

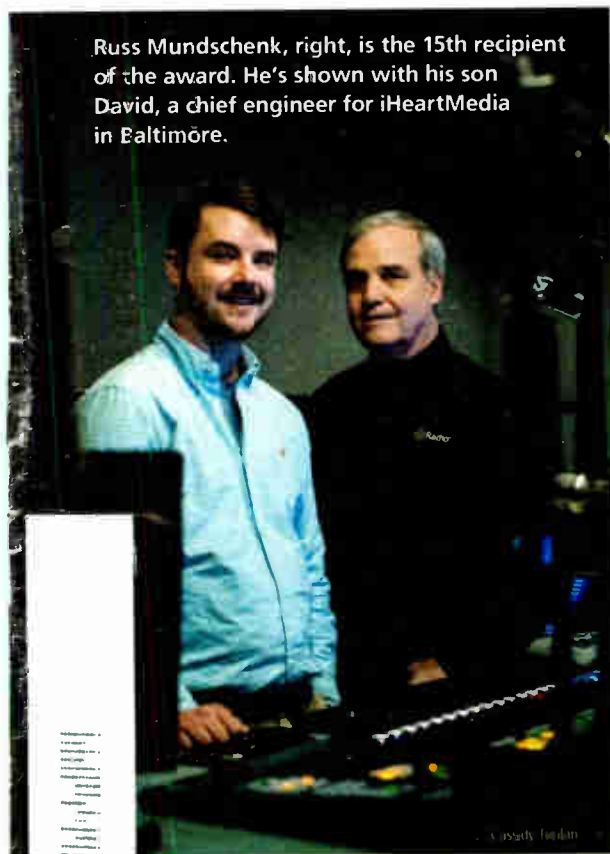


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Mundschenk Helps Radio Build Its Digital Future

Russ Mundschenk, right, is the 15th recipient of the award. He's shown with his son David, a chief engineer for iHeartMedia in Baltimore.

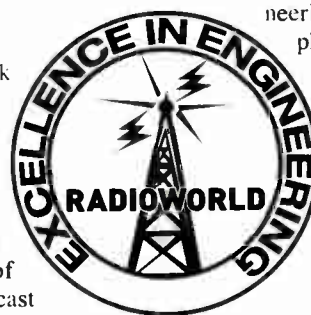


Radio World Excellence in Engineering Award recognizes his career of technical achievement

BY PAUL McLANE

Russ Mundschenk is the recipient of the Radio World Excellence in Engineering Award for 2018–19. Recipients of the award represent the highest ideals of the U.S. radio broadcast engineering profession and reflect those ideals through contributions to the industry.

Russ is a senior manager of broadcast engineering for Xperi, which owns and promotes HD Radio digital technology. We selected Russ not only for his 18 years (and counting) of work advancing digital radio in the United States and abroad, but for his full 44 years of service to radio — his work in local radio engi-



neering including Philadelphia and other markets; his early efforts in digital audio, switching and synchronization; his personal love and passion for radio; and his integrity and respect for his peers.

Russ is our 15th annual recipient; he joins a stel-

lar roster of engineers who have been so honored.

TECHIE FROM THE START

Like so many of his colleagues, Russ discovered an early interest in technology. His dad Manuel Mundschenk, known as “Munchie,” ran a hi-fi cabinet shop in Sherman, Conn. (Munchie was described in a 1959 Billboard article as a hi-fi “zealot” and was quoted saying, “Audio has proceeded beyond the point where the woman of the house is satisfied to have a piece of equipment on a shelf with wires dangling from it.”)

(continued on page 8)

Tariff Situation Could Boost Broadcast Equipment Costs

Cap ex budgets might not stretch as far in 2019

BY RANDY J. STINE

WASHINGTON — Heftier tariffs on Chinese-made electronics and other products appeared to be on hold as of early December. But broadcast manufacturers, watching the business headlines, expressed concern over the long-term impact on hardware prices for radio industry buyers if and when

higher tariffs do take effect.

A 10 percent levy on Chinese-made goods was announced earlier this summer and imposed in September. It was scheduled to ratchet up to 25 percent in the new year, but in December President Trump announced a 90-day hold that allowed for further negotiations between American and Chinese

(continued on page 3)

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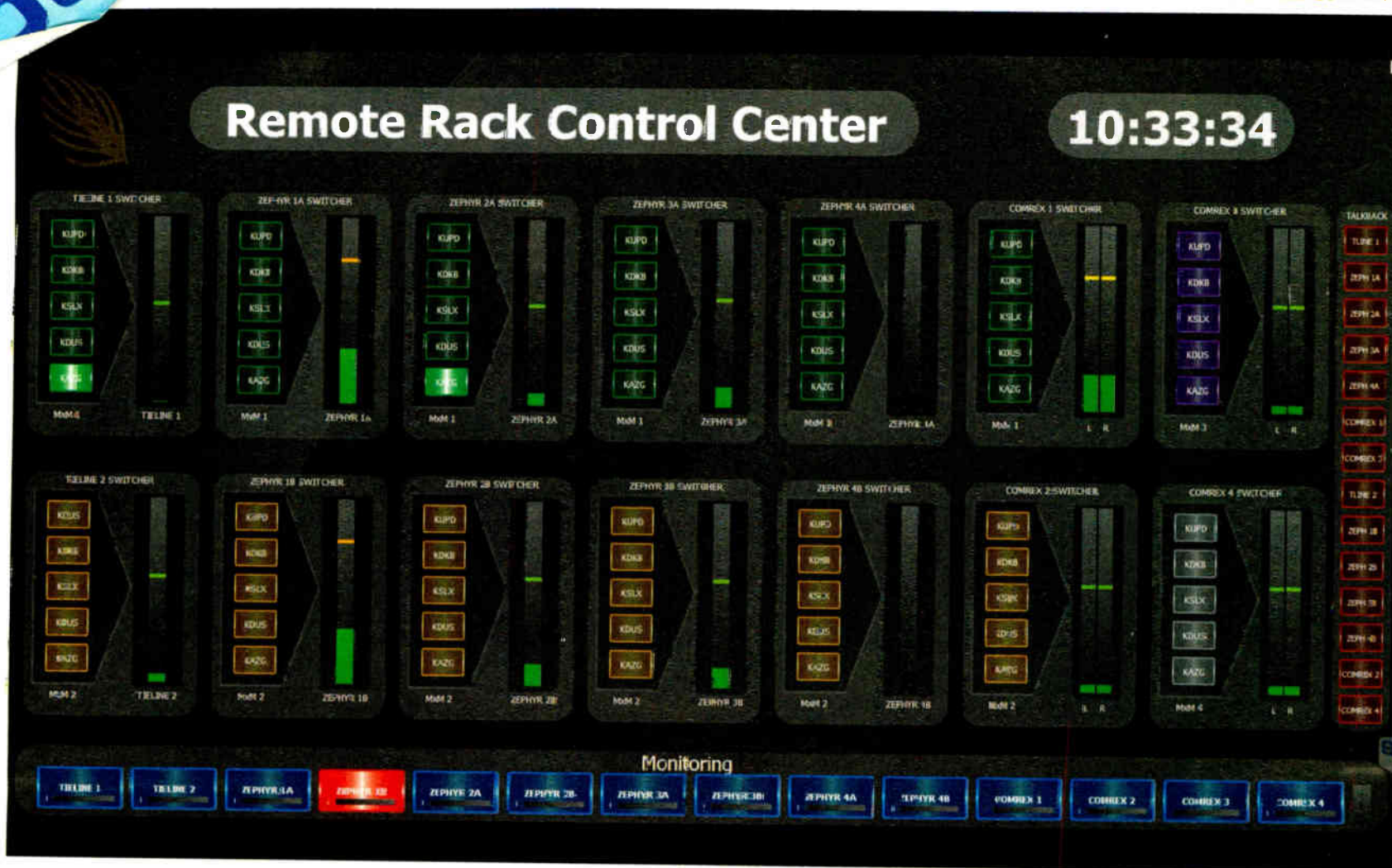
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This screen in the Hubbard Phoenix rack room provides easy touchscreen access to the group's assortment of codecs for its five studios. Included are monitoring and talkback buttons for set up and testing of remotes. Screen courtesy of RadioDNA

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CONTENT

Managing Director, Content Paul J. McLane,
paul.mclane@futurenet.com, 703-852-4628

Senior Content Producer — Technology Brett Moss, brett.moss@futurenet.com

Content Manager Emily M. Reigart, emily.reigart@futurenet.com

Technical Advisors Thomas R. McGinley, Doug Irwin

Technical Editor, RWEE W.C. "Cris" Alexander

Content Director — International Marguerite Clark

Contributors: Susan Ashworth, Dave Beasing, John Bisset, James Careless, Ken Deutsch, Mark Durenberger, Charles Fitch, Travis Gilmour, Donna Halper, Craig Johnston, Alan Jurison, Paul Kaminski, John Kean, Peter King, Larry Langford, Mark Lapidus, Jim Peck, Mark Persons, Stephen M. Poole, James O'Neal, Rich Rarey, Jeremy Ruck, John Schneider, Randy Stine, Jennifer Waits, Tom Vernon

Production Manager Caroline Freeland, Nicole Schilling

Managing Design Director Nicole Cobban

Senior Design Director Karen Lee

ADVERTISING SALES

VP/Media Technology Group
Carmel King, carmel.king@futurenet.com, 703-852-4602

Publisher, Radio World International
Raffaella Calabrese, raffaella.calabrese@futurenet.com, +39-320-891-1938

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MANAGEMENT

Managing Director/Senior Vice President Christine Shaw

Chief Revenue Officer Luke Edson

Chief Content Officer Joe Territo

Chief Marketing Officer Wendy Lissau

Head of Production US & UK Mark Constance

FUTURE US, INC.

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TARIFFS

(continued from page 1)

government officials, according to news reports. The proposed higher tariffs would have affected about 800 categories of goods and materials imported into the United States.

If negotiations fail to prevent an uptick, radio engineers may find their 2019 capital expenditure budgets stretched. Equipment manufacturers seem to be holding the line on equipment prices for now but noted the volatility of the situation.

SURCHARGES

Ben Barber, president and CEO of Inovonics Inc., said the company had received notification in June from several vendors that beginning in July there would be a surcharge added to invoices for certain components.

Radio engineers may find their 2019 capital expenditure budgets stretched thin if negotiations fail and there is an uptick in U.S. imposed tariffs on Chinese made electronics.

“Inovonics purchases the bulk of our raw components from U.S.-based companies like Arrow, Future, Digikey and Mouser, to name a few of the popular ones,” he said. “Now, of course, most all electronic components are manufactured offshore, but we do the major line of purchasing through these and other U.S. channels. Since July 2018, we have seen an increase in component prices, averaging somewhere around 19.5 percent.”

The potential price increase is “pretty nebulous” though, he continued. “For instance, we purchase OLED displays from a U.S.-based company that is adding \$1.227 to each \$20.45 display we purchase from them. When you buy in lots of 1,000 pieces, as we do, that surcharge increases our display costs by \$1,227. That turns out to be an increase of 6 percent,

which is a hard and fixed cost to Inovonics.”

The company manufactures audio processing, RDS messaging and signal monitoring gear. It received communications from U.S.-based distributors that on Jan. 1 they would add a 25-percent increase to component costs: Barber said this may be subject to change given the president’s subsequently proposed 90-day delay.

Adding to the complexity of this issue is that fact that supply chains are often convoluted and not always transparent, said Kris Bobo, managing director at Comrex. Components may be purchased from companies in the United States but still be subject to a tariff if they were originally from China.

“We’re currently discovering that any new tariff will have a much broader impact than we anticipated,” she said. “Almost all electronics contain parts that were originally manufactured in China. Even if something was built in another country, if it contains a component that originated in China, the price for American buyers will be affected in some way.”

Bobo said it isn’t possible to predict the impact of additional new costs because suppliers tend to handle them in different ways.

“It’s hard to predict how U.S. manufacturers can absorb such a substantial hit. We’re in the process of strategizing, but suffice to say, we’re concerned,” she said.

Comrex, which is based in Devens, Mass., produces a variety of audio and television codecs and studio telephone interfaces.

WAVE OF NOTICES

Ben Palmer, sales engineer with Arrakis Systems, said his company hadn’t been directly impacted yet by the tariffs on Chinese goods, but feels it’s likely that extra costs would eventually snake through the entire U.S. economy.

“We have received a wave of notices from our parts distributors that we would see an increase in cost on parts in the near future, but this hasn’t taken place yet. Most of our parts orders are placed and scheduled out for a year or more. This is useful when prices may bounce around, and for times like this,” Palmer said.

“Some of our parts distributors, such as Master Electronics, have made promises to not raise rates as a

(continued on page 4)

TARIFFS

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result of the tariffs. So we may see that some distributors may absorb some of the increases.”

Colorado-based Arrakis makes consoles, furniture and automation systems; it solders and assembles its hardware in-house and sources its fabricated metal from a local company. Palmer said, “the only exceptions being a small handful of components and ICs from companies such as Texas Instruments.”

Arrakis uses a parts management software program to track costs. “We evaluate the costs of our various assemblies on a regular basis. We are always focusing on keeping our product at the same competitive price point. As we see increases on prices for some components, we achieve the same costs by lowering our costs elsewhere.”

Manufacturer Wheatstone also is watching developments. “Components like NKK switches, raw PCBs, Amp connectors, AKM DACS and ADC, Panasonic and Nichicon capacitors, various LEDs and displays — there’s quite a list,” said Andy Calvanese, VP of technology and engineering for the company. “Many of these components are not available anywhere else and just about every manufacturer is affected as a result.”

