Individual and corporate contributions to the Broadcasters Foundation of America, a registered 501(c)3 Public Charity, are fully tax deductible.

PS: Many individuals have identified their Guardian contributions as memorial tributes in the names of current family members, past associates and lifelong friends.

BILINGUAL EAS

(continued from page 3)

each program stream.

"The success of today's test is exciting, as it indicates that we do indeed have the capacity to convey multilingual public alerts and warnings to the diverse communities we serve," said Lillian McDonald, managing director of ECHO Minnesota, a nonprofit organization serving cultural communities, and a partner with Twin Cities Public Television, which participated in the test.

At the IPAWS booth in Las Vegas, bystanders watched screens and listened as the local CBS affiliate played the message in English; across the aisle, the Entravision station played the Spanish version of the message. This activity was duplicated in Albuquerque, where IPAWS team members observed a monitoring suite capturing multiple television and radio broadcast off air.

Kenyon said: "What we did today demonstrates a design capability of IPAWS. It will take a lot of work and local coordination to incorporate the ability to originate multilingual messages and develop appropriate local distribution plans that properly serve broadcasters and the public."

Looking to 2016, FEMA plans to continue regional NPT testing throughout the first half of the year. New FCC rules regarding EAS participant action upon receipt of an NPT message will go into effect July 30, 2016.



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FM CROWDING

(continued from page 1)

to the most recent FCC data. Add in 1,364 LPFM broadcasters and we can see why there is some concern with increased interference in the FM band going forward.

The National Association of Broadcasters declined to comment on the potential for added interference on the FM band. The group was supportive of the FCC order to revitalize AM radio, according to NAB Executive Vice President of Communications Dennis Wharton.

The FCC is expected to offer several filing opportunities in 2016 for AM stations to relocate one existing FM translator up to 250 miles to operate as a fill-in facility. Class C and Class D AM stations will be eligible to file in the first window for the first six months, with all other AM classes eligible thereafter for an additional three months.

The commission declined to give an estimate on the total number of new FM cross-service translators it expects to see as the result of its plan. Industry experts expect most new FM translators will be in rural areas.

STRETCHING THE LIMITS?

At a minimum, the commission actions are expected to present allocation challenges.

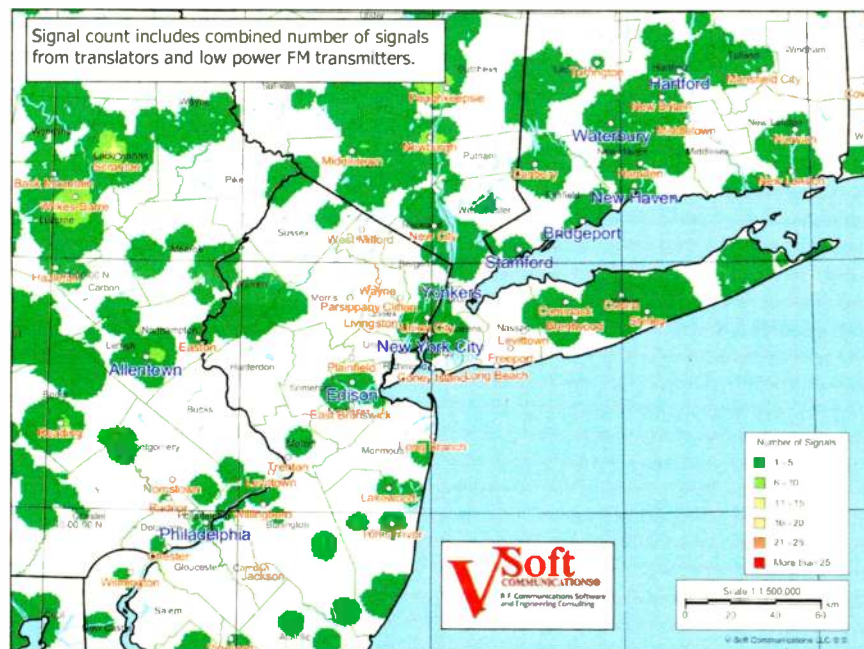
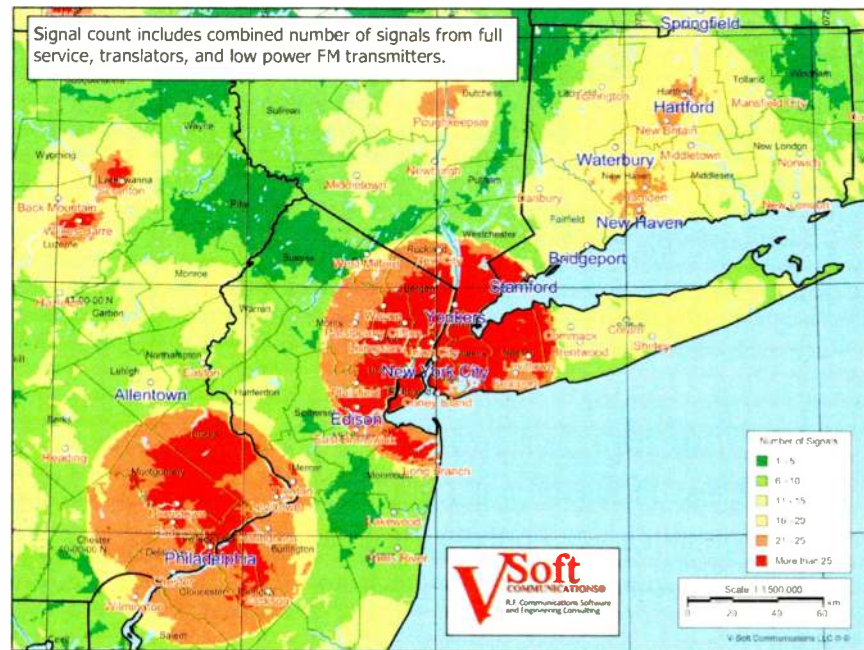
"The recent LPFM filing window really stretched the limits of the rules in the more populated market areas," said Stan Salek, senior engineer with broadcast consulting firm Hammett & Edison.

For example, the FCC encouraged "sandwiching" LPFM stations on second-adjacent channels between full-service FM stations if a showing of no likely interference could be made, Salek said.

"Many such applications were filed and granted, so I am left to wonder how many more FM translators could be made to fit in urbanized areas. I believe, though, that increased interference to full-service and other FM stations is unlikely unless the FCC makes changes to present allocation policy for co-channel or first-adjacent channel conditions."

Bert Goldman, president of Goldman Engineering Management, believes FM band crowding in major markets will be an issue.

"It's going to be a real problem, both for full-service FM stations and for the new translator operators. Full-service



These maps give an example of FM coverage density. They show signals receivable at each location (where field strength is greater than 60 dBu using FCC contour-based prediction methodology). The first shows all FM stations; the second shows only translators and LPFM signals.

stations will need to be vigilant to make sure they don't lose listeners to aggressively built translators," Goldman said.

Goldman said there is risk for AM owners who pursue FM translators. "Imagine you've just stretched your already tight budget to buy a translator and then paid the money to build, only to find that when you turn the translator on, you are creating impermissible interference to an existing FM station."

He estimates that a startup FM translator owner could spend thousands of dollars on application fees and equipment — industry estimates are from \$20,000 to \$30,000 to get a FM translator on the air — only to find out that the new translator is creating impermissible interference to an existing FM. If the interference cannot be resolved, the AM

operator ultimately could be required to turn off the translator.

And while power is limited to 250 watts, Goldman noted that for AM fill-in service there is no height limit; assuming a translator otherwise "fits," coverage and associated interference areas can be significantly greater. So while the absolute number of translators may not increase, spectrum use will increase significantly, especially in more urbanized areas.

The band crowding issue has already begun in major markets, Goldman said, and he anticipates the problem will worsen. "Filling the few remaining holes with FM translators for AM stations will likely complete the crowding process in larger markets. In smaller markets I doubt it will cause much crowding."

While the rules do not allow the translator to cause prohibited contour overlap interference, the commission has been open to second- and third-adjacent contour overlaps if the applicant can show, on paper, that no "actual" interference will be caused, Goldman said.

Doug Vernier, president of engineering software company V-Soft Communications, said many existing FM stations have listeners outside their protected 60 dBu service contours.

"While the FCC has rules that prohibit interference to a regular listener to FM station outside the protected contour, these rules are difficult to enforce, and the only way the existing FM station can prove interference is occurring is to wait until the translator takes the air and then file with the FCC," Vernier said.

The translator owner then has time to attempt to correct the interference, he said, which may never happen. "Nevertheless, that translator can stay on the air right up to the moment the FCC issues a cease and desist order, and that often takes years," he said.

There is also a risk of new translators causing interference to small LPFM stations or other FM translators, Vernier said. "So there is a lot at stake here."

"OVERCROWDED" OR "COMPETITIVE"?

The industry experts interviewed by Radio World for this story all said it is hard to estimate the number of new FM translators that ultimately will find their way to the FM band and whether they will be located near large markets or more rural areas.

John Garziglia, a communications attorney with Womble Carlyle Sandridge & Rice LLP, said he expects the planned 250-mile filing window in 2016 will substantially reshuffle locations of existing FM translators.

"To the extent that an FM translator moves under the 250-mile waiver, that move will in many cases open up spectrum space at its prior location for an AM station to apply for a new translator under the 2017 auction filing window."

Garziglia, who has written in Radio World about translators and other topics, said any new or changed service on the FM band brings with it the chance for increased interference.

"However, FM translators will not crowd the FM band any more than have past changes, and will result in more consistent and noise-free reception for many AM stations.

