Chapter 4

Allocations, Allotments and Plans

4.1 FREQUENCY ALLOCATIONS

4.1.1 International Table of Frequency Allocations

Article 5 of the Radio Regulations of the International Telecommunication Union (Edition of 2020) has been incorporated to the extent practicable in this section on the left side of the Table. The International Table of Frequency Allocations is subdivided into the Region 1 Table, the Region 2 Table, and the Region 3 Table. The International Table is included for informational purposes only.

4.1.2 United States Table of Frequency Allocations

1. The United States Table of Frequency Allocations is comprised of federal and non-federal Tables of Frequency Allocations. The United States Table indicates the normal national frequency allocation planning and the degree of conformity with the International Table. When required in the national interest and consistent with national rights, as well as obligations undertaken by the United States to other countries that may be affected, additional uses of frequencies in any band may be authorized to meet service needs other than those provided for in the United States Table.

2. Specific exceptions to the United States Table of Frequency Allocations are as follows:

a. A federal frequency assignment may be authorized in a band allocated exclusively for non-federal use, as an exception, provided that a) the assignment is coordinated with the Federal Communications Commission (FCC) and b) no harmful interference will be caused to the service rendered by non-federal stations, present or future.

b. A non-federal frequency assignment may be authorized in a band allocated exclusively for federal use, as an exception, provided that a) the assignment is coordinated with the IRAC and b) no harmful interference will be caused to the service rendered by federal stations, present or future.

3. In the case of bands shared by federal and non-federal services, frequency assignments therein shall be subject to coordination between the NTIA (via IRAC) and the FCC and no priority is recognized unless the terms of such priority are specifically defined in the United States Table of Frequency Allocations or unless they are subject to mutually agreed arrangements in specific cases.

4.1.3 Federal Table of Frequency Allocations

1. The Federal Table of Frequency Allocations shall be used as a guide in the assignment of radio frequencies to federal radio stations in the United States and Possessions. Exceptions to the Table may be made by the IRAC after careful consideration to avoid harmful interference and to ensure compliance with the ITU Radio Regulations.

2. For the use of frequencies by federal radio stations outside the United States and Possessions, federal agencies shall be guided insofar as practicable by the ITU Table of Frequency Allocations and, where applicable, by the authority of the host government. Maximum practicable effort should be made to avoid the possibility of harmful interference to other authorized U.S. operations. If harmful interference is considered likely, it is incumbent upon the agency conducting the operation to coordinate with other U.S. Flag users, as provided for in Section 8.3.11.

3. Application of the federal table is subject to the recognition that:

a. Below 25000 kHz the table is only applicable in the assignment of frequencies after September 5, 1961; under Article **48** of the International Telecommunication Constitution, administrations "retain their entire freedom with regard to military radio installations of their army, naval and air forces"; and under No. **4.4** of the ITU Radio Regulations, administrations may assign frequencies in derogation of the ITU Table of Frequency Allocations "on the express condition that harmful interference shall not be caused to services carried on by stations operating in accordance with the provisions of the Convention and of these Regulations."

b. Some frequency assignments below 25000 kHz that were made before September 5, 1961, are not in conformity with the Federal Table of Frequency Allocations. Because of the exception mentioned in subparagraph a, the status of these assignments can be determined only on a case-by-case basis. With this exception, the rules pertaining to the relative status between radio services are as follows:

4. Station of a secondary services: are on a non-interference basis to the primary service:

a. Shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date;

b. Cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date;

c. Can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date.

5. Additional allocation - where a band is indicated in a footnote of the Table as "also allocated" to a service in an area smaller than a Region, or in a particular country. For example, an allocation which is added in this area or in this country to the service or services which are indicated in the Table.

6. Alternative allocation - where a band is indicated in a footnote of the Table as "allocated" to one or more services in an area smaller than a Region, or in a particular country. For example, an allocation which replaces, in this area or in this country, the allocation indicated in the Table.

7. Different category of service - where the allocation category (primary or secondary) of the service in the Table is changed. For example, the Table reflects the allocation as Fixed, Mobile and RADIOLOCATION, the category of these services are changed by the footnote to FIXED, MOBILE and Radiolocation.

8. An allocation or a footnote to the Federal Table of Frequency Allocations denoting relative status between radio services automatically applies to each assignment in the band to which the footnote or allocation pertains, unless at the time of a particular frequency assignment action a different provision is decided upon for the assignment concerned.

9. A priority note reflecting the same provisions as an allocation or an applicable footnote to the U.S. Federal Table of Frequency Allocations is redundant and shall not be applied to frequency assignments.

10. An assignment that is in conformity with the service allocation (as amplified by pertinent footnotes) for the band in which it is contained takes precedence over assignments therein that are not in conformity unless, at the time of the frequency assignment action, a different provision is decided upon.

11. Where in this Table a band is indicated as allocated to more than one service, such services are listed in the following order:

a. Services, the names of which are printed in all capital letters (example: FIXED); these services are called "primary" services;

b. Services, the names of which are printed in "normal characters" (example: Mobile); these are "secondary" services.

12. The international allocations are contained on the left side of the table, while the U.S. provisions are shown on the right side of the table. Three columns are contained under the U.S. portion of the table. Column 1 contains services allocated for use by federal users. Column 2 provides services allocated for use by non-federal users. Column 3 contains remarks. If all the allocations in Columns 1 and 2 are the same, these columns are shown merged.

a. Column 1 indicates the band limits for the federal allocations including all "US" and "G" (retained from previously used terminology) footnotes considered to be applicable to the federal users nationally. Where the allocated service is followed by a function in parentheses, e.g., SPACE (space-to-Earth), the allocation is limited to the function shown.