Wheatstone, whose products include consoles, AoIP networking and audio processing gear, manufactures its products at its facility in New Bern, N.C., which helps the firm manage price fluctuations.

“Those companies that rely on third parties to assemble and manufacture for them are probably the most vulnerable to these kinds of price fluctuations ... the more control you have over the process itself, the better off you are in terms of quality, pricing and delivery,” Calvanese said.

He said that a manufacturer’s inventory management may delay any impact. “We’re really aggressive about inventory, so realistically, broadcasters won’t see this tariff’s effects on Wheatstone products in the short term, given the way we manufacture and the inventory levels we carry,” he said. “Everyone will be affected by tariffs ultimately, unless the trade issues get resolved soon.”

Industry Innovators Honored

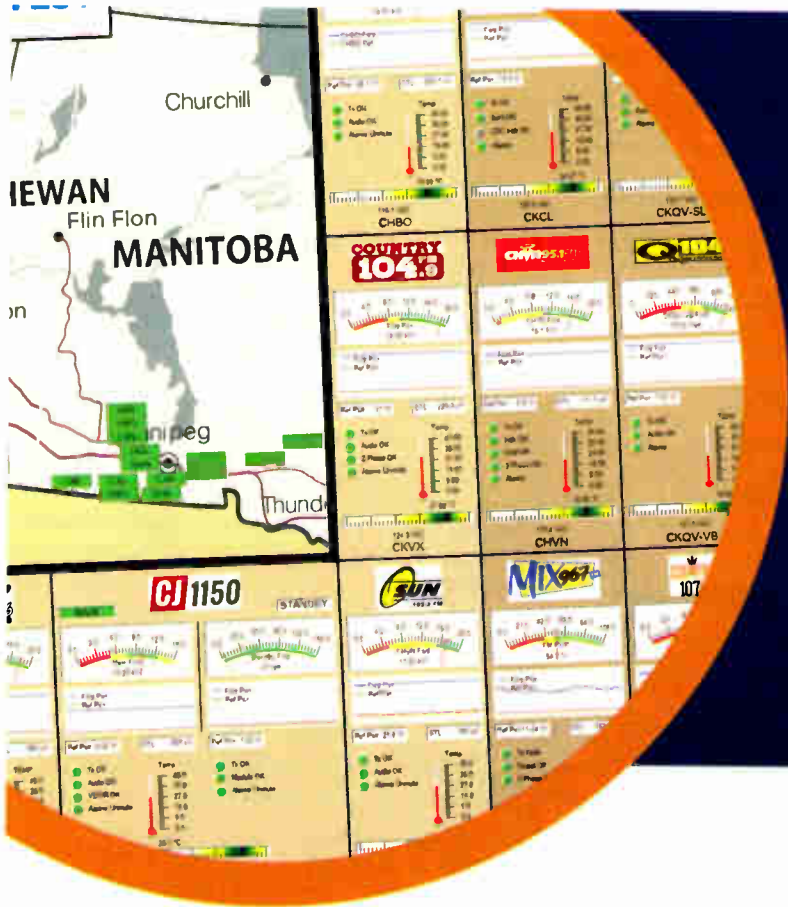
The media technology brands of Future are pleased to introduce our second annual Industry Innovator Awards.

Five Future publications — Radio World, TV Technology, Digital Video, Video Edge and Government Video — invited nominations of people deserving recognition for their professional achievements, technical and business innovations and continuing influence within our industries. Nominations typically are submitted by friends, peers or employers who pay a fee for each nomination.

The recipients for Radio World are Jeff Keith, senior product design engineer for audio processing at Wheatstone; Paul Roberts, founder/station manager of OC Talk Radio; and Greg Shay, chief technical officer of The Telos Alliance.

A new digital guide features all of the nominees in the 2018 program; highlighted pages indicate recipients. Read it at <https://tinyurl.com/rw-innovators>.

The awards are designed to shine a spotlight on the people behind the companies and technologies on which our industries depend. We offer a heartfelt “thank you” for their contributions and wish them continued success.



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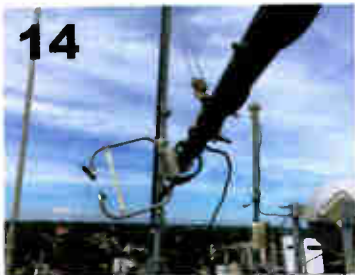
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Super Typhoon Devastates USAGM Transmission Sites

Yutu scored a direct hit on two islands in the Northern Mariana Islands in October

DISASTER RECOVERY

BY JAMES CARELESS

Two shortwave radio transmission/antenna farms used by the U.S. Agency for Global Media in Saipan and Tinian were ripped apart by 180 mph winds in October. That's when Category 5 Super Typhoon Yutu ravaged the Northern Mariana island group in the northwestern Pacific Ocean.

Deemed to be tied with Super Typhoon Mangkhut as "the strongest storm on Earth this year" by NASA's Earth Observatory, Yutu levelled buildings and electrical infrastructure in this U.S. commonwealth. Power was still unavailable in many areas as of early December, and repairs are expected to take many months.

"Yutu's eye passed between the two islands of Saipan and Tinian, so the super typhoon scored a direct hit on our two transmission sites," said Terry Balazs, USAGM director of the Office of Technology, Services and Innovation. "The damage was very extensive at both sites, and, of course, on both of the islands."

USAGM — until recently named the Broadcasting Board of Governors — uses the Saipan and Tinian sites to broadcast Radio Free Asia and Voice of America multi-language radio programming into China and other Asian nations. Although RFA/VOA shortwave transmissions have been moved to other Pacific Ocean sites for the time being, none offer the range and reach of the Saipan/Tinian sites. Collectively, the two locations are known as the Robert E. Kamosa Transmitting Station or REKTS.

"Both stations were completely wiped out," wrote William Martin, manager of the USAGM Philippines Transmitting Station, in a text message to long-time "World of Radio" broadcast host and DX Listening Digest editor Glenn Hauser that was shared with Radio World. "Antennas mangled, roofs partially torn off, fence lines flattened. Both sites will be off air a minimum six months, possibly up to a year."

JAW-DROPPING DAMAGE

The extensive and extreme damage suffered at the two REKTS sites are breathtakingly portrayed in USAGM photos. So powerful were the winds that the concrete weight rings that hold

(continued on page 6)



Above: Damage to antenna feed line on Saipan

Below: Damage to antenna counterweight on Tinian



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TYPHOON

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down an antenna guy wire anchor were literally shaken to pieces.

Feed and power lines were knocked down everywhere; STL links toppled and curtain-array shortwave antennas (consisting of transmission wire webs strung between support towers) were tangled and torn like unravelling knitted sweaters.

"Every operating curtain-array antenna has been damaged, in a way that they cannot be used," said Balazs. "The towers are still there, but the curtains and elements have been severely damaged and, in many cases, torn off. So there's no way in the short term that we're going to

Destroyed satellite antenna dish on Saipan



be able to restore broadcasting. We need to send an expert there to assess which antennas can be repaired, and which ones have to be replaced."

Meanwhile, satellite dishes that downlinked RFA and VOA were either fragmented like china plates dropped on a stone floor or simply "blown away," he said. "They're just gone."

In contrast, the main buildings at both sites "are pretty much intact," Balazs told Radio World. "The shortwave transmitters inside the building are intact, but some of them have water damage. We have dried them up, but you never know if they're going to be completely functional until you fire

them up again."

REKTS does have local power, thanks to its own generators, but the main electrical grid that normally feeds the two sites is still offline at this writing.

REKTS staff have been doing whatever repairs are necessary to the two sites' buildings, plus removing fences knocked down by Yutu's 180 mph winds and debris blown onto their properties. "Debris from anywhere in the islands seem to have ended up on our sites," said Balazs.

But repairing the massive curtain arrays in a timely manner is beyond their capacity; they just don't have enough people or equipment to do the job without substantial outside help.

AN UNCERTAIN FUTURE

The destruction of REKTS' shortwave transmitting capability comes at a time when the USAGM has been backing away from shortwave radio broadcasting in general. The big reason is money. For example, the cost of powering the three 100 kW Continental 418E transmitters at the Saipan site alone is astronomical compared to streaming content online. For similar reasons, governments around the globe have either cut back their international radio services — the BBC World Service having ceased shortwave broadcasts to North America — or eliminated them entirely.

"USAGM has made no secret of its desire to shift its investment from shortwave to newer, more fashionable technologies," said Kim Andrew Elliott, retired VOA audience research analyst and producer of "Shortwave Radiogram," which



Damage to radiating elements of curtain antenna 305L on Tinian

broadcasts text and images via analog shortwave stations WRMI in Florida and Space Line in Bulgaria.

"As such, it might be tempted to take this opportunity to close the Northern Mariana shortwave stations, or at least Saipan, the smaller of the two. Still, if the towers at Saipan are still standing and the transmitters still operational,

and given the rising potential for crises in East Asia further squeezing the internet, it would be a good idea to keep both stations on the air," Elliott said.

This view is echoed by Glenn Hauser, another of the world's most knowledgeable shortwave authorities. Asked if he expect the USAGM to repair these sites

(continued on page 8)

REKTS IN AN INCREASINGLY CENSORED WORLD

Before being knocked off-air by Super Typhoon Yutu, REKTS' Saipan and Tinian shortwave farms played a central role in the USAGM's radio broadcasts to Asia.

"The HFCC [High Frequency Coordination Conference, the international co-operative group that coordinates shortwave frequency allocations among nations] had 38 daily transmissions registered for Tinian, with eight transmitters; and 10 for Saipan with three transmitters, planned for the B-18 season which began a few days after the typhoon," said "World of Radio" host Glenn Hauser. These were mostly Radio Free Asia broadcasts to the region from Tinian in Burmese, Tibetan, Mandarin, Korean, Khmer, Uighur, Cantonese. Saipan in Mandarin, Lao and Korean; plus some limited VOA transmissions.

"Tinian was the primary site for RFA to China, although China was already also reached from the west via transmitters in Kuwait — already being upgraded for increased capacity — and Germany," he added.

To counter Chinese jamming of RFA broadcasts, the REKTS sites transmitted on numerous frequencies at once. Losing REKTS has substantially reduced the number of available frequencies, "so RFA to China has taken a major hit," said Hauser. But "listeners still have a chance to hear

it, if they can get past the jamming."

Losing REKTS could seriously undercut the USAGM's ability to reach Asian audiences with an American perspective, said Kim Andrew Elliott.

"To the extent they ever have been, Asian audiences are mostly out of the habit of tuning in shortwave radio broadcasts. They are watching TV and accessing the internet," Elliott said. "But in most Asian target countries for VOA and RFA, domestic terrestrial relays of its television broadcasts are not allowed. And most television viewers do not have access to the satellites that carry VOA and RFA content.

"As for the internet, China and other countries in the region are finding more and more ways to block internet content. They are also going after circumvention technologies and VPNs. Even savvy internet users in Asia might run out of ways to work around these efforts."

For this reason, shortwave should remain a component of USAGM's delivery to Asia, Elliott said. "The direct audiences will not be large, but a few thousand technology enthusiasts can receive content from abroad via shortwave, then pass it on to larger audiences through domestic channels. The VOA Radiogram and Shortwave Radiogram projects have shown that text and images can be transmitted on shortwave, with no special additional equipment needed by broadcasters and requiring only the addition of free software for the audience."

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MUNDSCHENK

(continued from page 1)

So, says Russ, “Even when I was three or four, I had a soldering iron in my hand. I grew up around hi-fi. I had my own little radio station set up.” He was thrilled by the glowing tubes he saw during a childhood visit to the Carmen Hill transmitter site of what was then WGHF(FM) in Brookfield — it eventually became WINE(FM) and then WRKI. For a science fair at Sherman Elementary School, he won prizes by building an electric arc one year and a repulsion coil the next.

“I found an article in a 1940s Popular Science that showed how to make a repulsion coil. ‘Hey, this thing is cool. You get a one-foot-square aluminum plate and you levitate it and it throws rings into the air.’ I contacted one of the local transformer manufacturers, and said, ‘Hey, guys, you got any transformer laminations?’ I slapped all them together and shellacked each one. I actually got them to wind the darn thing for me. ... All the lights dimmed in the house when I turned it on, but it was a real trip.”

His high school interest in Citizen’s Band radio brought him together with future fellow engineer Tom Osenkowsky.

“He was at one end of Candlewood Lake, I was at the end of the other; we were both on our CB radios. He was an only child, I was an only child; he went to Brookfield High, I went to New Milford High.” Osenkowsky would become a friend until his death last year.

Russ then spent time at the radio station at Western Connecticut State College; he obtained his First Class Phone; and he got a job for a while at WLAD(AM) in Danbury, tending its Harris System 90 automation. “Programming back in those days involved pushing sliders up and down for the carousel cart machines and making sure that the tapes were changed on time,” he recalls.

The early professional years brought a flurry of gigs as he learned his craft. Having switched schools to the University of Bridgeport, he took a part-time gig as assistant engineer at WMMM and WDJF, then a full-time job at WNTY, a two-tower daytimer on 990; then a job for the WADS cluster of stations in Wilimantic, where he learned from engineers Peter Gowen and Terry Smith.

After school, moving to Florida, he worked for Palmer Communications as assistant chief of WCVU and WNOG in Naples, and then WINK(AM/FM/TV) in Ft. Myers, where he was chief of radio before returning to Connecticut to be chief engineer at WKCI and WAVZ in New Haven.

