4940-4990 MHz

1. Band Introduction

The 4940-4990 MHz band is allocated exclusively for non-Federal fixed and mobile (except aeronautical mobile) services. The band is also allocated to the space research (passive) and Earth exploration-satellite (passive) services on a secondary basis. The Federal agencies are authorized to use this band on a non-interference basis.[1] Radio astronomy observations are permitted at specific locations on an unprotected basis. This band is used for a number of applications including: point-to-point data links; research and testing; land mobile; and air-to-ground operations. There are also limited uses of this band for flight telemetry and ship-to-shore operations. This band was transferred from the Federal Government to non-Government use in 1999, in accordance with the provisions of the Omnibus Budget Reconciliation Act of 1993.[2]

2. Allocations

2a. Allocation Table

The frequency allocation table shown below is extracted from the NTIA 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)
4940-4990 5.339 US311 US342 G122	4940-4990 FIXED MOBILE except aeronautical mobile 5.339 US311 US342	Private Land Mobile (90)

[1] *See* NTIA Manual Chapter 4; Non-interference basis is a condition of use relative to other specified uses that affords no protection from harmful interference from the other specified users, and prohibits causing harmful interference to other specified users.

[2] Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, 107 Stat. 312.

2b. Additional Allocation Table Information

5.339 The bands 1370-1400 MHz, 2640-2655 MHz, 4950-4990 MHz and 15.20-15.35 GHz are also allocated to the space research (passive) and Earth exploration-satellite (passive) services on a secondary basis.

US311 Radio astronomy observations may be made in the bands 1350-1400 MHz, 1718.8-1722.2 MHz, and 4950-4990 MHz on an unprotected basis at the following radio astronomy observatories:

Allen Telescope Array, Hat Creek, CA	Rectangle between latitudes 40° 00' N and 42° 00' N and between longitudes 120° 15' W and 122° 15' W.	
NASA Goldstone Deep Space Communications Complex, Goldstone, CA	80 kilometers (50 mile) radius centered on 35° 20' N, 116° 53' W.	
National Astronomy and Ionosphere Center, Arecibo, PR	Rectangle between latitudes 17° 30' N and 19° 00' N and between longitudes 65° 10' W and 68° 00' W.	
National Radio Astronomy Observatory, Socorro, NM	Rectangle between latitudes 32° 30' N and 35° 30' N and between longitudes 106° 00' W and 109° 00' W.	
National Radio Astronomy Observatory, Green Bank, WV	Rectangle between latitudes 37° 30' N and 39° 15' N and between longitudes 78° 30' W and 80° 30' W.	
National Radio Astronomy Observatory, Very Long Baseline Array Stations	80 kilometer radius centered on:	
	North latitude	West longitude
Brewster, WA	48° 08'	119° 41'
Fort Davis, TX	30° 38'	103° 57'
Hancock, NH	42° 56'	71° 59'
Kitt Peak, AZ	31° 57'	111° 37'
Los Alamos, NM	35° 47'	106° 15'
Mauna Kea, HI	19° 48'	155° 27'
North Liberty, IA	41° 46'	91° 34'
Owens Valley, CA	37° 14'	118° 17'
Pie Town, NM	34° 18'	108° 07'
Saint Croix, VI	17° 45'	64° 35'
Owens Valley Radio Observatory, Big Pine, CA	Two contiguous rectangles, one between latitudes 36° 00' N and 37° 00' N and between longitudes 117° 40' W and 118° 30' W and the second between latitudes 37° 00' N and 38° 00' N and between longitudes 118° 00' W and 118° 50' W.	

In the bands 1350-1400 MHz and 4950-4990 MHz, every practicable effort will be made to avoid the assignment of frequencies to stations in the fixed and mobile services that could interfere with radio astronomy observations within the geographic areas given

above. In addition, every practicable effort will be made to avoid assignment of frequencies in these bands to stations in the aeronautical mobile service which operate outside of those geographic areas, but which may cause harmful interference to the listed observatories. Should such assignments result in harmful interference to these observatories, the situation will be remedied to the extent practicable.

US342 In making assignments to stations of other services to which the bands:

13360-13410 kHz	42.77-42.87 GHz*
25550-25670 kHz	43.07-43.17 GHz*
37.5-38.25 MHz	43.37-43.47 GHz*
322-328.6 MHz*	48.94-49.04 GHz*
1330-1400 MHz*	76-86 GHz
1610.6-1613.8 MHz*	92-94 GHz
1660-1660.5 MHz*	94.1-100 GHz
1668.4-1670 MHz*	102-109.5 GHz
3260-3267 MHz*	111.8-114.25 GHz
3332-3339 MHz*	128.33-128.59 GHz*
3345.8-3352.5 MHz*	129.23-129.49 GHz*
4825-4835 MHz*	130-134 GHz
4950-4990 MHz	136-148.5 GHz
6650-6675.2 MHz*	151.5-158.5 GHz
14.47-14.5 GHz*	168.59-168.93 GHz*
22.01-22.21 GHz*	171.11-171.45 GHz*
22.21-22.5 GHz	172.31-172.65 GHz*
22.81-22.86 GHz*	173.52-173.85 GHz*
23.07-23.12 GHz*	195.75-196.15 GHz*
31.2-31.3 GHz	209-226 GHz
36.43-36.5 GHz*	241-250 GHz
42.5-43.5 GHz	252-275 GHz

are allocated (*indicates radio astronomy use for spectral line observations), all practicable steps shall be taken to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (*see* ITU *Radio Regulations* at Nos. **4.5** and **4.6** and Article **29**).