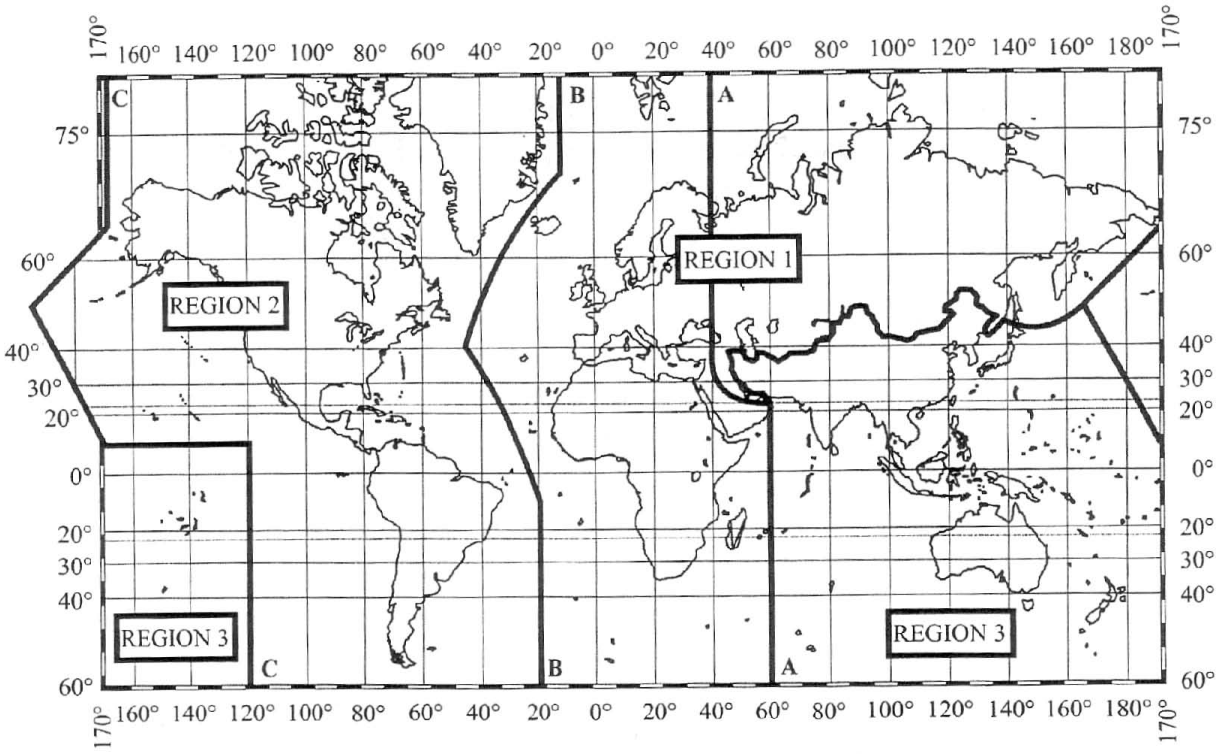
b. Column 2 indicates the band limits for the non-federal allocations including all "US" footnotes, and certain "NG" footnotes as contained in Part 2 of the FCC Rules and Regulations. Where the allocated service is followed by a function in parentheses, e.g., SPACE (space-to-Earth), the allocation is limited to the function shown. This non-federal (NG–retained from previously used terminology "Non-Government".) data has been included in the federal table for information purposes only.

c. Column 3 contains such remarks as serve to amplify the federal and non-federal allocation or point out understanding between the FCC and NTIA in respect thereof. The numbers in parenthesis ( ) refer to the FCC Rule Part number. The international footnotes shown in the columns to the left of the double line are applicable only in the relationships between the U.S. and other countries. An international footnote is applicable to the U.S. Table of Allocations if the number also appears in Columns 1 and 2 of the U.S. Table.

13. The international footnote is then applicable to both federal and non-federal use. The text of the footnotes in this Table is listed in numerical order at the end of the table, in sections headed International, United States (US), Non-Federal (NG) and Federal (G) footnotes.

Chart of Regions as Defined in the Table of Frequency Allocations

For the allocation of frequencies the world has been divided into three Regions as shown in the following map in Nos. **5.3** and **5.9**:



The shaded part represents the Tropical Zones as defined in Nos. **5.16** to **5.20** and **5.21**.

5-01

Table of Frequency Allocations

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
Below 8.3 (Not Allocated) 5.53 5.54			Below 8.3 (Not Allocated) 5.53 5.54		
8.3-9 METEOROLOGICAL AIDS 5.54A 5.54B 5.54C			8.3-9 METEOROLOGICAL AIDS 5.54A		
9-11.3 METEOROLOGICAL AIDS 5.54A RADIONAVIGATION			9-11.3 METEOROLOGICAL AIDS 5.54A RADIONAVIGATION US18 US2		
11.3-14 RADIONAVIGATION			11.3-14 RADIONAVIGATION US18 US2		
14-19.95 FIXED MARITIME MOBILE 5.57 5.55 5.56			14-19.95 FIXED MARITIME MOBILE 5.57 US2	14-19.95 Fixed US2	
19.95-20.05 STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)			19.95-20.05 STANDARD FREQUENCY AND TIME SIGNAL (20 kHz) US2		
20.05-70 FIXED MARITIME MOBILE 5.57 5.56 5.58			20.05-59 FIXED MARITIME MOBILE 5.57 US2	20.05-59 FIXED US2	
			59-61 STANDARD FREQUENCY AND TIME SIGNAL (60 kHz) US2		
			61-70 FIXED MARITIME MOBILE 5.57 US2	61-70 FIXED US2	
70-72 RADIONAVIGATION 5.60	70-90 FIXED MARITIME MOBILE 5.57 MARITIME RADIONAVIGATION 5.60 Radiolocation	70-72 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59	70-90 FIXED MARITIME MOBILE 5.57 Radiolocation	70-90 FIXED Radiolocation	Private Land Mobile (90)
72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60 5.56		72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60			
84-86 RADIONAVIGATION 5.60		84-86 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59			