NICE AND EAZY

It was in Philadelphia that Russ Mundschenk settled in, finding a job with legendary radio owners David Kurtz and Jerry Lee as the chief engineer of FM station WEAZ “EAZY 101.”

“It was like, ‘Okay, it’s beautiful music. Maybe nobody really wants to deal with beautiful music [but] I don’t care what their format is.’” The easy listening station was a smash success in that time period, making lots of money and consistently enjoying ratings successes as it battled for top ratings with news outlet KYW in one of the nation’s largest media markets. It remained popular in its later iteration as WBEB “B101.”

“I’ve got to credit Dave and Jerry as giving me pretty much free rein there,” he said. “It was really great working for an independent station and Jerry Lee; he was just the best, as was Dave Kurtz. Our family became very good friends with the Kurtzes, and it was just a terrific environment and a really good experience for me.”

Having an early adopter personality, Mundschenk spent part of his 17 years at the station exploring digital technology. It was one of the first in the country, perhaps *the* first, to install digital consoles and to explore digital switching and synchronization.

“We used the Zaxcom console, which was being sold by Harris Corp. I did a lot of work with that, I even wrote the manual on it. At the time, it was a single radio station, so we had a production room, an air studio and a voice studio. I just loved the versatility that the digital



Magical Mystery Tour:
NAB’s demonstration of the Eureka system gave listeners a chance to compare DAB and FM reception in a moving vehicle.

Digital radio has long been an interest for Mundschenk, seen here at far right in the third row, next to WBEB co-owner Dave Kurtz, in a photo from Radio World in the 1990s.

format, not to mention the audio quality, afforded.”

I asked him what the concept of digital really meant to radio people at the time.

“I don’t know whether broadcasters had really gotten their teeth around it,” he said. “Broadcasters are not known for adopting new technologies real quickly — ‘If it ain’t broke, don’t fix it.’ In fact, I don’t know whether building these digital studios really made Jerry Lee any more money. It gave him and me some press; to a certain extent, it helped out the announcers and made their work a little bit easier.”

He also recalls experimenting with automation systems during that time period.

“It seems like we tried every kind of commercial system known to man, from carts to a floppy disk, a 13 megabyte floppy disk-based system, which didn’t last too long; then to playing CDs, and then the hard drive system, a DCS

[Computer Concepts’ Digital Commercial System] implementation.”

When the company acquired WFIL in Philly, the team rebuilt that AM transmitter facility, added studios and implemented a Media Touch Automation system, using DCS for the commercials and Sony multi-CD changers for the Music.

DIGITAL ALL DAY LONG

During this time Mundschenk became close with another of Philadelphia’s legendary radio people, engineer Glynn Walden, who worked at KYW(AM) and had become a driving force in Project Acorn, a multi-company effort seeking to find an in-band on-channel (IBOC) digital broadcasting solution for the U.S. radio industry. Eventually CBS and Gannett established USA Digital Radio, joined soon after by Westinghouse, efforts that eventually led to the HD Radio system.

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TYPHOON

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given that the agency has publicly discussed closing down REKTS in 2019, Hauser replied, “I doubt it, as the trend has already been away from shortwave toward webcasting.”

Asked if REKTS was slated for shutdown before Yutu’s onslaught, USAGM’s Balazs replied, “We haven’t made a decision on that.”

Given the uncertain future of the REKTS sites -- whose assets are collectively valued at \$7.6 million in the USAGM’s FY 2018 Performance and Accountability Report -- he thinks the most sensible way to handle the repair process would be



Destroyed telephone service tower on Tinian.

on an antenna-by-antenna basis, rather than as one big, expensive project.

“When we get the first one fixed, we could use it to resume broadcasting because more than likely the transmitters will be easier to repair,” said Balazs. “As to how far do we would go with the restoration process? Again, that hasn’t been decided yet.”

During Balazs’s 35 years of service, the USAGM and its predecessors “have never faced a station disaster quite like this before,” he said. “We’ve lost antennas and

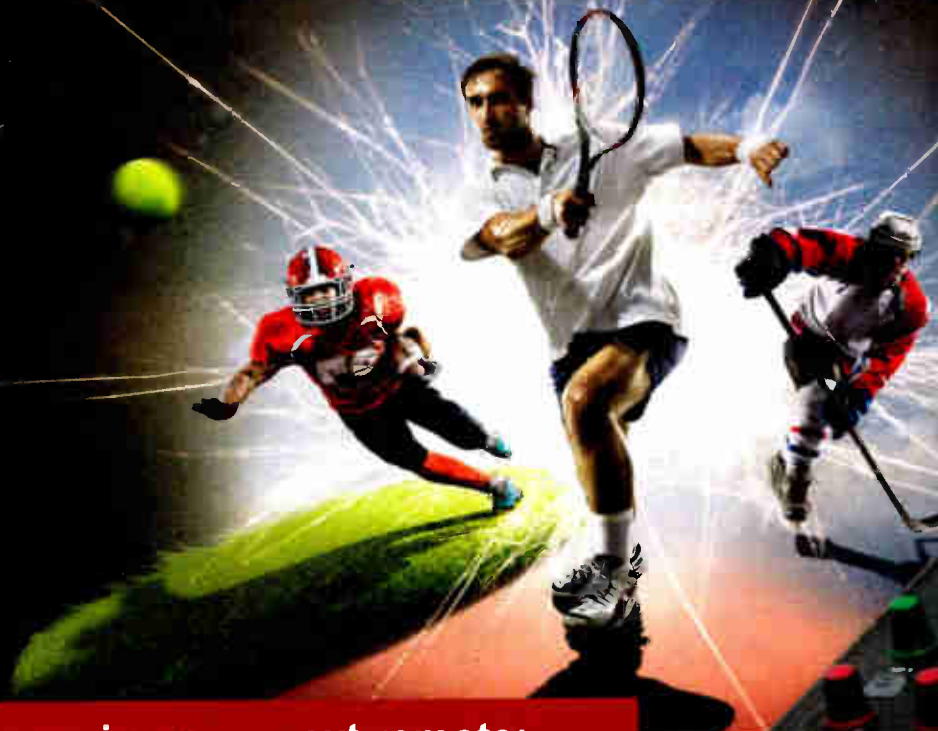
power due to storms over the years, but we’ve never lost the complete capability of a transmission site before. This is really unprecedented.”



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World Radio History

MUNDSCHENK

(continued from page 8)

“We used to go out to lunch at least once a month; we really got to be good buds,” he said of Walden. “Every show I’d walk up the Acorn booth and Glynn would go, ‘Guess what, we’ve got a chip that can receive a signal out of the noise. It’s like 20 dB below the noise.’ Glynn was very excited about this technology; he certainly got me excited about it.”

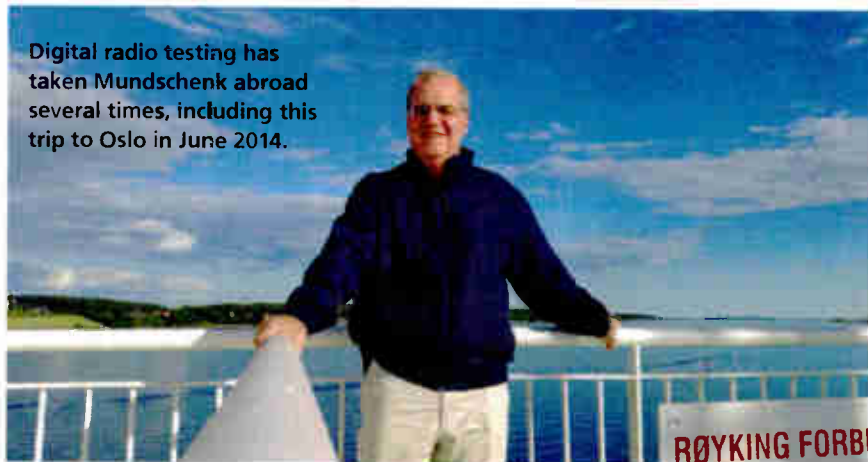
Around that time USADR hired a number of people from the broadcast industry, including Jeff Detweiler, Tom

Walker and Pat Malley. Mundschenk, sensing an opportunity to move his career forward, accepted a position as field test and implementation manager.

That decision has put him in the middle of two decades of industry technical change and adoption, even as USADR became iBiquity and then eventually part of Xperi Corp.

“I’ve done a lot of field testing, analysis of field testing, analysis of allocations and an awful lot of work in ComStudy to do propagation prediction — determine where the signal should work and where it wouldn’t. Then you go out in the field

Digital radio testing has taken Mundschenk abroad several times, including this trip to Oslo in June 2014.



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and you try different modes.”

He’s been involved with numerous test scenarios over those 18 years — the AM and FM IBOC National Radio Systems Committee standard and evaluation program; tests of FM IBOC higher-power levels with NAB; nighttime tests of AM IBOC with the NRSC; tests of FM asymmetric sidebands; tests of all-digital on the FM band in both the U.S. and Norway; tests of AM all-digital in the U.S.; FM IBOC high-power tests and single-frequency network research; and IBOC testing in Brazil.

Field work, he said, has been a critical part of the digital radio story. “Right from the very beginning, HD Radio has adopted the opinion of doing no harm — to the analog service or anybody else. I like to characterize it as living in an apartment building; you just want to make sure you don’t turn your stereo up high enough to bother the neighbors. Certainly, you want that stereo to be high quality when you’re listening to it in your own room.”

(One of his most memorable moments in the field came before he joined Xperi and took place literally in a field. Working at a Florida transmitter site, he recalls, “My compatriot Bill Maranto said, ‘Russ, don’t move. There’s a bull right behind you.’” Happily, the animal seemed more interested in eating than charging. Russ adds, “Every single broadcast engineer you talk to is going to have a story like this.”)

“DRAMATIC IMPROVEMENT”

The best part of his job is working with top-flight engineers.

“They say that if you play a sport, you should always play with somebody better than you. If I didn’t give you a whole laundry list, I’d be leaving somebody out.” but he does highlight Glynn Walden, Paul Shulins, Jeff Littlejohn and Milford Smith.

Given the decades-long history of IBOC, through both controversy and uptake, what would he want people in the industry to know?

“HD Radio is a very mature technology. It’s certainly has been through

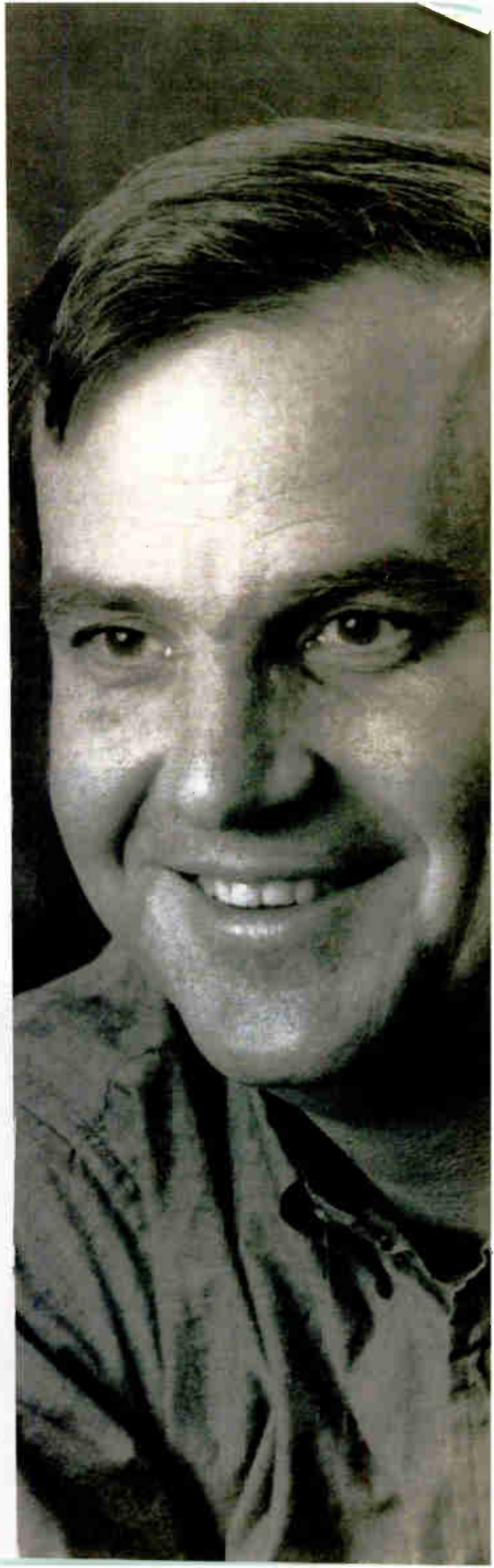
(continued on page 12)

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MUNDSCHENK

(continued from page 10)

the ringer. It's on 2,500 radio stations around the country. It has the ability to deliver a great variety of programming and data that the analog system just will not do. In today's environment, for the broadcaster to have the ability to deliver that level of variety is very, very important. One program stream just doesn't make it anymore."

He notes that the "great majority" of auto manufacturers are installing HD Radio as standard equipment in their vehicles; and he expresses enthusiasm for the work being done at Xperi with its Connected Radio initiative, which marries the technologies of the IP stream along with any transmission, digital or analog, to provide a richer, metadata-enhanced experience.

Will either band of U.S. radio ever go all-digital? Mundschenk is confident the answer is yes.

"In my opinion, the first band to take advantage of it is going to be the AM band. What we've shown — in our testing, and with David Layer's effort at the NAB to test the all-digital AM system — [is] that the AM signal can be increased at least another third in distance and is much less susceptible to interference. It's really dramatic improvement."

