C-BAND WORRIES — Page 6

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NEED TO KNOW

5G — Riding Wireless' Next Wave

New platform will accelerate wireless speeds, connect the Internet of Things — and drive competition

BY JEFF BAUMGARTNER

Welcome to the next edition of Need to Know, in which Radio World and our new parent company Future U.S. explain complex topics and how they apply to each industry we serve, on our websites and in our magazines.

The race to build out "fiber in the sky" is on.

The next-gen mobile standard known

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Congratulations to winners of the Radio World Best of Show Awards at the 2018 NAB Show.

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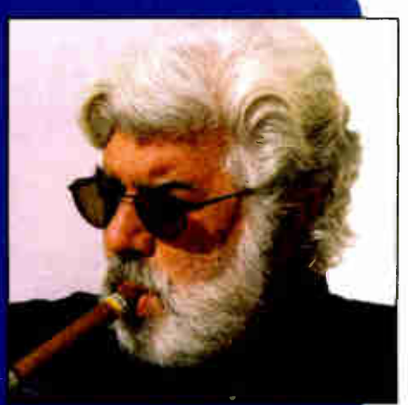
Remembering the radio legacy of **Nick Michaels**, who passed away in late May. Page 24



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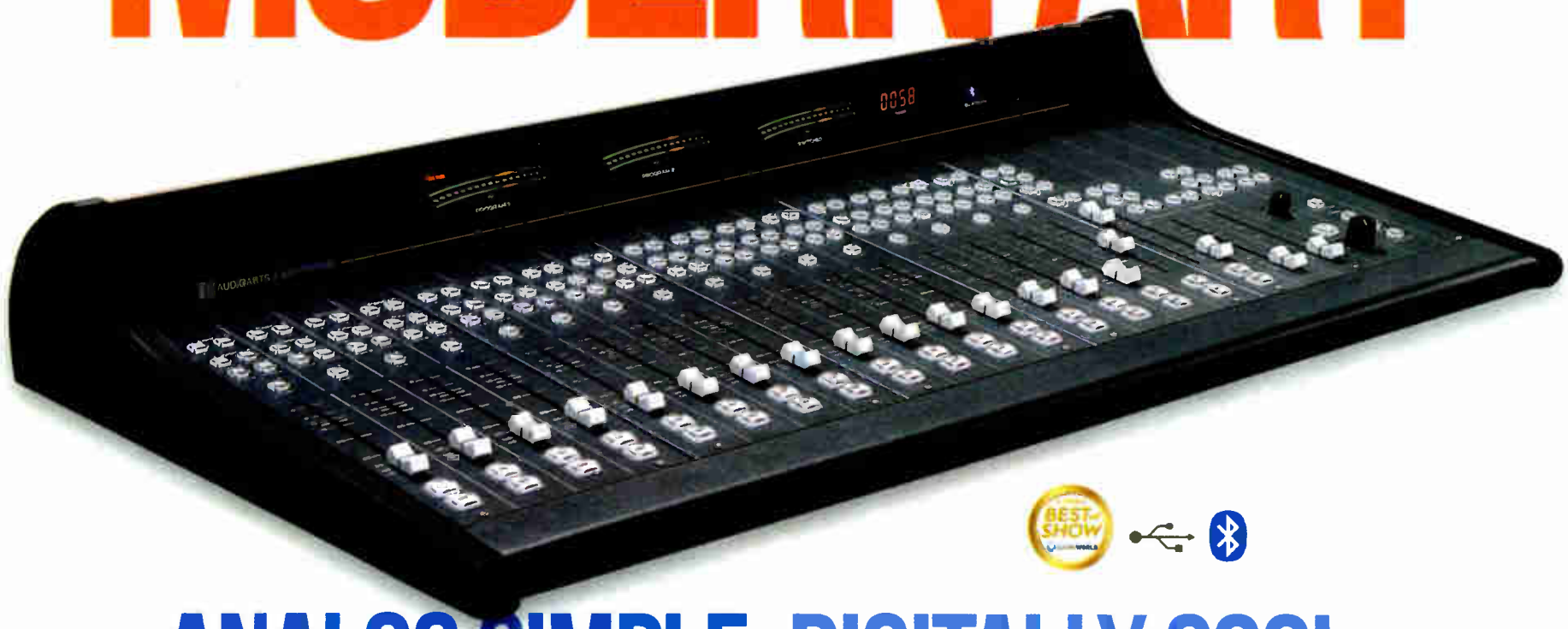

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From Social to Cloud, It's All About Connections

But tech trends aside, recruitment remains one of the biggest challenges facing leaders

TECHTRENDS

BY RANDY J. STINE

Wrapping up the recent spring NAB Show season, we asked a few top tech executives what themes caught their attention at the convention. We heard about studio virtualization, cloud-based automation systems, social media management tools and all things IP.

Steve Johnston, president of the Association of Public Radio Engineers, said it "seems like everything has an Ethernet port and a built-in web server" these days. But Johnston, whose priority at the spring show was the overlapping Public Radio Engineering Conference, also was struck by how many times presenters mentioned the growing issue of RF noise. "Or perhaps it's just that more people are recognizing the problem. What good is a radio receiver if it can't pick up any stations out of a sea of noise?" Johnston said.

In addition, he is closely following recent work of the National Radio Systems Committee in RBDS/RDS standards and new emergency alerting efforts; and he mentioned work being done on single-frequency networks — SFNs, synchronized on-channel booster systems — that could be very helpful to stations.

Jeff Littlejohn, executive VP of engineering and systems integration for iHeartMedia, browsed the offerings on display. He saw a number of products to help announcers and programmers manage the vast social media connections with listeners — and even to execute new creative tasks and workflows around those interactions.

"The connection we have with listeners is what sets radio apart from other forms of media, so it was great to see several companies thinking about how to improve that connection," he said.

MORE ON-DEMAND

He also mentioned Wheatstone's Switchblade product as promising for replacing ISDN or other audio remotes, eliminating the need for a studio phone system or intercom and allowing ad-hoc creation of audio networks.

One corporate engineering manager sensed momentum in software processing that operates in the cloud. There were a handful of cloud-based automation offerings that were interesting, he said.

Another engineer noted that some vendors are moving toward an "embedded Importer/Exporter" for stations broadcasting HD Radio.

Alex Roman, director of integrated technologies for

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Photo by Jim Peck

Attendees of the spring NAB Show

World Radio History

Welcome to the World of Radio

Radio succeeds because it rests on one of the earliest of our developmental experiences

BY PAUL McLANE

I was honored to be asked to write the preface to the latest edition of the textbook "The Radio Station: Broadcasting, Streaming & Podcasting," authored by John Allen Hendricks and Bruce Mims. The book is now in print from Routledge (find it at routledge.com, *Amazon or other retail outlets).*

In sitting down to write a few months back, I found it a thoughtful exercise to ask, "What would I want to tell someone who is thinking of taking up this field as a career?" Here's the result, which I share with permission.

Welcome to the world of radio.

This book will open your awareness to the practices of a medium that enjoys unique power and romance. It will help you understand its career opportunities and how to pursue them.

But why, a century after revolutionizing mass communication, does radio remain so compelling? How has it thrived and reinvented itself while so many other media and electronic innovations have launched and disappeared?

Perhaps it's the unique intimacy of a voice whispering in our ear.

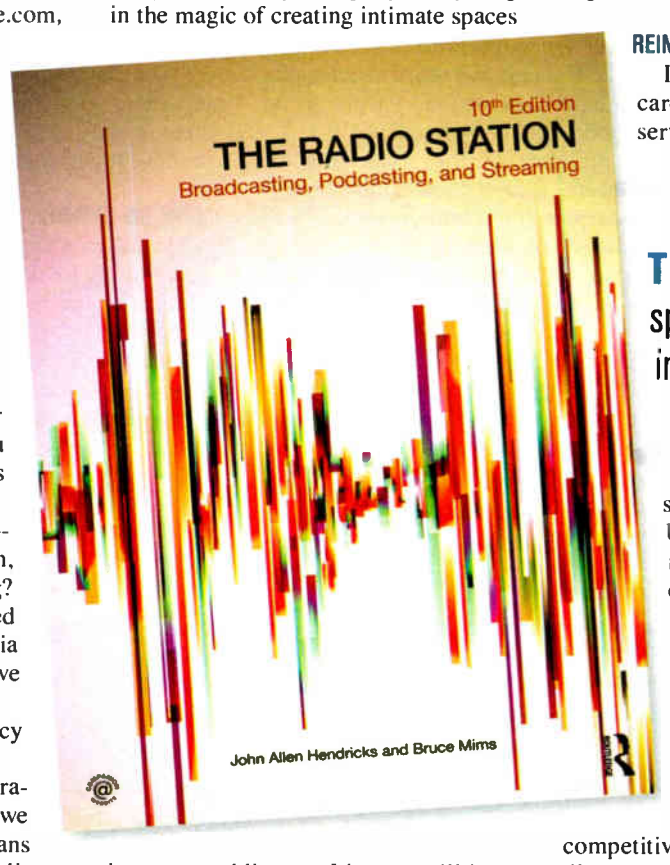
Perhaps it's the skill of a curator who helps us discover songs we didn't know existed, of musicians who create soundtracks for our lives, of storytellers who create theater in our mind, of advertising professionals whose creative endeavors whet our appetite for their new products.

Maybe, too, it's the thrill of pleasure at the sound of the crack of a baseball bat. Or it's the "drop what we're doing" urgency of hearing a meteorologist interrupt our afternoon music to tell us about a dangerous funnel cloud forming outside of town. Or the deep satisfaction of listening to a long-form interview with our favorite author, actor or digital innovator.

These are experiences from the listener's perspective. Radio is best when it engages, provokes, entertains, informs us.

But who would not want to be the one *creating* those experiences?

The people who make good radio enjoy a special privilege, participating in the magic of creating intimate spaces in a very public way. I hope you'll have the opportunity to feel this yourself; and you don't have to be an air talent to do it. There are many crucial roles in creating this magic.



In their revised, expanded edition of "The Radio Station," Bruce Mims and John Allen Hendricks have put extra emphasis on career opportunities — in music, news, sports, sales, engineering, IT, social media.

There are other new elements. The chapter on research includes an article from Andrew Forsyth at NielsenBDS about how to use data to identify and schedule new music, as well as an extended interview with Geoff Steadman of the Telos Alliance about its Voltair product and a discussion about changes in the influential Nielsen PPM ratings system. Cumulus Media's Mike McVay and Producer Ray Slater of "The Bobby Bones Show" provide expert insights. Veteran communications attorney David Oxenford shares expertise about regulatory issues, music and copyright law.

This book is weighted toward commercial broadcasting operations in the United States, but will help you understand other forms including public, college, low-power FM and U.S. government-sponsored international broadcasting. Keep in mind too that other countries have their own regulatory regimes and transmission infrastructures that differentiate broadcasting further.

REINVENTION

If you are considering a radio career, I'd be doing you a disservice not to acknowledge that some people, particularly in U.S. commercial broadcasting, lament trends such as corporate consolidation, programming similarity, voicetracking and shrinking workforces. Critics also note the under-representation of women and minorities at ownership and management levels. Such factors undermine radio's quality or competitiveness, in their view. I don't dismiss these considerations, and if you enter the industry you will find debate over such issues to be a part of daily life.

But challenge anyone who tells you radio is a buggywhip industry. We live in an exciting time to enter media careers. Not only are thousands of people making careers in radio — many doing exceptional work — but the smartest of them work for companies eager to employ and develop forward-looking multimedia professionals.

Keep in mind too that those companies are also reinventing themselves; and the term "radio" can mean something much different than it did a few years ago. People debate what exactly the word means anymore. Does it still refer strictly to over-the-air, "one to many" programs broadcast via terrestrial towers and antennas to a multitude of receivers in local listenership communities? Does it include satellite radio? How about streamed audio and online services that combine access to traditional stations with personalized or curated content?

Are we listening to radio when we plug a smartphone into a car dashboard? Is the video stream of a station's morning show part of "radio"? Why are podcasts considered different from radio? And what will come of emerging "hybrid" technologies that aim to bring an interactive, two-way aspect to our radio listening?

Radio is in a period of dramatic and accelerated evolution, as are the devices that carry our programs, as well as the very vehicles and living rooms where we want our "station" to be heard. Further, as consulting firm Research Director Inc. puts it, what was once a blind conversation is now a multidimensional relationship.

The people who make good radio enjoy a special privilege, participating in the magic of creating intimate spaces in a very public way.

So ignore questions of definition. The listener doesn't care if words and music arrive via a land-based tower, satellite or smart speaker. They want compelling content and experiences. Instead of asking "what is radio" or "what is a radio station," the question broadcasters must ask ourselves is, "What business am I in?" You the reader have the opportunity in your career to define the answer. To me, ultimately, radio is about creating connections between us and a listener. Everything else is a tool to that end.

Radio though is unusually persistent. One learns to trust in this persistence. There's something about the inherent connection between speaker and listener, something preserved in the electronic path between microphone to eardrum, that sets radio apart. Radio succeeds because it rests on one of the earliest of our developmental experiences: sharing human emotion through sounds.

When we create meaning in the mind of fellow humans, we engage in a far older form of communication than books or moving images. It's noble. It's fundamental. And it's pretty dang cool.

Comment on this or any story. Note our new email address: radioworld@futurenet.com.

FROM THE EDITOR

Paul McLane

World Radio History

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TRENDS

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Emmis in New York, saw substantial progress towards expanding on-demand and multimedia content delivery.

"The tools have improved and broadcast companies are working to use their talent and other existing assets to deliver content that the audience can consume on their own schedule," Roman said. "The large podcast audience delivered by existing radio broadcasters was often discussed, particularly the enormous success by public radio organizations."

One of the most promising changes Roman saw during the show was studio virtualization. "The same way that server virtualization has changed IT, this will change how we think about our production environment," he said.

> **The connection** we have with listeners is what sets radio apart from other forms of media.
>
> – Jeff Littlejohn

Roman said Telos demonstrated a platform which combined console control, automation and digital media management "on a single pane of glass," a user interface design term to imply consolidation of different functions into one container.

"For example, you can do a large touchscreen for a host with everything on it, or put tablets at co-host positions with a single mic control and button bar play-out from automation, or give a producer a wireless tablet to help run the board.

"It has the potential to provide much more flexibility in production. It'll be easy to take the morning show into a video production studio or a space that can accommodate an audience. If you want to produce a live webcast program you can have all the assets of your studio plant with less hardware," he said.

RECRUITMENT CHALLENGES

The NAB Show means different things to different people. Yet another engineering manager said this year's show "felt more like an evolution year than an innovation year."

"This felt like a really good show though, but not because of new or emerging tech in the radio universe, but because people seemed to be spending money and vendors seemed to be very willing to listen and share opportunities."

Additional areas of interest, as reflected in the agenda of the Broadcast Engineering and IT Conference, included new workflows for on-air radio talent; management of IP traffic across radio STLs; the uses of voice assistance in local media; and the operation of wireless mics in the wake of the FCC incentive auction. Podcasting continues to surprise. And beyond radio, the themes of artificial intelligence, cybersecurity, cloud migration and the uses of "big data" were evident.

More than one engineering manager mentioned the biggest challenge remains the recruitment, development and training of technical staff.