86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.56	5.61	86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60	US2	US2	
90-110 RADIONAVIGATION 5.62 Fixed 5.64			90-110 RADIONAVIGATION 5.62 US18 US2 US104		Aviation (87) Private Land Mobile (90)
110-112 FIXED MARITIME MOBILE RADIONAVIGATION 5.64	110-130 FIXED MARITIME MOBILE MARITIME RADIONAVIGATION 5.60 Radiolocation	110-112 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	110-130 FIXED MARITIME MOBILE Radiolocation		Private Land Mobile (90)
112-115 RADIONAVIGATION 5.60		112-117.6 RADIONAVIGATION 5.60 Fixed Maritime mobile			
115-117.6 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64 5.66		 5.64 5.65			
117.6-126 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64		117.6-126 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64			
126-129 RADIONAVIGATION 5.60		126-129 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64 5.65			
129-130 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	5.61 5.64	129-130 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	5.64 US2		
130-135.7 FIXED MARITIME MOBILE 5.64 5.67	130-135.7 FIXED MARITIME MOBILE 5.64	130-135.7 FIXED MARITIME MOBILE RADIONAVIGATION 5.64	130-135.7 FIXED MARITIME MOBILE 5.64 US2		Maritime (80)
135.7-137.8 FIXED MARITIME MOBILE Amateur 5.67A 5.64 5.67 5.67B	135.7-137.8 FIXED MARITIME MOBILE Amateur 5.67A 5.64	135.7-137.8 FIXED MARITIME MOBILE RADIONAVIGATION Amateur 5.67A 5.64 5.67B	135.7-137.8 FIXED MARITIME MOBILE 5.64 US2	135.7-137.8 Amateur 5.67A US2	Amateur Radio (97)

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
137.8-148.5 FIXED MARITIME MOBILE 5.64 5.67	137.8-160 FIXED MARITIME MOBILE 5.64	137.8-160 FIXED MARITIME MOBILE RADIONAVIGATION 5.64	137.8-160 FIXED MARITIME MOBILE 5.64 US2		Maritime (80)
148.5-255 BROADCASTING	160-190 FIXED	160-190 FIXED Aeronautical radionavigation	160-190 FIXED MARITIME MOBILE US2	160-190 FIXED US2	
	190-200 AERONAUTICAL RADIONAVIGATION		190-200 AERONAUTICAL RADIONAVIGATION US18 US2		Aviation (87)
5.68 5.69 5.70	200-275 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	200-285 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	200-275 AERONAUTICAL RADIONAVIGATION US18 Aeronautical mobile US2		
255-283.5 BROADCASTING AERONAUTICAL RADIONAVIGATION 5.70 5.71	275-285 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons)		275-285 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons) US2 US18		
283.5-315 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73 5.74	285-315 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73		285-325 MARITIME RADIONAVIGATION (radiobeacons) 5.73 Aeronautical radionavigation (radiobeacons)		
315-325 AERONAUTICAL RADIONAVIGATION Maritime radionavigation (radiobeacons) 5.73 5.75	315-325 MARITIME RADIONAVIGATION (radiobeacons) 5.73 Aeronautical radionavigation	315-325 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73	US2 US18 US364		
325-405 AERONAUTICAL RADIONAVIGATION	325-335 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons)	325-405 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	325-335 AERONAUTICAL RADIONAVIGATION (radiobeacons) Aeronautical mobile Maritime radionavigation (radiobeacons) US2 US18		Aviation (87)
	335-405 AERONAUTICAL RADIONAVIGATION Aeronautical mobile		335-405 AERONAUTICAL RADIONAVIGATION (radiobeacons) US18 Aeronautical mobile US2		
405-415 RADIONAVIGATION 5.76	405-415 RADIONAVIGATION 5.76 Aeronautical mobile		405-415 RADIONAVIGATION 5.76 US18 Aeronautical mobile US2		Maritime (80) Aviation (87)
415-435 MARITIME MOBILE 5.79 AERONAUTICAL RADIONAVIGATION	415-472 MARITIME MOBILE 5.79 Aeronautical radionavigation 5.77 5.80		415-435 MARITIME MOBILE 5.79 AERONAUTICAL RADIONAVIGATION US2		

