5 000 - 5 010 MHz

1. Band Introduction

The Department of Defense (DoD) uses the band 5 000 - 5 010 MHz for training purposes within the United States in a few states. DoD has identified the band for future applications of the Global Positioning System. The Federal Aviation Administration (FAA) is testing use of the band for radio local area networks to support air traffic on the surface of airports.

2. Allocations

2a. Allocation Table

The frequency allocation table shown below is extracted from the Manual of Regulations and Procedures for Federal Radio Frequency Management, Chapter 4 – Allocations, Allotments and Plans.

Table of Frequency Allocations

United States Table

Federal Table	Non-Federal Table	FCC Rule Part(s)
5 000 - 5 010 AERONAUTICAL RADIONAVIGATION US260 RADIONAVIGATION-SATELLITE (Earth-to-space) US211 US367		Aviation (87)

2b. Additional Allocation Table Information

US211 In the bands 1 670 - 1 690, 5 000 - 5 250 MHz and 10.7 - 11.7, 15.1365 - 15.35, 15.4 - 15.7, 22.5 - 22.55, 24 - 24.05, 31.0 - 31.3, 31.8 - 32.0, 40.5 - 42.5, 116 - 122.25, 123 - 130, 158.5 - 164, 167 - 168, 191.8 - 200, and 252 - 265 GHz, applicants for airborne or space station assignments are urged to take all practicable steps to protect radio astronomy observations in the adjacent bands from harmful interference; however, US74 applies.

US260 Aeronautical mobile communications which are an integral part of aeronautical radionavigation systems may be satisfied in the bands 1 559 - 1 626.6 MHz, 5 000 - 5 250 MHz and 15.4 - 15.7 MHz.

US344 In the band 5 091 - 5 250 MHz, the FCC shall coordinate earth stations in the fixed-satellite service (Earth-to-space) with NTIA (see Recommendation ITU-R S.1342). In order to better protect the operation of the international standard system (microwave landing system) in the band 5 000 - 5 091 MHz, non-Federal tracking and telecommand

operations should be conducted in the band 5 150 - 5 250 MHz.
US367 The band 5 000 - 5 150 MHz is also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. 9.21 of the ITU *Radio Regulations*.

3. Federal Agency Use

3a. Federal Agency Frequency Assignments Table

The following table identifies the frequency band, types of allocations, types of applications, and the number of frequency assignments by agency.