"The number of people able to integrate, manage and maintain everything in a broadcast plant continues to shrink and the required skill set continues to expand. We now have a complex server, data storage and application environment that requires constant upkeep to stay online, plus maintain the studio environment and transmitter plant and handle administrative tasks," said one.

What tech trends are on your *mind? Email us at* radioworld@futurenet.com *with "Letter to the Editor" in the subject field.*

You'll find the Radio World winners of the 2018 Best of Show at NAB awards starting on page 18. But there's more to explore from the Best of Show Program.

Hot off the digital presses, the Best of Show Program Guide is a great way to learn about many more new products introduced at the spring NAB Show for TV/video, radio and AV professionals. This digital guide features nearly 300 nominated products and highlights the winners.

The guide allows companies to tell you in their own words why they believe a certain product is noteworthy; and it offers an excellent sampler of new technology from the convention floor. Find it online at *tinyurl.com/rw-bos-2018*, or under the Awards section of *www.radioworld.com/resource-center*.

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A C-band uplink installation for Dakota News Network in 2015. From left: LinkUp founder Mark Johnson, Clay Johnson, Daryl Doss and Robert Morrison.

FCC's C-Band Plan Worries Broadcasters

NAB says virtually every TV and radio household in America relies on C-band

BY TOM VERNON

For years, radio and television broadcasters, as well as cable providers, have been relying on C-band satellite systems for reliable distribution of programming content. Some estimates place the number of C-band downlink sites in the United States at more than 27,000, and demand for new facilities shows no signs of letting up.

But as Radio World has reported in recent months, the C-band isn't something that broadcasters should take for granted. The system is in imminent peril of being rendered useless by terrestrial interference, at least according to some observers.

Among them are Mark and Karen Johnson, principals of LinkUp Communications Corp., who recently traveled to Washington to make their case before the commission.

MAKE WAY FOR BROADBAND

The problem is the FCC's consideration of changing the rules to allow 3.7–4.2 GHz to be shared by other services. The move is being spearheaded by broadband companies, including Google and Verizon, who are asking the commission to turn over some or all of the spectrum to internet providers for future 5G technology.

But syndicators and networks such as Premiere, Westwood One and NPR as well as many radio and television broadcasters stand opposed to the proposed changes, claiming that interference from terrestrial services could render satellite reception all but impossible.

These developments precede an expected Notice for Proposed Rule Making on the proposal that would allow 5G to operate within the same frequency ranges as C-band in the United States. The FCC expects to vote on the matter at its July meeting.

Karen Johnson said that she and Mark Johnson were excited to present to the FCC a "real-life" perspective on the impact 5G broadband could have on the heavily used C-band frequencies. They presented to members of the International Bureau and to staff members of three commissioners in individual meetings.

These moves precede an expected Notice for Proposed Rule Making on the proposal that would allow 5G to operate within the same frequency ranges as C-band in the United States.

While the issue is being considered, the FCC instituted a 90-day freeze starting April 19 on applications for new receive-only Fixed Satellite Service (FSS) earth stations in the C-band. At the same time, it asked users of existing earth stations to register them by July 18. While not mandatory, this registration is being strongly urged by leading broadcast groups as well as the commission.

"We had been urged by both Intelsat and SES Global to make the trip to Washington. Representatives from the Society of Broadcast Engineers joined us, and began to discuss how we could make the best use of the 30 minutes we had before the FCC," she said.

Intelsat, Intel and SES Global support what they call a market proposal that would let wireless operators access mid-band while satellite users would continue to receive services in the remaining portions of the band with certainty of high-quality operation; that initiative is explained at *www.intelsat.com/about-us/c-band-spectrum*.

"We quickly realized that our list of concerns was too long for this initial meeting. We decided to focus on the FCC filing forms for registering earth stations — the complexity of the form, the need for the ability to 'batch file' multiple C-band downlinks and the fee itself."

Mark Johnson noted that members of the FCC's International Bureau, responsible for collecting and tabulating the earth station registration forms, seemed sympathetic to some of the concerns they raised — "in particular, the sheer number of C-band downlinks that many in the industry were attempting to register, and the un-budgeted expense of registering multiple downlinks.

"Despite that," he said in May, "the $435 filing fee is likely to remain. We were told it was necessary to compensate staffing for the additional burden of handling so many complex filings in such a short amount of time. We are hopeful the FCC may provide some financial relief for multiple downlink registrations, I believe they understood the undue burden this hefty expense would have on so many broadcast licensees." (An earlier requirement for independent frequency coordination, however, was dropped, saving registrants another step that typically cost $1,000 or more.)

Karen Johnson felt that the FCC staff responded best to hard numbers.

"As Mark spoke about how we arrived at a true number of C-band downlink earth stations in the U.S. — approximately 27,000 — the FCC took note. They were also most interested when we shared that our customer base covered 144 markets with a listenership of 14 million. More importantly, our clients use C-band communications for as much as 98 percent of the programming distributed by their stations into local communities."

A CALL FOR 'RIGOROUS' ANALYSIS

The National Association of Broadcasters filed comments with the commission at the end of May, emphasizing the extensive use of the C-band for content distribution by broadcasters, the

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C-BAND

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lack of reasonably practical alternatives such as fiber, the need for rigorous technical analysis of proposals for terrestrial uses and finally the need to preserve full-band, full-arc licensing of earth stations (see sidebar at right).

Commenting separately, Dennis Wharton, NAB executive vice president of communications, said, "Every day, thousands of commercial and public TV and radio stations use so-called 'C-band spectrum' to deliver broadcast programming to tens of millions of listeners and viewers. These airwaves are essential to the successful transmission of the most popular program content on TV and radio, and suggestions that there are sufficient content delivery alternatives have yet to be proven.

"The burden is on wireless carriers to provide the FCC with rigorous, fact-based analysis that demonstrates that any proposal would not threaten interference-free reception of free and local broadcasting," Wharton said.

Asked by Radio World earlier this year about interference worries, Commissioner Michael O'Rielly said, "Radio broadcasters and broadcasters in general should not be concerned. As someone who's leading the effort on the 3.7 to 4.2 band, and the 6 GHz bands, which are the C-band up and down links, we're going to take care of incumbents. I'm not interested in disrupting incumbents."

O'Rielly said at the time that he was open to other approaches but also urged C-band users to register: "Tell us if you exist. It's hard to protect people we don't know about."

But then in late May, Karen Johnson said that broadcasters — already feeling somewhat discouraged by the proposed reallocation — became even more so when Chairman Ajit Pai announced a plan to vote on the matter July 12, seven days *before* the deadline for broadcasters to register earth stations.

Pai spoke to the Wireless Infrastructure Association Connectivity Expo in Charlotte, N.C. He addressed the dual connectivity challenges of infrastructure and spectrum associated with 5G, and barriers that he said broadband faces in the global race for 5G dominance.

WHAT THE NAB SAID ABOUT C-BAND

Excerpts from NAB's comments:

"First, the C-band is extensively used for content distribution. Virtually every U.S. television and radio household relies on C-band satellite operations for content distribution in some manner. Content providers rely on the C-band to deliver television programming to thousands of MVPD head-ends, over 1,000 broadcast television stations affiliated with national networks and over-the-top service providers. Radio content also relies heavily on dependable access to the C-band. National Public Radio has stated that the public radio system depends on the C-band 'for reliable distribution of programming to the 475 public radio earth stations that together broadcast public radio programming to 42 million Americans each week.'

"Second, the availability of reasonable, practical alternative means of content delivery, such as fiber, are significantly overstated. In many cases, substitute modes of delivery are unavailable or less reliable. Even in those areas where fiber is available, it may not be economically viable.

"Third, because of the importance of the C-band, and because of the limited alternatives, the commission should insist on rigorous technical analysis of specific and detailed proposals before making decisions that will impact tens of millions of radio and television households. The commission should not assume that technical solutions will appear that will allow incompatible services to share spectrum. NAB reiterates that, as a practical matter, this means the commission should acknowledge that terrestrial users cannot share C-band frequencies based on geographic separation alone. As commenters have explained, earth stations must be designed to reliably capture highly attenuated signals from satellites more than 22,000 miles away. Accordingly, these facilities are extremely sensitive and highly vulnerable to terrestrial interference. Indeed, this is the reason why the FCC has historically required frequency coordination

iStockphoto

between satellite and point-to-point microwave users in this band. Significant separation distances, ranging from tens or, under extreme circumstances, even hundreds of kilometers, would be required to ensure that fixed and mobile terrestrial signals do not prevent reliable reception of satellite downlinks. Mobile operations in particular cannot be authorized in the same frequency band as existing C-band operations because there is no reliable means of geofencing mobile users or mobile handsets from operation in exclusion zones.

"Finally, in considering options for expanded fixed use of the C-band, the commission should reject any proposal to eliminate or constrain its longstanding and highly successful full-band, full-arc earth station licensing policy, under which FSS earth stations may coordinate across the entire frequency band over the entire geostationary arc. Preserving the longstanding flexibility that full-band, full-arc licensing provides is essential to broadcasters and other users that rely on satellite services. Because satellites are in orbit high above the earth, on-orbit equipment problems or failures cannot be repaired by a 'truck roll.' Significant flexibility in both satellite choice and transponder frequency are absolute necessities to assure reliable operation."

He spoke of freeing up spectrum, including frequencies identified as C-band for wireless services; he then announced his intent to put up an NPRM. Details regarding that proposal were yet be released at press time. If it passes, opponents would have 60 days to try to influence the commission before a final vote.

ECONOMIC QUESTION

As broadcasters rally to protect the C-band, they face opposition from several forces. Not only is a powerful Washington lobby for broadband interests engaged, there are other political driving forces in play.

One is the significant boost to the economy that broadband is expected to provide. CTIA estimates that 5G will create 3 million jobs, add $275 billion in new investment and spur $500 million in economic growth. But in order to do that, these experts say, they must access multiple spectrums, including the mid-band frequencies populated by C-band.

The newsletter Inside Towers reported that CTIA President Meredith Attwell Baker urged the FCC to finish rules for the 3.5 GHz portion of mid-band spectrum in time for the July meeting; Baker was also reported to be urging the FCC to schedule an auction for the Citizens Broadband Radio Service spectrum in 2019.

Yet another driving force for broadband is the global race for connectivity. The consulting firm Analysys Mason ranked 10 countries across key factors to determine which were in the best position to win the race to 5G. It put the United States in third place, behind China and South Korea.

Karen Johnson said this is the time for the C-band community to come together and take action.

"We encourage everyone to address the FCC directly with your concerns about the encroachment of 5G into C-band satellite frequencies. Registering your C-band earth station with the FCC and filing a letter stating your concerns about 5G encroachment into C-band frequencies are two very tangible ways you can make a difference."

To register, visit *http://licensing.fcc.gov/myibfs*. If you find that page daunting, several of the organizations cited in this article have posted suppport pages; just do an online search for the term C-band and an organization name like NPR PRSS, Intelsat, SBE or SES for example.

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World Radio History

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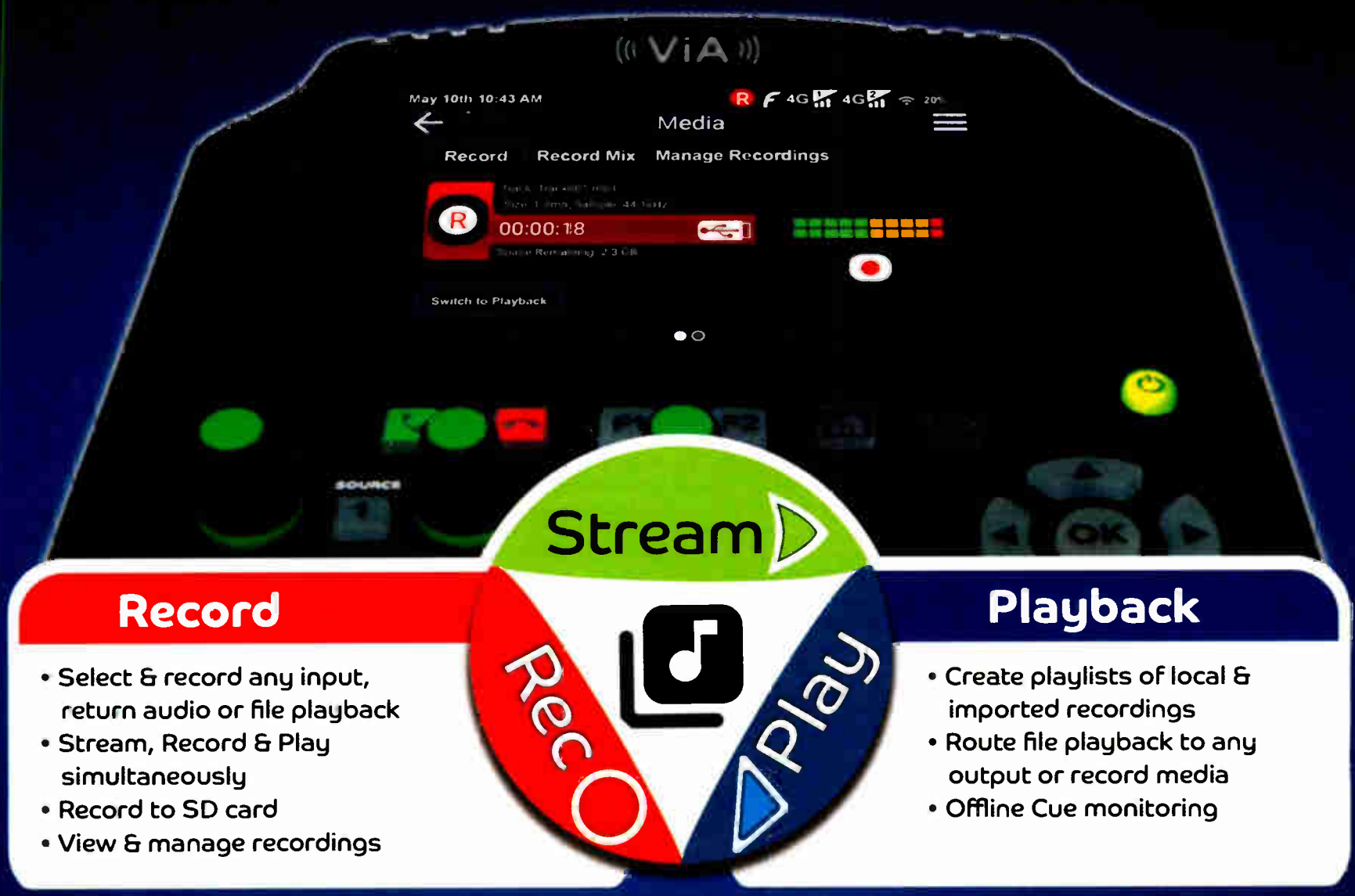

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World Radio History

5G

(continued from page 1)

as 5G, the fifth generation of the technology, is poised to create a new platform that is not just faster, but much more agile than today's state-of-the-art 4G (also known as Long Term Evolution, or LTE) networks.

Expected to debut wide in the next two years, it's the latest in the continuum of every innovation in wireless technology, and it promises to disrupt — if not complement — many industries with lightning-fast communication speeds.

5G will roll out as a network of cell sites offering gigabit-level speeds (100X faster than today's highest speeds) over fiber lines, and lower latency (no more hourglass or beachball icons!)