"Those complaining about crowding from FM translators are as likely to be adverse to the competitive threat represented by the enhanced reception of AM station programming as they are to the technical aspects of FM translators."

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PROGRAMMATIC

BY TOM VERNON

This is one in a series of articles about new programmatic tools in radio and media.

Programmatic advertising is a relatively new initiative in the ad business. It's primarily about automating the back end of sales transactions, resulting in a more efficient process and a greater amount of a station's inventory being sold.

Early efforts to introduce programmatic to the radio industry have centered on educating radio station management and sales personnel, as well as installing the technology to make it all happen. A startup company in Newport Beach, Calif., however, is approaching programmatic from a different perspective.

Veritone Media has developed technology to understand and respond to the natural human interface of audio and video content. The underlying technology is called the Cognitive Media Platform or CMP. This cloud-based system enables near real-time analysis of audio and video streams. To date Veritone Media's clients include Westwood One, DraftKings and Uber.

Veritone Media is a privately owned, venture-backed company. Though it is new, its founders are no strangers to radio or to the concepts that are playing out in the programmatic space. In 2002, brothers Chad and Ryan Steelberg launched dMarc Broadcasting, a radio advertising company whose solutions aimed to connect advertisers to stations through an automated advertising platform. The platform simplified the sales process, scheduling, delivery, and reporting of radio advertising, enabling advertisers to purchase and track their campaigns. dMarc was acquired by Google in 2006.

RICH DATASETS

With CMP, advertisers will be able to search every word that is monitored or recorded on any type of audio or video channel. Once the information is gathered, Veritone Media says it can track not only the mention of a product or service, but the tonality, and do it in near real time.

The CMP delivers a "very rich dataset of almost everything that is being spoken about or displayed on that medium, inclusive of every single word that is mentioned," said President Ryan Steelberg. He said this is a deeper and more complete capture than current techniques that might be used such as closed caption or metadata typical in the market today.

Veritone refers to the generated informatics as "actionable intelligence." This monitored content is fully searchable. "What Google does for the written word, Veritone does for audio and video," he said. As a cloud-based platform, the system requires no user software. The company notes that it does not retain copyright or original content in the cloud; content is processed from its original location.

He said CMP has three broad applications.

"First is search and discovery. Users can search processed material for words and key phrases. A second is for internal production. A radio station may use

CMP in conjunction with a program logger to automate the process of searching for clips, which may be used, for example, to create a promo for a morning show. It may also be used for podcasting. Radio stations don't often think of chunking and repurposing content, but perhaps they should, and this technology makes that much easier."

The third application is in advertising. In addition to

searching content for ads that have run, the CMP can assist with contextual-based targeting to predict what would be the best ads to insert as live reads in programming that is ongoing.

"This is especially relevant for stations with news-sports-talk formats where there are free-ranging discussions," said Steelberg. "Based on where the discussions are going, some ads would probably work better than others. The Cognitive Media Platform can analyze the dialogue in near real time, and dynamically make recommendations for the next break."

(continued on page 10)



An analytics dashboard shows conversions over time.



This dashboard measures mentions of an advertiser brand across all programs and over time.

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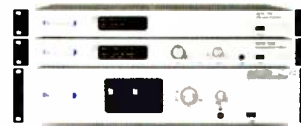
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Brickwall mastering pushes music to the edge (and sometimes beyond). Omnia-exclusive 'Undo' technology in Omnia.9 and Omnia.7 processors reverses the effects of poor mastering, restoring life to even the squarest waveforms.



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VERITONE

(continued from page 8)

Currently, Veritone Media's CMP ingests about 10,000 hours of audio/video content per day. Within five minutes of ingestion, the material has been converted to metadata. The company recently announced that since January of 2014, its CMP technology had processed more than 1 million hours of audio and video content.

VERIFY AND IDENTIFY

Between traditional media, Web streams and outdoor advertising, most of us are exposed to thousands of ads every day. Advertisers need a way to determine which ones are working.

CMP, the company argues, is the tool that will verify and identify not only a client's live reads and discussions about their products, but also those of their competitors.

"What used to be proprietary information is no longer," said Steelberg. "Veritone Media's platform delivers the same intelligence about a competitor's creative, target demo and media consumption."

It can also track the sentiment being expressed about a brand. Veritone believes this technology will give the advertising business a useful analytics tool to gain insights into where brands are being mentioned, and how to gain leverage when buying ads. Its dataset includes numbers of mentions, stations, programs, average audience and other metrics.

While most broadcast clients of Veritone Media will be using the CMP for the analytics that it provides, the platform has potential for customization through its open ecosystem. Programmers will be able to embed

Program	Date & Time	Advertiser	Audience	Status
Mike and Mike Show	Mon Mar 30, 2015 02:54 AM	Acme Widgets	181,900	Verify
The Dan Patrick Show Podcast	Thu Mar 26, 2015 04:59 PM	Acme Widgets	0	Verify
Ross Tucker Football Podcast	Fri Mar 20, 2015 02:23 AM	Acme Widgets	0	Verify
The Joe Rogan Experience	Thu Mar 19, 2015 08:33 PM	Acme Widgets	0	Verify
The Joe Rogan Experience	Thu Mar 19, 2015 08:33 PM	Acme Widgets	0	Verify
The Joe Rogan Experience	Wed Mar 18, 2015 04:28 PM	Acme Widgets	0	Verify
The Joe Rogan Experience	Wed Mar 18, 2015 04:28 PM	Acme Widgets	0	Verify
Jillian Michaels	Mon Mar 16, 2015 10:47 AM	Acme Widgets	0	Verify

This is a list of advertiser brand mentions by different programs, including the transcription and video.

their own cognitive engines into the platform for applications such as transcription, facial recognition and sentiment extraction.

"This is particularly compelling to major advertising agencies and their parent companies," said Steelberg. "We see that every one of them is working on gathering internal data from all their clients and trying to create proprietary tools to glean insights and analysis from the work they do for their advertisers. CMP is seen as a unique tool to bring all the third-party applications that

one would need to do this correctly to the table, and do it in a way that enables fluid use on a case-by-case basis."

The company is planning release of an Open API/Developer model early next year, and will work with one or two agencies to integrate CMP into their systems prior to release. Steelberg said that in addition to its use in broadcast media, the CMP has applications in law enforcement, politics and higher education.

How is your media company using programmatic tools? Email us to share at radioworld@nbmedia.com.

NEWSROUNDUP

DRONES: FAA officials said they planned to review the recommendations of an advisory group and take next steps toward creating a registration process for unmanned aircraft. The group recommended that registration be as simple as possible; users would fill out a Web form, obtain a registration number and mark it on the drone.

SPECTRUM: The European Broadcasting Union welcomed a decision by WRC-15 delegates that the UHF spectrum would remain "exclusively allocated to terrestrial TV services in ITU Region 1 for at least the next decade." During a November session, representatives agreed there would be no change to the allocation in the 470–694 MHz band now or at WRC-19 in four years. A review of spectrum use in the entire UHF band (470–960 MHz) will next take place at WRC in 2023. Officials with WorldDAB and Digital Radio Mondiale supported the decision. ITU Region 1 comprises Europe, Africa, the Middle East (west of the Persian Gulf), and the whole of the territory of Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey and Ukraine.

TRANSLATORS: Broadcast investor Ronald Unkefer set up a website, fmtranslatorauction.com, to facili-



tate bidding on FM translators. The translators in the auction were owned by Unkefer's First Venture Capital Partners; the auction was to run through Dec. 9. According to a release: "Any station owner of a Class C or D AM station will be able to purchase and then relocate any existing commercial band FM translator anywhere within a 250-mile radius to simulcast their current AM station location. The 25+ FM translators included in this auction can collectively be relocated to cover all or parts of 22 different states."

MT. WILSON: The Poole Tower Complex on Mt. Wilson was sold to InSite Towers Development LLC. Rising almost 6,000 feet above sea level, the complex was developed in the 1950s by the late Los Angeles broadcaster John H. Poole.

BBG: Broadcasting Board of Governors officials told the Senate Foreign Relations Committee that the CEO position needs more power. The committee, chaired by Sen. Bob Corker (R-Tenn.), is considering reforms to restructure U.S. international broadcasting. BBG CEO/Director John Lansing and Board Chair Jeff Shell floated the idea of shifting more authority to the new CEO position.

HAM RADIO: The Senate Commerce, Science and Transportation committee endorsed a bill that would give ham radio operators who live in deed-restricted communities reasonable accommodations to erect antennas. A twin bill was introduced in March in the House.

PICKERING: The Audio Engineering Society noted the death of Norman Pickering, one of its founders and a man known for turning the lowly phonograph needle into a reliable transcriber of audio. For many, his name became synonymous with the replaceable and affordable phonographic cartridge.

MURROWS: A call for entries for the 2016 Edward R. Murrow Awards was issued by the Radio Television Digital News Association. Honoring outstanding achievements in electronic journalism, the awards are open to stories aired in 2015 on radio, television and digital media. Entries are to be submitted through RTDNA's online registration and are accepted through Feb. 5. See http://rtdna.org/content/edward_r_murrow_awards.



FCC: The U.S. House by voice vote passed the FCC Process Reform Act of 2015, H.R. 2583. The bill went to the Senate. It would require the FCC to set minimum comment periods for rulemakings, prevent the commission from placing large amounts of information in the record on the last day of a comment period and require publication of the text of proposed rules. It also tackles procedural items including public notices for rulemakings, petitions and applications; sets minimum periods for comments and replies; addresses commissioners' deliberations; and clarifies when reports, decisions, budgets and other agency documents are made public.

