

REPACK IMPACT

HOW IS IT AFFECTING WIRELESS MICS? JAMES E. O'NEAL, NOV.13, 2019

WASHINGTON—Ever since the use of wireless microphone technology exploded several decades ago, virtually all TV broadcasters large and small—"cut the cable," deploying wireless mics both in the field and in the studio. Ditto with live music, Broadway and Hollywood adopting wireless mics for sound reinforcement and motion picture production.

production. Paradoxically, as the popularity and use of these devices has risen, the amount of permissible spectrum for their deployment continues to shrink, beginning with the TV channel repack 10 years ago, which made the 800 MHz spectrum "off-limits," and continuing today with the cap being lowered to 608 MHz.



Wisycom's state of the art dual-channel wireless mic receiver, the MRK980, is designed to help operators maximize operating spectrum.

The FCC issued a "heads-up" notice addressing this as the most recent TV spectrum auctions were ending, advising that wireless mics could still be used in 600 MHz spectrum as long as there was no interference to TV broadcasters or wireless broadband operations. The commission also established a firm "line in the sand" deadline of July 13, 2020, for a complete cessation of wireless mic operations in the 600 MHz spectrum deeded over to the telecoms.

WILL THERE BE ANY 'WHITE SPACES' LEFT?

With the deadline less than a year away, like broadcasters, wireless mic users face the loss of more than 80 MHz in the region between 608 and 692 MHz where mics had been allowed to operate (minus, of course, spectrum occupied by TV stations that were operating in that range). This lost chunk of spectrum is in addition to the 100 MHz or so that was reallocated for wireless broadband use when TV channels 52 to 69 "went away" in the aftermath of the 2009 transition to DTV. The FCC is still allowing unlicensed

wireless mic operation on any unoccupied UHF (or VHF) TV channel, but the gotcha is that with the current consolidation of stations into an even smaller neighborhood, there are fewer and fewer unoccupied channels anymore, especially in metropolitan areas—where the great majority of wireless mic users are found.

Admittedly, a wireless mic requires a lot less operational spectrum than a TV station, but users are feeling the pinch nonetheless.

"The reallocation of the UHF Band for mobile and other services is the single largest regulatory challenge that has faced the wireless microphone industry globally," said Mark Brunner, vice president of corporate and government relations at Shure. "Reduction of TV band spectrum has occurred while demand by productions for wireless microphones and related pro audio equipment has steadily increased. The TV spectrum has been the primary home for wireless microphones since the beginning, and this spectrum is ideally suited to the RF performance characteristics desired by technical crews."

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Karl Winkler, vice president of sales and marketing at Lectrosonics, echoed Brunner's observations.



The Lectrosonics' D Squared fourth generation is also representative of new high-tech wireless systems designed to help users cope with limited spectral resources.

"The popularity and utility of wireless microphones has not waned at all despite the loss of a significant portion of the spectrum," he said. "The convenience, freedom of set design and movement, and the ability to rapidly respond to evolving news situations have all contributed to this popularity. Thus, the loss of spectrum has forced the industry to respond with newer technologies and features, along with the need to offer assistance to customers who have been displaced."

Winkler noted that this assistance has been in the form of rebates, trade-ins, special pricing and other incentives being offered by wireless mic manufacturers, and observed that while broadcasters were being compensated for the changes forced by the reduction in spectrum, this was not the case with mic users.

"The government has not offered any compensation for wireless users the way they have for broadcasters to repack or go off the air," he said.



This Sennheiser SK6000 bodypack transmitter is typical of the very large number of wireless devices vying for space in an ever-shrinking RF spectrum landscape.

Joe Ciaudelli, director of spectrum affairs within Sennheiser's Research and Innovation division, also weighed in on the issue.

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Emergency Alert System

EL PASO, TX SBE CHAPTER 38 **MEETING MINUTE**

DATE 11/15/2019 LOCATION: RIO CHINA BUFFET

MEETING CALLED TO ORDER: 12:40 PM, BY ANTONIO CASTRO. THERE WERE 18 (EIGHTEEN) ATTENDANTS.