He mentioned the recent decision by Hubbard Broadcasting's Dave Kolesar to operate a 4.3 kW AM station in Frederick, Md., in all-digital.

"Its coverage is absolutely amazing. It goes down to the .15, .2 millivolt per meter contour. I think it's a definite opportunity for AM stations to take advantage of the technology."

He senses that the FCC would be open to hearing from other stations interested in trying that approach. "The more stations that go on, the more the mode is tested; and the greater chance that it will become our standard mode."

So what's next? His work these days involves researching new modes as well as finding ways to implement those that have been accepted but not widely implemented yet.

"The thought originally was that we're going to start out with this MPI mode, which has two 70 kilohertz sidebands, which give you 96 kilobits per second of throughput. Then we added multicast to that; and then additional carriers were lit up that gave us another 24 kilobits per second. Then there's another mode called MP11, which will light up another 24 kilobits per second worth of carriers."

More recently, Xperi and its partners such as NAB, Beasley and Nautel participated in testing of all-digital on the



On the job in Las Vegas with fellow engineer and former chairman of the National Radio Systems Committee Milford Smith in 2018. "I always kid with Smitty. I think that he has driven in a car with me a greater number of miles than I have with my family. It's just the same route over and over and over again, trying different power levels, different levels of asymmetry for the IBOC sidebands, different modes."

FM band at KKLZ in Las Vegas. If the United States isn't ready for all-digital on the FM band yet, he says, at least the idea will have been vetted.

And there are some new transmission modes on the horizon. "These modes will be partially backward compatible, they will fall back to a mode that an older receiver can receive; [but] newer receivers are going to be able to receive additional data and audio. This is really cool, because that means the receivers can be specifically designed to receive these new services."

"What we're giving the broadcaster is additional capability."

TREMENDOUS OPPORTUNITY

Russ Mundschenk remains a proponent for forging ahead and trying new things. Reflecting on his career, he recalls a tip from consulting engineer Dean Sargent, while they were working to put up a new antenna at WEAZ in 1984.

"Dean spoke his mind. I got a real good chance to talk to Dean about a lot of different things. During one of our discussions, he says, 'Russ, just remember one thing: It's always easier getting forgiveness than permission.'"

He is now 63; somewhere Munchie

must be proud of his kid. Now comes a third generation of tech heads. Russ and Becky have been married for 33 years, and he credits her with being so supportive of his career. And while their elder son Eric works in the food distribution business, younger son David Mundschenk, still in his 20s, is the chief engineer of iHeartMedia's four-station Baltimore cluster. By all accounts, David loves working in radio engineering.

Still, I wondered if Russ would encourage young people generally to take up this business. "Absolutely," he replied. "It might not be the career that I had. It might be a totally different career. Broadcasting can be defined in many different ways. It can be an over-the-air signal. It could be an IP signal. There are going to be a lot of options in the future. Whatever happens, there is certainly a tremendous opportunity for the younger generation."

He does feel broadcasters have an obligation to educate the younger generation; and he praised iHeartMedia for its creative internal efforts to help employees like son David gain more managerial and technical experience.

It's also obvious in his conversation that Russ Mundschenk is a proud papa.

"There was one day about five or six years ago, I was watching my son soldering an XLR or something. I said to him, 'David, where did you learn how to do that?' He said, 'By watching you, Dad.'"

"I guess the baton has been passed, or something like that," Mundschenk says. "[But] don't think for a second that your kids aren't watching what you're doing."

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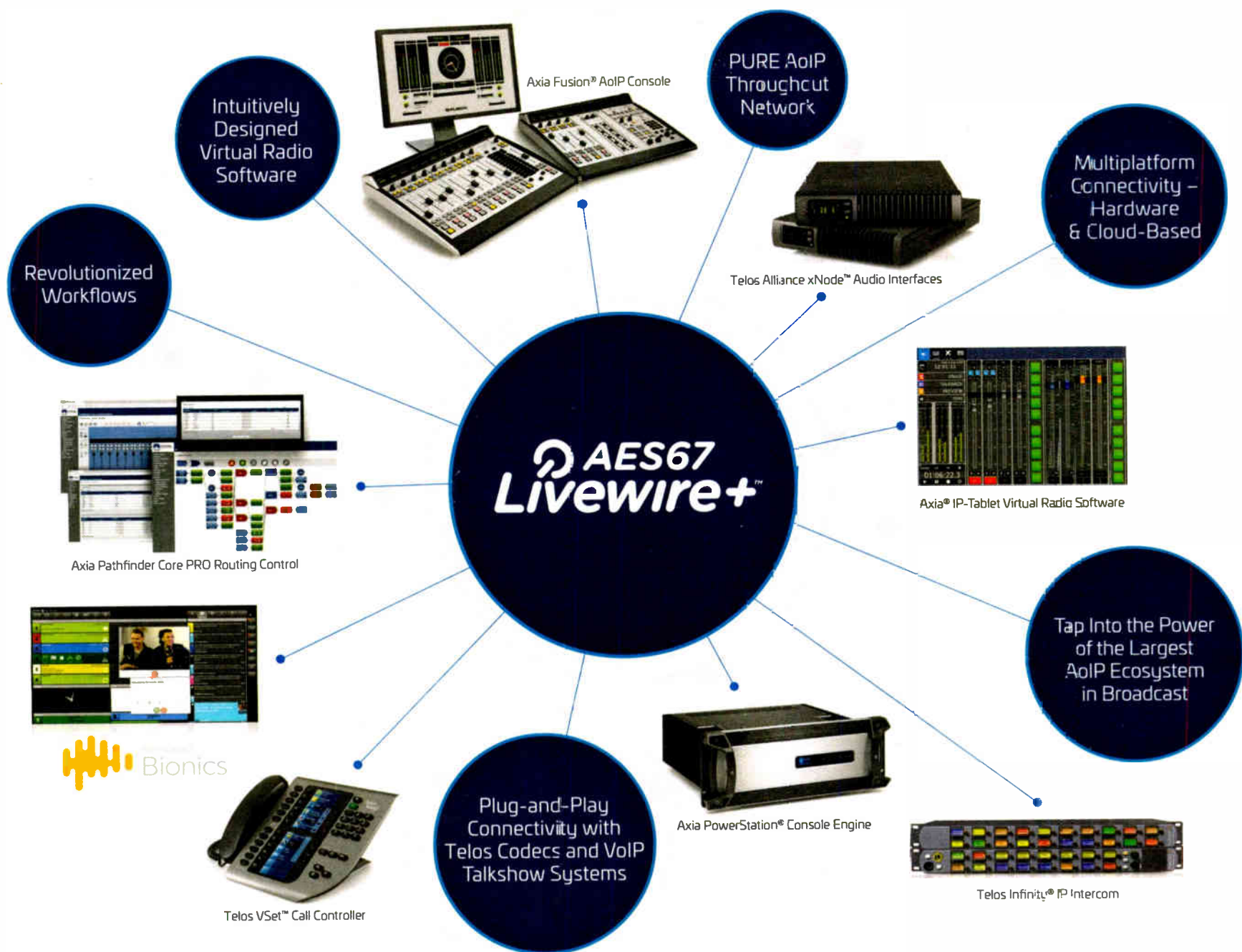


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FM Antenna Access Without Climbing the Mast

Also, early impressions of radio studios can have a lasting impact

WORKBENCH

by John Bisset

Email Workbench tips to johnbisset@gmail.com

Engineering consultant David Maxson, a principal with Isotrope LLC, saw Jack Roland's submission about a mast on a pivot in our Nov. 7 column. The article reminded David of a translator in Newport, R.I.

The mast has been up for about 25 years with a Shively two-bay antenna. The coax deteriorated to the point that when its surface was wet, the VSWR jumped up. To inspect and ultimately replace the cable, and to inspect the bays, David wanted to make it a one-person operation.

His goal was to be able to tilt the mast down, without damaging the structural integrity when the mast was up. To achieve this, David mounted a short section of pipe on the mast-mount, directly beneath the mast. He then joined the short pipe to the mast using a tough Unistrut hinge.

Next, David scrounged a sturdy fiber-reinforced plastic beam to serve as a gin pole. (This nonconductive material should have little impact on the antenna pattern, if he decided to leave the rig in place.)

David then calculated the load and selected hoisting gear — including pulleys, cable and a winch — adequate to handle it. He picked up a cheap boat-trailer winch at the local discount tool store. David points out that the rig has a 2:1 mechanical advantage. This reduces the force on the winch but doubles the amount of cranking needed to move the mast up and down.

The next step was to remove the clamps from the main mast and lower it with the winch. *Voilà!* Easy access to the antenna and the line.

Take care to ensure that the transmission line is free to follow the lowering of the mast, without getting crimped. Just as important, remember to e-connect and ground connections and cable ties when you're done.

(continued on page 16)



Fig. 1: The heavy-duty strut hinge joins the mast and short pipe. (Left to right: gin pole, mast mount, antenna mast.)



Fig. 2: A side view, showing the hinged mast (left), the mounting pipe (center), the FRP gin pole (right) and the winch (lower right).

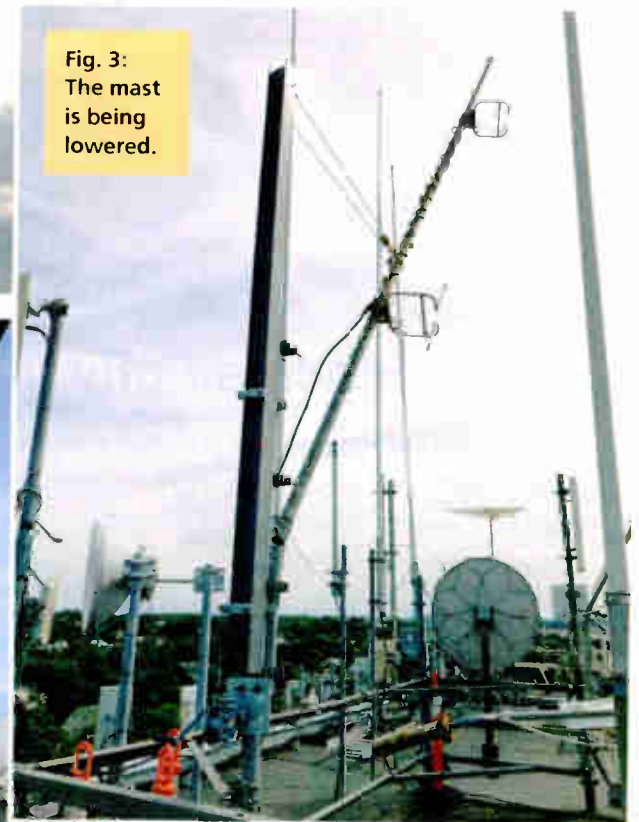


Fig. 3: The mast is being lowered.

Fig. 4: The mast fully lowered, providing access to the antenna.

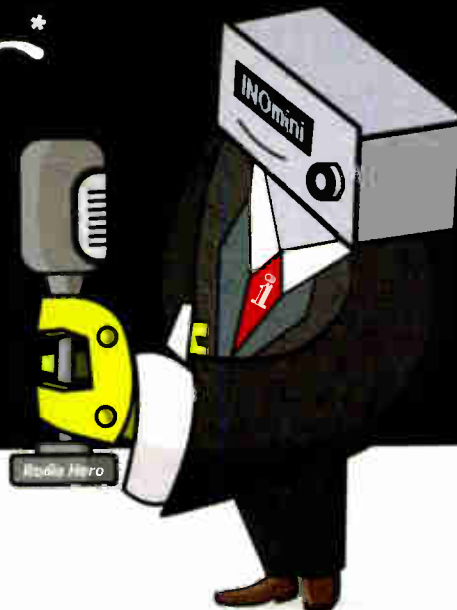
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Two Events, Many Communities

NFCB and GRC chose the West Coast for gatherings

COMMUNITY RADIO

BY JENNIFER WAITS

The National Federation of Community Broadcasters and the Grassroots Radio Coalition both chose the West Coast for fall gatherings that explored critical issues facing community radio.

While NFCB's more intimate regional summit in Santa Rosa, Calif., was geared mainly towards local member stations, GRC's national conference in Portland, Ore., was broader in scope, with representatives from 61 stations in attendance. The agenda for both events included not only nitty-gritty sessions (think fundraising, automation systems, digital media, and more), but also plenaries and keynotes focused on emergency broadcasting and the state of community media.

FIRE — THE BACKDROP OF NFCB SUMMIT

Less than a year after the devastating Tubbs fire (the most destructive wild-

fire in California history until it was surpassed by the Camp Fire), approximately 100 community radio participants gathered in Santa Rosa at NFCB's Regional Summit.

Ernesto Aguilar, NFCB program director, notes that "Santa Rosa was perfect with the proximity of member stations [KWMR, KBBF, KRCB] directly in the community, and the many California and [Pacific Northwest] stations for whom the trip was possible."