The technology will also underpin a vast array of fixed (non-mobile) and mobile devices, services and applications across an array of industries, including entertainment, education, music and medicine. Consumers need only a modem to connect.

There is much to be worked out, but 5G is poised to be a gamechanger for anything streamed or downloaded.

Deployments of 5G are already underway using pre-commercial technology by the usual suspects — the incumbent mobile network operators — but there are a host of new providers, including cable operators, that have become increasingly eager to add mobile and wireless to their service arsenals.

The first anticipated type of 5G-based services will be fixed wireless data offerings that can deliver speeds in the neighborhood of 1 gigabit per second to the home or business. The implications for the Internet of Things, in a world where every home appliance and gadget is dependent on robust wireless connections, are enormous.

BLAZING FAST INTERNET

For traditional services, imagine downloading a full two-hour movie, or an entire semester of classes to a student, in mere seconds — while also supporting the massive data rates that will be required by new virtual reality and augmented reality services.

Further out, 5G will also be mobile, with sub-millisecond latencies that greatly cut down the time it takes for data to be transferred after it is requested, and will be a major requirement, for example, for mobile networks that can ensure that self-driving cars stay connected and can navigate the streets safely.

For now, despite its futuristic reputation of sensors everywhere, 5G is saddled with technical hurdles. For example, 5G signals, particularly when delivered in the upper, millimeter-wave frequency bands, will need a clear path, as their performance is vulnerable to obstacles such as trees and buildings.

For the cable industry, 5G is viewed as a threat and an opportunity. While 5G could create a new speedy broadband rival, 5G will also require the deployment of millions of dense, high-capacity small cells that

(continued on page 12)

Will 5G Deliver for Radio?

"It is in broadcasters' interest to be out in front in embracing this technology and using it to provide the best possible product to our listeners"

BY RANDY J. STINE

Even with 5G a few years away from full deployment, interest in it is growing among radio engineers. Observers say radio groups are already tinkering with ways the next-gen wireless standard might affect operations. For instance, how will 5G affect live remotes, streaming and shared audio and video? Can 5G be useful for point-to-point links, and what are its possible wireless network applications?

Technical observers contacted by Radio World about this next generation of cellular networks say there's a lot of be excited about. Impact in broadcast circles obviously is yet to be known; but the tech folks say radio groups should be planning now for the integration of 5G-based fixed wireless services to maximize its potential.

While the futuristic powers of 5G wireless will allow for connectivity in the United States at higher speeds with more bandwidth, experts say it is not yet defined as a technology and has unknowns, which means the radio industry is still guessing about the potential. In fact, the FCC says it is still pursuing a "comprehensive wireless strategy for the deployment of the next-generation wireless technologies."

Anyone in the content delivery business, including broadcasters and internet pure-play providers like Spotify and Pandora, will surely benefit from the next generation of wireless systems. Said one top-level radio engineering executive: "It is in broadcasters' interest to be out in front in embracing this technology and using it to provide the best possible product to our listeners."

ONE BIG PIPE

Milford Smith, a veteran engineer and principal with Smith, Khanna and Guil Inc., said broadcasters should view 5G as one big broadband pipe and that its delivery capability is limited only by one's imagination.

"5G is certainly going to make the delivery of streamed content even more ubiquitous, faster and with the potential for greatly increased metadata throughput which, of course, could and will include very-high-quality video. Increasingly, stations are including streaming components well beyond just audio to enhance and compliment the OTA product," Smith said.

Smith, former DOE for Greater Media, believes radio remotes will be easier to accomplish with the ability to provide high-quality video and enhanced metadata from mobile situations.

The phase-in of 5G will provide broadcasters and others a significant increase in wireless speed, capacity and performance, said Bert Goldman, president of Goldman Engineering Management.

"In preparation, I think radio executives and engineers should consider efforts to improve and expand their streaming options, since the 5G infrastructure will mean a more personal experience for listeners and radio is in a unique position to leverage its existing resources to compete in this new environment," he said.

Further, Goldman said the additional capacity and speed of 5G will mean more use of wireless communication and telematics in vehicles.

"The cost of content distribution for broadcasters will likely be reduced, thus allowing streaming and offering of multiple new entertainment products possible and more cost-effectively," he said.

MORE DISRUPTION

5G will almost certainly present additional competition to radio, Goldman said. "Near-instantaneous downloading of audio could allow users to compile a playlist on the fly. The additional capacity to include high-quality video at little extra cost will create some pressure on those who remain committed to audio-only offering," he said. "5G will bring yet another disruption in the media and entertainment industry."

Goldman said anecdotal evidence he has seen firsthand suggests a strong suit of 5G will be the ability of near-immediate deployment of high-capacity fixed or mobile service.

"I have recently been involved with testing of an upgraded 4G network to handle high-capacity fixed data services. Distribution of digital audio to four sites was deployed in just a few hours and once deployed, didn't drop any data packets in over two weeks, far more reliable than fixed data services in the past," Goldman said.

"This was used as a temporary solution, but with 5G, waiting months for engineering services and installation of STL and other high-capacity data circuits could be a thing of the past."

Broadcast equipment suppliers also are studying the potential impact of 5G on their goods and services. Tom Hartnett, technical director for Comrex, said his company's codecs are designed to be network-agnostic, positioning the company to leverage 5G modems the day the networks become available.

"To a large extent, 5G can be considered a congestion-avoidance scenario. The millimeter wave bands used for 5G have a lot of bandwidth available, but real limitations in terms of coverage and building penetration. But hopefully putting the users who can access 5G up there will result in less congestion in the present LTE bands, providing for better overall experiences in large cities," he said.

In essence, "the great ideas that have promulgated due to 4G availability" will now work better due to 5G being there to take on more of the user load, Hartnett said.

World Radio History

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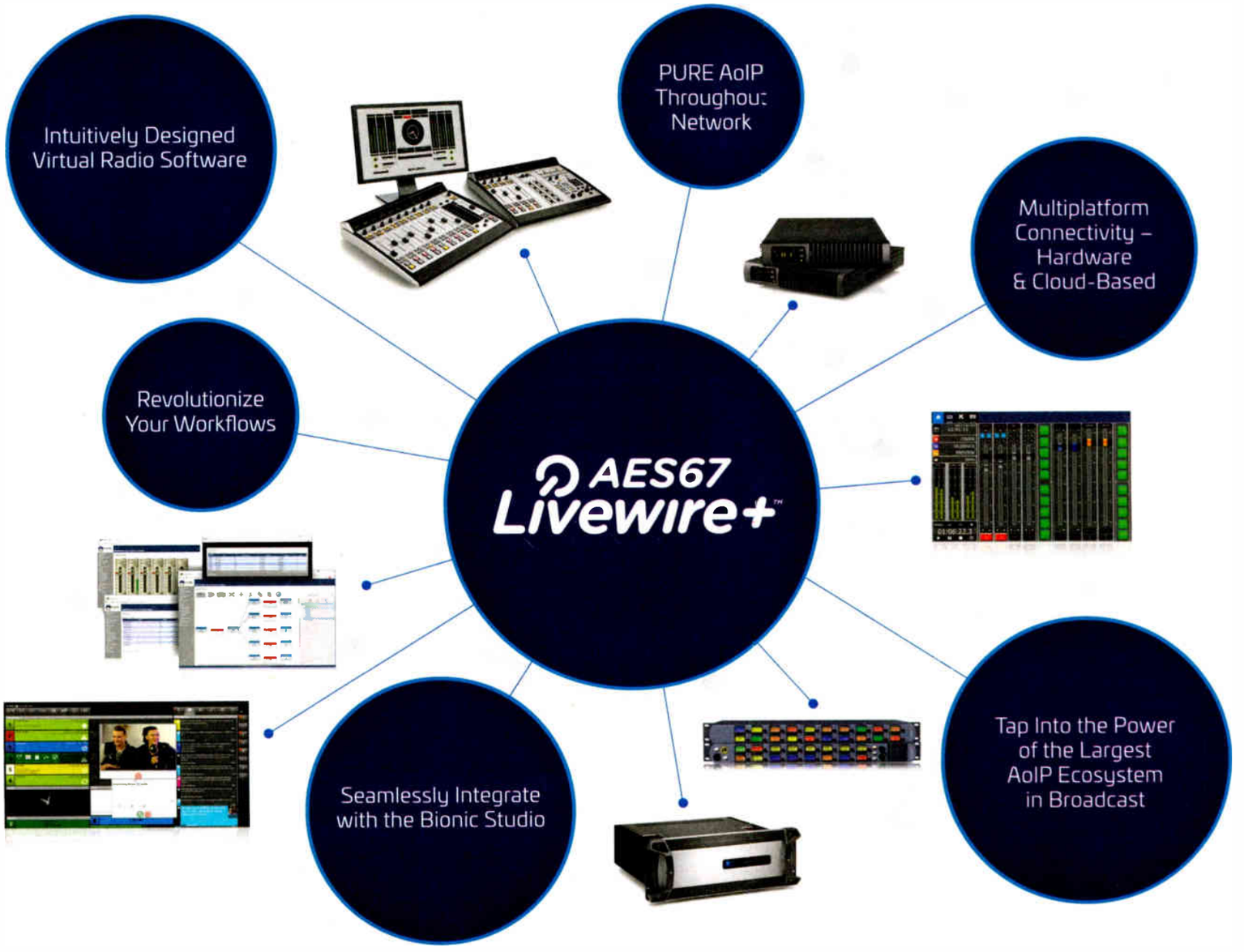

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World Radio History

5G

(continued from page 10)

are in stark contrast to the macro-cell networks used by today's 4G networks. And it so happens that cable's fiber-rich network is well positioned to provide those critical backhaul and powering requirements. That could be a major moneymaker for the cable guys.

NOT-READY-FOR-PRIMETIME PLAYER

When will all of the pieces fall into place? Though some 5G-based fixed wireless services will take hold in 2018, the big ramp for the technology isn't expected to emerge until 2020.

Several mobile service providers, cable operators and startups like Starry are already well downstream with 5G-based fixed wireless tests and deployments. The mobile aspects of 5G aren't expected to take hold in a big way until 2020.

In the meantime, initial 5G-based fixed wireless deployments could put some pressure on wireline ISPs.

"The use case [for 5G] I get most excited about is the opportunity to have a nearly nationwide broadband footprint," Randall Stephenson, AT&T's chairman, president and CEO, said on the company's Q4 earnings call, expressing confidence that 5G could serve as a fixed-line replacement for both business and residential customers.

"The capacity is there, the performance is there. There's going to be full gigabit throughput," he said.

MOBILE MAKING A MOVE

But that work isn't stopping progress on mobilized 5G even before there are smartphones and other mobile devices that will support it. AT&T, for example, plans to launch a mobile form of 5G by the end of 2018 in about a dozen markets. However, the initial deployment won't involve direct integration with laptops, smartphones or tablets, but instead rely on a smaller router-like device that can connect other devices to the 5G network.

"Think of this as a puck," Stephenson said of the new device. He wants AT&T to push mobile 5G forward before handsets that support the next-gen wireless technology become available.

T-Mobile will be keying its 5G strategy on spectrum in the lower spectrum bands. While that will address the mobile opportunity, "it will also open up this massive set of opportunities on 5G in the Internet of Things space, where you can connect everything that can be connected," Neville Ray, T-Mobile's chief technology officer and executive vice president, said on the company's Q4 2017 call in February.

And the phone company plans to be aggressive. John Legere, T-Mobile's CEO, said that 5G, when fully deployed, "will be in every spectrum band, and we will be participating in a lot of ways either through acquisition of spectrum, acquisition of companies, mergers and consolidation."

But T-Mobile's focus on the wide-area benefits of the 600 MHz band for its 5G rollout underscores a critical factor in the rollout of 5G: Not all spectrum is created equal. Millimeter wave signals don't propagate well over long distances, have difficulty in the presence of trees and buildings, and require almost perfect line of sight.

"They hardly like air," Robert Howald, Comcast's vice president of network architecture, said at an industry event last year. He was making a joke, but he also makes an important point — it's unlikely that any 5G strategy will be able to live successfully on millimeter wave spectrum alone.

There is much to be worked out, but 5G is poised to be a gamechanger for anything streamed or downloaded.

Watch a video on this topic and explore articles on the impact of 5G in other sectors at www.radioworld.com/needtoknow/need-to-know-5g-riding-wirelesss-next-wave.

Watch a video on this topic and find other resources at *https://www.radioworld.com/needtoknow/need-to-know-5g-riding-wirelesss-next-wave.*

NEED TO KNOW MORE?

Have a burning question about 5G — or maybe request for a different topic you'd like to see us tackle? Email us at *needtoknow@nbmedia.com* and we'll put our top minds on it!

FCC Explores Class C4

The FCC in early June issued a notice of inquiry about a possible new FM class of stations in the United States called Class C4. We checked in with proponent Matthew Wesolowski about this. He is general manager of WYAB(FM), licensed to Jackson, Miss.

Radio World: What exactly did the FCC do about Class C4?
Matthew Wesolowski: After five long years, the commission has finally acknowledged that there is a demand for a new station class, as well as ending needless overprotection of some decades-long underbuilt FM facilities. Although the FCC took public comments in this proceeding in 2014, it certainly is time to freshen up the official record prior to moving on to a more formal Notice of Proposed Rulemaking.

RW: Please summarize the NOI in a few sentences.
Wesolowski: The Notice of Inquiry seeks to establish whether or not eligible Zone II FM Class A stations are interested in taking advantage of an increase in power from 6,000 Watts to 12,000 Watts. The NOI attempts to address if smaller operators would be interested in such an upgrade, the implications of conferring a 73.215 status to underbuilt stations, and how the whole proposal may affect secondary services.

RW: Were you surprised by this development?
Wesolowski: My company co-authored the petition with MMTC, and I do not believe that either one of our organizations had advance notice of this release. I was quite surprised, but pleasantly, of course. The supporters are very excited about this development!

RW: Do you have any insight into which way the winds are blowing in the halls of the commission on this issue? What's your prognosis for it?
Wesolowski: I believe that some commentators have said that the NOI is an indication that the commission is trying to brush off this matter or that it is no longer a priority. I could not disagree more. In 2014, the FCC took nearly universally positive comments in this proceeding (then RM-11727), and the NOI is a necessary step in confirming that there is still interest in the FM Class C4 issue. Since the NOI's release, I have talked to several dozen FM Class A licensees who are beyond ecstatic about the prospects of getting a power boost. I find it hard to believe that the commission would turn away so many broadcasters at this stage, particularly as the chairman has publicly endorsed the idea.

RW: What do you feel is the main objection to the whole concept that's been raised to date; and how do you respond to it?
Wesolowski: FM translator licensees are concerned that FM Class A stations upgrading to FM Class C4 will somehow knock hundreds of secondary signals off the air. Their concern is understandable, but the data and studies of likely stations apt to take advantage of the new class do not support that conclusion. My company conducted a study after the fourth and final AM Revitalization filing window this year, taking into account thousands of new and relocated FM cross-service translators, and concluded that the impact of the FM Class C4 stations to these licenses would be negligible.

RW: What else should we know?
Wesolowski: I would encourage all Zone II FM Class A station licensees to file supporting comments in the MB 18-184 proceeding as soon as possible. It is vital that the commission hears from smaller operators who would benefit from this proceeding.