435-472 MARITIME MOBILE 5.79 Aeronautical radionavigation 5.77 5.82	5.78 5.82		435-472 MARITIME MOBILE 5.79 Aeronautical radionavigation 5.82 US2 US231	435-472 MARITIME MOBILE 5.79 5.82 US2 US231	
472-479 MARITIME MOBILE 5.79 Amateur 5.80A Aeronautical radionavigation 5.77 5.80 5.80B 5.82			472-479 US2	472-479 Amateur 5.80A 5.82 US2 NG8	Amateur Radio (97)
479-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.77 5.82	479-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.77 5.80 5.82		479-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.82 US2 US231	479-495 MARITIME MOBILE 5.79 5.79A 5.82 US2 US231	Maritime (80)
495-505 MARITIME MOBILE			495-505 MARITIME MOBILE		Maritime (80) Aviation (87)
505-526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION	505-510 MARITIME MOBILE 5.79	505-526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Land mobile	505-510 MARITIME MOBILE 5.79		Maritime (80)
	510-525 MARITIME MOBILE 5.79A 5.84 AERONAUTICAL RADIONAVIGATION		510-525 MARITIME MOBILE (ships only) 5.79A 5.84 AERONAUTICAL RADIONAVIGATION (radiobeacons) US18 US14 US225		Maritime (80) Aviation (87)
526.5-1606.5 BROADCASTING	525-535 BROADCASTING 5.86 AERONAUTICAL RADIONAVIGATION	526.5-535 BROADCASTING Mobile 5.88	525-535 MOBILE US221 AERONAUTICAL RADIONAVIGATION (radiobeacons) US18 US239		Aviation (87) Private Land Mobile (90)
	535-1605 BROADCASTING	535-1606.5 BROADCASTING	535-1605	535-1605 BROADCASTING NG1 NG5	Radio Broadcast (AM)(73) Private Land Mobile (90)
5.87 5.87A	1605-1625 BROADCASTING 5.89		1605-1615 MOBILE US221 G127	1605-1705 BROADCASTING 5.89	
1606.5-1625 FIXED MARITIME MOBILE 5.90 LAND MOBILE 5.92	 5.90	1606.5-1800 FIXED MOBILE RADIOLOCATION RADIONAVIGATION	1615-1705 US299	 US299 NG1 NG5	Radio Broadcast (AM)(73) Alaska Fixed (80) Private Land Mobile (90)
1625-1635 RADIOLOCATION 5.93	1625-1705 FIXED MOBILE BROADCASTING 5.89 Radiolocation 5.90				
1635-1800 FIXED MARITIME MOBILE 5.90 LAND MOBILE 5.92 5.96	1705-1800 FIXED MOBILE RADIOLOCATION AERONAUTICAL RADIONAVIGATION	5.91	1705-1800 FIXED MOBILE RADIOLOCATION US240		Alaska Fixed (80) Private Land Mobile (90) Page 4

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
1800-1810 RADIOLOCATION 5.93	1800-1850 AMATEUR	1800-2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIONAVIGATION Radiolocation	1800-2000	1800-2000 AMATEUR	Maritime (80) Amateur Radio (97)
1810-1850 AMATEUR 5.98 5.99 5.100					
1850-2000 FIXED MOBILE except aeronautical mobile 5.92 5.96 5.103	1850-2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIOLOCATION RADIONAVIGATION 5.102	5.97		NG92	
2000-2025 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103	2000-2065 FIXED MOBILE		2000-2065 FIXED MOBILE	2000-2065 MARITIME MOBILE	Maritime (80) Private Land Mobile (90)
2025-2045 FIXED MOBILE except aeronautical mobile (R) Meteorological aids 5.104 5.92 5.103					
2045-2160 FIXED MARITIME MOBILE LAND MOBILE 5.92			US340	US340 NG7	
	2065-2107 MARITIME MOBILE 5.105 5.106		2065-2107 MARITIME MOBILE 5.105 US296 US340		Maritime (80)
2160-2170 RADIOLOCATION 5.93 5.107	2107-2170 FIXED MOBILE		2107-2170 FIXED MOBILE US340	2107-2170 FIXED MOBILE except aeronautical mobile US340 NG7	Maritime (80) Private Land Mobile (90)
2170-2173.5 MARITIME MOBILE			2170-2173.5 MARITIME MOBILE (telephony) US340	2170-2173.5 MARITIME MOBILE US340	Maritime (80)
2173.5-2190.5 MOBILE (distress and calling) 5.108 5.109 5.110 5.111			2173.5-2190.5 MOBILE (distress and calling) 5.108 5.109 5.110 5.111 US279 US340		Maritime (80) Aviation (87)
2190.5-2194 MARITIME MOBILE			2190.5-2194 MARITIME MOBILE (telephony) US340	2190.5-2194 MARITIME MOBILE US340	Maritime (80)

2194-2300 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103 5.112	2194-2300 FIXED MOBILE 5.112	2194-2495 FIXED MOBILE	2194-2495 FIXED MOBILE except aeronautical mobile	Maritime (80) Private Land Mobile (90)
2300-2498 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.103	2300-2495 FIXED MOBILE BROADCASTING 5.113	US22 US340	US22 US340 NG7	
2498-2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)	2495-2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)	2495-2505 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)		
2501-2502 STANDARD FREQUENCY AND TIME SIGNAL Space research				
2502-2625 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103 5.114	2502-2505 STANDARD FREQUENCY AND TIME SIGNAL 2505-2850 FIXED MOBILE	US1 US340 2505-2850 FIXED MOBILE US285	2505-2850 FIXED MOBILE except aeronautical mobile US285	Maritime (80) Aviation (87) Private Land Mobile (90)
2625-2650 MARITIME MOBILE MARITIME RADIONAVIGATION 5.92				
2650-2850 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103		US22 US340	US22 US340	
2850-3025 AERONAUTICAL MOBILE (R) 5.111 5.115		2850-3025 AERONAUTICAL MOBILE (R) 5.111 5.115 US283 US340		Aviation (87)
3025-3155 AERONAUTICAL MOBILE (OR)		3025-3155 AERONAUTICAL MOBILE (OR) US340		
3155-3200 FIXED MOBILE except aeronautical mobile (R) 5.116 5.117		3155-3230 FIXED MOBILE except aeronautical mobile (R)		Maritime (80) Private Land Mobile (90)
3200-3230 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.116		US22 US340		Page 6