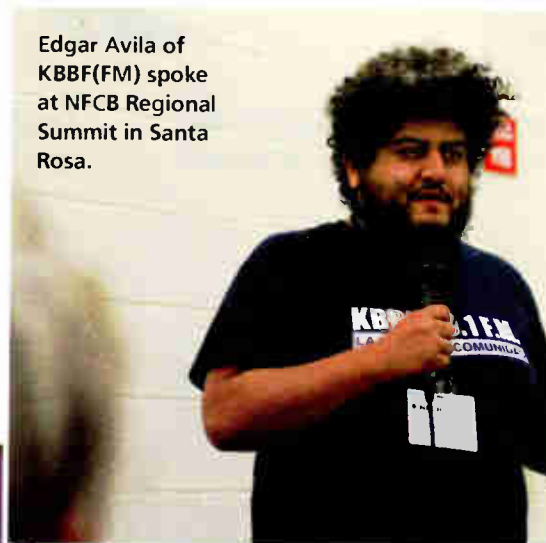
He said, "Given all the community has faced with wildfires, it also was a relevant backdrop to the emergency preparedness conversation NFCB has centered at our summits." NFCB CEO Sally Kane launched the organization's regional summits in 2015 to connect with member stations and experiment with a pared down, more affordable conference experience.

"It was a way to inform myself about station realities on the ground and hear from a broader array of

folks that the usual suspects who come to the national conference," she said. "As a new leader to the organization, I wanted to ground myself in the field experience and get to know the stations and the people in their own spaces."

The Santa Rosa gathering was the last in a trio of 2018 NFCB summits, preceded by events in Charlottesville, Va., and Grand Rapids, Mich. Purposefully site-specific, the Santa Rosa summit kicked off with an evening reception attended by a city council member and deputy fire chief.

Edgar Avila of KBBF(FM) spoke at NFCB Regional Summit in Santa Rosa.



Photos by Jennifer Waits

A plenary session the next day, "Community Radio Emergency Response: California Wildfires," made clear that Santa Rosa was still recovering from its fires a year later. Moderator Steve Mencher, news director at Northern California Public Media, thanked out-of-town attendees for "coming to our city," saying that for the residents, the October 2017 fires are still very much a part of everyday life.

Panelists also shared what it was

(continued on page 18)



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WORKBENCH

(continued from page 14)

Dr. Curtis Holsopple, K9CH, is an academic coordinator for graduate studies at Virginia State University's Department of Mass Communications in Petersburg, Va. Curt has enjoyed learning how other Workbench readers have gotten into broadcasting.

In his case, it started with an appearance on a local kid-oriented TV show in San Francisco in 1955. Curt's older sister appeared on the program for her birthday, and Curt (the bratty little brother) insisted on going along.

He was only four years old but he still remembers the towering studio doors, cables snaking all over the studio floor, the camera and floor director crew wearing headsets, and the very cheesy set for the show. Curt wasn't disillusioned — he was fascinated.

A couple of years later, his dad did some radio broadcasts in Tacoma, Wash., and Curt wanted to go along. He got a full tour of the studios and control room. He saw the DJ cueing records and tapes, noticed his audio board operations, the movement of the VU meter — and heard him do a live commercial for Sunbeam bread.

Curt eventually got the little-boy wiggles, and was excused to the car to sit with Mom and listen to Dad on the car radio. That's when he realized that he could tune away from that radio station and select a different one, even though Dad was talking through a tower that was *right there* in front of him. Curt wanted to know how that worked.

He got into ham radio when he was 10, then radio and TV broadcast work at 15. He soon started studying for the First Phone. That led to a 50-year career in broadcast-related work and mass media education.

I told Curt about a similar experience I had on NBC 4's "Bozo" show, with Willard Scott as Bozo in Washington. I rushed home and built a "camera" out of a cardboard box, gluing a soup can and tuna can to a pie tin — which I would turn to select the appropriate "lens."

Curt tells me he made a cardboard camera, too. In his case, he used a shoe box and a gift wrapping paper tube so he could actually look through his camera. His tripod? A kid-size coat tree. Curt cut a hole in the bottom of the box and stuck it on top. This permitted tilt and pan moves! But dolly and truck were more like "scrape and drag."

Author John Bisset has spent 48 years in the broadcasting industry.

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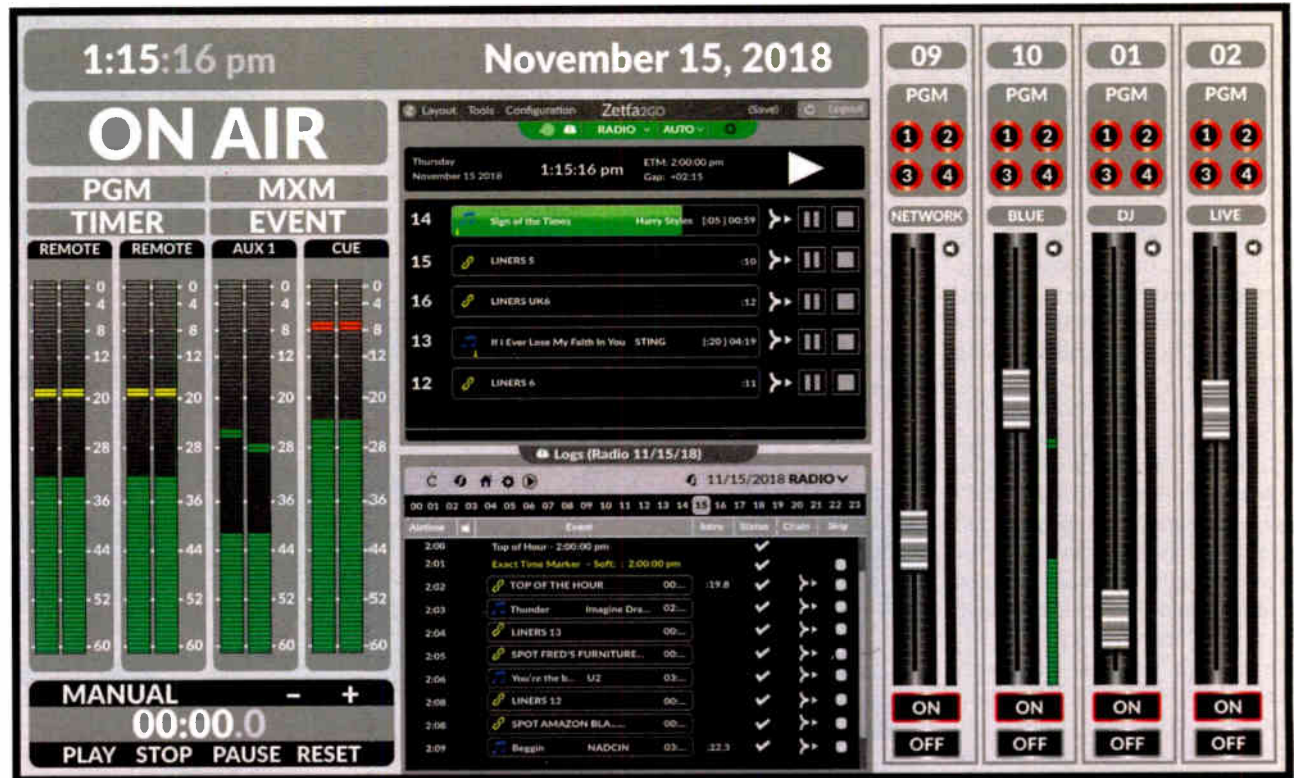
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GRC*(continued from page 16)*

like to be on-air during an emergency. At KRCB(FM), Mark Prell was first at the station the morning of the fires. Cell service was cut off, power was out, and KRCB's main transmitter was down. With "rumors flying," the station decided to only broadcast verifiable information, and it also stuck with its existing morning and afternoon news format, maintaining its daytime music programming.

Edgar Avila, program director of KBBF(FM), spoke of the challenges of providing emergency coverage to the large Spanish-speaking audience in Santa Rosa when there was a dearth of information on the fires available in Spanish. By 7 a.m., KBBF had volunteers doing research and translating material, because at that point in the emergency, there were no official sources of information in Spanish. KBBF ended up doing non-stop coverage.

Avila said, "We are the only station in our region that ... does public affairs programming in Spanish," and during the fires KBBF was "the lifeline for the Spanish-speaking community."

Jeff Parker from KZYX(FM) said, "There are no opportune times for disasters." Fires broke out in Mendocino County in October 2017 a few hours after the station's fall pledge drive ended. One of their transmitters got knocked out and cell, phones and internet went down in parts of the community.

Parker said, "Why did ... our signal not collapse? A huge, proper, defensible perimeter around the tower that Cal Fire maintained and our use of old-fashioned STL microwave. We weren't using fiber, the digital modern thing up the side of

a mountain that would burn. And a lot of luck."

An experienced programmer also held things together, providing information over the air through the night. Parker recommended that stations work on emergency planning and protocols, including systems for sharing information among volunteers and programmers. More massive fires broke out in July 2018, once again testing KZYX. Parker pointed out that with even bigger disasters, the response becomes more complex, adding that because of that, "we community stations must find ways to support each other."

ACCESS, EQUITY & ACTIVISM

During three days of panels, workshops, and keynotes, the 2018 Grassroots Radio Conference in Portland, Ore., drew close to 200 participants from 61 radio stations, evenly split between low-power and full-power FM outlets) from Alaska to Florida. Like the GRC Summit, the event had pragmatic sessions on topics ranging from

audio editing to website security. Additionally, overarching themes of access, equity and activism were addressed across panels as well as during keynotes by former FCC Commissioner Mignon Clyburn, ACORN International's Wade Rathke and journalist David Barsamian.

Grassroots Radio Conference 2018 co-chair Becky Meiers — KBOO(FM) development director at the time — said, "This was my first GRC, and I felt it was important to bring some big-picture thinking to our grassroots-level,

awareness? How do we leverage our collective power to face the challenges of a changing regulatory and technological paradigm? How do we deeply address systemic barriers to access?"

These topics were addressed by Clyburn during her keynote, "Community Media Is the Future." Sharing her appreciation for radio, Clyburn told the audience, "Radio is the purest form of media," adding that it "is tangible. It is always available ... it never goes out of style."



WXOX(LP) ARTxFM's Sharon Scott awarding former FCC Commissioner Mignon Clyburn the ART FM Radio Pioneer Award.



KLEK(LP)'s LaGanzie Kale and Rashida Burch-Washington of WXIR(LP) chat with Facebook Live audience.



KBOO(FM)'s Erin Yanke at the KBOO Open House.



ACORN International's Wade Rathke signs books after his talk at Grassroots Radio Conference 2018.



KZSC(FM)'s Keith Rozendal poses in front of the GRC Quilt that he conceptualized and his mother crafted out of community and college radio T-shirts.

hyper-focused work.... I wanted us to think a little more deeply [about] the systems-level transformation we hope to achieve in an ever-evolving world.

"How then do we convey our theory of change to build participation and

As she addressed a packed room full of community radio participants, she lauded non-commercial media, stating that these outlets "speak for the too-often ignored." Clyburn added, "We're going to need you more than ever before."

Articulating terrestrial radio's ability to reach a wide population, she reiterated that broadband internet is not accessible to all and that radio still has the power to be "disruptive," to borrow a term from the tech industry. "The reason why I came here ... is because I believe in you," Clyburn said.

Along similar lines, Barsamian told a lunch-time crowd of community media

(continued on page 20)



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Its All in WheatNet-IP

GRC*(continued from page 18)*

participants that “the times demand active engagement” and “we are the cure for this wave of propaganda.” He called for inclusivity and equity in media in light of what he sees as an “erosion of democracy.”

Before a screening of the documentary “The Organizer” about his work with ACORN, Rathke echoed these sentiments. Heavily involved with community radio at KABF(FM) in Little Rock, Ark., and at WAMF(LP) in New Orleans, he said he’s a proponent of “this voice-of-the-people thing,” arguing that now is the time when certain constituencies need a “megaphone of a voice.”

While host station KBOO(FM) — a station that recently celebrated its 50th anniversary — offered up its best practices in numerous panels and welcomed attendees to an open house, personnel from new LPFM stations — including an engaging presentation on creating a fundraising prospectus by LaGanzie Kale, general manager of KLEK(LP) — were also on the schedule, giving advice and practical tips from their perspectives.

Some folks attended both the NFCB Summit and the Grassroots Radio Conference, including representatives from

San Francisco Public Press’ soon-to-launch KSFP(LP).

Program Director Stacy Bond said, “Both seemed like good opportunities to start getting our core team members immersed in the practical aspects of making radio and operating a station,” as well as providing an opportunity to “tap into the current thinking around programming, operations and the technical aspects of radio.”

NFCB’s Aguilar said one surprising takeaway from the summit was “the growing awareness of stations about core service to communities. Sometimes we as an ecosystem can get in the weeds about affairs inside the building. Fires, emergencies and the cultural moment have reminded all of us that outside the building is crucial to our prosperity. To its credit, community radio is stepping up more to meet the challenge.”

Jennifer Waits is co-founder of Radio Survivor and co-chairs the College, Community & Educational Radio Caucus on the Library of Congress’ Radio Preservation Task Force. She’s fascinated by the culture of radio and has visited more than 120 radio stations in the United States and in Ireland. A long-time college radio DJ herself, she hosts a weekly show at KFJC 89.7FM in Los Altos Hills, Calif.

UP, UP IN THE AIR

For the 18th year, Scott and Lisa Fybush are bringing us an industry favorite: their iconic calendar featuring broadcast tower site photographs from around the country and abroad. Featured facilities for 2019 include Radio Towers Park in Hamden, Conn.; WNPB in Rhode Island; KNZZ in Grand Junction, Colo.; Entercom’s Las Vegas cluster; KTBC in Austin, Texas; and the home of the Nebraska Rural Radio Station.

Insider tips for folks who collect ‘em: You can order the calendar with a storage bag; autographed versions are also available; and if you missed the 2018 edition, you can add it to an order for just \$2.

Prices are \$20 to \$27. Calendars are shipped Priority Mail. Check it out at fybush.com.

