

# Sennheiser

## FCC Rules for NEW TV BAND DEVICES

*(Posted on November, 18th 2008)*

### What This Means for Wireless Microphone Users

The FCC has finally released its rules allowing a new class of unlicensed consumer electronic products to operate in locally unused TV channels. These have previously been referred to as white space devices (WSD) but are now called TV Band Devices (TVBDs). They will mainly be used as broadband access devices.

TVBD are categorized as:

1. **Fixed** - These are allowed to operate with effective radiating power up to 4W on channels 2-51, with the exceptions of channels 3, 4, and 37.
2. **Personal/Portable** - They are restricted to channels 21-51, and are also not allowed in channel 37 (reserved channel for radio astronomy and medical telemetry). They are limited to 100mW operating power or 40 mW if operating in a channel adjacent to an active station. This moderate power will reduce their range and therefore the possibility to cause interference.

Licensed operation of wireless mics takes precedence over TVBD. TVBD must coordinate around active licensed wireless microphone systems. The rules include several safeguards to avoid interference to wireless microphones:

1. **Spectrum Sensing** - TVBDs must include the ability to listen to the airwaves to sense wireless microphones (in addition to TV stations). Until they can demonstrate through "proof of performance" that they can reliably sense wireless mics and avoid causing interference they must also use a:
2. **Geolocation/Database system** - TVBDs must use location sensing in conjunction with a database of registered broadcast license assignments. The database will also include a list of protected areas for wireless microphones such as entertainment venues and sporting events. TVBDs must first access the database to obtain a list of permitted channels in the area before operating. A TVBD that lacks this capability can operate only under the direct control of a TVBD that has it.
3. **Reserved channels** - Personal/Portable devices will be barred from channels from 14 – 20 (470 – 512 MHz). In addition, in 13 major markets where certain channels between 14 and 20 are used for land mobile (municipal and public safety) operations, two channels between 21 and 51 will be reserved and available for wireless microphones. These will be the first open (non-TV) channels above and below channel 37.

This means, at minimum, 16 wireless systems (8 in each TV channel) can be used simultaneously in any venue. When using our equipment with high linearity (extreme suppression of harmonic distortion known as intermodulation) such as our 3000 and 5000 series equipment, the number increases to at least 20 systems (10 in each TV channel). Protected areas will be able to operate many more channels.

Multi stage and studio properties can also effectively increase the number of systems in use through:

1. **Physical distance and transmitter output power management** - This can be augmented by a balance of other techniques such as shifted coordinated frequency sets, zone isolation (natural or enhanced shielding between rooms), directional antennas, and filtered distribution systems.

2. **Time multiplexing** - Using systems in different rooms at different times

The anticipation of these changes has caused a great deal of anxiety for many customers. However, when you choose Sennheiser you not only get great hardware, you get service and support. To help manage customers through this transition and assure they can purchase with confidence, we will be introducing several new service and support programs. In the meantime, we invite you to register here for a free initial consultation. A Sennheiser representative will contact you, assess your current list of equipment and make recommendations to ensure reliable operation of all your wireless audio equipment.

**Response to FCC WSD Ruling**

*(Posted on November 5, 2008)*

Although the FCC has adopted rules to allow white space devices (WSD) to operate in locally unused TV channels, the specifics of these rules have not yet been made public. We will not know the full impact on wireless microphone users until they are released. Once they are published, we will carefully review the details of the ruling and communicate what they mean for our customers.

We were surprised that the Commission acted so quickly despite the erratic performance of white space device prototypes tested by the FCC's own engineers. However, it is encouraging that the FCC press release and each of the Commissioner's statements cite safeguards to protect wireless mics from interference. Clearly, the voice of our industry has had some impact. We hope that the rules are drafted to ensure adequate protection. Nevertheless, this ruling will pose new challenges for the pro audio industry, requiring high quality gear operated with best practices.

We will continue to stand shoulder-to-shoulder with our customers, industry groups and even our competitors to continually remind the FCC and our legislators of the necessity to maintain content production quality. U.S. news and entertainment is the best in the world and one of our highest valued exports. Wireless audio devices are essential to the high standard of TV, radio, film, and live entertainment that the global population has come to expect.

**FCC voting scheduled for November 4th 2008**

*(Posted on October 21, 2008)*

There have been two recent communications from the FCC that have caused heightened anxiety. The FCC has scheduled a discussion and may vote on these issues on November 4th 2008.

1. **Notice of Proposed Rule Making on banning wireless mics from the 700 MHz band** -

This NPRM can be read in its entirety here and here.

Sennheiser had predicted this action. We advised our customers back in early 2007 that the FCC was likely to impose restrictions on operating wireless microphones between 698 MHz and 806 MHz. We therefore eliminated systems operating in this range from our regular assortment and made them available only based on a special order.

Sennheiser submitted a detailed response to this proposal on Oct 3rd and again on Monday, Oct. 20th. We are lobbying hard for a measured migration out of the 700 MHz band that includes a grace period that would allow existing users to continue operating in this band on a non-interference basis.

2. **The White Space Technical Report** - The FCC executive summary can be found here

This report relates to spectrum sensing capabilities of proposed white space devices (WSD). Other than the FCC stating that "...we believe... the 'proof of concept' has been met," there is nothing new in this report:

1. WSD devices would still be required to detect and avoid wireless mics
2. Fixed WSD are being considered ahead of the more problematic portable units
3. More development is required on WSDs to meet the performance standards that have been set

Furthermore, there is also a proposal being considered that would dedicate at least two TV channels in every market for wireless microphone use. Major events, such as sports, would have additional channels reserved.

Wireless mics will continue to be used throughout our nation. We will distribute the results of this vote, scheduled for November 4th 2008 as well as a detailed analysis of what this means to wireless microphone users.