Read the NOI including instructions on how to comment at https://tinyurl.com/rw-fcc-c4.

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World Radio History

Sage Advice From the ABA

Plus here are some LED flashlight pointers and an alternative suggestion

WORKBENCH
by John Bisset
Email Workbench tips to johnpbisset@gmail.com

If you haven't visited your state broadcast association's website lately, try it. Many association websites offer a wealth of information.

The Alabama Broadcasters Association, home of the ABA Engineering Academy, is a case in point. Its fall Radio and Television Engineering Classes have been updated.

The radio class has added more information about audio over IP, digital audio, HD Radio and AM/FM antenna operations. The television class explores video over IP (SMPTE 2110), ATSC 3.0 and the television repack. Both classes also include maintenance guidelines for current technology.

The Radio Class is scheduled for the week of Sept. 24–28, and the Television Class is the week of Oct. 15–19. You can register online at *http://al-ba.com/wp2/aba-engineering-academy*.

In our recent site inspection discussion we spoke about posting informative license information.

Although the FCC posting requirement is being reviewed, the ABA newsletter reminds engineers of the FCC rules requiring a station log. The log must contain entries covering EAS activities, any tower light malfunction and compliance with the terms of the station license. It must be reviewed weekly, signed and dated by the station chief operator.

To aid stations in maintaining this log, the ABA has put together a sample station log for documenting the required information for the entire month. ABA reminds engineers that these logs are required to be retained for two years.

You can download a copy of the sample station log at *http://al-ba.com*. Click on the EAS tab at the top of the page.

Speaking of EAS, the ABA website also reported that Sage Alerting Systems had released a firmware update that you must install to allow your ENDEC to continue to receive EAS CAP alerts from FEMA. Radio World reported this too in our Newsbytes e-newsletter.

A FEMA signing certificate expires at 11:45 a.m. June 24. If you do not install this update, you will not receive CAP messages from the IPAWS system after June 24.

You can find the release notes at *www.sagealertingsystems.com/release1-1/cr-rev4-release-notes.pdf*. The firmware update is straightforward, and the update will not change any of the settings on your ENDEC.

The installation process is straightforward and is described in the release notes. Installing this update will not change any of the settings on your ENDEC. If you have questions, call Sage Alerting Systems at (914) 872-4069 and press 1 for support.

Marc Mann of San Diego offers readers a suggestion, after reading the May 23 Workbench column in which I highlighted the "insurance" of having an inexpensive LED flashlight ready to go.

It's been Marc's experience that most inexpensive *and* expensive LED flashlights rely on a three-position pushbutton switch, mounted in the tailpiece, for actuation. The issue is that these

Fig. 1: The GFI "ground fault" outlet.

three-position switches (Off-On-Strobe) don't provide a true battery disconnect "off" function. The circuit relies on this simple latching switch feature to toggle amongst the choice of light desired. So what we end up with is a constant parasitic drain on the batteries.

This drain can cause the batteries not only to fail but to leak when needed most. Merely having spare batteries won't help, as the corrosion from leaked battery electrolyte insulates the battery terminals.

A well-known brand of flashlight that uses an aluminum case (as many now do) is tough — except when the batteries leak. When that occurs, the electrolyte creeps into the tailpiece screw threads. This prevents you from ever opening the flashlight again! (Marc adds that he knows; he's tried.) Yes, you can try lubing the threads initially with Vaseline or anti-seize compound but this can cause a mess.

Fig. 2: Plugs may obscure the test/reset buttons.

So the next question is whether there really is any new kind of flashlight available. Surprisingly, yes. Instead of multi-groups of individual LEDs, there is now COB, short for "chip on board."

Marc suggests you look at the NEBO brand of "Big LarryC" pocket-size Cob flashlights. These flashlights are compact, built well and affordable, with base models as low as $9.99. These flashlights are also available at Ace Hardware and through online shopping. Head to *www.acehardware.com* and in the search block enter "NEBO LarryC." Or on Amazon, search "6306-Flashlight-Worklight-Magnetic-Assorted" for a variety of models and price points.

Whichever you decide, Marc's advice is to look for flashlights with positive on-off switches. By the way, does anyone really use that strobe function?

Let's wrap up with a little point about the GFI outlets, featured in Fig. 1. Some plugs cover the test/reset pushbuttons on these outlets, shown in Fig. 2.

If the plugs are not periodically removed, you may forget that it's a GFI at all. This can have you running in circles, wondering why there's no power.

A solution? Get your labeler out and print a label to be mounted above the outlet, identifying it as a GFI.

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

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McMartin Muzak Memories

Digging into the McMartin TR-55D FM subcarrier receiver

The front end of the TR-55D is crystal-controlled and uses a diode-protected, dual-gate D-MOS RF amplifier. It is capable of 55 dB linear gain reduction, giving the receiver an overall dynamic range of over 100 dB.

PLUGGING INTO THE PAST

BY TOM VERNON

The word "broadcasting" really explains what the concept is all about: Casting a net to reach the largest number of listeners possible.

There are times however when the goal is to reach a small audience, or a subset of that larger audience. For that, the term narrowcasting was coined.

In the internet age, scaling a web stream for larger or smaller audiences is a simple matter, but in the analog days, the task was more challenging. One way to narrowcast was with an FM subcarrier, or in the FCC terminology of the day, a Subsidiary Communications Authorization.

This time in Plugging into the Past, let's look back at the history and technology of FM subcarriers, which inevitably leads to a history of McMartin Industries. We will also check out a McMartin TR-55D FM/SCA tuner that survived a near-death experience.

SUBCARRIER ORIGINS

FM subcarrier technology had its origin during World War II, the outcome of extensive research by the U.S. Navy. After the war, it was sanctioned by the Federal Communications Commission and adopted by FM broadcasters.

Part of the reasoning was that no one was making money off FM broadcasting in the early days, and leasing subcarrier channels offered up a potential revenue stream. The normal SCA channels of 67 and 92 kHz were "invisible" to consumer radios and could only be received with special tuners such as the TR-55.

Much of the early research and development work on FM subcarriers was done by Leonard Hedlund, who joined McMartin Industries in 1957 and served as vice president for research and development for many years. One of Hedlund's more innovative projects was for Market Information, who wanted not only to transmit stock quotations by voice over SCA channels, but also to have that information digitally coded for display on a video monitor. He also wrote numerous brochures and white papers about FM subcarriers.

While subcarriers could be used to reach any small audience within a station's coverage area, the technology became synonymous with Muzak throughout most of the 1960s and '70s. While it was derisively termed "elevator music," its bland, easy listening material was ubiquitous in retail and office settings of the day.

The audio signal for a subcarrier service typically arrived at the station's FM transmitter site via an equalized telephone line. From there, it usually went through some form of audio processing, and on to the station's subcarrier generator and then to the exciter. Stations broadcasting subcarriers had to have an FCC type-approved SCA monitor and take regular meter readings of subcarrier frequency, injection level and modulation.

At the receive site, a rooftop antenna was always installed, as FM subcarriers are even more sensitive to multipath degradation than stereo. The installers usually carried an assortment of high-gain, cut-to-frequency, gamma-matched 72-ohm three- and five-element Yagi antennas in their trucks. Cut-to-frequency antennas usually yielded a gain of about 20 dB over broadband FM devices. For extreme reception issues, a stacking harness was available so that two or more antennas could be deployed.

Getting a solid, multipath-free signal in urban areas was no easy task. Often there wasn't a direct line of sight to the transmitter, and a clean reflected signal was the best hope. Also, the lowest multipath signal didn't always arrive in the horizontal plane, and a rotation adapter was often used to tilt the antenna for best performance.

The coax run from antenna to receiver was kept as short as possible, and the receiver was usually located in a utility closet. The audio out was connected to an amplifier which fed a 70-volt distribution system, which usually ended in a series of ceiling-mounted speakers.

While Muzak was the largest consumer of FM subcarriers, there were others. The Physician's Radio Network leased subcarriers in large cities to distribute medical news and commercials for medical professionals, while Market Information Inc. broadcast commodity quotations for brokers, grain elevators and feed lots.

There were also countless regional and local users of SCA, including reading services for the blind, which often had an arrangement to use the subcarrier of the local public radio station. Ethnic groups in large cities used them for foreign language broadcasts. The low cost of desktop receivers combined with the simplicity of operations were advantages for these populations.

By the early to mid 1980s, the use of subcarriers began to decline, as direct satellite broadcast operations were usually more affordable. Reading services and ethnic broadcasters held on for a while longer, but many eventually switched to streaming media. Satellite technology also helped to expand a new genre of radio, storecasting, where large retail chains could have their own channels.

MCMARTIN INDUSTRIES

It's difficult to recount a history of FM subcarriers without examining McMartin Industries.

Entrepreneur Ray B. McMartin graduated from MIT with a Bachelor of Science degree in business and engineering administration. He then worked in market research, sales engineering and marketing for several major corporations. He also served as a first lieutenant in the U.S. Air Force.

In 1956, Ray McMartin founded Continental Manufacturing to build consumer electronics devices. He shifted gears in 1962, renamed the company McMartin Industries Inc. and started in the broadcast business. The first products were subcarrier receivers, followed by FM monitors. The company soon evolved into a turnkey manufacturer of all types of broadcast equipment.

Operations grew rapidly until the company split into four divisions. In addition

The TR55D was introduced by McMartin in 1978. It is pictured with an earlier A-72-PA indoor FM antenna. The tuned helix element is fed to high Q FET RF amplifier, which is factory-tuned to the customer's frequency. Production of the A-72-PA began in 1966.

World Radio History

to Broadcast Products, the SCA division manufactured all types of subcarrier equipment. Commercial and Engineered Sound built equipment that was engineered into building sound systems and incorporated into various commercial sound applications. Private Label manufactured equipment for OEM accounts including Muzak, 3-M, Physicians Radio Network, Dow Jones, Hughes Aircraft, SCI, RCA Service Company, Western Electric, A.D.T. and Collins Radio.

Sales began at a modest $600,000 in 1963, hit the $1 million mark in 1973, and peaked at around $10 million by 1979. At that point, the company occupied a 55,000-square-foot research and manufacturing facility located on seven acres in Omaha. McMartin had 150 employees during the peak years.

The year 1979 marked a turning point in McMartin Industries' history. Interest rates skyrocketed, and the company had a difficult time paying back its loans. At the same time, the economy faltered, and sales of subcarrier equipment also declined, as many providers switched to satellite delivery. While all this was going on, sales expenses for broadcast equipment had increased. The end came when the bank took over, closed the company and liquidated its assets at auction.

After McMartin Industries went under, there were two attempts to revive the company. Ray McMartin launched McMartin International in Gunnison, Colo., which closed after a year. In 1983, Jerry Martin and John Miller tried to revive the company as McMartin Inc., based in Council Bluffs, Iowa, but that closed in 1985.

Today, sales and service of McMartin equipment continues through Goodrich Enterprises, run by former McMartin Industries Director of Engineering Charlie Goodrich. The company sells rebuilt McMartin AM and FM transmitters and high-power transmitting tubes, as well as servicing McMartin SCA and background music receivers, as well as modulation monitors.

LOOKING INSIDE

Our own McMartin TR-55D was discarded in the mid-1980s by a local public address and sound contractor, who had installed subcarrier equipment in the 1970s.

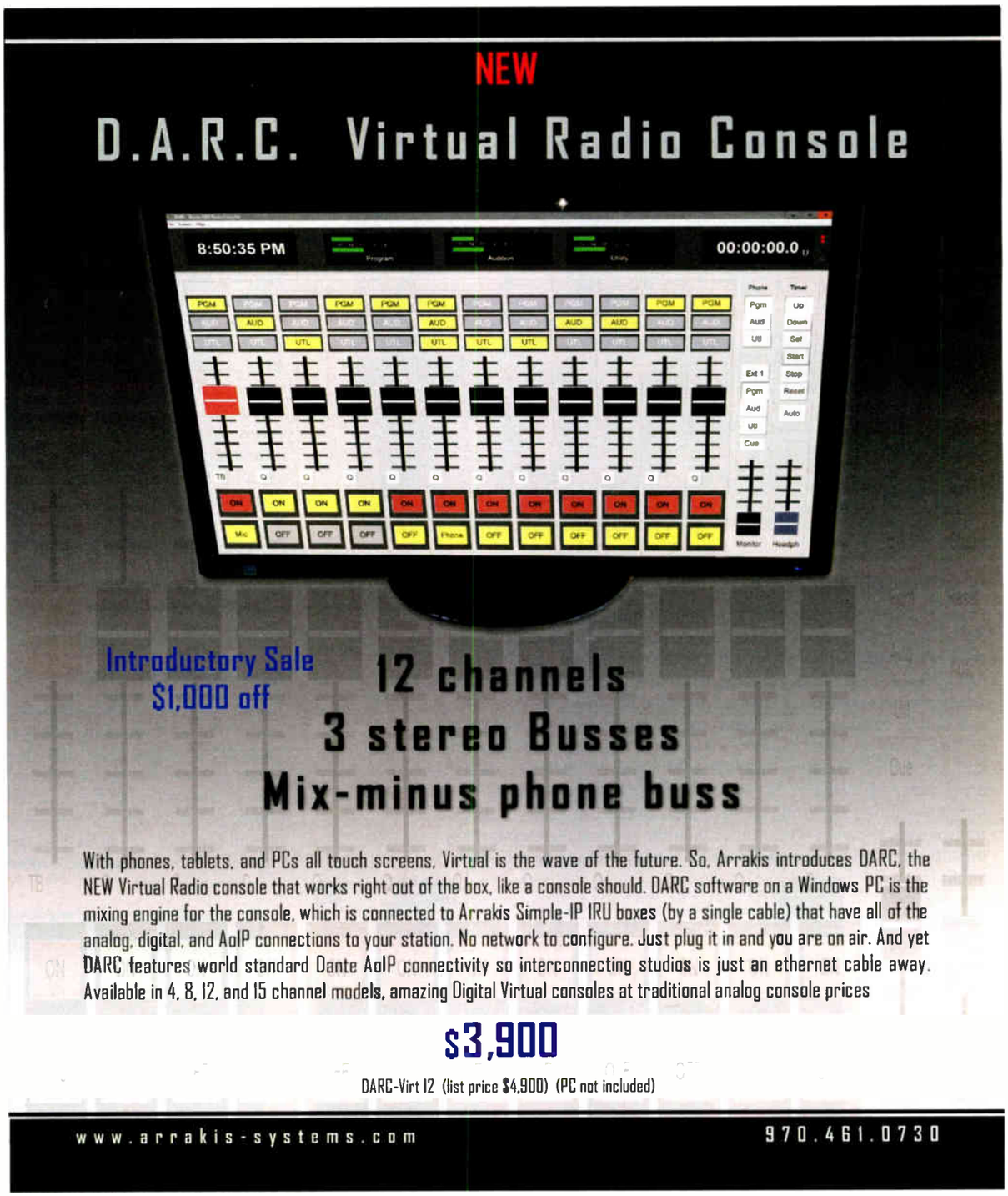
The service tag said "power transformer zonked," and they weren't kidding. When the top cover was removed, the inside was completely black. The large hole in the side of the power transformer, combined with the bits of molten metal embedded in the side of the chassis suggested that the life of this receiver came to a violent end as the result of a lightning strike. Not having a need for a subcarrier receiver, it was tossed in the attic for the next 30 years.