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*this is for the 8-channel

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You Can Troubleshoot Via This Dongle

It's a "must-have" for contract engineers and those who maintain a lot of translators or LPFMs

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

Reid Fletcher is with the University of Wyoming broadcast engineering department. Not long ago, he was at a new site, pointing a dish for their Ku

with software-defined radio for several years. He was introduced to SDR by a friend who is an EE professor at UW and encouraged Reid to purchase a small digital video broadcasting-terrestrial dongle. These DVB-T dongles are USB devices that are intended to be DVB-T, FM and HDTV tuners but have a mode

productive with the data.

The dongles are available on e-Bay, typically for \$20 or less. Software is available on the Web to download and can be accessed free in some cases. Fig. 1 is a screenshot showing a pilot carrier display.

A few years back, Reid and then-Engineering Director Shane Toven were on an engineering trip when they got word from the studio that a listener reported one of the stations (KUWA)

analyzer on this trip, so Reid pulled out his DVB-T dongle. After plugging it into his laptop's USB port and firing up the software, he and Shane could see there was no signal from the LNB. Replacing the LNB returned KUWA to the air.

A \$20 dongle and a laptop provided a quick tool that solved the off-air problem in a pinch. Though this is not a serious measurement instrument, it proved useful for some quick troubleshooting. It's a "must-have" for contract engineers or those who maintain a lot of translators or LPFMs.

Fig. 2 shows a screenshot of the LNB

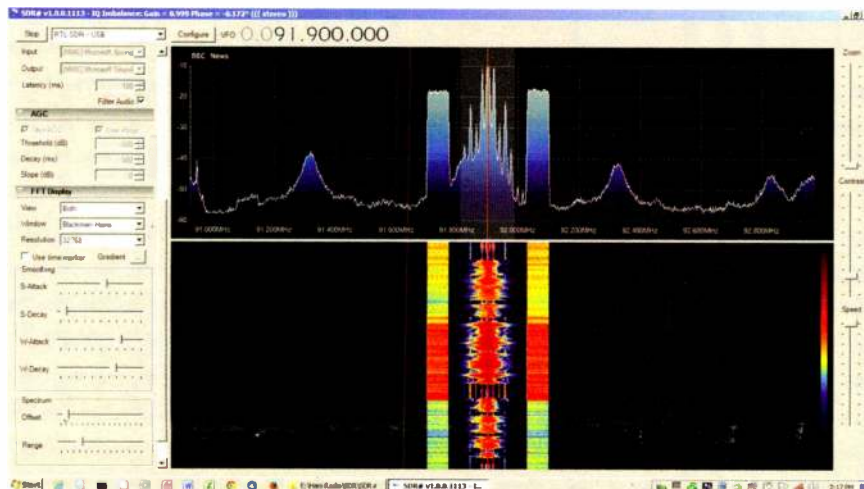


Fig. 1: A pilot carrier display using a DVB-T dongle.

feed. For curiosity's sake, Reid decided to experiment with a device he keeps with his laptop.

Reid is an amateur radio operator (WB7CJO) and has been experimenting

where they become essentially an A to D converter with a local oscillator and mixer for a tunable front-end and to output an I-Q data stream. From that point, it's up to software to do something

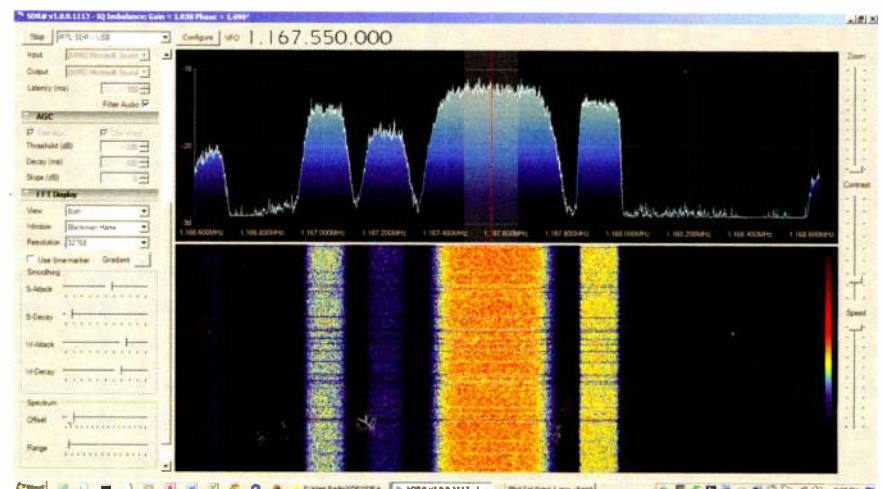


Fig. 2: The display can show LNB output, helpful in troubleshooting and aligning dishes.

was off the air. Arriving at the troubled station, they found there was no audio from the Ku receiver. For various reasons, they had not brought a spectrum

output during the dish pointing as previously described, using SDRSHARP SDR software driven by the R820T-based dongle. Reid's signal is the fat signal at 1167.55 MHz.

Realize there is no calibration, so these pictures aren't worth a thousand words, but in a pinch, you just might use the display to get back on the air!

Kuala Lumpur-based broadcast engineer Paul Sagi sends in this helpful link: www.shortcutworld.com/en/win/Windows_8.html.

Shortcutworld is a wiki-style reference data base to keyboard shortcuts. The link above will take you to the Windows 8 shortcuts but the site includes shortcuts for operating systems from Windows XP to Windows 10. Plus, there are Mac Operating System shortcuts and even shortcuts for Linux users.

Paul also writes about a new technology, Wi-FM, which uses FM signals to speed up your computer and reduce the interference problems that overlapping Wi-Fi channels cause. Routers negotiate to take turns when there is co-channel (same channel) interference, whereas overlapping channels just jam each other.

(continued on page 18)

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Bench Techniques and Tools of the Trade

Use common sense to save time and money when servicing equipment

TECHTIPS

BY MARK PERSONS

There are fewer fully equipped service benches in the radio broadcast industry today, and doing things yourself is increasingly common. Here are some professional tips to simplify the job and ensure better results when you do your own repair work. They apply even if you are just looking inside a piece of equipment to see where the smoke might have leaked out.

It goes almost without saying that you need a clean well-lit area with plenty of power outlets. Poor lighting can easily cause you to misread the color on a wire or resistor. Visual inspection of malfunctioning gear can often reveal a problem even without extensive electronic testing.

When benching a piece of equipment, the first thing I do is use a marker pen

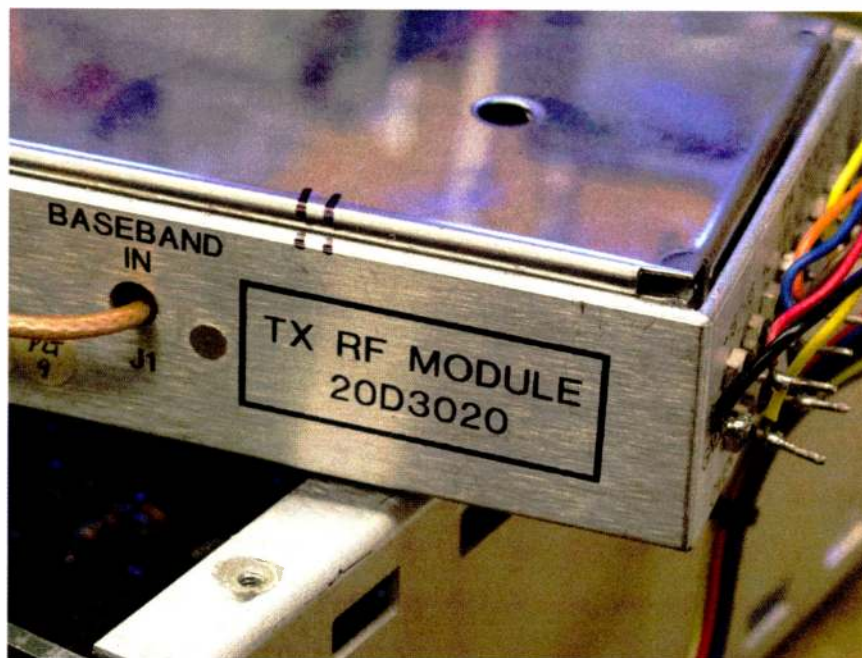


Fig. 1: Make registration marks with a liquid pen.



Fig. 2: Label connectors to avoid errors.

to put “registration marks” on cabinet parts so they can be reassembled later without a question of what goes where. (This might not seem important if you did well on the “square peg and round hole” test when you were young; but if

you didn’t this could be a lifesaver.) You can even take a digital photo and refer to it when reassembling the equipment. Sometimes it is important to also mark the exact position of hardware, as it may have been factory-aligned precisely.

I sometimes receive “basket case” equipment for repair. Someone had attempted a repair and then gave up, leaving many screws and other small parts behind on the service bench before throwing the dismembered equipment into a shipping box. Fortunately, I did well in the square peg/round hole test, and I have a huge assortment of new and used hardware. Yes, I save old screws, bolts and nuts to replace missing ones

workshop area. A paintbrush works well to help loosen dirt so an air blast can blow it away. This is a two-handed operation.

Use a liquid pen to label everything you disconnect, including connectors, before you take anything apart. It is so much easier to go back to where it all started, especially if you are unexpectedly interrupted by a phone call and rush to a dead transmitter. The pen I use is the Ultra Fine Point SCA-UF by Pilot. Unlike other markers, it barely fades over the years.

Mark words or abbreviations on circuit cards where wires might be removed, even temporarily. Short-term memory becomes a problem as you grow older, and this might save you a lot of trouble down the road.

