

the UWB rules unless the transmissions comply with the minimum bandwidth requirement when measured with the sweep or hopping sequence stopped. The Commission indicated that this was necessary as no measurement procedure had been established to permit the emission levels from such devices to be determined while sweeping or hopping. The Commission expressed similar concerns in the Notice of Proposed Rule Making in this proceeding, 65 FR 37332 (June 14, 2000), and declined to include transmitters employing swept frequency and similar modulation types from consideration as UWB devices. For these reasons, it denied the petition from Siemens VDO to permit pulsed frequency hopping vehicle radars to be included under the definition of a UWB device by permitting such transmitters to occupy the minimum required bandwidth within any 10 millisecond period rather than at any point in time.

10. The rules permit UWB devices to be operated indoors for any purpose provided the -10 dB bandwidth is within the 3.1–10.6 GHz band. These systems are permitted to operate at the part 15 general emission limits, -41.3 dBm in the subject band, and are required to attenuate their emissions outside of this band. Within the 960–1610 MHz band, the emissions may not exceed -75.3 dBm, a level 34 dB below the part 15 general emission limits. The Commission denied the petition from Kohler to increase the emission limit in the 960–1610 MHz band for indoor devices.

11. The Cellular Radiotelephone Service operates at 824–849 MHz and 869–894 MHz; the PCS operates at 1850–1910 MHz and 1930–1990 MHz. UWB devices do not operate with their -10 dB bandwidths located within the PCS bands. However, like many other radio transmission systems, they may place unwanted emissions within that spectrum. The Commission denied the petitions from Cingular, Qualcomm and Sprint to decrease the emission levels permitted from UWB devices in the cellular, PCS and GPS frequency bands. It added that there was no basis for Sprint's and Cingular's claim that cellular or PCS exclusivity prohibits the Commission from providing for the operation of new radio services, including the operation of UWB devices that could place emissions within these bands. Further, the Commission denied the petitions to modify the transmission acknowledgement requirement for UWB systems, to amend the rules limiting certain UWB devices to indoor-only operation, or to amend the standards for imaging systems.

12. The Satellite Digital Audio Radio Service (SDARS) operates in the frequency bands 2320–2332.5 MHz and 2332.5–2345 MHz. Sirius, which operates under the name Satellite CD Radio Inc., uses the lower band, and XM uses the upper band. Through-wall imaging systems and surveillance systems, the only UWB devices permitted to operate in the SDARS bands, must not exceed an emission level of -41.3 dBm/MHz in the SDARS spectrum. All other UWB devices are required to attenuate any emissions that appear in the SDARS bands, as follows: (1) GPRs, wall imaging systems, low frequency through-wall imaging systems, medical imaging systems, and indoor UWB devices must attenuate emissions in the SDARS bands to at least -51.3 dBm/MHz; (2) vehicular radar systems and hand held UWB devices must attenuate their emissions in the SDARS bands to at least -61.3 dBm/MHz; and (3) the new public safety imaging systems must attenuate their emissions in the SDARS bands to at least -41.3 dBm/MHz. The Commission denied the petitions from Sirius and XM to reduce the limits on emissions in the SDARS bands from UWB devices.

13. The Fixed Satellite Service (FSS) operates in the 3.7–4.2 GHz band. UWB devices are permitted to operate in this band at an emission level not to exceed -41.3 dBm/MHz. The Commission rejected the petition of SIA requesting that the emissions from outdoor UWB devices be reduced in the FSS band. The Commission also supplied additional clarification as to how it performed the interference calculations employed in the First Report and Order.

14. Except for vehicular radar systems, all UWB non-imaging devices operate in the 3.1–10.6 GHz band at an emission level not to exceed -41.3 dBm/MHz. The Commission denied the joint petition from ARINC and ATA requesting that all UWB operations, except for coordinated terrestrial imaging systems, be located above 5.5 GHz; that the average power limits between 3.1–5.5 GHz be reduced to -51.3 dBm for indoor UWB devices and to -61.3 dBm for handheld UWB device; that the coordination information for UWB imaging systems be posted on the Internet to permit quick access by licensees and users of licensed services, including GPS users, to enable enforcement of the non-interference requirements; and that all UWB devices, particularly consumer-oriented indoor and handheld devices, be labelled "Warning: Not for use on aircraft" with similar warnings to be placed in the operating manuals.

15. Multipoint Distribution Service (MDS) and Instructional Television Fixed Services (ITFS) systems are permitted to operate in the 2150–2162 MHz and 2500–2690 MHz bands. UWB through-wall imaging systems and surveillance systems are permitted to operate in these bands at an emission level not to exceed -41.3 dBm/MHz. Emissions from all other UWB devices must be attenuated to -51.3 dBm/MHz or to -61.3 dBm/MHz, depending on the specific UWB equipment. The Commission denied the petition from WCA to reduce the emissions in the 2150–2162 MHz and 2500–2690 MHz bands from UWB devices to the same limits as those adopted for the PCS bands.

16. Under the non-UWB rules, emissions below 1000 MHz from most Part 15 devices are measured using a CISPR quasi-peak detector. When an average emission limit is specified, the rules also specify a limit on the permitted amount of peak power equal to 20 dB more than the average limit. In some cases, a pulse desensitization correction factor (PDCF) must be applied to the measurement of a peak level obtained from a spectrum analyzer in order to compensate for the analyzer's inability to respond fast enough to pulse widths narrower than the inverse of the resolution bandwidth. The PDCF can considerably increase the measured peak emission level. This standard was employed when Part 15 devices used narrowband emissions, and unfairly penalizes transmission systems that use a wide bandwidth. However, the Commission denied as outside the scope of this proceeding the petition from MSSSI to permit peak measurements of non-UWB devices to be performed using a 1 MHz resolution bandwidth and without the use of a PDCF.

17. The Commission also used this *Memorandum Opinion and Order* as a vehicle to present a summary and discussion of comments filed in response to the measurement program, undertaken in April 2002 by the Technical Research Branch (TRB) of the OET Laboratory Division, to examine the existing levels of ambient RF signal energy present in the frequency bands used by GPS and Aeronautical Radionavigation systems. In addition, spurious emissions generated by common electronic/electrical devices were also measured within the GPS frequency bands. This measurement effort represented a "first step" toward collecting the data necessary to perform an objective evaluation of assumptions inherent in the link budget analysis