National Association of NAB BROADCASTERS
TV TechCheck
THE WEEKLY NEWSLETTER FOR TV BROADCAST ENGINEERS

October 23, 2006

FCC RELEASES DETAILS IN THE UNLICENSED DEVICES PROCEEDING

On October 18, 2006, the FCC released the full text of its *First Report and Order and Further Notice of Proposed Rule Making* in the Unlicensed Devices proceeding. In the *Notice of Proposed Rulemaking (NPRM)* in this Docket, the FCC proposed to allow unlicensed devices to operate on unused TV channels, provided these devices don't cause interference to TV and DTV reception. The Commission posited that cognitive radio techniques could be developed that would enable "Spectrum Sensing" to be used to avoid transmitting on occupied TV channels. The FCC said they expect that this will foster the development of new and innovative types of unlicensed broadband services (e.g. wireless Internet) for businesses and consumers, particularly in rural and underserved areas. The NPRM proposes 2 types of devices, fixed (such as a wireless ISP base station) and personal/portable (e.g. PDAs, notebook computers, etc).

In the *Report and Order* section, the FCC concluded that they would allow fixed devices to operate in the TV bands on frequencies that are not being used by authorized services subject to the development of final technical rules that will prevent harmful interference to the authorized services. The FCC will not permit operation of these devices on channel 37 (used by radio astronomy and wireless medical telemetry services), and on channels 52-69, as that spectrum has been reallocated for other services and will no longer be part of the TV bands after the digital television (DTV) transition. In addition, personal/portable operation is not permitted on TV channels 14-20 because of the potential to interfere with public safety land mobile services operating on those channels.

The FCC did not authorize the personal/portable devices noting that generally they pose a greater risk of harmful interference to authorized operations than fixed devices because such devices may have antennas that are less efficient and may be in a less advantageous position for sensing incumbent transmissions. Also, it may be difficult for TV and other users to locate a non-fixed device that causes interference because it frequently changes location, whereas a fixed device that causes interference can be located more easily. The Commission addresses personal portable devices in the *Further Notice*.

The *Report and Order* also states that low power TV band devices may be marketed immediately after the end of the DTV transition on February 17, 2009, but not before. The FCC believes that there will be more vacant channels available after the DTV transition and allowing operation of these devices before the end of the transition could cause interference to DTV possibly disrupting and impeding the transition.

The *Further Notice* portion seeks comment on a number of issues that would enable the FCC to adopt final technical rules that would define how unlicensed devices would operate. For example, the original NPRM did not make any specific proposals regarding spectrum sensing, and there is no information in the record of this proceeding as to key criteria that would need to be specified to allow the use of that technique, such as the required levels for sensing, spectrum to be scanned, and durations for the sensing.

The *Further Notice* proposes a number of specific technical criteria for unlicensed behavior. It based its proposal on rules adopted in the unlicensed systems operating in the 5 GHz band. These rules include a requirement that the devices employ a technique call dynamic frequency selection (DFS) to determine whether signals from military radar systems are present before they can access the spectrum. The FCC has proposed the following DFS parameters to govern unlicensed TV device behavior:

- **DFS Detection Threshold** The required detection level defined by detecting a received signal strength that is greater than a threshold specified, within the TV band device channel bandwidth - referenced to a 0 dBi gain antenna, DFS must be able to detect DTV signal at -116 dBm.

- **Available Channel** A radio channel on which a *Channel Availability Check* has not identified the presence of a signal.

- **Channel Availability Check** A check during which the TV band device listens on a particular radio channel to identify whether there is a station operating on that radio channel. The TV band device may start using the channel if no station with a power level greater than the detection threshold value listed above is detected within 30 seconds.

- **Channel Move Time** The time needed by a TV band device to cease all transmissions on the current channel upon detection of a station above the DFS detection threshold. After a DTV station's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the station's signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

- **In-Service Monitoring** A mechanism to check a channel in use by the TV band device for the presence of a station. A TV band device shall perform in-service monitoring at intervals no greater than 10 seconds.

- **Operating Channel** Once a TV band device starts to operate on an *Available Channel* then that channel becomes the *Operating Channel*.

The *Further Notice* also seeks comment on various other technical regulatory issues such as whether these devices should be licensed, should personal/portable systems be allowed on channels 14-20, use of a so-called geolocation database to help identify available channels and out-of-band emission limits.

Finally, the Commission noted that it plans to conduct extensive testing in its laboratory to assess the potential interference to DTV receivers by low power devices operating in the TV bands, before adopting final rules. It also invited parties to submit their test results in order to help the commission craft those technical rules.

A copy of the *First Report and Order and Further Notice of Proposed Rule Making* is available on the FCC Web site at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-06-156A1.pdf.

Reminder! Digital EAS Requirements Kick In At Year's End

Effective December 31, 2006 the FCC's rules will require that all digital television (DTV) and digital radio broadcasters participate in all national EAS activations. Participation in state and local EAS activations remains voluntary, but if broadcasters choose to transmit state and local EAS messages on their digital channels, they must do so on all program streams, in compliance with Part 11 of the FCC's rules.

Call for Proposals for NAB2007 Extended Until November 8

If you have a suggestion for a presentation for the 2007 NAB Broadcast Engineering Conference you still have time to submit it. For additional information on how to submit your suggestions just go to the NAB Call for Proposals Web site at: http://www.nabshow.com/nab2007/callForProposals.asp.

VSB Seminar Offerings

ATSC Digital Television Transmission System 8-VSB Measurement Seminar

Wednesday, November 1, 8:30 am – 5:45 pm
KNME-DT Studios, Albuquerque, NM

This one-day seminar focuses on the types of VSB transmission system measurements that are desired in the laboratory, at transmitter sites and at remote field sites

ATSC Digital Television 8-VSB Tranmission System Fundamentals & Measurement Seminar
Wednesday, November 8 from 1:00 –6:00 pm
Thursday, November 9 from 8:30 am-5:45 pm
Tutwiler Hotel, Birmingham, AL

This seminar will help you develop an understanding of the 8-VSB transmission system basics as well measurement techniques that are desired in the laboratory, at transmitter sites and at remote field sites. Both seminars will be presented by Gary Sgrignoli of Meintel, Sgrignoli & Wallace. For more information on either of these seminars contact Gary Sgrignoli at (847) 259-3352, gary.sgrignoli@ieee.org or check out the Meintel, Sgrignoli and Wallace Website at www.mswdtv.com.