You can never have too many tools on hand. I recommend a soldering iron rather than a soldering gun. An iron will stay warm for the entire job and will not have to be reheated each time you make a solder connection. I like to use a soldering station, which keeps the iron tip at a constant 700 degrees F. A wet sponge to wipe the iron tip on is an excellent choice, too.



Fig. 3: Mark wire color on board before removing wire.

on equipment. You should too.

An electric screwdriver usually works well in disassembling equipment. Reassembly is different and will be discussed later.

In the meantime, use small cups to hold screws and other hardware so they don’t escape to the floor or elsewhere. Keep loose hardware in one place so it doesn’t get lost; I use plastic boxes from 3M Scotch brand electrical tape. Better yet, use several containers so you won’t confuse bolts and nuts from one module with hardware from another part of the equipment.

Once I have the equipment open/disassembled, I use compressed air to blow bugs and dirt out. Do this outdoors so grime does not get into your

Use a small sharp pair of wire cutters to trim ends off tie wraps. Leaving tails long is a good way to tear skin next time you or someone else is working in that area.

Do it right by resting one side of the cutter jaw on the side of the tie-wrap large end and then slice the tail as you squeeze. This action shaves the tail flush. If you are in a situation where tie wrap reliability is important, put a drop of Super Glue in the end.

Denatured alcohol and cotton swabs are my constant companions for cleaning. You should take pride in making repairs that keep a piece of equipment looking the way it did when it came out of the factory. Even if the equipment owner does not know you did a good

job, at least you can be proud of your handiwork.

One valuable piece of bench gear is the Sencore AC Powerite. It is a 0 to 150 volt variable AC isolation transformer capable of handling 470 watts. The circuit breaker on the front is a handy on-off switch, so I don't have to go looking for the power cord every time a component is replaced and the power needs to be turned back on for more testing. The Powerite allows me to start at zero and slowly bring voltage up to see if and when a problem occurs.

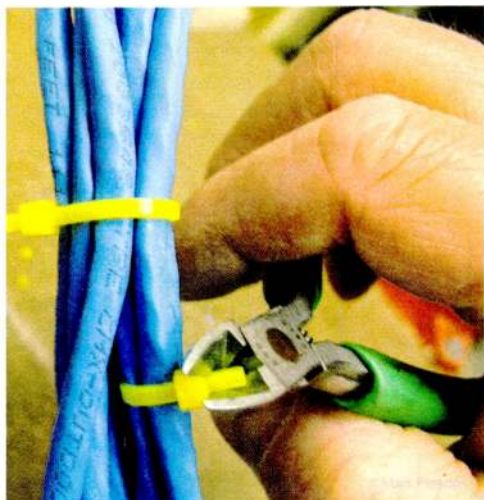


Fig. 4: Cut tie wraps close to prevent future injury.

I also use it to determine how low the 120 volts can be reduced before power supply hum happens in audio. If power supply electrolytic capacitors are weak, that might happen quickly. Any good piece of electronic equipment should work fine down to 100 volts or even lower.

When reassembling equipment, I often use a jeweler's screwdriver, sometimes called a precision screwdriver, to get the hardware started. The one shown was available at Radio Shack and now there is an updated version with a larger handle (part number 6400188).

I do *not* use an electric screwdriver at this point. Cross-threading a screw can have lasting consequences. The "feel" of how a screw is threading tells me when all is well. You don't get that with an electric screwdriver. The skinny body of a jeweler's screwdriver cannot normally provide enough torque to cause hardware problems.

The good part is that you can turn chassis screws in quickly using this tool. Yes, they are smaller than a full-sized screwdriver, but you are not going to use one to tighten a bolt or screw. Just turn the hardware in with a loose fit. Waiting to "tighten" chassis screws until they are all in place is the right thing to do too. How many times have you tightened hardware and then had to loosen it because mechanical tolerances prevented inserting the remaining screws?



Fig. 5: Use a jeweler's screwdriver to start bolts.

Sometimes working on equipment requires delicacy akin to surgery. A wide assortment of tools is a great asset here.

Document any changes you make to the equipment, ideally in the original equipment manual. I usually make notations in pencil so they can be modified again in the future.

Mark Persons, WQMI, is a Certified Professional Broadcast Engineer who has more than 45 years' experience. His website is www.mwpersons.com.

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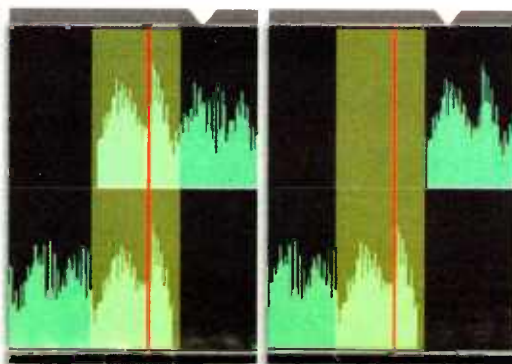
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Reestablish islands of reliability.

Studio networks have a way of expanding, and those so-called islands of reliability could now be one large landmass the size of Australia. If one studio goes down, they all will...

For the entire story... INN29.wheatstone.com

Standing Beneath the Big Tower

90 Years of WSM

By Scott Johnson

From three miles north on I-65, I see it, rising from the trees like a steeple. And for radio engineers and country music fans alike, it does mark a place of great reverence. It is the 808-foot tower of radio station WSM-AM, and this day marks an important date in that station's storied history. 90 years ago on this date, WSM first signed on.

As I drive up and am directed to parking in a corner of the vast field, along with a hundred or

more other guests, both the scale of the place and the weight of the experience sink in. I'm here for WSM's 90th anniversary celebration, an open-house at one of the nation's most famous transmitter sites.

For the entire story... INN29.wheatstone.com



Kim Komando's New Studios @ Corner of IT and Radio

Oh, the irony.

Kim Komando's talk show about gadgets and computer technology was turned down by two broadcast networks in 1994 because they said computers and the Internet were a passing fad.

Of course we now know that IP is here to stay. And the irony? The Kim Komando Show, produced by WestStar, is now viewed on her television network streamed over the Internet, and it's being distributed to 450 radio stations from a new studio facility that is — you guessed it — IP based.

For the entire story... INN29.wheatstone.com



Processing Tip From the Field

Mike Erickson reports in with this audio processing tip:

Clip restoration processors can make great additions to the production studio but we don't recommend them for the air chain, where they can play tricks on otherwise great sounding audio

These algorithms seem to work on overly clipped audio but can be unpredictable on audio that doesn't need to be restored.

For the entire story... INN29.wheatstone.com



MAKING THE ABSOLUTE BEST IN RADIO FOR OVER 35 YEARS



World Radio History



Digital, Deciphered

A primer on digital technology for the rest of us

DIGITALBASICS

BY JIM WITHERS

For most of us, the value of digital technology is simply beyond question. Even my coffee pot includes “digital programming for maximum brewed flavor.”

The pot does make great coffee. But I sometimes find the public’s enchantment with all things digital ironic. After all, we are analog beings in what is, primarily, an analog world.

Light, sound, touch and smell; these are all analog senses. And yet no one doubts that anything digital is simply better than anything analog.

In the world of broadcasting, this is, in fact, true. Who, after all, wants to go back to the bad old days of 45 RPM records and needles in grooves? Broadcasters have been converting studio equipment to digital for years; lately transmitter equipment has made the switch as well.

Still, replacing all of that legacy equipment has not been without significant effort and expense.

It is technically very complex to transform sound waves into electrical signals via a microphone, to encode those analog signals into digital pulses, transmit them, recapture the transmitted stream and finally decode them (complete with error correction) back to analog electrical signals, where they excite speaker cones and headphone transducers in consumers’ cars and homes.

The basis for doing all of that is the subject of this new series of articles.

THE WAVE

Scottish physicist James Clerk Maxwell, expanding upon ideas first put

forth by Michael Faraday, stated in 1865 that in addition to sound, all electrical, magnetic and light energy is made up of waves.

These waves, from the longest to the incredibly short, vibrate like waves in a pond, in a continuous motion; one wave after the next, after the next.

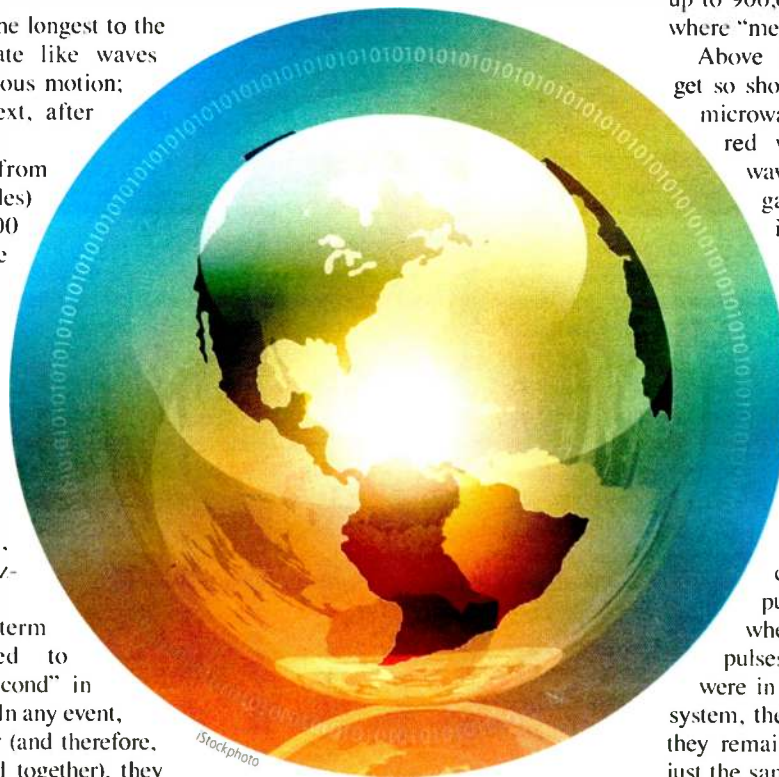
Long vibrations, from about 20 waves (or cycles) per second to 20,000 cycles per second, are received by our ears as sound. The waves themselves are known as Hertzian Waves, in honor of Heinrich Hertz, the German physicist, who in 1886 validated Maxwell and Faraday’s propositions by generating the waves, rather than just theorizing their existence.