Repairing several FMR-1D receivers for a station in 2012 rekindled my interest in vintage McMartin RF gear from the '70s. It became a challenge to see if this TR-55 could be brought back from the dead after so many years. Lightning damaged equipment is always a gamble to fix because even semiconductors that survive the surge can be weakened and fail at a later date — or not.

I needed a quick strategy to assess the condition of the receiver before investing a lot of time and energy in parts and labor. The schematic indicated that the TR-55 ran off a 13-volt DC supply, so the bench supply was connected in its place. When it was powered up, voltages were checked on the receiver against those indicated on the schematic, and they generally agreed. It was safe to assume this TR-55 was in working condition, and that the lightning strike had destroyed the transformer and nothing more.

Next, all the electrolytics and one zener were replaced, and a crystal for the local NPR station was installed. The moment of truth came when the receiver was tuned according to the manual, an analog voltmeter was connected to the indicated test points as the oscillator, doubler, antenna, RF, mixer and doubler coils were peaked. Success of sorts came, as the main channel of the NPR station was loud and clear. Sadly, the radio reading service was no longer in operation, so only faint white noise was audible from the subcarrier jack.

Pictured with the TR-55D is a McMartin A-72-PA indoor preamp FM antenna. It consisted of a tuned helix element that fed an FET preamp, and could be powered by most McMartin SCA receivers of the day, by batteries, or with an external power supply. Since they were intended for the subcarrier market, few were sighted around radio stations.



World Radio History

Congratulations to winners of the Radio World Best of Show Awards at the 2018 NAB Show. Participating companies nominated new products and paid an entry fee for consideration; the winners were chosen by a panel of radio broadcast engineers. To learn about all the nominated products, visit the Resource Center at *radioworld.com* and scroll to Awards to read the Best of Show Program Guide. Photos by Jim Peck unless otherwise noted.

Inovonics 732 Advanced Dynamic RDS Encoder

To make station branding easier on you and more engaging for your listeners, Inovonics offers the 732, which connects with your playout system to air song title, artist information, station IDs and more. Features include dynamic web interface for control and monitoring; flexible scheduler to program static PS or RT messages; SNMP and UDP-multicast support; security with IP whitelisting for automation data ports; alarms and notifications; and RDS data delay to match profanity or diversity delays. Shown gettin' dynamic are Josh McAtee, Mukesh Chaudhary, Ben Barber, Zack Calden and Gary Luhrman.

Experimental All-Digital Testing on FM Band

Four organizations demonstrated multiple audio services on one FM signal. Nautel, PILOT, Xperi and Beasley Broadcasting demonstrated the ability to transmit multiple IBOC sidebands within KKLZ's signal using Nautel's HD Multiplex technology. The demo provided two IBOC sidebands on *each* side of the station's analog carrier; they played short loops of audio on the "even" dial positions around KKLZ (96.0, 96.2 etc.) and provided capacity for up to 12 HD Radio audio services in addition to the FM carrier. This was a follow-up to testing of *all*-digital broadcasts in which a variety of signals, including a 600 kHz-wide HD Multiplex signal, consisting of three pairs of IBOC sidebands, were transmitted, showing reception of 15 audio services. Participants say the intent is to start a conversation on what an all-digital transition might look like. Shown with RW's Paul McLane, left, are Kevin Rodgers of Nautel, Russ Mundschenk of Xperi and Kelly Williams of PILOT.

MXL Visual Podcasting Station Bundles

Marshall can help you improve your visual offerings via podcasting, YouTube or other channels with the MXL VPS Podcasting Bundle. The package includes a broadcast mic, articulating stand, XLR-to-USB adapter, USB hub and high-quality POV camera with two lenses so you can start broadcasting live HD video from your home computer. The Duo version doubles up on key components and is suitable for creating interview-style, "talking head" videos which, the company adds, are popular on YouTube. Then add broadcast software like HDV Mixer or OBS Studio for more complex editing and effects. Shown in the booth is Jackson Root.

DEVA DB-45 DSP-Based FM Radio Receiver and Modulation Analyzer

Here's a compact FM radio monitor/receiver that incorporates a ton of features and gives precise measuring of RF level, MPX deviation, MPX power, left and right audio levels, RDS and pilot injection levels. It has a DSP-based core and supports TCP/IP and optional GSM connectivity, allowing for monitoring of channel status and listening to real-time audio from your phone. It has a built-in audio streamer that gives you the opportunity to listen to and record the audio from any station. Todor Ivanov (sold separately) is with the rack.

Gracenote Radio Station ID

The company is owned by Nielsen, which acquired it from Tribune last year. Nielsen subsequently announced it would adopt Gracenote IDs as the standard content identifier for its audience measurement solutions. Gracenote says it helps people connect to music, TV shows, movies and sports across entertainment platforms and devices; its Radio Station ID offering — which now integrates with Apple CarPlay — lets car occupants find and tune into their desired content by radio formats, station logos and locations. It uses Automatic Content Recognition to deliver song metadata as well as cover art.

Courtesy Gracenote

World Radio History

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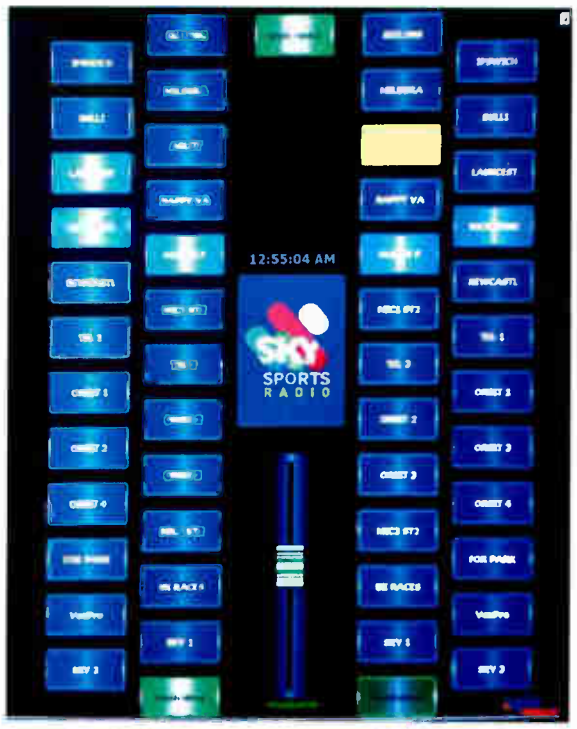
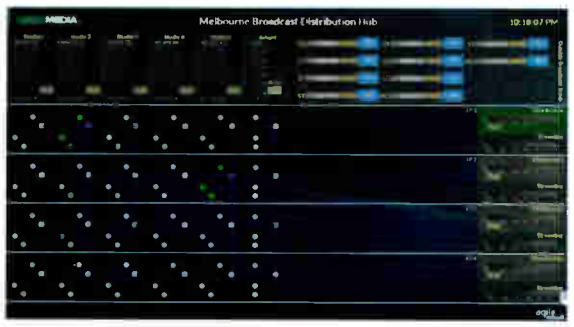
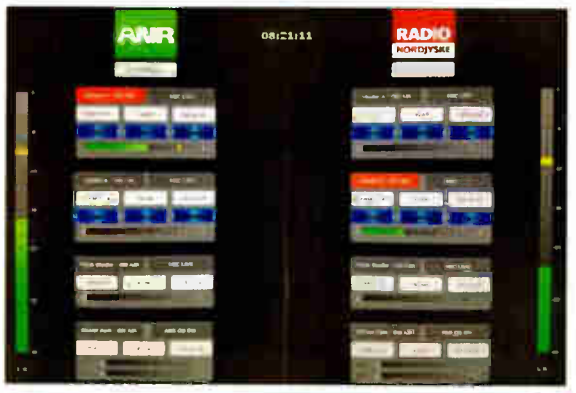
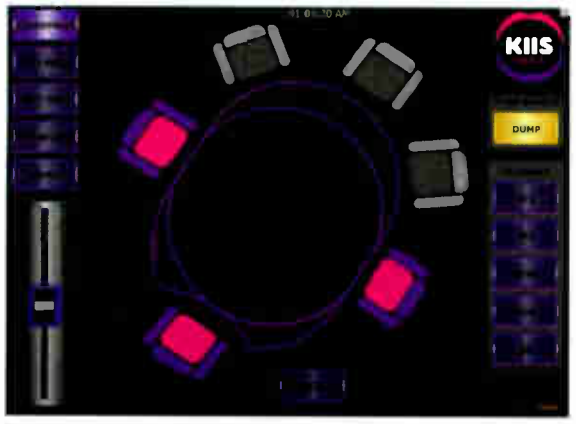
World Radio History

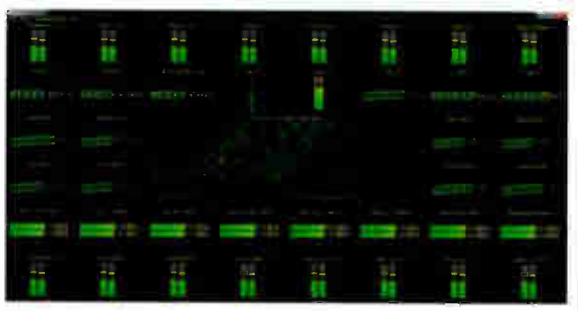
Why Stop At The Console…

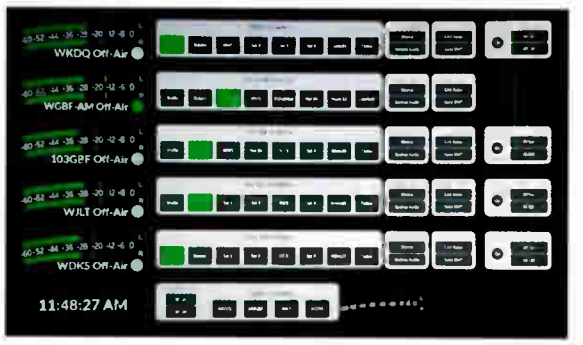


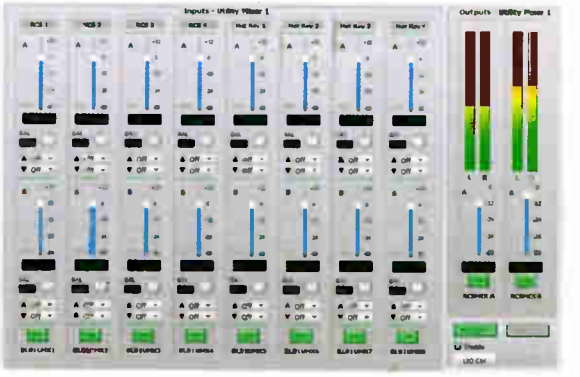












Shown are just a few touchscreens, created by users and deployed in broadcast facilities today, utilizing our ScreenBuilder virtual development platform.

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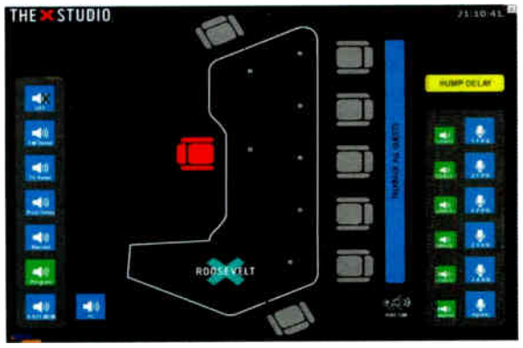
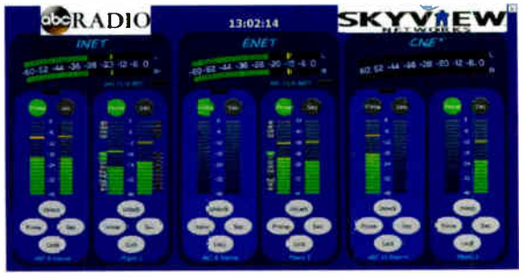
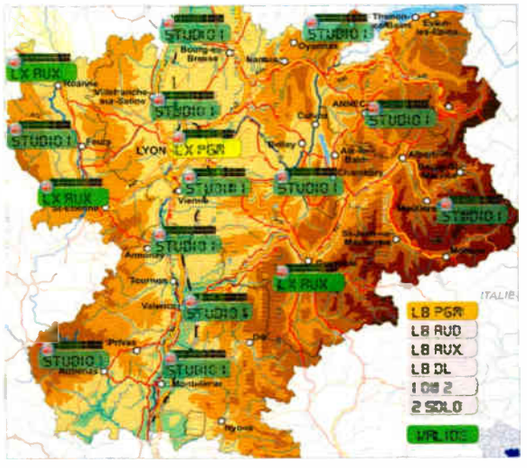
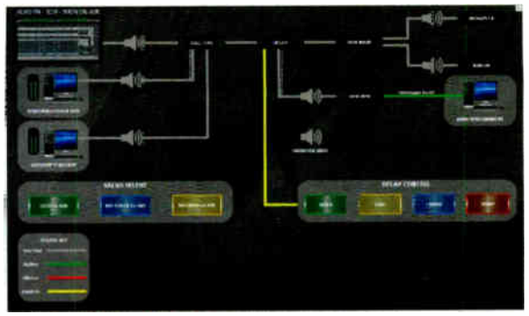
World Radio History

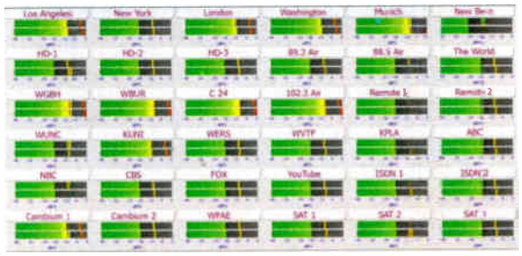
...When You Can Virtualize Your Entire Studio?











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World Radio History

Telos Infinity IP Intercom

Telos Infinity is a new AoIP-based product line that the company celebrates for scalability and ease of integration, and first in the series is the Telos Infinity IP Intercom. Its features include interoperability through Livewire+ AES67; "infinite" scalability for internal and external communications; plug-and-play device integration; an intuitive user interface; and a matrix-free distributed network architecture. Frank Foti, Scott Stiefel, Maciej Szlapka and Derek Pilkington are shown escaping the matrix.

ENCO ClipBoard

ClipBoard is a nifty IP control surface intended to go well beyond familiar "button boxes" by displaying images and visual confirmation of playout on OLED screen buttons. "In the fast-paced environment of a radio studio, operators need to be able to find and play assets at a moment's notice," the company says. ClipBoard gives a visual representation of the audio or video asset right on the button, so you can get fast access to those files without using multiple screens or a mouse or keyboard. Cool features include countdown timer on the buttons, eight pages of 48 OLEDs and the ability to trigger any asset in the automation or playout system. Doin' the Clip are David Turner and Ken Frommert.

Heil PR 77D Professional Dynamic Microphone

Heil Sound got approving glances for its PR 77D, a large-diaphragm dynamic microphone with a vintage look, aimed at broadcast, podcasting and studio or home recording. This mic retails for $249, and is sold in black or purple. You can select frequency characteristics; the Voice position rolls off the low end; the Music position removes the filter. Kissing up to the newcomer are Jerry Lynch and Michelle Miller Levitt.