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WHO'S BUYING WHAT

Grant County Broadcasters has standardized WNKR(FM) and WNKN(FM) on the ENCO DAD radio automation system to "enable easy and efficient operation" of the two stations, which share music playlists and talent but have "distinct newscasts, community reports and weather and traffic updates," among other content. WNKR broadcasts



Tom Cat Michaels of WNKR and WNKN voice tracking with ENCO DAD.

live University of Kentucky sports and simulcasts its programming online through streaming solutions provider and ENCO partner StreamGuys.

The San Antonio Spurs have signed Skyview Networks to provide play-by-play broadcast services. The NBA team will now have "a fully integrated broadcast solution" that offers "greater control and advanced reporting," according to the Scottsdale, Ariz.-based broadcast solutions company. Radio broadcasts of Spurs games can be heard on WOAI(AM).

Chicago's WGN(AM) has selected The Telos Alliance's Telos Infinity networked IP Intercom system to produce and coordinate its 24/7 live news and talk content.

Total Traffic and Weather Network has formed a newswire content partnership with Adams Radio Group. TTWN will provide news, sports, show-prep and audio content via its 24/7 News Source wire service to Adams' 24 radio stations in five markets.

Horizon Media has chosen Jelli's demand-side platform SpotPlan as the first media agency to power its programmatic radio ad buying operations. Also, Horizon Media uses "SpotPlan to activate audio upfronts" for clients.

Podcasting solution provider Voxnest has tapped digital audio advertising platform DAX to offer a turn-key solution for creating, monetizing and distributing digital audio for publishers in the UK.

Spanish Broadcasting System's Aurora, Ill.-licensed WLEY(FM) has chosen a MaxxCasting system to increase its coverage-to-contour ratio and target Spanish-speaking Chicago neighborhoods with its regional Mexican music programming, GeoBroadcast Solutions says.

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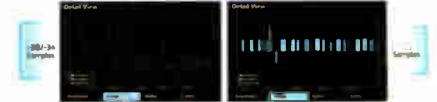


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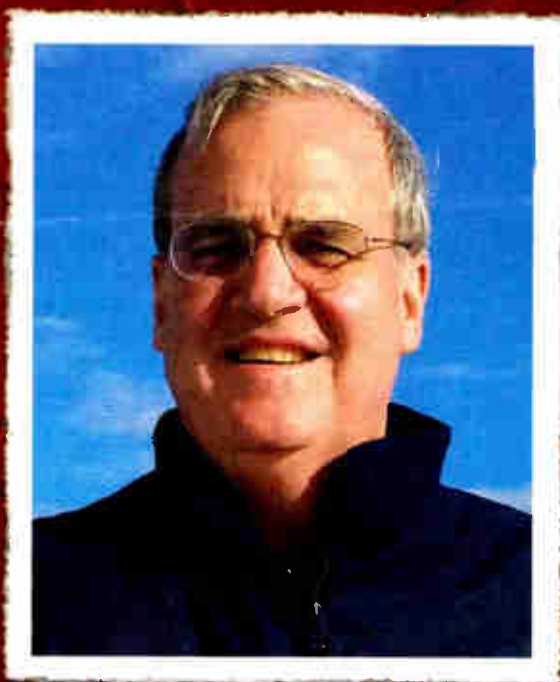
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Congratulations, Russ, from all of us at Comrex.



Your generous help during the formative days of HD Radio was instrumental to DaySequerra/Orban Labs' success. (And you covered our bar tab on multiple occasions, for which we will be eternally grateful!)

DaySequerra

Inovonics wishes to extend our congratulations to Russ Mundschenk, who has always been a conscientious engineer — and a great guy!



Congratulations, Russ, on your receipt of this well-deserved award. We join the industry in saluting you for your contributions to the broadcast engineering profession.



Congratulations, Russ. Your dedication and lifetime of contributions to the industry make you well-deserving of the Excellence in Engineering honor!



A long and storied broadcast radio engineering career — with more to come. Well done, Russ.



WSCI Radiates Far and Wide With Dielectric

DCR-M allowed for pattern customization, HD Radio and is ready for repack

USERREPORT

BY MICHAEL GILL
 Manager of Transmission Operations
 South Carolina Public Radio

COLUMBIA, SOUTH CAROLINA — South Carolina Public Radio is a statewide NPR broadcaster with eight FM transmitters and live streams delivering news/talk and news/music formats. In association with the state's educational TV agency, South Carolina ETV, the organization covers the entire state (and parts of North Carolina and Georgia as well) terrestrially with local and national content.

SCETV is in the midst of a busy repack schedule for its 10 TV stations, many of which will receive new equipment. As our FM and TV stations are collocated at various tower sites, we have worked closely with our key transmission vendors — Dielectric for antenna systems, GatesAir for transmitters — to avoid disruption to our FM broadcasts.

We are also adding new FM systems where needed, and have taken care to plan new installations well in advance. This was the case with WSCI(FM), our 20 kW Charleston-based flagship station that recently installed a new Dielectric DCR-M 10-bay antenna. Since installing the antenna, we have also turned on HD1 and HD2 feeds supported through the same system — the first South Carolina Public Radio station to launch HD Radio channels.

The DCR-M replaced a Dielectric antenna installed in 1989 following the devastation of Hurricane Hugo. Having served us well for nearly 30 years, it was time to upgrade to a new system with HD signal quality. It made sense to make a change during the relatively quiet period before our actual repack installation work commenced.

There were also interference concerns due to an adjacent signal, which required some custom design attributes. Dielectric included a special "notch" in the antenna to prevent signal radiation into the adjacent signal's area. The 10-bay design, in addition to providing the desired antenna gain we sought, also simplified positioning of the protective notch to eliminate

southeast radiation.

WSCI's coverage pattern is similar to (but not quite) an omnidirectional azimuth configuration, with some unique characteristics that affected antenna design. With a center of radiation at 1371 feet, the side-mounted antenna is a circularly polarized, center-fed antenna with flexible, custom design options. That flexibility proved critical to the antenna design based on the tower position and coverage goals. Ultimately, the pattern is



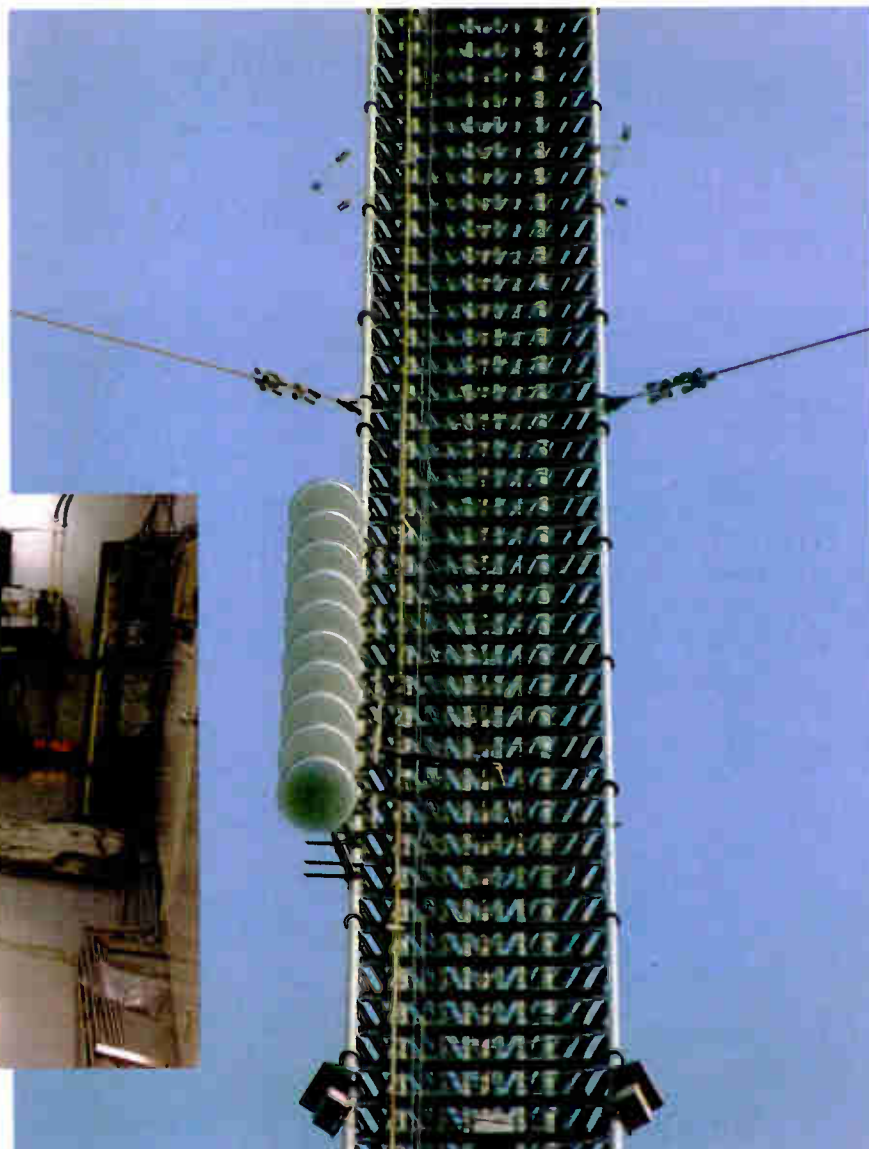
omnidirectional except for the southeastern quadrant of the region.

The station's tower is located north of Charleston, and the antenna faces south toward the city. The area to the north is covered by sister station WHMC of Conway/Myrtle Beach. The goal was to reach the coastline without transmitting into the ocean, keeping our signal on land as much as possible. We also aimed to minimize shading issues based on the tower position.

OPTIMAL PERFORMANCE

The installation was trouble-free, building and hanging the bays from the top down. A transition was added from the antenna to existing transmission line, with no modifications required to the line or filters. Inside the transmitter building, we replaced a motorized switch with a manual patch panel. This would simplify how we later modified transmission line and ran dummy loads for our HD Radio signals. The antenna itself was HD Radio-ready, with no design adjustments needed.

Following installation, Dielectric



sent an engineer to sweep the antenna. Antenna performance has been outstanding. Among other performance attributes, this confirmed the low VSWR rating we anticipated to minimize reflected power. Coverage has overall been optimized; whereas our previous antenna delivered a solid 50-mile range measured near end of life, our new DCR-M has increased our range to 75 miles.

As we have come to expect with Dielectric, the engineering quality of the antenna is top shelf. There are no shortcuts, from the construction of the materials to the quality of manufacture. It should be noted that the welds on the antenna and transmission like joints are absolutely beautiful. A radome was added to protect the antenna from birds and weather-related deterioration, but remained light enough to keep our overall wind load acceptable.

Dielectric continues to be our exclusive antenna partner for TV and FM, due

to the confidence we have in the performance and long-term return on investment of the antennas. At press time, we are beginning to take delivery of permanent and standby UHF and VHF repack antennas for our 10 TV stations, most of which will happen during Phase 5 of the 10-phase repack initiative.

Mark Jahnke, vice president of engineering and technology for SCETV, contributed to this article.

For information, contact Kim Savage at Dielectric in Maine at +1-207-655-8258 or visit www.dielectric.com.

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TECHUPDATES**DB ELETTRONICA OFFERS RANGE OF FM ANTENNAS**

DB Elettronica Telecomunicazioni's line of FM Antennas include dipoles, panels, yagi and logarithmic units for directional and omnidirectional patterns with vertical, horizontal or circular polarization.

The company provides complete antenna systems (power dividers, coupling cables, mounting brackets) and can design and calculate the coverage area of a system, using satellite map-based software.



Specifically, the firm's P1 vertical polarization dipole FM antenna series is composed of a balun feed vertical dipole and is made of stainless steel (PX1 models) or aluminum alloy (P1 models).

While the P1 antenna's radiation pattern is omnidirectional, it is possible to stack antennas to obtain a customized patterns, increase gain and power capacity, according to user requirements. Custom patterns, electrical beam tilt and null fill designs are available upon request.

According to the company, the easy-to-install, broadband unit is suitable for single-channel or broadband operations with multichannel combiners. Furthermore, it says, the input connector and internal balun are protected against rain and icing by a special, sealed housing, while the entire antenna is grounded to protect against lightning strikes.

For information, contact DB Elettronica in Italy at +39-049-870-0588 or visit www.dbbroadcast.com.

SINE CONTROL SURGE SUPPRESSOR SUITABLE FOR TRANSMITTER SITES

Sine Control Technology Inc. is now shipping the new Series 5 PowerClamp power line surge suppressor.

The Series 5 PowerClamp is a new surge protective device (SPD, also called a TVSS) that the company says is ideal for use at transmitter sites that have moderate exposure to lightning.

According to the company the Series 5 will prevent short-term power line spikes and surges damaging the transmitter. The Series 5 SPD is rated at 80,000

surge-amps per phase, and will attenuate most spikes and surges to within about 10 volts of the normal sine wave peak voltage.

Solid-state transmitters that use switcher power supplies are highly vulnerable to damage caused by power line spikes. The Series 5 PowerClamp will protect the transmitter, improve its reliability, and the reduce maintenance costs by preventing power supply damage.

The Series 5 PowerClamp uses a hybrid of multiple technologies to achieve its exceptionally low clamping level. This low clamping level remains constant even after years of use and thousands of "hits." The unit's Sine Wave Tracking automatically compensates for gradual dips or rises in input voltage, so the clamping margin remains consistent at all times. All PowerClamp units are fused and require no maintenance.

The Series 5 SPD is installed in parallel with the power feed to the transmitter. This eliminates the need for load-matching, and guarantees the transmitter will remain on the air even if an overload causes the SPD fuse to open.