REPORT OF THE SECRETARY: MINUTES IN THE NOVEMBER NEWS-LETTER. ACCEPTED BY DAVID GRICE, SECONDED BY BRUNO CRUZ.

REPORT OF THE TREASURER: \$ 2,925.53 IN THE BANK, ACCEPTED BY DAVID GRICE, SECONDED BY JULIAN AKLE.

REPORT OF THE CERTIFICATION COMMITTEE: NO REPORT

REPORT OF THE MEMBERSHIP COMMITTEE: INVITED JOEL QUINTANA, PhD, FROM U.T.E.P., MARCO AVILA FROM KVIA AND JULIAN LANDEROS/ARTURO DE SANTIAGO FROM EL PASO LIVE.

REPORT OF THE FREQUENCY COORDINATOR COMMITTEE: NO REPORT

REPORT OF THE SCHOLARSHIP COMMITTEE: NO REPORT.

REPORT OF THE WEBSITE COMMITTEE: 2805 LAST MONTH. NOW 2846= 41 HITS.

REPORT OF THE EAS CHAIRMAN: MONTHLY TEST OF TX & NM WERE FINE.

REPORT OF THE PROGRAM COMMITTEE.: BOB ORBAN TO PRESENT A TELECONFERENCE ON DEC.10. HARMONICS TO PRESENT IN JANUARY 14, 2020. INVITED TEE THOMAS FROM ANYWHERE COM-MUNICATIONS TO HAVE A PRESENTATION FOR FEBRUARY 2020

UNFINISHED BUSINESS: NONE.

NEW BUSINESS OR ANY ITEMS FOR THE CHAPTER INTEREST: APPROVED TO BRING THE ENNES WORKSHOP FOR 2020

OTHER: NONE.

NEXT MEETING DATE AND LOCATION: DECEMBER 10, 2019 AT THE KFOX STUDIOS AT NOON

MEETING ADJOURNED: AT 13:23 PM.

HOLIDAY GREETINGS !!! "WE WISH YOU A MERRY CHRISTMAS AND A HAPPY NEW YEAR." Jose Feliciano.





95.5FM

BRAD DUBOW GENERAL MANAGER

FOR NOVEMBER, WE HAD OUR REGULAR MEETING AT THE RIO CHINA BUFFET ALONG WITH A PRESENTATION. THE SPONSOR WAS **BRUCE LI**, FROM LIANTRONICS. IT WAS A NICE PRESENTATION AND FOR THAT WE ARE VERY GREATFUL.

NOW, FOR THE MONTH OF DECEM-BER, WE ARE GOING TO HAVE OUR REGULAR MEETING AND ANOTHER PRESENTATION, THIS TIME WILL BE AT THE KFOX/KDBC STUDIOS.

THE PRESENTER AND SPONSOR IS AGAIN **BOB ORBAN** BRINGING A TELECONFERENCE INTRODUCING A NEW PRODUCT. FOOD AND DRINKS WILL BE PROVIDED BY "CARINO'S ITALIAN" CATTERING. LET'S GET TOGETHER, IT IS VERY IMPORTANT TO ATTEND !!.

WHEN: TUESDAY DECEMBER 10, 2019.

PLACE: KFOX/KDBC STUDIOS.

TIME: 12:00 PM



"The repurposing of spectrum from traditional over-the-air broadcast to mobile broadband is an issue of distribution of content," said Ciaudelli. "It slices the distribution 'pie' into smaller slices. Conversely, the content creation 'pie,' which requires wireless microphones and similar devices, continues to experience exponential growth. Furthermore, productions continue to advance in technical sophistication."

This has put engineers in a very difficult position, according to Ciaudelli.

"Many producers and directors don't know the details of the spectrum crunch and regulatory changes," he said. "They understandably are focused on nontechnical aspects of the production. They just expect the engineers to make it work, without realizing the magnitude of the challenge the engineers face."