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
3.23-3.4 FIXED MOBILE except aeronautical mobile BROADCASTING 5.113 5.116 5.118			3.23-3.4 FIXED MOBILE except aeronautical mobile Radiolocation US340		Maritime (80) Aviation (87) Private Land Mobile (90)
3.4-3.5 AERONAUTICAL MOBILE (R)			3.4-3.5 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
3.5-3.8 AMATEUR FIXED MOBILE except aeronautical mobile 5.92	3.5-3.75 AMATEUR 5.119	3.5-3.9 AMATEUR FIXED MOBILE	3.5-4 US340	3.5-4 AMATEUR US340	Amateur Radio (97)
3.8-3.9 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	3.75-4 AMATEUR FIXED MOBILE except aeronautical mobile (R)				
3.9-3.95 AERONAUTICAL MOBILE (OR) 5.123		3.9-3.95 AERONAUTICAL MOBILE BROADCASTING			
3.95-4 FIXED BROADCASTING	5.122 5.125	3.95-4 FIXED BROADCASTING 5.126			
4-4.063 FIXED MARITIME MOBILE 5.127 5.126			4-4.063 FIXED MARITIME MOBILE US340		Maritime (80)
4.063-4.438 MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 5.128			4.063-4.438 MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 US82 US296 US340		Maritime (80) Aviation (87)
4.438-4.488 FIXED MOBILE except aeronautical mobile (R) Radiolocation 5.132A 5.132B	4.438-4.488 FIXED MOBILE except aeronautical mobile (R) RADIOLOCATION 5.132A	4.438-4.488 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	4.438-4.488 FIXED MOBILE except aeronautical mobile (R) RADIOLOCATION 5.132A US340		Maritime (80) Private Land Mobile (90)
4.488-4.65 FIXED MOBILE except aeronautical mobile (R)		4.488-4.65 FIXED MOBILE except aeronautical mobile	4.488-4.65 FIXED MOBILE except aeronautical mobile (R) US22 US340		Maritime (80) Aviation (87) Private Land Mobile (90)
4.65-4.7 AERONAUTICAL MOBILE (R)			4.65-4.7 AERONAUTICAL MOBILE (R) US282 US283 US340		Aviation (87)
4.7-4.75 AERONAUTICAL MOBILE (OR)			4.7-4.75 AERONAUTICAL MOBILE (OR) US340		

4.75-4.85 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE BROADCASTING 5.113	4.75-4.85 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113	4.75-4.85 FIXED BROADCASTING 5.113 Land mobile	4.75-4.85 FIXED MOBILE except aeronautical mobile (R) US340		Maritime (80) Private Land Mobile (90)
4.85-4.995 FIXED LAND MOBILE BROADCASTING 5.113			4.85-4.995 FIXED MOBILE US340	4.85-4.995 FIXED US340	Aviation (87) Private Land Mobile (90)
4.995-5.003 STANDARD FREQUENCY AND TIME SIGNAL (5 MHz)			4.995-5.005 STANDARD FREQUENCY AND TIME SIGNAL (5 MHz)		
5.003-5.005 STANDARD FREQUENCY AND TIME SIGNAL Space research			US1 US340		
5.005-5.06 FIXED BROADCASTING 5.113			5.005-5.06 FIXED US22 US340		Aviation (87) Private Land Mobile (90)
5.06-5.25 FIXED Mobile except aeronautical mobile 5.133			5.06-5.25 FIXED US22 Mobile except aeronautical mobile US212 US340		Maritime (80) Aviation (87) Private Land Mobile (90)
5.25-5.275 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A 5.133A	5.25-5.275 FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.132A	5.25-5.275 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	5.25-5.275 FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.132A US340		Maritime (80) Private Land Mobile (90)
5.275-5.3515 FIXED MOBILE except aeronautical mobile			5.275-5.45 FIXED US22 Mobile except aeronautical mobile		Maritime (80) Aviation (87) Private Land Mobile (90) Amateur Radio (97)
5.3515-5.3665 FIXED MOBILE except aeronautical mobile Amateur 5.133B					
5.3665-5.45 FIXED MOBILE except aeronautical mobile			US23 US340		
5.45-5.48 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5.45-5.48 AERONAUTICAL MOBILE (R)	5.45-5.48 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5.45-5.68 AERONAUTICAL MOBILE (R)		Aviation (87)
5.48-5.68 AERONAUTICAL MOBILE (R) 5.111 5.115			5.111 5.115 US283 US340		
5.68-5.73 AERONAUTICAL MOBILE (OR) 5.111 5.115			5.68-5.73 AERONAUTICAL MOBILE (OR) 5.111 5.115 US340		

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
5.73-5.9 FIXED LAND MOBILE	5.73-5.9 FIXED MOBILE except aeronautical mobile (R)	5.73-5.9 FIXED Mobile except aeronautical mobile (R)	5.73-5.9 FIXED MOBILE except aeronautical mobile (R) US340		Maritime (80) Aviation (87) Private Land Mobile (90)
5.9-5.95 BROADCASTING 5.134 5.136			5.9-6.2 BROADCASTING 5.134		International Broadcast Stations (73F)
5.95-6.2 BROADCASTING			US136 US340		
6.2-6.525 MARITIME MOBILE 5.109 5.110 5.130 5.132 5.137			6.2-6.525 MARITIME MOBILE 5.109 5.110 5.130 5.132 US82 US296 US340		Maritime (80)
6.525-6.685 AERONAUTICAL MOBILE (R)			6.525-6.685 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
6.685-6.765 AERONAUTICAL MOBILE (OR)			6.685-6.765 AERONAUTICAL MOBILE (OR) US340		
6.765-7 FIXED MOBILE except aeronautical mobile (R) 5.138			6.765-7 FIXED US22 MOBILE except aeronautical mobile (R) 5.138 US340		ISM Equipment (18) Private Land Mobile (90)
7-7.1 AMATEUR AMATEUR-SATELLITE 5.140 5.141 5.141A			7-7.2	7-7.1 AMATEUR AMATEUR-SATELLITE US340	Amateur Radio (97)
7.1-7.2 AMATEUR 5.142 5.141A 5.141B			US340	7.1-7.2 AMATEUR US340	
7.2-7.3 BROADCASTING	7.2-7.3 AMATEUR 5.142	7.2-7.3 BROADCASTING	7.2-7.3 US142 US340	7.2-7.3 AMATEUR US142 US340	International Broadcast Stations (73F) Amateur Radio (97)
7.3-7.4 BROADCASTING 5.134 5.143 5.143A 5.143B 5.143C 5.143D			7.3-7.4 BROADCASTING 5.134 US136 US340		International Broadcast Stations (73F) Maritime (80)
7.4-7.45 BROADCASTING 5.143B 5.143C	7.4-7.45 FIXED MOBILE except aeronautical mobile (R)	7.4-7.45 BROADCASTING 5.143A 5.143C	7.4-7.45 FIXED MOBILE except aeronautical mobile (R) US142 US340		Private Land Mobile (90)
7.45-8.1 FIXED MOBILE except aeronautical mobile (R) 5.144			7.45-8.1 FIXED US22 MOBILE except aeronautical mobile (R) US340		Maritime (80) Aviation (87) Private Land Mobile (90)