Around 1960, the term “Hertz” was adopted to describe “cycles per second” in honor of Hertz’s efforts. In any event, as the waves get shorter (and therefore, are more tightly packed together), they become part of the electromagnetic spectrum of frequencies.

The “waves-in-a-pond” idea became so embedded in the thinking of the day that scientists felt that light waves — and later, when radio waves were discovered — traveling through the vacuum of space must be assisted by some substance through which the waves could travel. After all, sound waves traveled from speaker to listener through the medium of air, so obviously, light and radio waves needed a substance as well.

To solve the conundrum, they postulated the existence of “ether.”

This, they thought, was a unique and otherwise undetectable substance that existed everywhere but which had no known physical properties other than to facilitate the propagation of both radio and light waves.



This theory was debunked by American scientists Albert Michelson and Edward Morley in 1887, when they measured the speed of light both in the direction of Earth’s rotation, and again at a 90 degree angle and found the speed to be identical. Clear indication that light waves were unaffected by anything, including ether.

Still, the conventional wisdom held in the minds of many and even today there are occasional references to radio

waves radiating out into the ether.

With or without the ethereal aid, energy at frequencies just above 50,000 Hz (50 kilo Hertz; “kilo” being the prefix for thousands) becomes so energetic that electrons jump off the wires into which the energy is applied to become radio waves. This goes on all the way up to 900,000,000 Hz (900 megahertz, where “mega” is the term for millions).

Above that frequency, the waves get so short and fast that they become microwaves, then even shorter infrared waves and ultimately light waves and beyond — to X rays, gamma rays and so forth. This is the analog world in which we live and around which all of our technology was built, until the advent of the digital age.

ON AND OFF

Digital signals are not wave-like at all. Rather, they are simply a series of pulses, either present or absent. For convenience, we call these pulses a “one” for a pulse that is present, or a “zero” when the pulse is absent. The pulses may be sent slowly (as they were in the first digital transmission system, the telegraph) or very fast, but they remain nothing more than pulses, just the same. The real black magic that gave us CDs and hard drive music is in the conversion, or encoding, of a continuous wave of analog sound picked up by a microphone, into those ones and zeros, and the decoding back to an exact copy of the original wave so we can hear it as it was originally spoken or played.

(Note that an “exact” digital copy of an analog wave is impossible for reasons that will become apparent, but we can get so close that the difference essentially is meaningless).

(continued on page 20)

WORKBENCH

(continued from page 12)

Paul’s recommendation is to choose a channel manually, instead of using the router’s automatic channel selection. He suggested Channel 1, 6 or 11 because they don’t overlap each other. Choose the channel least overlapped by other channels. In conclusion, Paul says to avoid Channel 9; microwave ovens use that frequency.

Any broadcast engineer knows the RF spectrum is getting crowded, which is having an adverse effect on FM/AM radio reception, specifically for HD signals.

The DX Engineering AFHD-4 antenna is a purpose-built AM/FM/HD receive antenna designed for audiophile-grade and vintage radios. The antenna is also a great option for community-antenna applications, like

those found in retail stores and apartment complexes. It improves analog signal reception and mitigates annoying HD digital phasing issues and “drop outs.”

The AFHD-4 boasts an omnidirectional receive pattern, with 520–1620 kHz (AM) and 88–108 MHz (FM) coverage. It features a slim, low-profile vertical design, yet achieves impressive gain on both the AM and FM bands.

Testing demonstrated the following typical receive ranges (range is dependent upon broadcast station transmit power):

- FM stereo, 80 miles
- FM digital, 50 miles
- AM mono, 90 miles
- AM digital, 50 miles

Better still, the antenna is served by a single run of RG-6 coaxial cable, sold separately. The antenna

package includes a splitter that sends each signal to the appropriate antenna port. This simplifies installation and keeps cable runs neat and tidy.

The DX Engineering AFHD-4 AM/FM/HD comes with the 4-foot antenna, the AM/FM band splitter and a coax to twin-lead adapter. It includes a clever mounting bracket that works for both mast- and wall-mount installations. You can obtain more information from this www.dxengineering.com/parts/ins-afhd-4 or call 800-777-0703.

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 46 years in the broadcasting industry and is still learning. He handles West Coast sales for the Telos Alliance. He is SBE certified and is a past recipient of the SBE’s Educator of the Year Award.

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ware — inside the computer.

Furthermore, to make the computer understand our instructions, we have to apply some rules. Rather than just send bit after bit after bit of instruction, which to the machine would look like "dothisanddothisanddothisanddothisanddothis," the bits are combined into computer words called bytes.

The term byte was not coined until 1956 by an IBM engineer. Before that, computer words were made of various numbers of bits; some 4 bits long, others 6, and still others, 8. The byte eventually was standardized to 8 bits, and this has worked out quite well.

It turns out that we need 101 different switch settings to define all of the alphanumeric characters in the English language, including both upper and lower case letters, numbers and punctuation that we typically use, including several combinations to

The first practical digital computers overcame the problem of analog inaccuracy by replacing continuously variable analog input controls with a series of electronic switches.

identify special functions on a computer keyboard, (like the "delete" key, etc.). To assign a unique BCD value to each character and function, then, we need at least a BCD count of 101. Standard keyboards are frequently called 101 keyboards for just this reason.

Using the BCD method of encoding, we know from our example that six bits is not enough, since that only allows for 64 unique combinations. Instead, we need a minimum of 7 bits ($2 \times 2 \times 2 \times 2 \times 2 \times 2 = 128$) to be able to identify all of the different characters, with a few left over. This arrangement and the specific bit combination for each character were adopted as the American Standard Code of Information Interchange (ASCII, pronounced "ask-ee"), and that term is also used to describe keyboards.

By adding an eighth bit (sometimes used as an error checking bit, called a "parity" bit), we get to the standard computer "word" of 8 bits. Note that a computer "word" is not a word in the sense that the letters on this page are combined to make words in the English language. Instead, a computer word, or byte, is a combination of bits combined in a certain way to define a numeric quantity in the computer.

FROM A TO Z AND THEN SOME

If we added two more switches to our arrangement on the previous page then we could generate any alphabetical or numerical character we wanted. For example, the decimal count for a lower case "a" in ASCII is 97. Arranging our eight switches in the following order of 01100001 gets us there. The LSB bit/switch on the right, with a value of decimal 1 is on, as are the sixth bit, with a value of 32, and the seventh bit, with a value of 64. $1+32+64=97$.

For readers who want to get deeply immersed in all things ASCII, (and confirm that a lower case "a" is indeed represented as decimal 97), www.ascii-code.com is a good place to start.

As I strike the keys of my laptop keyboard to write this article, I am sending unique 8-bit bytes to the central processor, which in turn tells the screen to display the correct character. I have typed 16,214 characters for this article (subject to editing!). The very first word of the headline — digital — is in my computer memory right now as:

01000100 01101001 01100111 01101001 01101000 01100001 01101100

Fifty-six bits just for that first word; 129,712 bits for the whole article. Sounds like a lot, but compared to digital audio storage and processing, it's not enough to record even one second of audio. The complexity of doing that is something we'll take up next time.

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.

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This Radio Conference Is Held in the Woods

The grassroots movement attracts attendees with affordable workshops in an unusual location

COMMUNITY RADIO

BY PETE TRIDISH

The Grassroots Radio Conference is an informal gathering of like-minded community radio station staffers who have met almost every year since 1996. The gathering arose from discussions among a cohort of stations dissatisfied with the general direction of public radio at the time.

They were particularly concerned about a program that was being recommended by consultants in the late 1990s

serves an audience that is historically neglected by mainstream media. Given the influx of stations from the LPFM window, some stations are on a tight deadline and needed the vital startup information shared at this gathering."

While most professional conferences take place in hotels, the Grassroots Radio Conference usually is hosted in donated spaces at schools, community centers, and once even in a post office that was refurbished to create a media arts center. Attendees often sleep at local volunteer homestays and in tents, and all presenters come on their own dime and make presentations for free. The storytelling that might happen at a Las Vegas bar during NAB Show hap-

pens around a campfire for the Grassroots radio stations.

WLPP(FM)

The Grassroots Radio Conference was held this year at the Matreum of Cybele in Palenville, N.Y. The Matreum is the home of WLPP(LP), which has been on the air for just two months. The Matreum is a combination of residential community, temple, library, coffee shop and event space for female and transgendered spirituality. WLPP is also the first Pagan-owned radio station in the United States.

The participants in the Matreum were inspired to build the station by the disastrous floods caused during Hurricane Irene. During that catastrophe, much of the communications infrastructure was knocked out and citizens did not have many options for life saving information. WLPP(LP) wanted to build a station that could be locally focused and provide in-depth reporting for Palenville residents.