Aldena Telecomunicazioni SEP

It's a combination spectrum analyzer and three-axis antenna; Aldena Telecomunicazioni calls it the smallest selective EMF measuring equipment in the world, used for measuring in the 100 kHz to 3.6 GHz range. The spectrum analyzer, antenna and integrated RF switch are inside the small spherical device. Because it weighs only 13 ounces, it can be operated on a drone via optional wireless connection. In the booth with this little marvel are Roberto Di Bari and Carlo Perotta.

AEQ Systel IP Enhanced Talkshow System

The company introduced new devices and applications for its third-generation broadcast telephone and multi-conference system that operates on VoIP phone lines. Newcomers include SYSTELSET+ control terminal, which is particularly useful in confined spaces, small or self-control rooms or in programs without a large staff; the Systel IP16 VoIP phone system engine with Dante connectivity; and the Systel IP TV multi-conference system for TV. From left: Luis-Miguel Sánchez Migallón, Gustavo Robles Paredes, César Reyna, Miguel Sánchez Carreres Rogelio de la Fuente, José-Antonio Mártinez Atienza, Iván Olmeda Casadomé and Peter Howarth.

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World Radio History

Wheatstone Audioarts Lightning On-Air Console

Sometimes simple is best. This is a standalone board for studios that use mostly microphone and analog source inputs and where a lot of routing isn't required. The company says it compares in price to the past Audioarts R-55e but with more features, including access to editing software, Skype or other external sources through USB and Bluetooth connectivity. It comes in 12- or 16-channel tabletop configurations and has a modular design with four-channel input panels, and a Master/Monitor panel with linear faders for headphone and control room level control. Jay Tyler enjoys the win.

Broadcast Bionics Bionic Studio

"For the first time," says Broadcast Bionics, "studio tools are actively listening, watching, learning and reacting to the studio content in real time." The manufacturer puts several products together to create a system that can "contextualize" your broadcast, unmix its program elements, aggregate listener reaction and offer simplified broadcast and social media workflows. Features include multi-object recording, smart video switching, near-time speech-to-text transcription, textual audio/video editing and publishing of programs, highlights and podcasts to social. Duncan Smith is shown getting bionic.

Worldcast Systems Audemat RDS Encoder

In addition to features expected of RDS encoders, this box is ready for MPX over AES, including RDS encoding directly in the digital chain. "This means that the same encoder installed today can be used tomorrow with MPX over AES, eliminating replacement time and cost for the studio or network," the company states. The encoder also is prepared for RDS2 via a software upgrade when the time comes.

Audemat celebrates the intuitive web interface and SNMP management as well as TCP/IP and plug-in capability to any local Ethernet network. From left: Nicolas Boulay, Christophe Poulain, Tony Peterle, Chantal Fourgeaud and Gregory Mercier.

Blackloud Soundot AF1 & CF1 Headsets

You know that U.S. radio broadcasters have pushed smartphone makers to turn on the FM tuning ability of their phones. But Blackoud says, "Why not put a tuner in the headsets?" These babies have their own Silicon Labs FM radio chip; versions are available for iPhones and Android and retail for $69 to $79. Features include customizable graphic EQ, 3D stereo effect and a microphone. A control box has volume up/down and a multifunction button that works with a companion app to control the tuner and other settings. Celebrating at the show are Chih-Hsu Yen and Wei-Yung Ma.

Digigram IP Audio Codec IQOYA *X/LINK

Designed for delivery of several programs over IP networks, the codec provides four RJ-45 network ports allowing for integration in full IP infrastructures. Multi-encoding and multi-protocol streaming capability allows you to stream a radio program simultaneously to transmitter sites, web radio CDNs, Icecast/Shoutcast or other studios. The four ports allow for full separation of IP traffic for control and monitoring, redundant dual streaming through two network paths and synchronous AoIP (Livewire, AES67, Ravenna). On point in the booth are Stephane Bert and Marc Wilson.

World Radio History

Unleash the Power of Pets

Whether through events or photo contests, dogs and cats add opportunities

One of the most predictable radio talents I ever worked with was a dog.

The backstory: Our morning guy, Paul Harris, got a call from a listener who said he had dog that could predict the weather. At first, Paul didn't believe him, but of course thought it would make a funny one-time bit. Little did he know that Cindy the Weather Dog would become part of his show for the next six years.

Cindy's owners would open the door for her in the morning before they left for work. If she wouldn't go outside, this indicated that it was going to rain. When Cindy did decide to venture outside, it would mean that it would not rain that day. Paul found that, over time, Cindy had 90 percent accuracy.

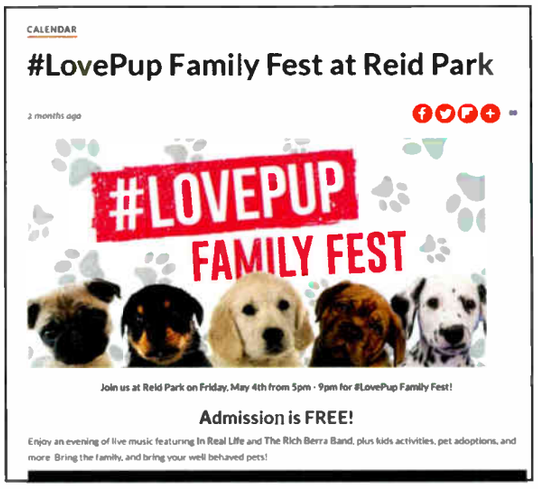
When the station challenged all the local TV weather people, nobody would compete against her. Who wants to lose to a dog?

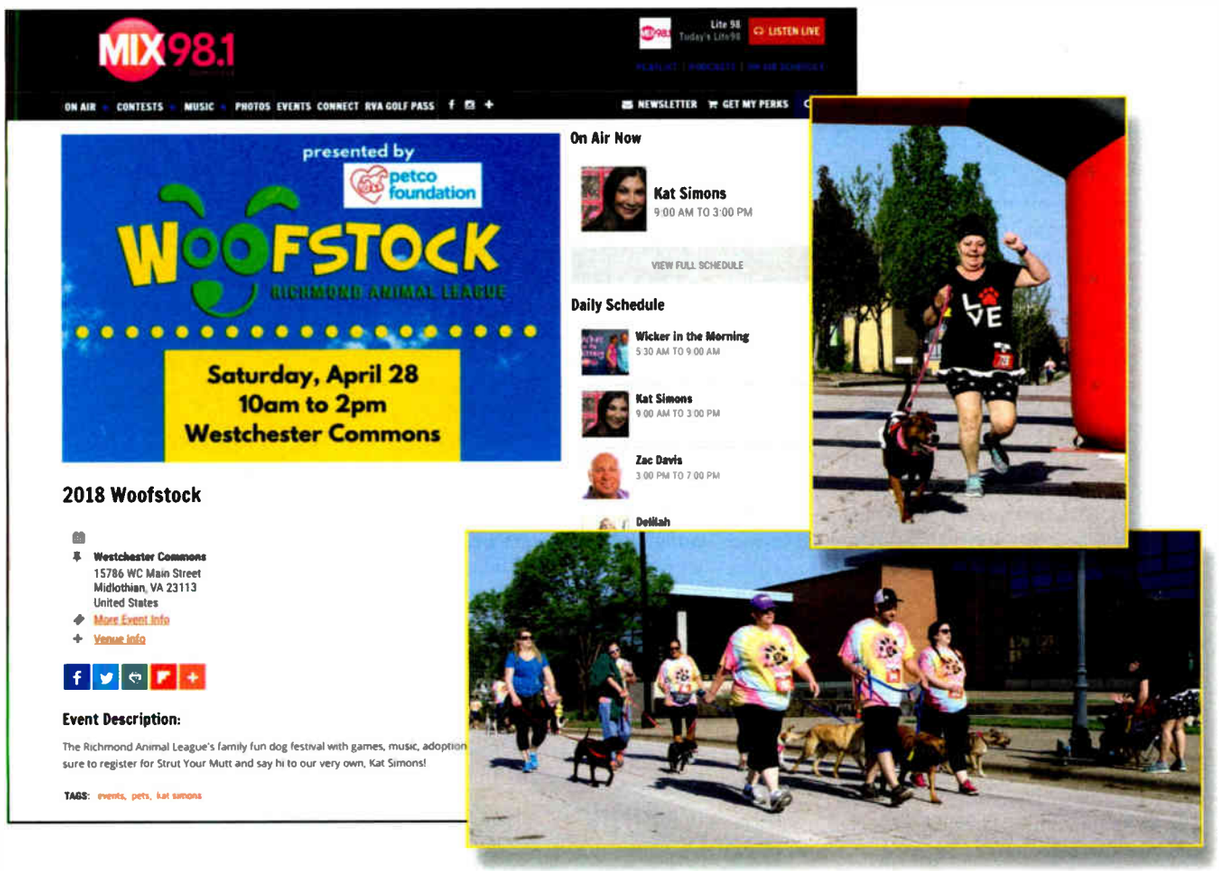
Let us now unleash the power of pets to help your station make one more powerful connection with listeners.

#LOVEPUP

Pet adoption is a serious concern in the United States, and it's one of those rare issues that crosses political and even economic lines.

Here's a terrific activation you can model: Since 2015, the nationally-syndicated "Johnjay & Rich Show" has found more than 500 permanent homes for dogs with their #LovePup annual campaign.





When you're dealing with dogs it is easier to get local and national celebrities involved, which of course adds flair to the entire affair. This effort has had support from Selena Gomez, Zedd and Enrique Iglesias.

Fun fact: The team's more general #LoveUp project started accidentally when auto-correct changed Johnjay's friend's text from "love it" to "love up." The wonderful charity reminds people to pay it forward and spread the love. And #LovePup was a natural extension of it to help our canine friends, with the bonus of an easy-to-remember hashtag.

When conducting gatherings with a significant number of canines, make sure to involve a non-profit that has experience handling dogs in mass numbers. You don't want dog fights — or human fights over dog fights!

And remember to include cleanup in the business plan.

Here's a large event where dogs bring their humans to a 5K Mutt Walk & Run. If a dog can't run, it can walk or simply be carried. The exercise is followed by tons of fun and music at — can you guess? — Woofstock!

The Scripts stations in the Ozarks — KTTS, KSGF, KSPW, KRVI — team up annually with the Humane Society of southwest Missouri to hold these big, happy events, bringing awareness about homeless pets and raising money for the charity.

Each summer in Cleveland, WQAL (FM), WNCX(FM), WKRK(FM) and WDOK(FM) focus on man's best friend with their annual Dog Paddle & Pet-A-Palooza. The event features adoption, an animal safety seminar and vendor booths.

PET PICS

For those of you who like the idea of bringing dogs and other animals into your sphere but don't have a large enough staff to execute such a plan, there is another way to participate. Pet pictures!

Solicit for pics on-air and through social media, and you'll be flooded with pet pixels each time you do it.

Add fun by conducting a Cutest or Homely-But-Adorable photo contest on your station website. The winners get something from your pet store sponsor, like a year's worth of pet food or a grooming session. As you receive the photos, generate wider participation by sending an auto-response to entrants encouraging each to have family and friends vote for their pet.

Before anyone barks at me about not mentioning cats, I am well aware that some people are dog people, while others are cat people. In the last two minutes, I'm betting another 3,000 cat videos have been posted to YouTube. Whether you go with cats or dogs, one thing is for sure: You don't typically have to be concerned with talent fees.

PROMO POWER

Mark Lapidus

World Radio History

Nick Michaels Taught "It's Not About Us"

But this column is about remembering him and his accomplishments

21ST CENTURY PD by Dave Beasing

When voiceover giant Nick Michaels died from a heart attack last month at the age of 67, radio lost one of its biggest fans and most ardent critics. But as anyone who really knew Nick will tell you, that's exactly how Nick expressed his love — both directly and by investing the time to challenge your thinking.

Nick's family laughs that even a subject as mundane as "How to Make Turkey Meatballs" could be deemed worthy of an argument.

On even meatier subjects, Nick's rants were famous. He dared to tell clients they were wrong, then his talented writing and voice work would prove himself right.

"In the beginning, we argued about how hard he was on everybody who disagreed with him," says veteran researcher and management consultant John Parikhal. They met at a hip party in Toronto in 1972, probably because Nick approved of Parikhal having changed the disc on the turntable to a Van Morrison LP.

"I'd say, 'You can catch more flies with honey,' and he'd say, 'No, first I have to shatter their belief systems because they're only going to really listen if I turn up the volume and turn up the ideas. Then, the ones who are still listening are the ones I want to work with."

Nick Michaels, right, with Hubbard Chicago Production Director Matt Bisbee

Radio programmers who hired Nick to be the voice of their stations sometimes got more than they bargained for. Nick would refuse to read bad copy, and the promotional scripts that most radio stations air were — in Nick's opinion — just plain bad.

"Listen at 5, depend on us, enter to win — Nick thought phrases like those were completely ineffective," says consultant David G. Hall, who hired Nick for Los Angeles stations KFI and KNX. "He referred to them as doggy commands."

Instead, Nick believed in letting audiences draw their own conclusions. After southern California survived some scary wildfires, rather than chest pounding about around-the-clock breaking news coverage, "Nick dramatized the emotions of being told to evacuate your home, of quickly deciding which of life's greatest treasures to pack, and he pointed out that our staff had done the same thing," says Hall. "But then we came to work to get out the information that the community needed because, he said 'We live here, too.'"

AN ALTERNATIVE TONE AND VOICE

Many listeners first experienced Nick's understated tone in Chicago. Programmer Greg Solk had helped make WLUP "The Loop" iconic with a loud, bombastic style of rock radio that was emulated nationwide.

So when Solk needed to counter with a different approach to launch WDRV in 2001, Solk asked Nick to be the voice — and conscience — of "The Drive." Nick knew how to cut through the clutter, explaining, "In the over-communicated world, a whisper becomes a scream."

Nick quickly demonstrated that the upstart rock station "understands" the artists by telling stories that matched the emotions of their music. "Do you know what made 'Start Me Up' by the Stones such a great song?" Nick asked "The Drive" Production Director Matt Bisbee. "The *feeling* it gave you."

During the Iraq War in 2003, Nick's promo conveyed the complicated emotions of the time using the Crosby, Stills & Nash song "Find the Cost of Freedom" as a backdrop. Nick explained that understanding the war — as KFI listeners did — was important because "History repeats itself." The audio was so poignant and moving that none other than Barbra Streisand requested a copy.

In 1985, Nick called Parikhal, whispering, "You must promise you'll never tell a soul about this," and he never has until now. Having signed an ironclad non-disclosure agreement, Nick knew he could trust his best friend with the news that Coke was about to change its classic flavor.

From John Parikhal's scrapbook, a picture with his friend of 46 years, Nick Michaels.

When Nick was asked to voice the announcement, he reportedly ranted, "Coca-Cola is the only thing that unites my grandmother, my mother and me. We all drink Coke. You're about to change something that bonds generations, the fabric of America. This... will... not... work!" He eventually, reluctantly, read the copy. He then ad-libbed some lines that were supposedly from God himself, because — Nick insisted — only a heavenly intervention would be reason enough to change the formula of Coke.

For now, the work that probably made Nick proudest, his storytelling rock program "The Deep End With Nick Michaels" is still airing in syndication, produced by Terry Gangstad. Whether and how to continue is under discussion.