Series 5 PowerClamp units are available for single-phase and three-phase WYE power at any voltage up to 480 volts. For sites with high lightning exposure, Sine Control also offers the Series 8 and Series 10 SPD devices. All PowerClamp units include a five-year prorated warranty.

For information, contact Sine Control/Henry Engineering in California at +1-562-493-3589 or visit <https://henryeng.com/powerclamp/>.

ABOUT BUYER'S GUIDE

Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, is a freelance article by a paid reviewer who typically receives a demo loaner. Do you have a story to tell? Write to bmoss@futurenet.com.



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ALDENA EXPANDS HIGH-POWER ANTENNA RANGE



Aldena's range of FM antennas now includes three specific solutions for high-power applications (up to 12 kW per each antenna).

The ACF218 is a broadband FM double-crossed aluminum dipole antenna featuring omnidirectional patterns with preferred direction. The ASE 01022x0 is a broadband FM dipole antenna in welded aluminum or stainless steel, also with omnidirectional patterns with preferred direction, while the ASR0318 is a broadband-FM three-element yagi.

As for the firm's Band III DAB antennas, Aldena has added to its range of ADC wideband VHF Band III range with the new ADC0x04110. Particularly suited for DAB+ applications, the light-weight ADC omnidirectional series of antennas feature a gain of up to 6.5 dB and vertical polarization.

For information, contact Aldena Telecomunicazioni in Italy at +39-9039-0461 or visit www.aldena.it.

ERI OFFERS LOW- AND MEDIUM-POWER AXIOM FM ANTENNAS

ERI has expanded the Axiom product family with low- and medium-power broadband side-mounted models. The LPA (see picture) and MPA Series Axiom master FM antennas are rated for a combined input power of 25 kW (15 kW for four-bay configuration) and 39 kW (25 kW for four-bay configuration) respectively.



These side-mounted FM antenna configurations based on ERI's proprietary and field proven Rototiller FM antenna element. ERI offers 4-, 8-, 12- and 16-bay versions of the LPA and MPA Series Axiom master FM antennas. These Axiom models provide high input power handling capability and can provide service as main or auxiliary multistation FM antenna for systems that are limited to a bandwidth requirement of up to 18 MHz of the FM band (88 MHz to 108 MHz), according to the company.

The antenna can be designed with a single RF input or can be configured with two separate inputs, one feeding the upper half of the array and the other feeding the lower half of the array to provide higher power handling capability and emergency operating modes. FM channel combining systems are also available from ERI.

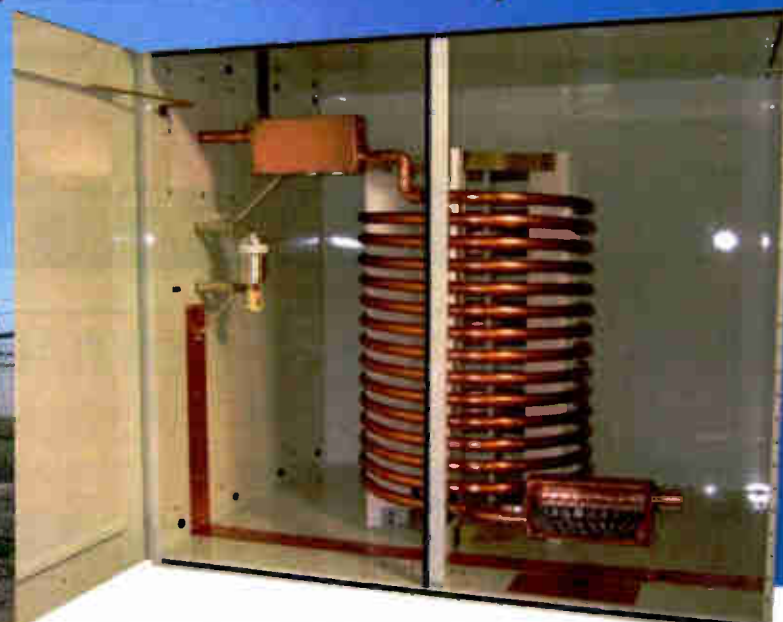
For information contact ERI in Indiana at +1-812-925-6000 or visit www.eriinc.com.



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TECHUPDATES

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Dummy loads are used to facilitate the off-air full power testing of an FM transmitter in the event that the main transmitter or auxiliary transmitter fails and needs to be taken off the air for repair, servicing and eventual restoration to on air status.

Kintronic Labs offers a line of convection/forced air-cooled FM dummy loads having an input impedance of $50 + j0$ ohms in the DC-110 MHz band.

Available for indoor or outdoor use in weatherproof designs and rated for transmitter input powers of 5 kW; 7.5 kW; 10 kW; 25 kW; 50 kW or 75 kW.



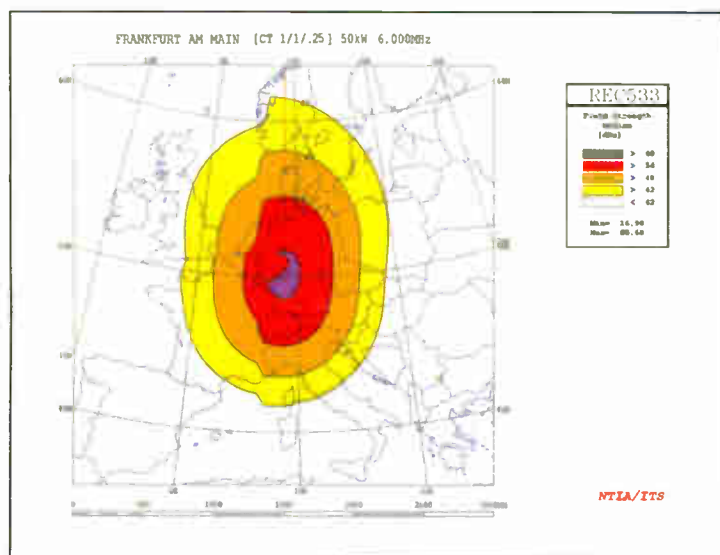
Each Kintronic dummy load can handle Peak Envelope Power of up to twice the average power rating for FM + HD and HD Radio.

FM dummy loads for pulse applications require custom design involving peak voltage and current, and peak energy levels.

In addition to FM dummy loads Kintronic is also introducing a motorized coaxial switch designed for FM and TV applications. They can be used as double-pole/double-throw (DPDT) (i.e. main transmitter to antenna and aux transmitter to dummy load) or just as single-pole/double-throw (SPDT). Several switches can be interconnected to allow complex switching configurations.

FM input powers of 500 W; 2 kW; 5 kW; 10 kW; 40 kW or 85 kW. Switch over time is 3 seconds. The coaxial switches can be operated manually in case of power outage. Isolation between inputs is >60 dB.

For information, contact Kintronic Labs in Tennessee at +1-423-878-3141 or visit www.kintronic.com.



AMPEGON ANNOUNCES NEW SHORTWAVE ANTENNA

Ampegon has developed the CT 1/1/0.25 low-power antenna for use in shortwave broadcasting.

The new CT 1/1/0.25 offers a simplified yet optimized approach, says Ampegon. The low-power CT 1/1 antenna is fitted with Ampegon components and, according to the firm, offers a rugged design, optimized performance, availability of WARC frequency bands, omnidirectional radiation pattern, DRM compatibility, 50 ohm coaxial antenna input, static grounding and minimal maintenance.

The company explains that one of its goals was to be able to create a design able to provide a 50 ohm coaxial input at the base of the antenna, adding that a proprietary balancing loop is used to avoid the use of coils and capacitors and maintain maximum possible operational efficiency and range.

With the $VSWR \leq 1.5$ in the operational frequency band ($Z_0 = 50$ ohms) and a gain of 8 dBi, the system can handle wind speeds of 160 kph.

In addition, the antenna system, with its folded dipole layout, needs no welding on-site and features fiberglass-reinforced guy ropes for minimum interference with antenna radiation.

For information, contact Ampegon in Germany at +49-621-63595-0 or visit www.ampegon.com.

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MISCELLANEOUS

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I'm selling between 150 and 200 cassette tapes that consist of old-time radio shows, sports shows, some local New York radio talk shows, etc... Must take entire collection and the price is negotiable. Please call me for details and, my phone number is 925-284-5428.

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

WYBG 1050, Messina, NY, now off the air is selling: 250' tower w/building on 4 acres; 12' satellite dish on concrete base; prices drastically slashed or make offer. 315-287-1753 or 315-528-6040

WANT TO BUY

Collector wants to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035 or ilg821@aol.com.

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

Equipment Wanted: obsolete, or out of service broadcast and recording gear, amplifiers,

processing, radio or mixing consoles, microphones, etc. Large lots preferred. Pickup or shipping can be discussed. 443-854-0725 or ajkivi@gmail.com.

I'm looking for KFRC radio special of Elvis Presley which aired on January 8, 1978. I'd be willing to pay for a digital copy. Ron, 925-284-5428.

I'm looking for the Ed Brady radio show in which he did a tribute to Duke Ellington, the station was KNBR, I'd be willing to pay for a digital copy. Ron, 925-284-5428.

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

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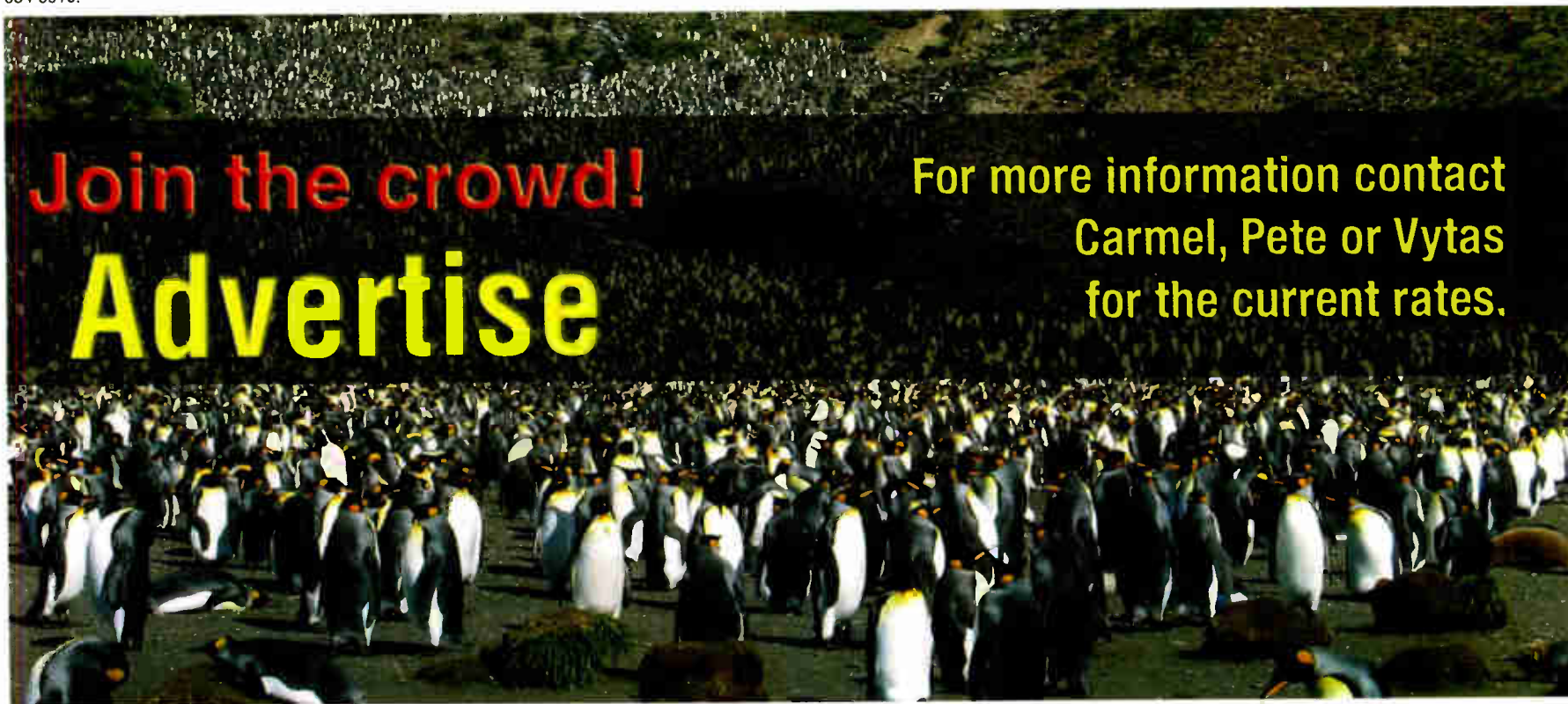
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Looking for a broadcast excerpt of a San Francisco Giant's taped off of K5FO radio from 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a home-run by Willie Mays and Felipe

Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

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MISCELLANEOUS

WANT TO BUY

I'm looking for KTIM, AM,FM radio shows from 1971-1988. The stations were located in San Rafael, Ca. Ron, 925-284-5428.

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

Looking for KSFY radio shows, Disco 104 FM, 1975-1978. R Tamm, 925-284-5428.

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

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Rotella: New Congress Means We Have a Lot of Work to Do

NJBA president/CEO tells broadcasters to remain on guard against potential legislative threats to free OTA radio

COMMENTARY

BY PAUL ROTELLA

The author is president/CEO of the New Jersey Broadcasters Association. Rotella shared this commentary with press outlets after the Midterm Election results were announced, and he highlights several policy issues of interest to radio broadcasters. His article has been lightly edited for style and length.