JUST HOW BAD IS THE PROBLEM?

While an exact headcount of wireless microphones, IFB systems and beltpack intercoms in the United States isn't available, James Stoffo, the chief technology officer at wireless intercom manufacturer Radio Active Designs, offered what he believes to be a good working estimate of the number of such systems that are now competing for spectrum. "My partner Geoff Shearing and I went to the FCC on multiple occasions on behalf of the broadcast and production communities, and tried to enlighten them as to how many wireless microphones and intercoms were out in the United States," said Stoffo. "When we first went, the FCC thought there were less than 1,000 wireless in the entire country. Actually, at that time there were closer to 2.5 million devices, and that caused a couple of jaws to drop."

Stoffo, who has been in the wireless business since the 1980s, and has served as RF coordinator for numerous large events for years, noted that even three decades ago the number of wireless systems in use was close to 2 million and has been growing steadily.

"At the NBC studios in New York, in one building there are probably 500 devices," he said. "In Broadway theaters—in just a three-block radius—there are probably 1,500 wireless devices. And in Disney World alone there are almost 2,000 devices."

Obviously, the diminishing spectrum for these devices is a huge issue and one that is not going to go away. So, with the loss of the 600 MHz TV channels, can there still be a "business as usual" attitude among users?

THE SHOW MAY STILL GO ON, BUT NOT WITHOUT CAREFUL PLANNING

Jim Dugan, president of wireless microphone company Wisycom USA and Jetwave Wireless, a firm that specializes in wireless technology deployment, has been involved in many large-scale wireless system deployments during his three decades in the business. These include ABC's "Dick Clark's New Year's Rocking Eve" Times Square broadcast, along with many other big-ticket sporting and music events, Presidential inaugurals and more. He was asked about the prospects of being able to "go wireless" at future events, given the contracting spectrum situation.

"It's all about coordination," said Dugan, pointing out that he acts, on a volunteer basis in conjunction with the local Society of Broadcast Engineers, as frequency coordinator for special events in Washington, D.C., and also works to coordinate wireless device use for many of the really big events just mentioned.

Dugan cites the most recent NHL All-Star game as a good example of the challenges of frequency coordination. "There were 500 frequencies in coordination—really a lot of stuff going on," he said. "We're in the process of revisiting this whole usage and coordination model right now. I'm also involved in coordinating the New Year's Eve Time Square broadcast origination. This is really big—ABC does a show, NBC does a show, Fox does a show, CNN does a show. Then there are the international broadcasters who will be there, plus all the musical acts that play at 45th Street—this will be a separate remote for ABC.

"During the past several years we've been looking at six TV networks with probably 500 wireless mics," Dugan added. "There have also been maybe 10 wireless cameras in use too, along with the thousands of people with their cell phones generating RF noise. This is a really good test of the technology."

Dugan starts notifying the networks in October, but adds that once the coordination plan was established it has pretty much stayed the same over the years.

"This year may be different," Dugan said. "Due to the repack, we are going to be re-evaluating what's doable and what's not within the remaining spectrum."

EDUCATION IS KEY

Loss of spectrum because of the repack is not the biggest problem facing the wireless mic arena, however, according to Dugan.

"I think it's spectral efficiency and spectrum management [band planning]," he said. "This problem shows up differently for different verticals. If you're an ENG operator you want to have 20 or 30 MHz between transmit and receive frequencies for talent. In broadcasting bigger installations, band planning is very important. A lot of people turn these things on and don't realize that they interact.

"I tend to look at everything in terms of inbound and outbound frequencies," he added. "People seem to understand this the least. There's really a big gap in the understanding of 'best practices' by a lot of operators t there. It can't be a situation anymore where 'planning' is accomplished by just issuing a purchase order for wireless mic equipment." While it appears that post-repack wireless mic usage can continue—along with over-the-air TV broadcasting—there will be fewer and fewer parking slots. This just might be a good time to check out your old tried-and-true corded microphones and cable sets to make sure they're serviceable, just in case the wireless broadband folks start eyeing some of those remaining parking places.