"I'm not sure that there's anybody left, Dave," says Parikhal. "Nick Michaels was such a bright burning candle in the darkness that — to Nick — radio had become. That may be the way that we can remember him."

Maybe we can keep that flame alive. On every opportunity, rather than talk about ourselves, we can make true connections with others by turning the conversation toward them, their lives, and their true feelings.

As the former program director of "100.3 the Sound" in Los Angeles, Dave Beasing gives Nick Michaels much of the credit for giving the legendary station its musical credibility. Dave can be reached at his new venture, SoundThatBrands.com.

NICKISM [NIK-IZ-UHM]

Noun — 1. Sentence or phrase that Nick Michaels uttered often.

Here are some sample Nickisms, compiled by Matt Bisbee of Hubbard Radio Chicago:

- "It's not about us; it's about them."
- "Tell a story. If you make it real, the listener will follow."
- "Write loudly and speak softly."
- "What the audience discovers is more important than what they're told."

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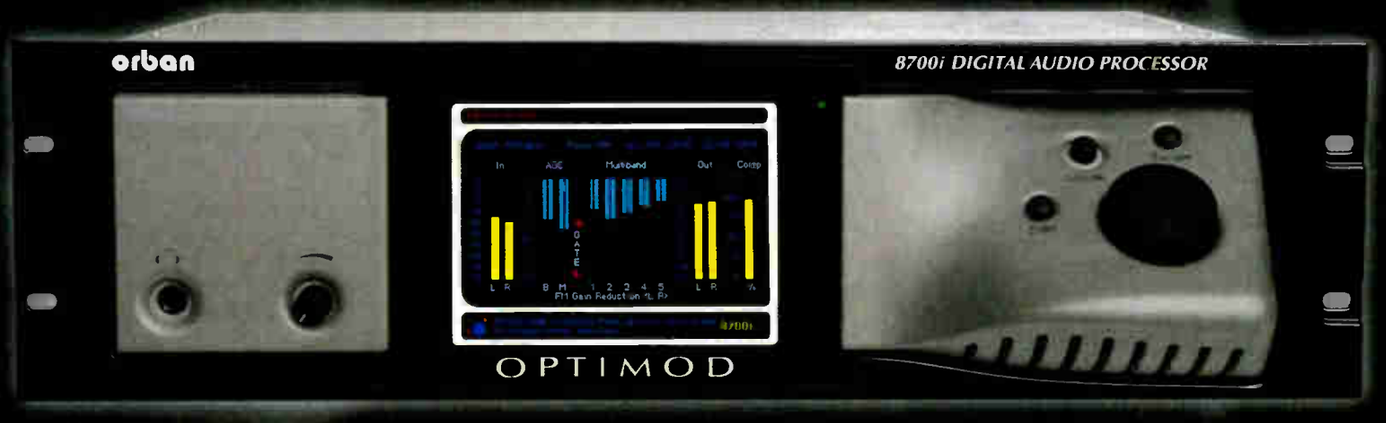

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World Radio History

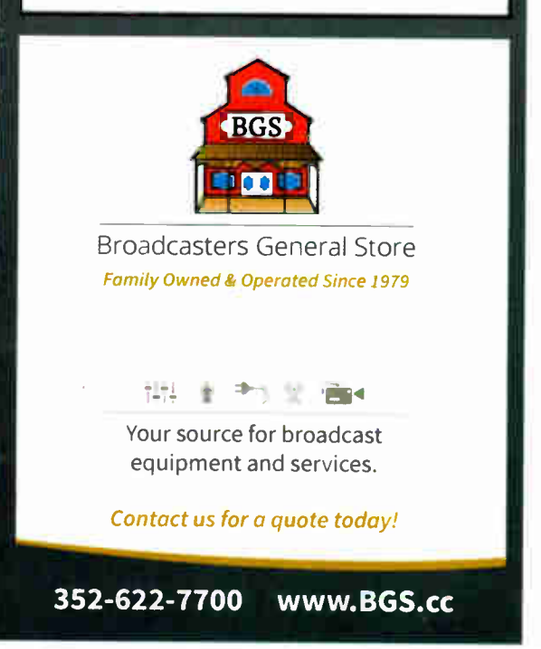
WHO'SBUYINGWHAT

A look at recently announced sales of products and services. Email news to radioworld@futurenet.com.

San Francisco's **Sutro Tower** recently added a DCR-S Series FM radio antenna (shown left) from **Dielectric**. According to Sutro Tower Inc. Chief Operating Officer Eric Dausman, the antenna features broadband and multi-channel capabilities and covers spectrum from 88 to 98 MHz, which enables broadcasters to multiplex signals. In total, Sutro Tower hosts about 300 antennas. According to the announcement from Dielectric, the the tower is used by four FM stations, 12 TV stations and 35 wireless radio communication users and others to distribute their signals across the Bay Area.

Across the country, **WGBH** Television and Radio has opted to use **Xytech's** MediaPulse Sky for facility and asset management, a web-based user interface. The broadcaster had previously utilized the company but announced the switch in April.

Send photos of your new acquisitions and you may see them featured here.



World Radio History

BLACKLOUD

SOUNDOT AF1 & CF1 Headsets With FM Chip

Free Access to FM Radio Without Internet or Smartphone FM Chips

Blackloud, working with design partners Tempo Semiconductor Inc. (TSI) and Silicon Labs (SLABS) who provided turnkey audio design solutions, launched its SOUNDOT AF1 (for iPhones and iPads using the Lightning interface) and CF1 (for devices with USB-C/USB Micro interfaces) headsets. With dedicated iOS and Android apps and their own FM reception chip, the headsets not only provide premium lossless sound quality for everyday listening, but also free access to FM radio anywhere in the world, even if the smartphone lacks an embedded FM chip or has one that isn't activated, or if the user is without Internet (Wi-Fi or 4G/LTE) connectivity.

Listening to FM radio using an embedded FM chip, instead of over the Internet, saves valuable mobile data and battery life. Further, in times of crisis when cell towers fail and/or networks are overloaded, FM radio can be a lifeline source of emergency information.

With the SOUNDOT headsets, consumers no longer have to worry if their mobile phone even has an embedded FM chip, or whether it's been activated. They can now enjoy free FM radio on all Android and Apple Lightning devices.

Blackloud SOUNDOT AF1 and CF1 headsets — The new headsets feature patented psychoacoustic technology, a six-band customizable graphic equalizer, 3D stereo effect, dual dynamic driver design, inline microphone and a control box containing volume up (+), volume down (–) and a multifunction (pause/play) button. This multifunction button enables many actions depending on the app that is running, including: answer/hang-up a phone/video call, start/stop recording or playback using most any audio/video/camera app, enable/disable/ seek up/seek down the FM tuner, and lastly, activate Siri or Google Assistant.

The accompanying apps let users control the digital FM tuner (seek previous/next, tune to exact station, save any station to one of six presets) and adjust DSP settings (six-band graphic equalizer, psychoacoustic bass and treble enhancements, 3D sound effects) to user preferences.

To cut its time to market, Blackloud worked with Tempo Semiconductor and Silicon Labs who provided turnkey audio design solutions. This let Blackloud focus on the aesthetics, patented mechanical design, acoustics, fine tuning the dual dynamic driver design and developing user-friendly iOS and Android apps for the SOUNDOT product family.

Tempo leveraged its headset reference designs (for Apple® MFi™ Lightning and USB-C) to incorporate the FM reception chip (Silicon Labs Si4705 FM/RDS digital radio tuner) into the SOUNDOT control box. Tempo also supplied complete schematics and layout reference files, customized microcontroller code for the Tempo TSCT8x Audio Hub Controller, a high-efficiency TSCS25xx premium 32-bit audio codec with integrated DSP, and reference iOS and Android app source code. Silicon Labs also supplied its brand new CP2615 USB Audio Bridge for the CF1.

Pricing and Availability

On April 7, the SOUNDOT AF1 and CF1 became available for pre-purchase from Blackoud: www.blackloud.com. Both units ($79.89 list) are expected to ship late June. Initial units will be red, with white and silver options expected later this summer.

www.blackloud.com

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DAVICOM, A DIVISION OF COMLAB INC.

Cortex360 Remote Site Management System

The Next Generation of Remote Site Management System

To continue growing and adding the many features requested by our extensive user-base, Davicom has redefined a hardware platform that will enable product evolution well into the future. We are, therefore, very excited to present the first member of Davicom's new Cortex product family — the Cortex360.

Built to satisfy demanding customer requirements and evolving industry standards, the Cortex 360 is based on the latest Dual ARM hardware processors running an embedded Linux kernel. The all-in-one design includes GPIO, SNMP, ModBus, Ethernet, Serial, Dial-up, DTMF and Voice Response capabilities.

BENEFITS

- Instantly see site status thanks to the built-in OLED system display. Easily view detailed system status and alarm conditions.
- Stay in control of your site for longer periods on battery backup power when power fails, or operate from solar-powered installations. Provisions are in place for further decreases in power draw in the future.
- Take full advantage of the power and flexibility of SNMP site management. Use the Cortex360's SNMP-Manager war machine with up to 1,024 GET, SET and TRAP commands to manage external devices.
- Save on having a computer at the site with the built-in HDMI output and keyboard/mouse inputs. Get full on-site management without an external computer.
- Manage your site over very low bandwidth communications channels down to 2,400 baud (if regular dial-up or IP channels are not available). Regular high-speed Ethernet, dial-up modem and DTMF/voice-response connectivity are also included at no extra cost.
- Count on stress-free firmware upgrades thanks to the Cortex360's dual firmware memory spaces that ensure fail-over and roll-back operation. Upgrades become virtually unbreakable, even if you pull the plug during an upgrade.
- Measure practically any type of analog sensor through the unit's fully differential metering inputs. Input ranges between ±0.5V and ±80V with a common mode of up to ±80V ensure full flexibility.
- Automatically detect channel silence with the built-in RMS signal detectors.
- Monitor the status of various pieces of site equipment by virtue of the Cortex360's status inputs with fully independent ground returns.
- Future-proof your network installation thanks to the Cortex360's IPV6 compatibility.
- Save on site gadgets through the Cortex360's built-in, four-port Ethernet switch and four-port USB hub.

- Easily navigate through Davicom's new simplified and streamlined HTML 5-based GUI. If you are already an experienced Davicom user, build on your familiarity and use the Advanced mode or DavLink to take full advantage of the unit's power.
- Operate with confidence in freezing cold or burning hot environments. The Cortex360's industrial temperature range (–40 to +70°C, –40 to +158°F) will keep it going in extreme conditions, should your site's HVAC fail or if your site simply does not have a controlled environment.
- No worries knowing the units are FCC, IC, CE and RoHS compliant.

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The new 732 Advanced Dynamic RDS Encoder takes RDS to a new level adding greater functionality and incorporating the latest RDS technology. The 732 provides all the tools broadcasters need to ensure an engaging and dynamic RDS presence. The 732 connects to virtually any playout system – broadcasting song title, artist information, station IDs and much more to listener's radios. Additional features include enhanced RT+ Tagging with variable replacement capability.

The 732 is controlled in real time via a dynamic web interface or through a large front-panel OLED display with easy-to-navigate menus. Email/SMS notifications are sent for pilot loss and when DPS/RT is not updating correctly. SNMP is fully supported and Firmware is updatable remotely via web server.

Installation of the 732 is simplified with a printed step-by-step Quick Start Guide and User Manual.

Features:

- Dynamic Web interface for control and monitoring.
- Flexible scheduler to program static PS or RT messages.
- SNMP and UDP-multicast support.
- Security with IP whitelisting for automation data ports.
- Alarms and notifications.
- RDS Data Relay to match profanity or diversity delay.

www.inovonicsbroadcast.com/product/732

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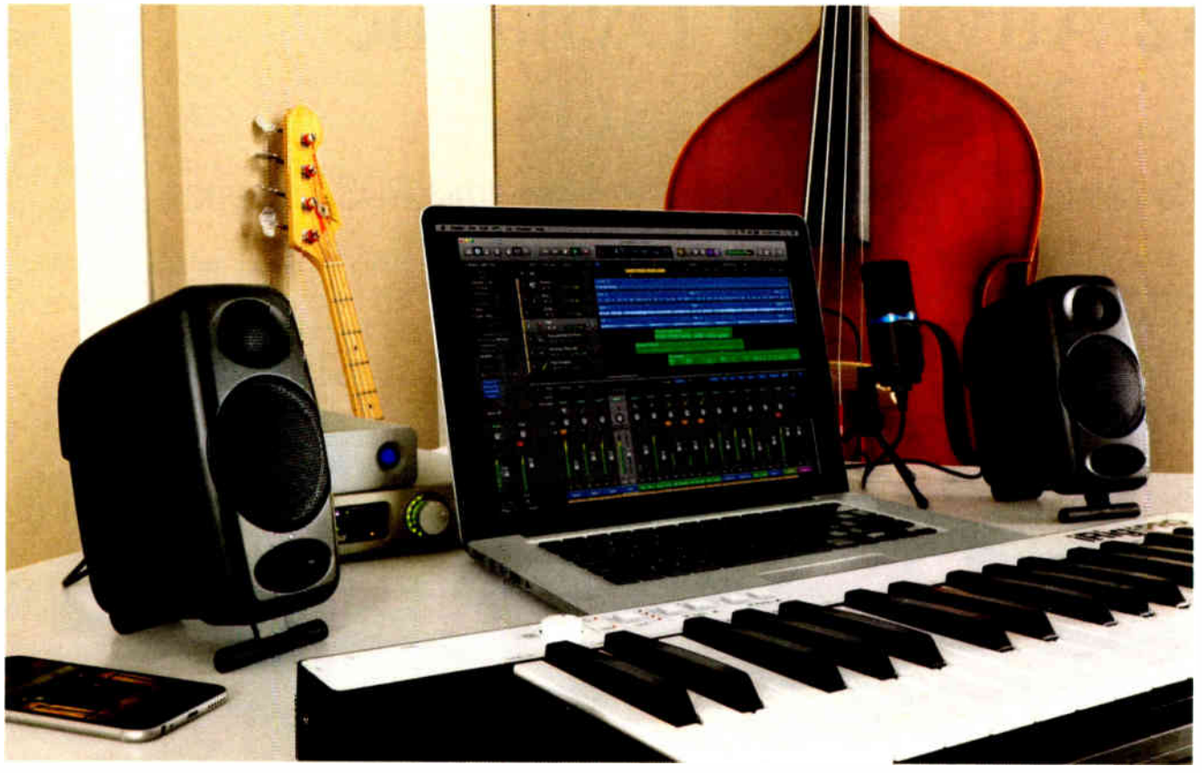


Don't be fooled by the diminutive size of the IK Multimedia's iLoud Micro Monitor

PRODUCT EVALUATION

BY CHRIS WYGAL

Mixing and mastering for radio is fairly straightforward. It requires, from a technical perspective, three important ingredients. The first involves using quality source material — good microphones, processing, acoustic considerations and production elements. The second ingredient is a producer who knows how to use a DAW and its amalgam of tools. The final ingredient sheds light on mix referencing. All the world-class production tools on Earth stand a good chance of being misused if the reference serving the listener's ear is substandard.