Dharma Dailey, a volunteer on the team that launched nearby community radio station WXGC, said, "As we were developing the station, we saw that people needed local information from resilient sources about what roads were closed in their town and where relief efforts were focused, but most media outlets focused on larger urban centers. One station that did a great job

was WRIP, where the station stopped regular programming and served as an information hub and emergency broadcaster. We felt every town in the region should have radio stations that were capable of that."

This year's GRC had a number of new LPFM stations in attendance. Another new startup is Zumix, an after-school music program for children in east Boston, which currently runs a Web stream.

"Zumix was founded in 1991 as a response to the worst year of youth-on-

WLPP.LP 102.9 FM
PALENVILLE, NY 12463



GrassRoots Radio Conference

September 24-27

2015



Photos by Ursula Ruedenberg

Grassroots Radio attendees gather in front of the Maetrum of Cybele.

called "Healthy Stations." This program encouraged local community radio stations to cut down on volunteer programmers and incorporate more syndicated content. Some stations embraced this approach, which was claimed to guarantee better quality for listeners and more fundraising dollars, but the Grassroots cohort chose to keep their volunteer centered ethos.

Donna DiBianco, a former station manager and current radio start-up consultant, was the lead organizer of this year's conference. She describes the conference as "a loosely formed coalition of dedicated people from nearly 70 community radio stations who work tirelessly to support similar groups. These outlets have a mission to serve their community with relevant, locally produced programming that generally



build a studio and broadcast some hours of student created programming.

When asked about challenges for their project, Thomas said, "We'll need to figure out a healthy balance between effective youth development and engaging content. While it will continue to be our priority to create a skill-building, supportive media creation process, our more public platform will require us to think more about listeners. And it is a big responsibility to figure out what to say to the world!"

EQUIPMENT AND BUDGETS

Though LPFM stations are non-profit and non-commercial and are generally small, they still need much of the same equipment as a full-power station; suppliers of equipment and content have taken notice of the opportunity. This year's conference was sponsored by equipment distributors such as SCMS, software and service providers like Spintron and NPR Distribution's Content Depot, Austin Airwaves, Pacifica Network, Nautel, Community Radio Goddess and two new companies, Kaatskit and Phantom Machine Works.

The storytelling that might happen at a Las Vegas bar during NAB Show happens around a campfire for the Grassroots radio stations.

The influx of low-power FM groups in recent years has spurred innovations that fit the needs and budgets of these small stations. Some technically oriented participants have even launched companies based on ideas developed for LPFM.

One company such company is Kaatskit (*Kaatskit.com*), which manufactures broadcast consoles. Kaatskit was started by Al Davis, an engineer and former university electronics professor. The company name reflects its location in the Catskill Mountains and is an homage to the Heathkit electronics kits that Davis built when learning circuit design. The Kaatskit console is modular, allowing the station to switch in different sorts of faders into the frame as the needs of the station change over the life of the station. The console is available fully built or in a kit form at a reduced price for stations that have technically oriented volunteers who can assemble it themselves.

Another new company at the conference was Phantom Machine Works, founded by Todd Wallin and David Klann. This company does turn-key installations and support of the Linux-based automation system Rivendell. Another project in development is a real-time broadcast quality audio processor, dubbed the NABRO, using Linux-based software on a computer with professional soundcards. They are also working on a streaming IP-based studio transmitter link software package with built-in measures for automatic reconnection and resilience.

WORKSHOPS

Many of the volunteer based stations are challenged for resources, and it is unusual for hosts to be paid. What money comes in to stations usually goes to equipment, expenses or certain organizational tasks that are difficult to find volunteers to do, such as accounting and professional services.

David Goodman offered a workshop on how volunteer hosts can make use of the skills they learn in community radio to earn a living as a freelance media creator. For example, Goodman broadcasts his weekly local interview show as a volunteer, but if he finds a story that he thinks is worthy of syndicated attention, he pitches it to various national shows that take pitches from freelance audio producers.

Goodman frequently does "double-enders" — he records broadcast quality interviews for producers in other cities who are talking with their guests over the phone. He also discussed doing recording, narration and editing for various companies, government agencies and non-profits, which need to have educational multi-media produced.

Another workshop focused on energy efficiency for radio stations, taught by Chris Maxwell, founder of WRIR(LP) in Richmond, who is working on supporting several new local groups starting radio stations around Virginia.

"One example I know, there is an LPFM radio station which spends \$10,000 per year on electricity, mostly for heating and cooling, when they should spend about \$3,000 or less," he said. "Save energy before you try to go solar, plug the leaks in your energy bucket before adding energy sources."

Given that the stations often have little capital, committed volunteers and an interest in green practices, community radio stations often investigate and sometimes can utilize opportunities for energy efficiency first. Solar can happen if the group can afford to invest up front and get lower bills over the long term.

Pete Tridish is a radio engineer and community radio policy advocate with the non-profit station building group International Media Action.

PEOPLE NEWS



Joe Tymecki

Vermont Association of Broadcasters

Awarded the Snyder-Teffner Award



Steven Altman

Corporation for Public Broadcasting

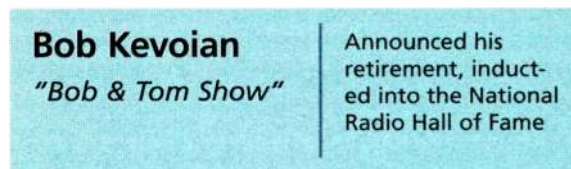
Tapped as EVP & COO



Clark Novak

Lawo North America

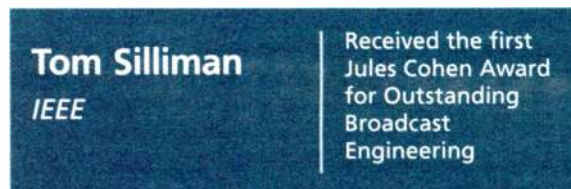
Joins as radio marketing specialist



Bob Kevoian

"Bob & Tom Show"

Announced his retirement, inducted into the National Radio Hall of Fame



Tom Silliman

IEEE

Received the first Jules Cohen Award for Outstanding Broadcast Engineering

Mark D. Montana

SCMS

Hired as a sales representative

Valery Galasso

FCC

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Jeff Shultz

CBS Radio

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With rugged construction and stylish, waveform-inspired design, the BP40 delivers clear and articulate reproduction. Optimized capsule placement helps maintain a commanding vocal presence even at a distance, while the multistage windscreen provides superior internal pop filtering. Mic also includes a switchable 100 Hz high-pass filter to provide additional pop protection. U.S. estimated street price \$349.

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WGBH Chooses ERI's SHPX-8AC

Lambda mounting system presents a uniform mounting structure to each bay

USERREPORT

BY DENNIS CORREIA
Broadcast Engineer
WGBH(FM)

BOSTON — It's strange how some listeners can better receive other stations but not the one you're working for. And when you decide to work at a different station? There's no escape there, all the others will continue to sound fine except yours. It's a law or something.

WGBH(FM) at 89.7 MHz on your cute radio dial with the scratchy tuning capacitor is Boston's highest power radio station at 98 kW — but power level does not guarantee reception. When WGBH changed programming, audience feedback indicated we needed a different signal delivery system to better serve evolving receivers in cars, homes and personal devices.

Our transmission facility is southwest of Boston in Milton, Mass., atop Great Blue Hill — that's where the "GBH" comes from. Since the late 1970s, our antenna was an eight-bay, full-wave-spaced SHP-8AC manufactured by Electronics Research Inc. When shiny and new, the SHP delivered programming to stations of the Eastern Public Radio Network. Farthest out was Albany, N. Y.

POLE CONSIDERATIONS

The eight-bay was chained to a 100-foot tapered pole mounted on a 130-foot Dresser self-supporting tower built for WGBH(TV) 2 in 1954. The pole diameter was more than 20 inches at the bottom and shrank to 6 inches at the top. Complex pattern distortions would result from pole and antenna flexing in moderate winds, especially the upper part of the taper.

The WGBH Radio engineering team — Emeric

Feldmar, Thomas Devlin and I — considered ideas for a replacement antenna. Based on performance and endurance, we thought the SHP should be replaced with another ERI antenna. A panel antenna was considered, but most are quite heavy and would require additional transmitter power.

ERI Eastern Sales Manager Carl Davis evaluated our situation and suggested replacement of the tapered pole with a 100-foot lambda section manufactured by ERI's tower division. Carl explained that the lambda mounting system was designed to present a uniform mounting structure to each bay of the antenna, allowing the energy from the bays to combine much as they would if the antenna were in free space. This was a much better alternative to modeling the tapered pole, with the added benefit of minimizing the flexing previously observed. We decided to continue with a similar antenna, ERI's SHPX-8AC.

In the summer of 2014, ERI conducted a series of detailed tower structure studies for the new lambda and other custom fabrications. The ERI tower crew arrived in August: Mike Boyer (foreman), Jeff Salazar, Tung Phan and Colin Harrington. Peggy Hunt managed our project from ERI headquarters.

The crew first installed a temporary antenna on our transmitter building tower, then removed the old SHP antenna. A crane lowered torch-cut tapered pole chunks to the ground. In concert with the tower construction, Dan Dowdle and Tom Scharf at the ERI test range were preparing a series of 14 pattern choices. Our pattern selection was translated into tower crew directions for installing the lambda system and our new SHPX antenna.

The new antenna was final tuned on Sept. 13 and placed on-air at full power. The ERI crew was on-site for about 15 days and it was a great pleasure working with them and all the folks at ERI. The system has performed flawlessly.

Best of all — the listeners who could only get the other stations? Well, we haven't heard from them yet.

For information, contact Joe Meleski at ERI in Indiana at (812) 925-6000 or visit www.eriinc.com.