So, What Exactly Is Left Spectrum-Wise?

With the UHF spectrum above Ch. 36 (602-608 MHz) fast becoming "verboten," just where can wireless mics, wireless IFB systems and beltpack intercoms operate?

According to the FCC, this depends. Rules allow such unlicensed devices to freely navigate both the VHF and (remaining) UHF spectrum, provided there is no licensed entity operating there. With the repack forcing some very close channel adjacencies, and even movement from UHF down to low VHF slots (there will even be 11 stations operating on Ch. 2 when the dust settles, according to <u>www.rabbitears.info</u>), broadcast spectrum that might be used for wireless mics and similar devices seems to be in short supply, especially in larger markets.



Available wireless microphone spectrum....WISYCOM USA

The FCC, in a recently-issued bulletin ("Operation of Wireless Microphones") rather optimistically states: "Many frequencies in the TV bands that had been available for wireless microphone use prior to the auction will continue to be available after the transition period."

Notwithstanding the reality of the highly-compacted post-repack spectrum, there is a glimmer of hope that operation of these devices will still be permitted above 608 MHz within "certain frequencies" in both the wireless broadband's 614–616 MHz "guard band" (just above TV Ch. 37) and in its "duplex gap" (657–663 MHz for unlicensed mics) and (653–657 MHz) for licensed devices. However, the commission's memorandum does not specify what the "certain frequencies" may be. (Definitely off-limits are the 617–652 MHz and 663–698 MHz regions.)

The Commission also requires that anyone selling or leasing wireless mic gear capable of operation in these latter two spectrum blocks must inform customers that they "must cease operating on these frequencies no later than July 13, 2020." It goes on to say that this "sunsetting" may even take place sooner if interference to licensed services (those of wireless broadband providers) occurs.

The FCC memorandum also recognizes some "bands outside the TV bands for wireless microphone use." Specifically, these are the 169–172 MHz region, some 900 MHz spectrum, as well as 1,435–1,525 MHz in the UHF band, and 6,875–7,125 MHz in the SHF (super high frequency) microwave region. A license is required to "fire up" a wireless device operating on any of the frequencies in these ranges, however, this may not be the easiest thing to get unless you belong to a certain group. This is spelled out clearly in FCC rules dealing with low-power auxiliary stations (LPAS) licensing and operation, with only large entities such as TV and motion picture production companies, cable TV operators, performance venues or professional sound reinforcement companies that "routinely use 50 or more" such low power devices eligible for a license.

If you don't fall into this group of "super users," the commission also sanctions wireless mic operation in some other spectrum blocks, but these are shared, and are not always the best neighborhoods. They include 902–928 MHz (also referred to as the 33-centimeter band), and 1,920–1,930 MHz, along with some additional territory in the microwave region (portions of the 2.4 gHz and 5 gHz spectrum bands.)

If you opt for 33-centimeter spectrum, you'll be sharing it with industrial, scientific and medical (ISM) RF equipment users, as well as radio amateurs. The 1,920–1,930 MHz block is shared with licensed "Fixed and Mobile" users, as well as some cordless telephones. Also, the commission forbids the plunking down of conventional FM wireless mics (or other communication devices) in this region. As it's shared, any unlicensed device must perform continuous monitoring and only produce RF where no other signal is detected, which requires a specialized class of wireless mics. You're also going to have some company in the 2.4 gHz and 5 gHz regions too, with such things as ISM devices, cordless phones, Wi-Fi and Bluetooth transmitters, and even garage door openers and microwave ovens vying for spectrum.

(Note: The spectrum usage information is only a summary of applicable FCC rules and regulations, and is not intended to replace careful reading and observance of the complete rule set. For detailed information on wireless mic operation, refer to the FCC's 15-100 "Report And Order," which was released Aug. 11, 2015.)

For more information on the repack, visit TV Technology's repack silo.

TAGS WIRELESS MICROPHONESWIRELESS MICSREPACKSPECTRUM

By James E. O'Neal