G122 In the bands 2395-2400 MHz, 2402-2417 MHz, and 4940-4990 MHz, Federal operations may be authorized on a non-interference basis to authorized non-Federal operations, but shall not hinder the implementation of any non-Federal operations.

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.

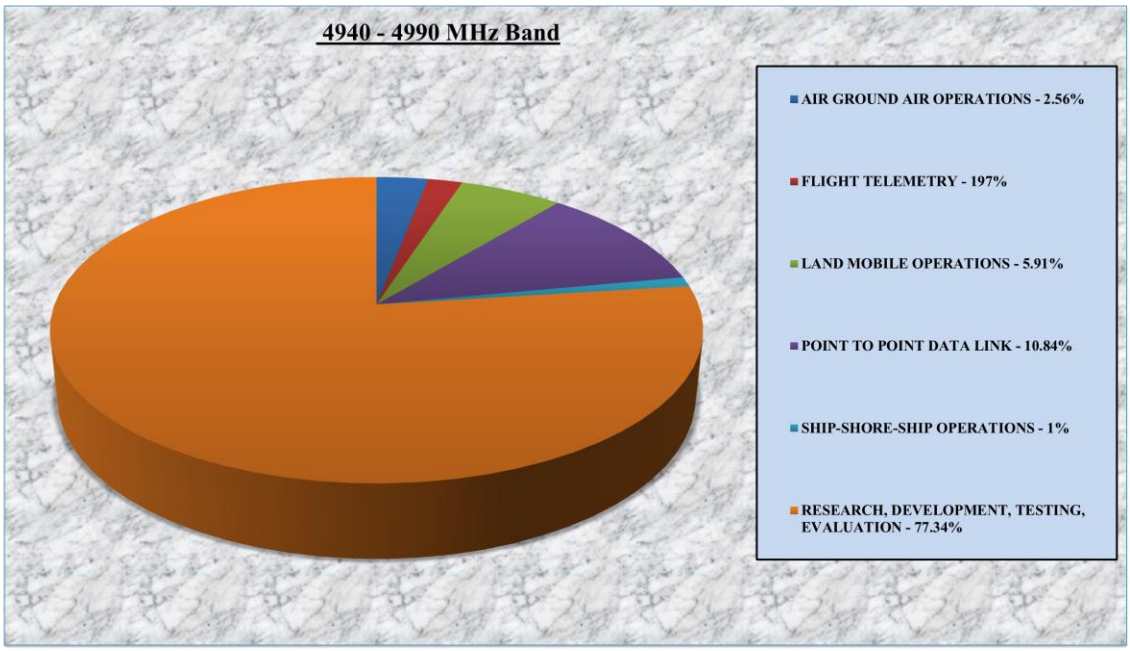
Federal Frequency Assignment Table

4940-4990 MHz Band							
NON FEDERAL EXCLUSIVE BAND							
	FIXED MOBILE (except aeronautical mobile)						
	TYPE OF APPLICATION						
AGENCY	AIR GROUND AIR OPERATIONS	FLIGHT TELEMETRY	LAND MOBILE OPERATIONS	POINT TO POINT DATA LINK	SHIP SHORE SHIP OPERATIONS	RESEARCH DEVELOPMENT TESTING EVALUATION	TOTAL
AF		2	1	5		76	84
AR	6	2	1	2		71	82
DHS						1	1
DOC						2	2
DOE			8	11			19
MC			2	4			6
N					2	7	9
TOTAL	6	4	12	22	2	157	203

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 of assignments.

3b. Percentage of Frequency Assignments Chart

The following chart displays the percentage of assignments in the Government Master File for the applications operating in the frequency band 4940-4990 MHz.



4. Frequency Band Analysis By Application

The 4940-4990 MHz band was reallocated for exclusive non-Federal use. Consequently, operations are limited and on a non-interference basis.

The military agencies represent the most use of this band by Federal agencies for operating tactical systems that are used for line-of-sight and over-the-horizon communications. The Navy operates the Light Airborne Multipurpose System, a wideband data link between helicopters and ships in this band. Other military agencies operate tactical data links and drone command and control systems in this band.

The National Aeronautics and Space Administration uses the 4950-4990 MHz band for passive observations and measurements to advance many areas of environmental change research including water salinity and soil moisture content. This band is also used for radio astronomy research (at selected radio astronomy observatories) via continuum measurement to study the detailed brightness distributions of both galactic and

extragalactic objects and to make radio maps of interstellar clouds and supernova remnants.[3]

5. Planned Use

The Federal Government use of this band for passive and radio astronomy measurements is expected to continue indefinitely.

Federal agencies may use this band with non-Federal public safety agencies for short-range, wideband data applications (e.g., imagery and video) in the future.

Military use of this band, on a non-interference basis and as described above, is also expected to continue.

3. This portion of the spectrum is highly desirable for radio astronomy because of the low level of galactic background continuum radiation.