8.1-8.195 FIXED MARITIME MOBILE			8.1-8.195 FIXED MARITIME MOBILE US340	Maritime (80)
8.195-8.815 MARITIME MOBILE 5.109 5.110 5.132 5.145 5.111			8.195-8.815 MARITIME MOBILE 5.109 5.110 5.132 5.145 US82 5.111 US296 US340	Maritime (80) Aviation (87)
8.815-8.965 AERONAUTICAL MOBILE (R)			8.815-8.965 AERONAUTICAL MOBILE (R) US340	Aviation (87)
8.965-9.04 AERONAUTICAL MOBILE (OR)			8.965-9.04 AERONAUTICAL MOBILE (OR) US340	
9.04-9.305 FIXED	9.04-9.4 FIXED	9.04-9.305 FIXED	9.04-9.4 FIXED	Maritime (80) Private Land Mobile (90)
9.305-9.355 FIXED Radiolocation 5.145A 5.145B		9.305-9.355 FIXED Radiolocation 5.145A		
9.355-9.4 FIXED		9.355-9.4 FIXED	US340	
9.4-9.5 BROADCASTING 5.134 5.146			9.4-9.9 BROADCASTING 5.134	International Broadcast Stations (73F)
9.5-9.9 BROADCASTING 5.147			US136 US340	
9.9-9.995 FIXED			9.9-9.995 FIXED US340	Private Land Mobile (90)
9.995-10.003 STANDARD FREQUENCY AND TIME SIGNAL (10 MHz) 5.111			9.995-10.005 STANDARD FREQUENCY AND TIME SIGNAL (10 MHz)	
10.003-10.005 STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111			5.111 US1 US340	
10.005-10.1 AERONAUTICAL MOBILE (R) 5.111			10.005-10.1 AERONAUTICAL MOBILE (R) 5.111 US283 US340	Aviation (87)
10.1-10.15 FIXED Amateur			10.1-10.15 US247 US340	10.1-10.15 AMATEUR US247 US340	Amateur Radio (97)
10.15-11.175 FIXED Mobile except aeronautical mobile (R)			10.15-11.175 FIXED Mobile except aeronautical mobile (R) US340		Private Land Mobile (90)

International Table			United States Table		FCC Rule Part(s)
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11.175-11.275 AERONAUTICAL MOBILE (OR)			11.175-11.275 AERONAUTICAL MOBILE (OR) US340		
11.275-11.4 AERONAUTICAL MOBILE (R)			11.275-11.4 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
11.4-11.6 FIXED			11.4-11.6 FIXED US340		Private Land Mobile (90)
11.6-11.65 BROADCASTING 5.134 5.146			11.6-12.1 BROADCASTING 5.134		International Broadcast Stations (73F)
11.65-12.05 BROADCASTING 5.147					
12.05-12.1 BROADCASTING 5.134 5.146			US136 US340		
12.1-12.23 FIXED			12.1-12.23 FIXED US340		Private Land Mobile (90)
12.23-13.2 MARITIME MOBILE 5.109 5.110 5.132 5.145			12.23-13.2 MARITIME MOBILE 5.109 5.110 5.132 5.145 US82 US296 US340		Maritime (80)
13.2-13.26 AERONAUTICAL MOBILE (OR)			13.2-13.26 AERONAUTICAL MOBILE (OR) US340		
13.26-13.36 AERONAUTICAL MOBILE (R)			13.26-13.36 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
13.36-13.41 FIXED RADIO ASTRONOMY 5.149			13.36-13.41 RADIO ASTRONOMY US342 G115	13.36-13.41 RADIO ASTRONOMY US342	
13.41-13.45 FIXED Mobile except aeronautical mobile (R)			13.41-13.45 FIXED Mobile except aeronautical mobile (R) US340	13.41-13.45 FIXED US340	Private Land Mobile (90)

13.45-13.55 FIXED Mobile except aeronautical mobile (R) Radiolocation 5.132A 5.149A	13.45-13.55 FIXED Mobile except aeronautical mobile (R) Radiolocation 5.132A	13.45-13.55 FIXED Mobile except aeronautical mobile (R) Radiolocation 5.132A US340	13.45-13.55 FIXED Radiolocation 5.132A US340	
13.55-13.57 FIXED Mobile except aeronautical mobile (R) 5.150		13.55-13.57 FIXED Mobile except aeronautical mobile (R) 5.150 US340	13.55-13.57 FIXED 5.150 US340	ISM Equipment (18) Private Land Mobile (90)
13.57-13.6 BROADCASTING 5.134 5.151		13.57-13.87 BROADCASTING 5.134		International Broadcast Stations (73F)
13.6-13.8 BROADCASTING				
13.8-13.87 BROADCASTING 5.134 5.151		US136 US340		
13.87-14 FIXED Mobile except aeronautical mobile (R)		13.87-14 FIXED Mobile except aeronautical mobile (R) US340	13.87-14 FIXED US340	Private Land Mobile (90)
14-14.25 AMATEUR AMATEUR-SATELLITE		14-14.35	14-14.25 AMATEUR AMATEUR-SATELLITE US340	Amateur Radio (97)
14.25-14.35 AMATEUR 5.152		US340	14.25-14.35 AMATEUR US340	
14.35-14.99 FIXED Mobile except aeronautical mobile (R)		14.35-14.99 FIXED Mobile except aeronautical mobile (R) US340	14.35-14.99 FIXED US340	Private Land Mobile (90)
14.99-15.005 STANDARD FREQUENCY AND TIME SIGNAL (15 MHz) 5.111		14.99-15.01 STANDARD FREQUENCY AND TIME SIGNAL (15 MHz)		
15.005-15.01 STANDARD FREQUENCY AND TIME SIGNAL Space research		5.111 US1 US340		
15.01-15.1 AERONAUTICAL MOBILE (OR)		15.01-15.1 AERONAUTICAL MOBILE (OR) US340		Page 12