All too often, good mixing environs and reference monitoring are hard to come by. These days, studio equipment is replaced by virtual mixing surfaces and plugins, and it begs this question: Why is much space is needed for a producer to mix audio? Additionally, that same producer may decide to stay home and commute via remote desktop. Chances are, he or she is mix referencing in his or her living room.

As studio equipment shrinks and producers become more mobile, relegating mix referencing to headphones, or worse yet "ear buds" is an unwise scenario. But who has room for professional studio speakers? For portable and compact studio-quality referencing, IK Multimedia designed the iLoud Micro Monitor. Don't be fooled by the small footprint. It packs a full-range punch.

NUTS AND BOLTS

The iLoud Micro Monitor is a two-speaker set that boasts three input format options. A 3.5 mm/1/8-inch TRS jack and stereo RCA jacks are handy for plugging into laptops, peripheral sound cards or small mixers. The second input option is Bluetooth. This is useful in the following scenario: A client wants to hear an audio file attached in an email. Or the GM wants to hear how the station's stream is sounding. More and more, we find ourselves using our mobile devices and the iLoud Bluetooth feature comes in extremely handy.

From a physical perspective, each speaker is 7 inches tall, 3.5 inches wide and 5.5 inches deep. The pair weighs in at 3.8 pounds and are connected together by a 6-foot cable. The "left" speaker serves as the master with DC

PRODUCT CAPSULE

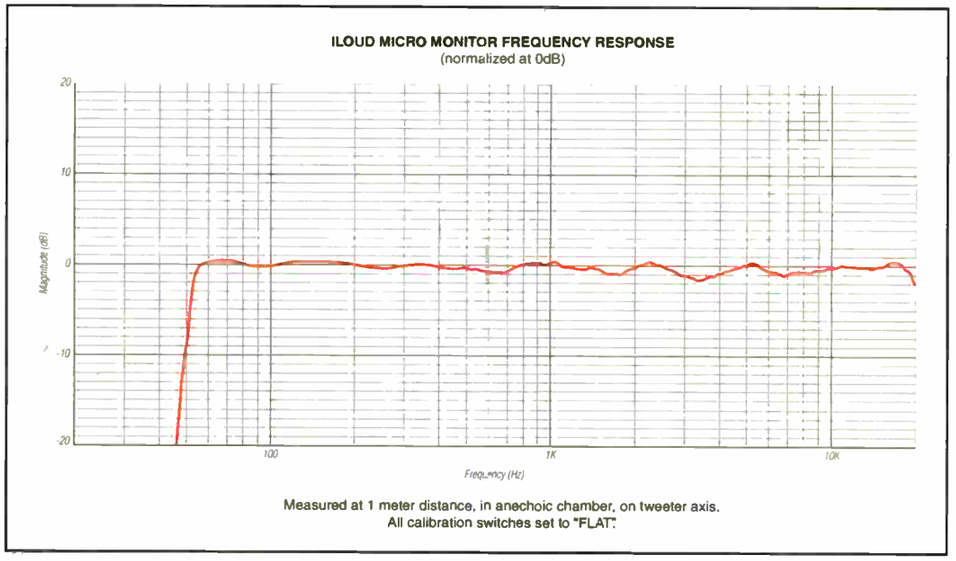
IK MULTIMEDIA
iLoud Micro Monitor

Thumbs Up
+ Very portable
+ Nice EQ package for small monitors
+ Excellent sound
+ Bluetooth option

Thumbs Down
– Size limits reproductive range

RETAIL: $299.99

CONTACT: IK Multimedia at 1-954-846-9101 or visit *www.ikmultimedia.com.*



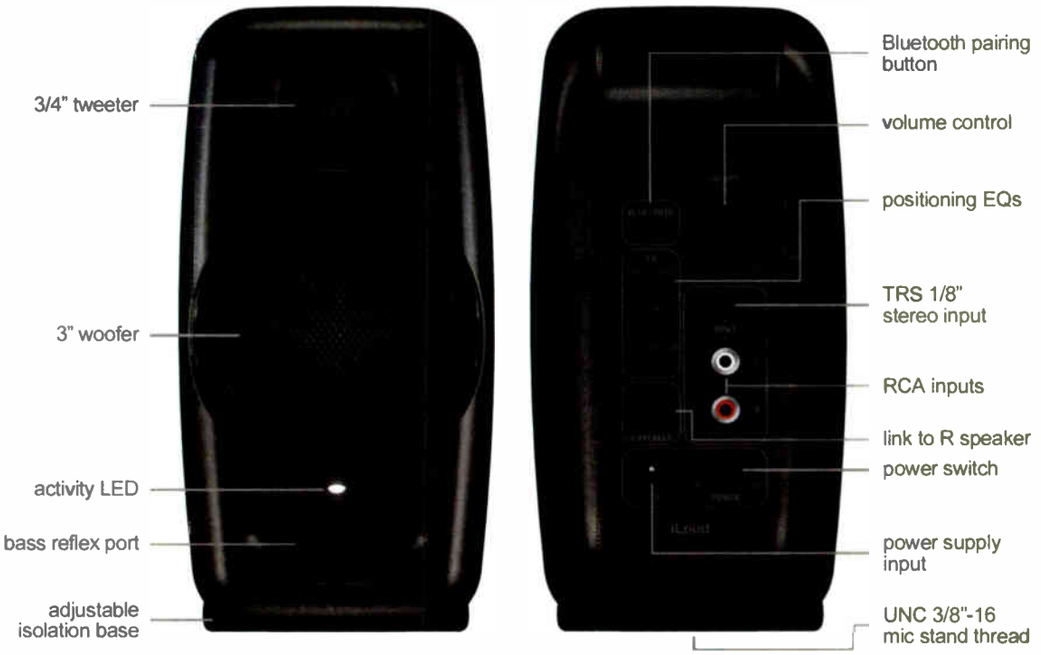
Measured at 1 meter distance, in anechoic chamber, on tweeter axis.
All calibration switches set to "FLAT."

World Radio History

power and audio input jacks and some rudimentary audio adjustments including volume control.

A "flat" or "desk" setting provides acoustical compensation for environments that present reflective properties resulting from hard desk surfaces. Adjustable high- and low-pass filters aid in tweaking unwanted frequency response due to the proximity effects related to room design. Fold-out isolation bases provide angling options for more accurate response, depending on speaker desk placement. The bottoms of both speakers are equipped with 3/8-inch mic stand threads for free-field use.

According to iK Multimedia technicians, the iLoud Micro Monitors contain a "secret sauce" that serves as the key to the full-range frequency response. While iLoud boasts a bass response down to 55 Hz, low frequencies near 47 Hz are audible. This is accomplished with 3-inch woofers and a bass reflex design that make iLoud's bass response surprisingly accurate. Onboard Class D amplifiers have a combined output of 50 W. The 3/4-inch silk dome tweeters and composite material woofers are governed by 56-bit DSP, assuring accurate and transparent crossover response.



IN THE REAL WORLD

In field testing for this review, the iLoud setup was compared to high-end studio reference speakers with 8-inch woofers. The similarities were quite striking. Due to the diminutive iLoud footprint, the 30–50 Hz "bottom end" harmonics were hard to come by. To be fair, iLoud is most at home in compact, mobile and generally unfriendly mixing environments. In that sense, clean and highly accurate 50 Hz response is welcomed and iLoud can deliver.

Plus, it brings a flat, uncolored studio response, which is critical for top-quality mixing and production. The design is rugged and the speakers can take some abuse. All in all, the user doesn't "hear" the iLoud Micro Monitors. Rather, the user hears an accurate reproduction of the working material. Having that quality, a compact reference monitor in compromised mixing conditions is worth its weight in gold.

World Radio History

DPA d:vice Records On-the-Go for N.Y. Public Radio

FROM THE FIELD

BY WAYNE SHULMISTER

The author is technical director of N.Y. Public Radio.

The Danish are giants in the world of design: Think of "Danish" Modern; George Jensen's fluid silver household accessories and jewelry; Louis Poulsen's space age hanging lamps; Hans J. Wenger's swan-like chairs; and the iconic spinosaurus-like Sydney Opera House by Jørn Oberg Utzon. So it's no surprise that DPA Microphones, originally Danish Pro Audio, would engineer a pragmatically distinctive A/D converter for iPhone, iPad or laptops — the puck-like d:vice MMA-A digital audio interface.

This two-channel interface, with high-quality preamps and MicroDot input jacks, can accommodate a variety of DPA field and studio microphones, including lavs and shotguns. It is about the size of your palm and can fit in your pocket. The d:vice is well designed and easy to set up. With 114 dB of dynamic range, low-noise floor, and up to 96 kHz sampling rate, you can achieve high-caliber recordings in a compact package. The DPA d:vice also has efficient use of power. I found that it lasted almost seven hours, using two condenser mics on a fully charged iPhone.

It favors Mac and iOS devices through a Lightning cable but will work with Windows devices via a USB cable.

The d:vice has a free dedicated app that is simple to use. It has three modes: mono, dual mono — great for interviews — and stereo, along with individual gain controls and high pass filter. The app also allows you to store gain settings and low-cut filters. The app does, however, require a third-party recording app, such as FiLMic Pro, Hindenberg Field Recorder or GarageBand.

When I started my career, I worked in state of the art recording studios and pristine performance halls, all with the finest microphones. In my role as technical director at N.Y. Public Radio I am responsible for outfitting more than 30 reporters and producers with recording equipment. Because I have budget restraints I have had to sacrifice fidelity. It was fulfilling to return to pure, clean recordings with the d:vice.

Here in New York, our reporters don't have the luxury of throwing gear in the trunk of their car to drive to an assignment. They work mainly on foot or use public transportation, so it's important that their gear be lightweight and nimble. Also, in any city environment, there is inherently a lot of ambience and acquiring solid audio recordings can sometimes be challenging — having portable lightweight gear that works is always a benefit.

For instance, reporter Yasmine Khan met three other women from Brownsville in Brooklyn for their morning exercise walk. Khan, who was expecting her second child, did not want to carry her standard ENG kit. I sent her with a d:vice along with DPA's d:screet 4061 miniature omnidirectional microphone and d:dicate 4017B shotgun microphone. She was impressed with the quality and especially the weight. Khan said, "It was so easy to connect, I put the lav on me and used the d:dicate for the three women. The recordings sounded great and the women felt so comfortable because they were all moving like they do every day. The small form-factor of the d:vice made it a breeze to capture the story on the go with minimal gear to carry with me."

In conclusion, the d:vice is a great solution for urban reporters who need to carry their gear with them to capture a story. Its audio quality and battery life make it a great choice for this type of setting and any project that needs to be truly on the go. I will make a couple of small requests of the Danes. Create a pouch for d:vice so that it can ride with iPhone like a "joey;" and add recording to the d:vice application, so I don't have to use a third-party app.

Price: $659

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Wanted: real plate reverb. abgrun@gmail.com.

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

WANT TO BUY

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MISCELLANEOUS

WANT TO SELL

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; collection of very old 78s dating back to 1904; 12' satellite dish on concrete base; prices d rastically 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 KTIM, AM,FM radio shows from 1971-1988. The stations were located in San Rafael, Ca. Ron, 925-284-5428.

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

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

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Looking for KSFX radio shows, Disco 104 FM, 1975-1978. R Tamm, 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 KTIM FM radio shows from 1981-1984 if possible unscoped. R Tamm, 925-284-5428 or ronwtamm@yahoo.com.

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A: *Call Michele at 212-378-0400 x 523 or email: michele.inderrieden@futurenet.com*

World Radio History

READER'SFORUM

NOT REALLY DIGITAL FM

Responding to "NAB to Detail All-Digital FM Field Test Data," radioworld.com:

Am I the only person who blinks when the term "digital FM" appears in print?

Just read a fine article about recent "all-digital FM" testing in Las Vegas. It would seem that the term "FM" should now be taken as "VHF audio broadcasting" instead of "frequency modulation." The abbreviation "FM" now stands for a band of frequencies, same as "C" or "X" or "Ku."

Someday, high-powered medium-frequency broadcasting will be appreciated once more for its giant footprint.

When AM broadcasters convert to digital modulation, let's please not make the same mistake and call it "digital AM." A new and catchy acronym like "DMF" could stand a better chance in the marketplace than applying the word "digital" to something perceived as ancient.

Dale Lamm
Director of Engineering
WHBC(AM/FM)
Alpha Media
Canton, Ohio

ENOUGH WITH "STILL"

Julie Koehn

On occasion and more often than not, media outlets covering radio will publish a headline that reads something like this: "93% of Americans Still Listen to Broadcast Radio Every Week."

Although a minor point to some, the inclusion of the word "still" in stories gives consumers, the advertising industry and some in broadcasting the impression that the term must be present in order to justify the reach of traditional radio broadcast, and that while our listening hasn't eroded yet, it is inevitable for our industry.

Why must we insert a word that can carry an inherently negative connotation? Is it without the term that broadcast licenses themselves are irrelevant?

I have a biased opinion on the matter, of course; but a headline that reads "93% of Americans Listen to Broadcast Radio Every Week" does not lose any meaning or impact when the word "still" is absent.

If the word "still" were removed from the vocabulary of every media and trade publication and broadcasters' own comments when describing the massive power of radio, the industry could be better focused on the real messages: the message of how we deliver $6–$12 return on investment for each dollar spent by advertisers … the message of how we donate and raise millions of dollars in community service across the country each year … the message of how we keep communities safe in natural disasters … the message of how radio broadcast is a community economic change agent, employing tens of thousands of people nationwide (over 8,000 in Michigan alone).

And … we reach 93 percent of Americans every week. Yup, we're "still" here.

Julie Koehn
President
Lenawee Broadcasting Co.
Adrian, Mich.

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C-BAND INTERFERENCE

All of us have been inundated with notices from various satellite program carriers about the latest fiasco with the FCC over use of C-band satellite frequencies as an ancillary terrestrial frequency band for cellphone and automotive data conveyance. Hence, the concern over interference with all of our C-band satellite program delivery from these outside sources.

What I don't get is why do thousands of broadcasters and home C-band satellite TV hobbyists have to foot the bill for "registering" their earth stations for protection with the FCC? This to me is akin to paying a more powerful mob for protection from other mobs in old Chicago back in the 1920s.

Seems to me our tax payer dollars — along with licensing fees for every RF conveyance under the sun in radio and TV — should already be paying for this kind of protection from the big boy on the block.

Why is it that the FCC is totally unaware of the entire C-band's use for the broadcasting industry? Seems like there had to be a CFR agreement somewhere about international usage of this band for broadcaster use around the globe.

You can't tell me the FCC was unaware of the tremendous use placed on this band for delivery of hundreds of radio talk shows, hundreds of TV shows, both network and syndicated, not to mention this is the band that local TV stations depend on to do local uplinks back to the studio when they are on live remote in their community or across the country. TV and radio networks that use this band abound, and it's crowded with all kinds of programming, both in vertical and horizontal polarizations on dozens of transponders.

So why wouldn't the FCC automatically protect this band from terrestrial interference as a matter of natural course? After all, it is their job, for God's sake!

Why charge us individually to protect us from outside interference, when protecting the bands from interference is supposed to be the mission of the FCC? Did I miss something?

Marvin Walther
Chief Engineer, Carroll Broadcasting
PD, WIOS(AM)
Tawas City, Mich.

World Radio History

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