Workers are preparing the 100-foot lambda section for WGBH's new antenna mounting structure.



TECHUPDATES

AM GROUND SYSTEMS OFFERS SITE SERVICES

AM Ground Systems Co. says it provides broadcast construction services to stations anywhere in the U.S. Turnkey and compressed time-line projects are specialties.

It says regardless of the project size, its team can provide resources and solutions to get the job done right. Services include large-array construction and rehabilitation. Specialties include evaluating, repairing, rebuilding and new construction of AM ground systems and elevated counterpoises. The company also does prep work for Method of Moments proofing and general AM array physical maintenance. It can design and install site lightning grounding to keep the FM site safe as well.

The multifaceted company is available to assist by providing a range of services at affordable prices.

For information, contact AM Ground Systems at (866) 227-2346 or visit www.amgroundsystems.com.



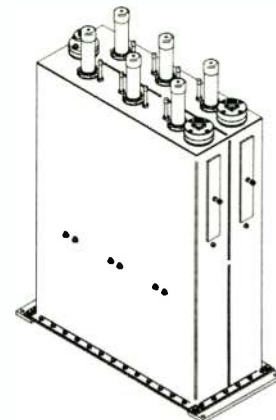
NEW COMBINERS FROM DIELECTRIC

Dielectric has introduced a new line of common-case channel combiners that combine two FM stations (–10 dB IBOC compatible) to one antenna.

The company says that combiner cost and efficiency is improved by eliminating the coaxial tee junction and associated line/elbows complex, making it useful for space-challenged installations.

Dielectric's common-case channel combiner module is field-tunable across the FM band in the event of the need for channel change. Modules use three- or four-pole filters and incorporate cross-coupling depending on channel spacing, contact factory with specific requirements. The LPFM common-case channel combiner (shown) handles 3 kW (analog + digital) with only 0.35 dB loss in a 32-inch x 13-inch x 40-inch footprint.

For information, contact Dielectric in Maine at (207) 655-8258 or visit www.dielectric.com.



TECHUPDATES

REMUS TOWER SERVICE INTRODUCES BEACON EXTENSION

Remus Tower Service recently introduced the RTS 36-66 Expandable Beacon Extension. It resolves beacon location compliance issues.

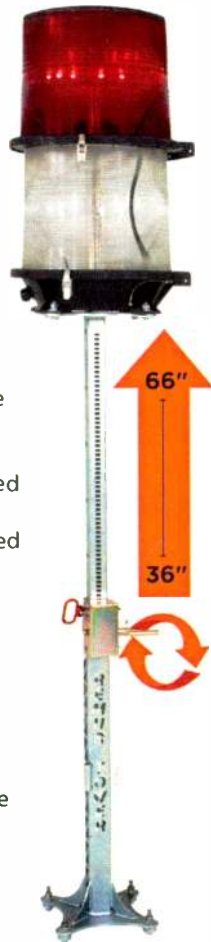
The development of this patented system was driven by two regulation changes in the tower industry. The first is the FAA regulation prohibiting the tower beacon to be located behind the antennas surrounding the top of the tower. The second was an OSHA act preventing work on any object over 36 inches above the structure of the tower.

Jared Remus, president and founder of Remus Tower Service, is a tower worker himself; he designed and developed the RTS 36-66 to provide a solution to these pending issues.

The RTS 36-66 is an expandable metal framework installed at the top of the tower to raise and lower the beacon above obstructions. When installed, the RTS-36-66 expands from 36 inches up to 66 inches with locking points every 6 inches. A person can safely work on the beacon at the retracted 36-inch height. Once completed, a small removable hand crank is used to extend the beacon up the the full 66-inch height.

The RTS 36-66 is made of durable zinc-plated steel. The frame features engineered gussets that are located to reduce weight while maintaining structural integrity.

For information, contact Remus Tower Service in Kansas at (785) 454-1007 or by email at jaredremus@gmail.com.



MYAT OFFERS ROHS-COMPLIANT SWITCHES

Myat says it has improved its line of coaxial switches by making them RoHS-compliant.

The company says that more broadcasters are looking for ways to "green" their operations and facilities, and the transmission plant is no exception. The smaller footprint and more efficient transmitters of today save space and money. Myat says the compact and lightweight designs of its switches aid broadcasters in making the most of reduced footprints in the transmitter room.

The company says that the radial port configuration makes "plumbing" them into a transmission system fast and efficient, often with fewer elbows than are required for "traditional" single-sided access switches. The Myat line of 3-1/8-inch, 1-5/8-inch, 7/8-inch and 7-16 DIN male and female switches are highlighted for their dependability, with low VSWR, high isolation and low insertion loss, according to the company.

RoHS refers to a directive regarding restriction of hazardous substances. Myat said the forward-thinking nature of RoHS compliance makes a transmission facility ready for whatever regulations or requirements the future may hold.

For information, contact Myat in New Jersey at (201) 684-0100 or visit www.myat.com.



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TECHUPDATES**DAVICOM INTERFACES WITH BDI ANTENNA SWITCH CONTROLLER**

Davicom says that courtesy of the SNMP manager within its DV-Mini or DV-208/216 remote monitoring units, those units can interface with Broadcast Device's Smart Switch Controller via its own SNMP agent. The DV-Mini or DV-208/216 products require firmware v. 5.54 or higher.

The interface consists of a Cat-5 cable, a DV configuration file and DavLink Workspace file that can be downloaded into any Davicom Mini or Davicom 208/216 unit and a PC. The files (for F/W v5.54) are free and available for download on the Davicom website.

The SSC-100 joins the DPS-100D power meter series from BDI that Davicom has been supporting since 2013.

For information, contact Davicom in Quebec at (418) 682-3380 or visit www.davicom.com.

**LBA TECHNOLOGY'S CAMI FACILITATES AM REBROADCASTS**

The FCC recently issued its report and order aimed at AM revitalization; part of the order is expected to prompt increased demand to place FM translators on "hot" AM towers.



LBA Technology says its CAMI provides a simple, cost-effective broadband medium-power isolation solution.

The CAMI is a medium-power isocoupler. It passes all frequencies from DC to 2500 MHz.

LBA says it designed the CAMI to isolate single auxiliary broadcast coaxial cables for FM translators, STLs, low-power FM and television translators. With very high AM isolation, it is a solution for mounting an FM translator antenna on many existing AM towers, even in directional arrays. The CAMI is designed for quick, easy installation and is resistant to weather and lightning, the company says.

For information, contact LBA Technology in North Carolina at (252) 757-0279 or visit www.lbagroup.com.

**KINTRONIC DELIVERS DRM-CAPABLE KINSTAR ANTENNA TO SOUTH AFRICA**

Earlier this year Kintronic Labs delivered a Model KSR-25-1440LP low-profile AM KinStar antenna to Sentech, the signal distributor for the South African broadcasting sector, in cooperation with local partner LS Telcom.

The KinStar antenna kit included the antenna conducting elements, all required installation hardware adapted to the customer-supplied sectionalized metal pole supports, guy strain insulators, turnbuckles and preforms, ground system materials, and a weatherproof broadband antenna tuning unit that yielded DRM-compliant bandwidth for a 25 kW transmitter operating on 1440 kHz.


According to Kintronic, this particular antenna constitutes the highest power KinStar antenna that has been installed to date.

Auxiliary services antennas were installed on the top of the center support pole of the Kintronic Model KSR-25-1440LP KinStar AM low-profile antenna.

The KinStar was chosen by the Sentech engineers for the purpose of conducting analog and DRM coverage tests in comparison to a skirt-fed tower that was installed and later taken down to permit the KinStar to be installed at the same location utilizing the same quarter wave ground system.

The company says that one unique installation feature of the antenna was the use of the center metal pole to support program feed dishes and telecom service antennas that had been previously installed on the tower that the KinStar replaced. All of the cables for these services were fed through the middle of the hollow metal support pole.

For information, contact Kintronic in Tennessee at (423) 878-3141 or visit www.kintronic.com.



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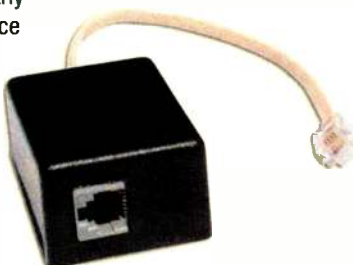
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Looking for KFRC signoff radio broadcast from 1930 Andy Potter, running time is 0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne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

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From "Electronics" to "Technology"

What's in a name (change)? In a word: plenty

TECHNOLOGY

BY GARY SHAPIRO

The author is president and CEO of the Consumer Technology Association.

Last month, the Consumer Electronics Association became the Consumer Technology Association. The new name more accurately reflects our vision, scope of activity, current membership base and brand promise. We announced the name and introduced the new logo at CES Unveiled New York, a half-day event offering a sneak preview of the year's most innovative products and technologies ahead of CES 2016 in early January.

While our association's name has changed, our mission has not.

As representatives of more than 2,200 U.S. technology companies, promoting and spurring innovation are at the core of everything our association does. And to represent our members fully and fairly, we needed to make sure we understood their needs and their business models. Starting from first principles, this has meant taking a closer look at our organization's name.

CTA remains the voice of the consumer technology industry and committed to its growth. We fight for and defend pro-innovation public policies. Our focus on, and commitment to, excellence in market research and industry standards, as well as to promoting and spurring innovation, will continue unabashed and unabated.



Our name change is less revolutionary than evolutionary. While our association has successfully staked its claim as a global champion of technological innovation, the term "electronics" no longer accurately represented the full scope of our membership and the industry we represent.