International Table			United States Table		FCC Rule Part(s)
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15.1-15.6 BROADCASTING			15.1-15.8 BROADCASTING 5.134		International Broadcast Stations (73F)
15.6-15.8 BROADCASTING 5.134 5.146			US136 US340		
15.8-16.1 FIXED 5.153			15.8-16.1 FIXED US340		Private Land Mobile (90)
16.1-16.2 FIXED Radiolocation 5.145A 5.145B	16.1-16.2 FIXED RADIOLOCATION 5.145A	16.1-16.2 FIXED Radiolocation 5.145A	16.1-16.2 FIXED RADIOLOCATION 5.145A US340		
16.2-16.36 FIXED			16.2-16.36 FIXED US340		
16.36-17.41 MARITIME MOBILE 5.109 5.110 5.132 5.145			16.36-17.41 MARITIME MOBILE 5.109 5.110 5.132 5.145 US82 US296 US340		Maritime (80)
17.41-17.48 FIXED			17.41-17.48 FIXED US340		Private Land Mobile (90)
17.48-17.55 BROADCASTING 5.134 5.146			17.48-17.9 BROADCASTING 5.134		International Broadcast Stations (73F)
17.55-17.9 BROADCASTING			US136 US340		
17.9-17.97 AERONAUTICAL MOBILE (R)			17.9-17.97 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
17.97-18.03 AERONAUTICAL MOBILE (OR)			17.97-18.03 AERONAUTICAL MOBILE (OR) US340		
18.030-18.052 FIXED			18.03-18.068 FIXED		Maritime (80) Private Land Mobile (90)
18.052-18.068 FIXED Space research			US340		
18.068-18.168 AMATEUR AMATEUR-SATELLITE 5.154			18.068-18.168 US340	18.068-18.168 AMATEUR AMATEUR-SATELLITE US340	Amateur Radio (97)
18.168-18.78 FIXED Mobile except aeronautical mobile			18.168-18.78 FIXED Mobile US340		Maritime (80) Private Land Mobile (90)

18.78-18.9 MARITIME MOBILE	18.78-18.9 MARITIME MOBILE US82 US296 US340		Maritime (80)
18.9-19.02 BROADCASTING 5.134 5.146	18.9-19.02 BROADCASTING 5.134 US136 US340		International Broadcast Stations (73F)
19.02-19.68 FIXED	19.02-19.68 FIXED US340		Private Land Mobile (90)
19.68-19.8 MARITIME MOBILE 5.132	19.68-19.8 MARITIME MOBILE 5.132 US340		Maritime (80)
19.8-19.99 FIXED	19.8-19.99 FIXED US340		Private Land Mobile (90)
19.99-19.995 STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111	19.99-20.01 STANDARD FREQUENCY AND TIME SIGNAL (20 MHz)		
19.995-20.01 STANDARD FREQUENCY AND TIME SIGNAL (20 MHz) 5.111	5.111 US1 US340		
20.01-21 FIXED Mobile	20.01-21 FIXED Mobile US340	20.01-21 FIXED US340	Private Land Mobile (90)
21-21.45 AMATEUR AMATEUR-SATELLITE	21-21.45 US340	21-21.45 AMATEUR AMATEUR-SATELLITE US340	Amateur Radio (97)
21.45-21.85 BROADCASTING	21.45-21.85 BROADCASTING US340		International Broadcast Stations (73F)
21.85-21.87 FIXED 5.155A 5.155	21.85-21.924 FIXED		Aviation (87) Private Land Mobile (90)
21.87-21.924 FIXED 5.155B	US340		
21.924-22 AERONAUTICAL MOBILE (R)	21.924-22 AERONAUTICAL MOBILE (R) US340		Aviation (87)
22-22.855 MARITIME MOBILE 5.132 5.156	22-22.855 MARITIME MOBILE 5.132 US82 US296 US340		Maritime (80)