Broadcast association executives, and indeed all association executives, both national and local, have their work cut out for them this fall with the election and appointment of a record number of new representatives and congressional staff.

Make no mistake, with this new crop of freshman congressmen and congresswomen (along with a handful of new senators), it is imperative that we be ever-present on Capitol Hill to help educate and inform the hundreds of new congressional staffers, and perhaps more importantly, their hundreds of counterparts in House leadership and committee staff. And this impor-



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tant work can't begin too early as we advance our sacred mission of advocacy and education.

Representing the broadcast industry, the New Jersey Broadcasters Association will be getting an early jump on the important initiatives we advanced in the last Congress, like the pirate radio legislation, SANDY Act, enhanced FM signal emergency alerting technology, along with the reinvigoration of SECC authority by the FCC, reformulation of arcane rules surround-

ing commercial radio ad disclaimers for automobile sales, streamlining of FCC procedures, and of course, our opposition of any performance royalty tax on broadcast radio.

Make no mistake, our opponents seeking to impose a toxic performance tax on broadcast radio have been gearing up for their "close-up" with the new members of Congress gaining power in January. And this issue, and its opposition, is not unique to Democrats or Republicans. Indeed, it crosses party

lines. And we best not be complacent merely because we have beaten back this measure for over a decade in at least five Congresses thus far. All it takes is a simple majority in the House just one time, or for a late night amendment to be included in a "must-pass" piece of legislation, to destroy the broadcast industry

Every Congress, a few well meaning, but misinformed legislators, appear as if to forget that they represent the people of their districts and not the foreign-owned record companies, and introduce, in one form or another, the noxious royalty fee legislation commonly known as the "performance tax." It does no one any good at all, and helps stifle the creative growth and opportunities for success of emerging artists, while destroying the best thing that ever happened to our diverse, shared culture: the free-over-the-air delivery of all forms of entertainment, local news, and most of all — music, to everyone, for free — no matter your social status or place of origin — radio!

A performance tax would destroy radio as we know it, and indeed harm everyone; artists, composers, communities, broadcasters and most sadly, all Americans. Nielsen studies confirm that close to 300 million of our friends, family, neighbors and coworkers in America (the very constituents that these legislators are supposed to serve) listen to radio every day.

The good news is that support for the Local Radio Freedom Act supporting local radio continues to be strong in the House and the Senate. In the last Congress, more than 180 members of the House are on record in opposition to a performance tax. New Jersey Broadcasters would like to express our deep appreciation to Congressmen Gottheimer, LoBiondo, Frelinghuysen, Pallone, Smith, Pascrell, Lance, Sires, Payne, Coleman and Norcross for their courageous leadership in previously opposing this unfair and wrongheaded tax. These legislators are to be applauded for their early recognition and constant vigil over free-over-the-air radio's service to the local communities they represent across the Garden State.

The P-Tax would demand exorbitant
(continued on page 30)

READER'S FORUM

NOT A RASCAL

I strongly object to Pete Simon's letter "Another Radio Rascal" (RW Oct. 24 issue), characterizing Rev. Dr. Carl McIntire as a rascal. He was nothing of the kind.

I knew and worked for Dr. McIntire at WXUR(AM/FM) in Media, Pa., during the late 1960s. He was a bona fide Christian minister and scholar, and founder of the Bible Presbyterian Church of Collingswood, N.J. My grandfather taught Sunday School there, and I attended Dr. McIntire's funeral.

He had a strong following locally and via his radio stations. He founded the Christian Admiral Hotel in Cape May, N.J., and sought to develop a viable radio station outside the then 12-mile limit of U.S. territorial waters in order to circumvent oppressive federal government speech restrictions. That effort did not succeed, as he was threatened by federal authorities to ditch the idea.

As an engineer at his stations, I knew the several on-air preachers and witnessed their attempts to attract "opposing points of view from responsible spokesman." However, those

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Rev. Dr. Carl McIntire

opponents didn't respond to such invitations, likely not being willing to dignify the McIntire stations with rebuttal. In such light, the alternative would be to cease broadcasting political and religious conservative views, which would be entirely unacceptable.

Dr. McIntire was a strong advocate of strict interpretation of both Judeo-Christian scriptures and the Constitution of the United States. In today's parlance, he would be labeled a "conservative," of which he would be proud. He objected to the Fairness Doctrine, which was subsequently struck down. It has been said in today's U.S.

Supreme Court that the Red Lion case would not be decided as it was back then.

He was subject to derision by the political left, much the same as today's political environment. Dr. McIntire stood his ground and took his lumps. I admired him, as did tens of thousands of his followers, lo these many years ago. A rascal he was not.

James B. Potter
Owner & CEO

Cutting Edge Engineering,
The Little Spot Shop & JBPotter Agency
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CONGRESS

(continued from page 29)

royalty fees from broadcasters to pay for the a few record labels failed business models. And these new royalty fees would be on top of the billions the radio industry already pays in royalties to artists and songwriters through ASCAP, BMI and SESAC! In these challenging economic times (or in any economic model), can any industry afford such confiscatory increases in net operating costs? And the public would gain no return for the fees taken. No community service, no public announcements, no lifesaving Amber Alerts or EAS warnings. Nothing at all but making a few more millionaires and billionaires richer, and all at the public's expense.

Nevertheless, the unavoidable result of the performance tax's passage is much more than merely wreaking economic havoc on local radio stations. The passage of the bill would force the closing of a majority of local radio stations in New Jersey and across the country. To be sure, the prospect of enhanced opportunities for localism, diversity and outreach would be hushed immediately. Station groups and networks would be hurt, as well. Localism would be out the window and thousands in New Jersey would lose their jobs.

But this is all not about dollars; It is about common sense. Much more horrific, the closure of these vital broadcast outlets across America would also decimate our Emergency Alert System capabilities and pose a genuine threat to

homeland security. And for what? So a few greedy foreign owned record companies can try to line their coffers with more American dollars, taking billions out of our economy? And worse, the move would directly or indirectly, wipe out hundreds of thousands of jobs in the United States.

Free over-the-air radio and television are the only exclusively local media in existence!

Moreover, a new oppressive performance tax would hurt emerging artists who might not ever get their music on the air if stations have to pay a fee every time a new song is played. Performing artists almost universally recognize the honest and incomparable value only broadcast radio air-play adds to their industry and business model. The record label's recognition of the unparalleled promotional value of radio airplay contradicts statements made by recording industry representatives in Washington who have characterized radio airplay as "a form of piracy." What nonsense.

Our two industries have worked perfectly together for decades. Certainly,

no artist would ever have an opportunity to become famous and successful absent their natural symbiotic partnership with free-over-the-air-radio! This symbiosis evinces the inescapable conclusion that both sides are benefiting. Why do you think local stations across the country are bombarded every day with sample CDs MP3s, and "demos" by emerging artists (and seasoned artists) begging station managers to play their new tune? It's because broadcasters and artists genuinely "get it." It's how they sell records, (yes, vinyl records are making a comeback) CDs, downloads, video and merchandise.

Worse, the P-Tax's foreseeable fractionalization of collaborative artists could hurt everyone associated with the creative process and diminish the very projects or songs they want to promote to be successful. It's a recipe for collusion, litigation, division, unfairness, and disaster.

Equally disturbing is the disingenuous comparison of broadcast radio to internet providers and pay/subscription audio entertainment programming and fees paid by satellite radio. The proponents of this legislation want us all to be alike — just because cable, satellite and Internet services pay these royalties. We are not alike! Remember how radio stations helped warn and serve New Jerseyans crushed by Superstorm Sandy? Well, New Jerseyans do. Free over-the-air radio and television are the only exclusively local media in existence!

Our cherished stewardship of the pub-

lic airways is a public trust, and no industry is more publically spirited. We have a very different mission from most; namely, to operate in the public interest; from the EAS for local emergency notification such as NJ Amber Alerts and to respond to community wide emergencies like Superstorm Sandy, ice and snow storms, and other extreme weather hazards, to local news of community events and happenings in entertainment from our great and diverse variety of formats.

The internet and satellite applications referred to in mislabeled "equitable royalty fee" arguments (and the specious claim of pure-play "radio" designations) do not provide such essential public service, nor are they designed or equipped to do so.

And to lie to rest the specious argument that the performing artists will get any money from the new performance tax, all you need to do is review the typical recording contract any new artist is "forced" to sign if they want to get their coveted "record deal." It often provides for very little compensation to flow to the artist after record production and promotion costs are re-cooped.

Finally, I feel that our great New Jersey Broadcaster Association represents much more than the radio and television industry in the Garden State. We also represent the vast and diverse audiences that our Congress members so ably serve. We represent the people, and we stand with them. We respectfully ask all of Congress to do the same. It's the right thing to do.

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READER'S FORUM

NRSC DEBATE

Responding to Cris Alexander's call to "Bring Consistency to AM Measurements" (<https://tinyurl.com/yalas37c>):

The AM NRSC Emissions Mask should continue to exist, but the requirement for annual measurements has little value.

As a contract engineer, I have done AM NRSC measurements when asked and rarely have I found any transmitter that was performing outside the NRSC mask. The ones that have had issues were quickly remedied by replacing some blue electrolytic capacitors.

If we are to keep AM broadcast alive, we need to alleviate the burden of outdated regulations that drain the pocket books of radio station owners.

*Dave Dybas
Owner/Engineer
Sparks Broadcast Service
Buffalo Grove, Ill.*



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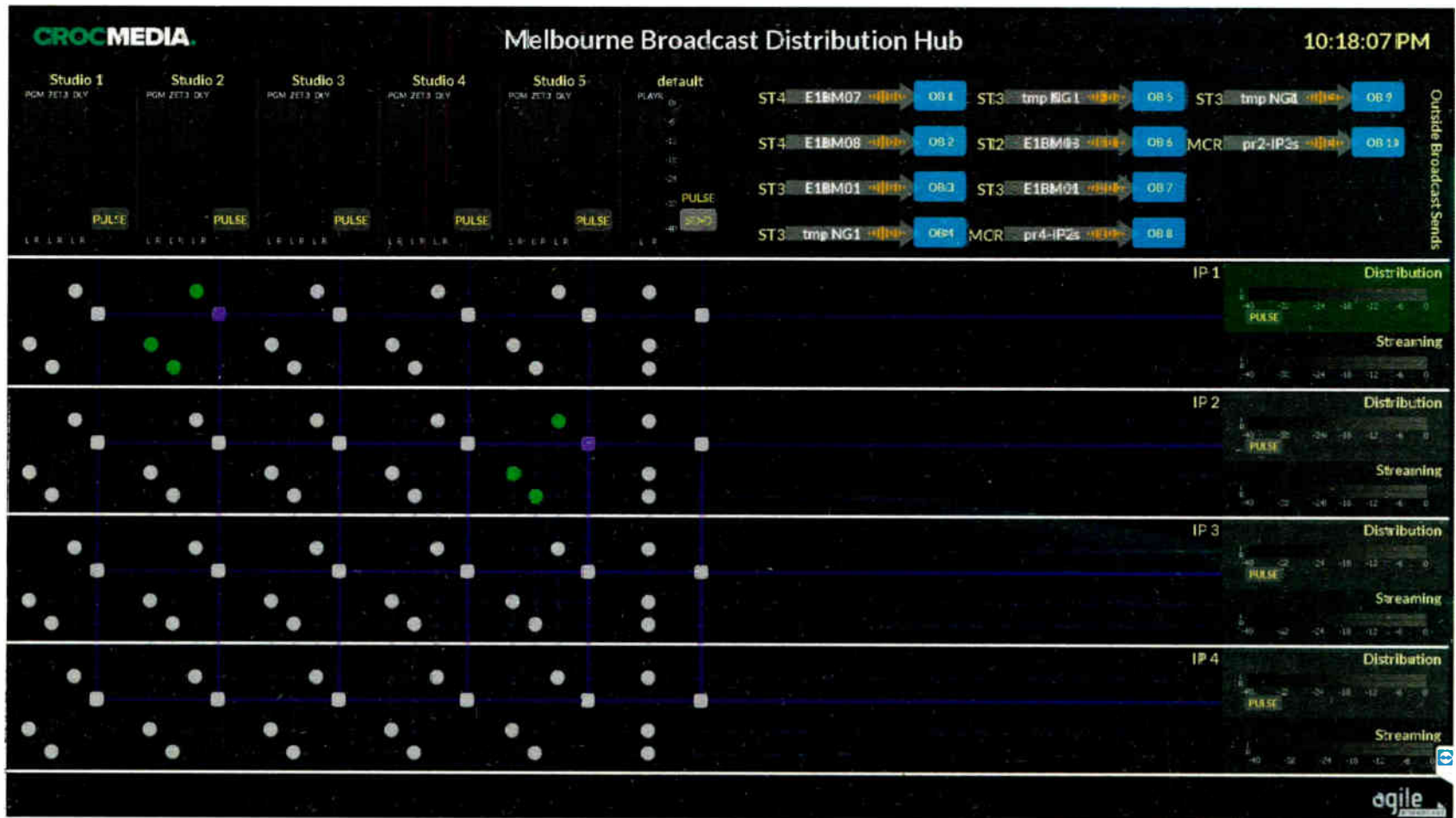
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This screen runs at Croc Media, a major Australian sports content provider. It shows the provider's five-studio distribution complex, with the audio feeds and control signal heading towards the satellite uplink. Technical staff can confirm correct operation of all their services at a glance, and see connection status of each of the 10 contribution lines. Courtesy Agile Broadcast.

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