Just think about the evolution in radio over the last two decades. In 1996, Sonicwave.com launched the first Internet radio station. Today, more than 119 million people listen to online radio every week, averaging about 13 hours of playtime. Technology is evolving at the lightning speed of innovation.

BACKGROUND

This name change is not our first reformation. In fact, our association has a long history of changing our name to reflect the rapidly-evolving industry we represent. We began, in 1924, as

the Radio Manufacturers Association. Later, we became the Electronic Industries Association, the Consumer Electronics Manufacturers Association and then the Consumer Electronics Association.



With every step in our evolution we've grown our membership, expanded our scope of technology and strengthened our public voice.

Over the last nine decades, our membership has broadened to include new technologies and innovative industries, including automakers, crowdsourcing technology, software and app creators, drone companies, 3D-printer makers, digital health leaders, robotics innovators, Internet of Things players, search engines, content creators and more. The name "Consumer Technology Association" allows us to update our brand without changing our identity.

With this evolution, we also more inclusively represent the member companies that are non-hardware innovators, such as Uber and Lyft, BMW and Ford, Netflix and Pandora, Expedia Inc. and Yelp, Google and WebMD, and Twentieth Century Fox and Starz. Indeed, much of what our industry is

creating today is smart, connected and not "electronics" per se — at least not as traditionally defined.

WHAT'S THE SAME?

One thing that isn't changing is the name of CTA's annual industry trade show in Las Vegas, CES, the world's gathering place for all who thrive on the business of consumer technologies, has become the global brand for innovation where representatives from the world's technology industry discover the latest trends, conduct business and network. With more than 2 million net square feet of exhibit space across three venues, CES reflects the awe-inspiring scope, breadth and innovative breakthroughs of today's consumer technology industry.

Consumer Technology Association™

Another thing that isn't changing is CTA's 35-year co-sponsorship of the National Radio Systems Committee in collaboration with the National Association of Broadcasters. During that time, the NRSC has standardized broadcast-radio technologies in analog and digital AM/FM radio, as well as text delivery via the Radio Broadcast Data System. The roughly 200 engineers who participate in the NRSC's standards development groups have helped keep consumer technology manufacturers on the same page as broadcasters, even as radio has evolved.

Because of the timing of our name change and the sheer size and scale of CES, some attendees will see CEA signage at the 2016 show. But anyone looking for us online at CEA.org is now automatically redirected to our new Web address, CTA.tech.

As technology evolves, so do we. Our new name better represents the full promise and potential of our member's products and services, whether that lies in creating new jobs, strengthening technology's role as an economic engine or introducing life-enhancing innovations. Embracing innovation is at the core of our organization.

Gary Shapiro also is author of the books "Ninja Innovation: The Ten Killer Strategies of the World's Most Successful Businesses" and "The Comeback: How Innovation Will Restore the American Dream." His views are his own. Connect with him on Twitter: @GaryShapiro.

READER'S FORUM

AUDIO PROCESSING

I totally agree with Mike Erickson ("Take Steps to End the Loudness War," Nov. 18).

We are a small radio group, but I push for no compressed audio in house and a transparent audio chain. Our staff is very aware of how good we sound, and when something is not right, it usually really sticks out, and we take care of it. Production and imaging easily can over process if not careful and when that goes through, on-air processing can really stand out.

Most of the big commercial production studios for national spots do a real good job and might be a good reference to keep in check. Plugins like Ozone can be great, but you can also ruin audio with them as well.

You must use your ears.

I keep some audio files that I really like in a folder to go back and listen to from time to time. Also, I have had to

educate folks that when you get an MP3 and convert it to a WAV, you did not just fix the problem... the problem was created when it was first made into an MP3.

That's my 2 cents.

Bruce Roberts
Director of Engineering
Apex Broadcasting
Charleston, S.C.

OPINION

Take Steps to End the Loudness War

You want a sound that's loud and clear — these tips can help you achieve it

COMMENTARY

BY MIKE ERICKSON

Before I left to work for Whatsonline six years ago, I was the chief engineer of WCBM (FM) in New York City. At the time, WCBM was somewhat aggressively processed but not over the top. I designed a unique signature, with feedback from programming and talent, that date back to the Clinton administration. Your new processor will bring out all those had details in your audio, details that your old processor covered up. Your high-performance spots ear the



you on the processor in the first place. But that's only if the audio is linear, and your air chain isn't packed with analog distribution amplifiers that date back to the Clinton administration. Your new processor will bring out all those had details in your audio, details that your old processor covered up. Your high-performance spots ear the

RADIOWORLD November 18, 2015

by case basis, and only in the production studio.

Step 5. Use the composite output of your processor (ie, it analog composite use of the AI's left right output moves the stereo generator to the center. While there are many good stereo generators in today's exciter, none compare to the one you can find in any modern

Your high-performance

READER'S FORUM

AM REVITALIZATION

Guy Wire's opinion piece ("iHeartMedia Makes a Preemptive Strike," Dec. 2) offers some new perspective and invites comment.

The classic picture of the heritage station covering 34 states is romantic, but its fabric is torn by reality. With a few notable exceptions, today's 1-A stations are committed to competing in their local markets against the big FMs. Therefore the idea that rural- and remote-area service justifies nighttime protection of those signals is hard to justify.

However ... if skywave protection *is* reduced, the commission should allow only the consequent existing-station upgrade opportunities. *No* new AM stations should be licensed on these channels. The goal of "saving the occupants of the AM band" will not be furthered by adding additional occupants.

The goal of "enhancing localism" should be put to sleep once and for all. Docket 80-90 taught some folks this lesson. New AM stations (likely multi-tower) would be built at minimum investment and would probably be automated. And the public would be no better served with emergency warnings and public-service information.

I'm also curious about what a reduction/removal of skywave protection might do to the IBOC picture. The current coverage ratios between adjacent 1-A stations (see: Chicago/New York, *et. al.*) have led some 1-As to shut down their digital pollution. How would that change in an environment where 1-As had less nighttime protection?

As to numbers, Guy's call for "more data" is important, but we know numbers can be massaged to prove almost anything. Having suggested that, ratings *are* key numbers, and I believe the 1-As that still deliver high listenership got there by investing in solid programming and resources.

Those investments should be protected; but it's hard to make the case that noise-free AM reception

should be protected beyond the contours of interference-free protected FM service.

Mark Durenberger, CPBE
Minneapolis, Minn

Interesting proposal from the FCC on potentially reducing nighttime and critical hours skywave protection for the big 50KWs in order to let local AM stations shine at night ("FCC Acts to Give AM Operators Relief," Nov. 4).

I'm for it (despite the fun I used have pulling in long distance station at night), if the locals truly fill in the news and info gap during an emergency that the big stations can give. The big regional stations aren't that necessary any longer to cover big geographic areas. Getting FM translators for the little AM operators would be helpful, too.

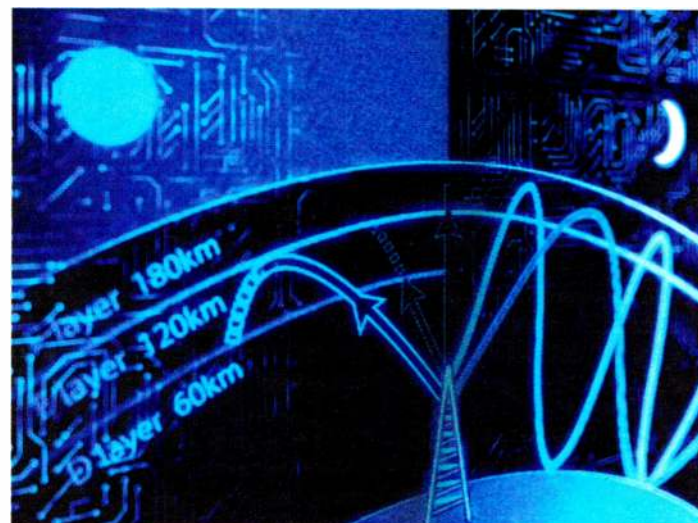
David McAlary
Volunteer radio producer
Fairfax Public Access/
Retired editor, newscaster and correspondent
Voice of America
Falls Church, Va.

In my neighborhood, the AM radio dial is 90 percent talk, especially right-wing talk aimed at angry seniors. And there are two stations that play Mexican music. All stations come in clear as a bell most of the time.

My younger neighbor (who is in the coveted demographic) has a dusty 1937 Phileo console that hasn't worked in a decade but he has an iPod hooked up in the cabinet that plays big band and doo wop music. His other radios are all FM.

I asked him if he would consider fixing up the radio if there was a big band or doo wop station to listen to. He jumped at the idea and smiled widely at the thought.

So who's the brain who decided that you can play music on AM, but only if it's Mexican oom-paa-paa?



And moving all that talk to FM will accomplish one thing: Lots of people will leave there too.

Duke Evans
Santa Rosa, Ca

I have followed this plan with the FCC since it was announced several years ago ("FCC Acts to Give AM Operators Relief," Nov. 4).

My interest is personal since I worked for a stand-alone owner of an AM/FM operation. My almost 30 years there meant nothing as he sold the stations for a tidy profit. Eventually, the new owners moved the FM to another county and he repurchased the AM, which he continues to operate. Now with this new plan he will be awarded an FM translator? This really seems wrong to me.

He willfully sold the station and made a nice sum in the process. Now, along with his money in the bank he will also have a new FM.

Any way I try to process this, I see it as wrong. And I wonder how many other towns in the USA have a similar story?

Steve "Kelly" Anderson
Programmer/on-air talent
New Philadelphia, Ohio



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