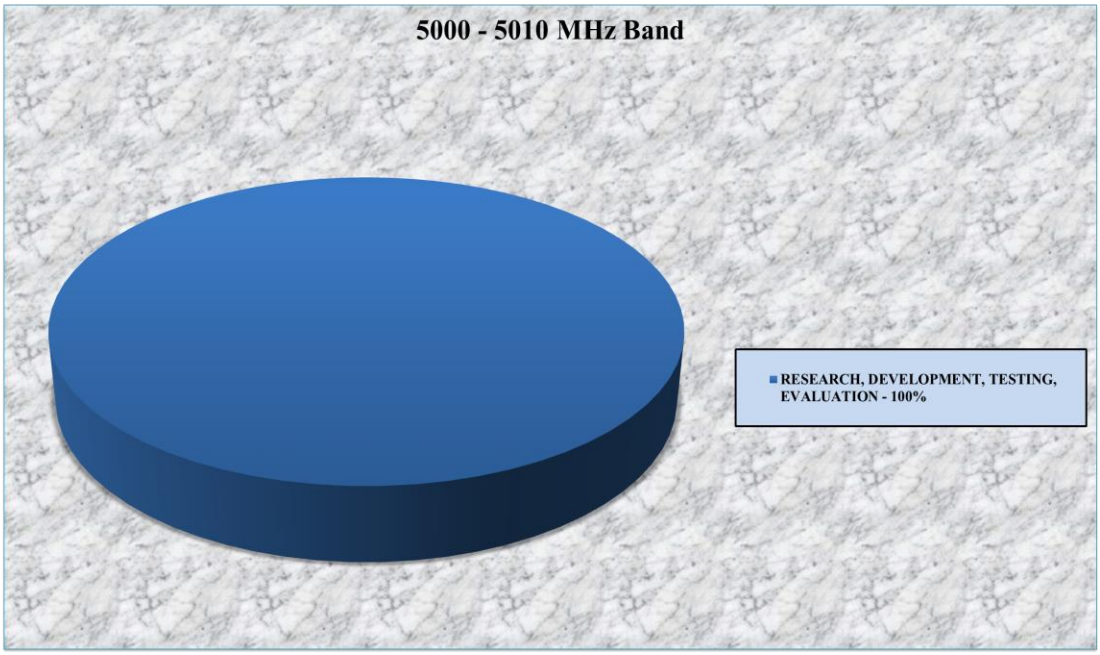
Federal Agency Assignment Table

5000 - 5010 MHz Band					
SHARED BAND					
	AERONAUTICAL RADIONAVIGATION				
	RADIONAVIGATION-SATELLITE (Earth-to-Space)				
	TYPE OF APPLICATION				
AGENCY				RESEARCH DEVELOPMENT TESTING	TOTAL
AF				22	22
TOTAL				22	22

The number of actual systems, or number of equipments, may exceed and sometimes far exceed, the number of frequency assignments in a band. Also, a frequency assignment may represent, a local, state, regional or nationwide authorization. Therefore, care must be taken in evaluating bands strictly on the basis of assignment counts or percentages assignments.

3b. Percentage of Frequency Assignments Chart

The following chart displays the percentage of frequency assignments for the systems operating in the frequency band 5 000 - 5 010 MHz.



4. Frequency Band Analysis by Application

The DoD uses the band 5 000 - 5 010 MHz for training purposes within the United States in Michigan, Montana, Nevada, Wyoming, Kansas, South Carolina, New York, South Dakota, and Missouri. This use is episodic in nature throughout the year and is used in aircrew training.

5. Planned Use

5a. Radionavigation Satellite

The Air Force has initiated GPS-III use for this band for telemetry, tracking, and command (TT&C) uplink feeder links to operational satellites. Planned for operation in the 5 000 - 5010 MHz band, GPS-III uplink feeder links will provide communications including system and satellite monitoring, commanding and control, updates of orbit ephemerides, and clock synchronization.

5b. Aeronautical Radionavigation

The FAA has identified a number of aeronautical mobile (route) service (AM(R)S) applications that could require access to spectrum at and around the surface of airports. These applications range from uploading of routing and electronic flight bag information, to scheduling de-icing facilities, and surface mapping to preclude runway incursion and aid in obstacle avoidance. In general, those applications share the characteristics of short-range (a few kilometers maximum) and high bandwidth. Limitation to ground transmission and the geographic separation of airports will likely facilitate airport-to-airport channel reuse. To accommodate future growth in surface applications, the FAA selected the 5 000 - 5 030 MHz band for evaluation as potential additional spectrum for Airport Network and Locating Equipment (ANLE) currently being developed for operation in the 5 091 - 5 150 MHz band.

ANLE is a high integrity, safety communications LAN for the airport area, combined with an interconnected grid of multilateration sensors. Simple transmitters on surface-moving vehicles allow for the development of a high-fidelity, complete picture of the airport surface environment. In order to speed development and reduce the cost of the ANLE, the system is based on existing Institute of Electrical and Electronics Engineers 802.16e standard.[1]

The International Telecommunication Union (ITU) - Radiocommunication Sector (ITU-R) developed an estimate of new aviation AM(R)S spectrum requirements for ANLE systems. This requirement is for high data throughput moving moderate transmission distances; thus frequencies can be shared at multiple geographic locations.[2] The ITU estimated that the airport LAN systems require 60 - 100 MHz of spectrum.

[1] While the system would be based on the IEEE standard, it is expected that system elements would be tailored for the aviation application. Such tailoring might include bandpass filtering to facilitate sharing with MLS operating in the adjacent band, improved receiver sensitivities, and sectorized antennas.
[2] See, Initial estimate of new aviation AM(R)S spectrum requirements, ITU Radiocommunication Sector Report M. 2120 (Geneva, 2007).