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
22.855-23 FIXED 5.156			22.855-23 FIXED US340		Private Land Mobile (90)
23-23.2 FIXED Mobile except aeronautical mobile (R) 5.156			23-23.2 FIXED Mobile except aeronautical mobile (R) US340	23-23.2 FIXED US340	
23.2-23.35 FIXED 5.156A AERONAUTICAL MOBILE (OR)			23.2-23.35 AERONAUTICAL MOBILE (OR) US340		
23.35-24 FIXED MOBILE except aeronautical mobile 5.157			23.35-24.45 FIXED MOBILE except aeronautical mobile US340	23.35-24.45 FIXED US340	Private Land Mobile (90)
24-24.45 FIXED LAND MOBILE					
24.45-24.6 FIXED LAND MOBILE Radiolocation 5.132A 5.158	24.45-24.65 FIXED LAND MOBILE RADIOLOCATION 5.132A	24.45-24.6 FIXED LAND MOBILE Radiolocation 5.132A	24.45-24.65 FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.132A US340	24.45-24.65 FIXED RADIOLOCATION 5.132A US340	
24.6-24.89 FIXED LAND MOBILE	24.65-24.89 FIXED LAND MOBILE	24.6-24.89 FIXED LAND MOBILE	24.65-24.89 FIXED MOBILE except aeronautical mobile US340	24.65-24.89 FIXED US340	
24.89-24.99 AMATEUR AMATEUR-SATELLITE			24.89-24.99 US340	24.89-24.99 AMATEUR AMATEUR-SATELLITE US340	Amateur Radio (97)
24.99-25.005 STANDARD FREQUENCY AND TIME SIGNAL (25 MHz)			24.99-25.01 STANDARD FREQUENCY AND TIME SIGNAL (25 MHz)		
25.005-25.01 STANDARD FREQUENCY AND TIME SIGNAL Space research			 US1 US340		
25.01-25.07 FIXED MOBILE except aeronautical mobile			25.01-25.07 US340	25.01-25.07 LAND MOBILE US340 NG112	Private Land Mobile (90)
25.07-25.21 MARITIME MOBILE			25.07-25.21 MARITIME MOBILE US82 US281 US296 US340	25.07-25.21 MARITIME MOBILE US82 US281 US296 US340 NG112	Maritime (80) Private Land Mobile (90)

25.21-25.55 FIXED MOBILE except aeronautical mobile			25.21-25.33 US340	25.21-25.33 LAND MOBILE US340	Private Land Mobile (90)
			25.33-25.55 FIXED MOBILE except aeronautical mobile US340	25.33-25.55 US340	
25.55-25.67 RADIO ASTRONOMY 5.149			25.55-25.67 RADIO ASTRONOMY US74 US342		
25.67-26.1 BROADCASTING			25.67-26.1 BROADCASTING US25 US340		International Broadcast Stations (73F) Remote Pickup (74D)
26.1-26.175 MARITIME MOBILE 5.132			26.1-26.175 MARITIME MOBILE 5.132 US25 US340		Remote Pickup (74D) Low Power Auxiliary (74H) Maritime (80)
26.175-26.2 FIXED MOBILE except aeronautical mobile			26.175-26.2 US340	26.175-26.2 LAND MOBILE US340	Remote Pickup (74D) Low Power Auxiliary (74H)
26.2-26.35 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A 5.133A	26.2-26.42 FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.132A	26.2-26.35 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	26.2-26.42 RADIOLOCATION US132A US340	26.2-26.42 LAND MOBILE RADIOLOCATION US132A US340	Remote Pickup (74D) Low Power Auxiliary (74H) Private Land Mobile (90)
26.35-27.5 FIXED MOBILE except aeronautical mobile	26.42-27.5 FIXED MOBILE except aeronautical mobile	26.35-27.5 FIXED MOBILE except aeronautical mobile	26.42-26.48 US340	26.42-26.48 LAND MOBILE US340	Remote Pickup (74D) Low Power Auxiliary (74H)
			26.48-26.95 FIXED MOBILE except aeronautical mobile US340	26.48-26.95 US340	
			26.95-27.41	26.95-26.96 FIXED 5.150 US340	ISM Equipment (18)
				26.96-27.23 MOBILE except aeronautical mobile 5.150 US340	ISM Equipment (18) Personal Radio (95)
				27.23-27.41 FIXED MOBILE except aeronautical mobile	ISM Equipment (18) Private Land Mobile (90) Personal Radio (95)
5.150	5.150	5.150	5.150 US340	5.150 US340	

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27.5-28 METEOROLOGICAL AIDS FIXED MOBILE			US340	US340	
			27.54-28 FIXED MOBILE	27.54-28	
			US298 US340	US298 US340	
28-29.7 AMATEUR AMATEUR-SATELLITE			28-29.7	28-29.7 AMATEUR AMATEUR-SATELLITE	Amateur Radio (97)
			US340	US340	
29.7-30.005 FIXED MOBILE			29.7-29.89	29.7-29.8 LAND MOBILE	Private Land Mobile (90)
				US340	
				29.8-29.89 FIXED	
			US340	US340	
			29.89-29.91 FIXED MOBILE	29.89-29.91	
			US340	US340	
			29.91-30	29.91-30 FIXED	
			US340	US340	
30.005-30.01 SPACE OPERATION (satellite identification) FIXED MOBILE SPACE RESEARCH			30-30.56 FIXED MOBILE	30-30.56	
30.01-37.5 FIXED MOBILE			30.56-32	30.56-32 FIXED LAND MOBILE	Private Land Mobile (90)
				NG124	
			32-33 FIXED MOBILE	32-33	
			33-34	33-34 FIXED LAND MOBILE	Private Land Mobile (90)
				NG124	

			34-35 FIXED MOBILE	34-35	
			35-36	35-36 FIXED LAND MOBILE	Public Mobile (22) Private Land Mobile (90)
			36-37 FIXED MOBILE US220	36-37 US220	
			37-37.5	37-37.5 LAND MOBILE NG124	Private Land Mobile (90)
37.5-38.25 FIXED MOBILE Radio astronomy 5.149			37.5-38 Radio astronomy US342	37.5-38 LAND MOBILE Radio astronomy US342 NG59 NG124	
			38-38.25 FIXED MOBILE RADIO ASTRONOMY US81 US342	38-38.25 RADIO ASTRONOMY US81 US342	
38.25-39 FIXED MOBILE	38.25-39.986 FIXED MOBILE	38.25-39.5 FIXED MOBILE	38.25-39 FIXED MOBILE	38.25-39	
39-39.5 FIXED MOBILE Radiolocation 5.132A 5.159			39-40	39-40 LAND MOBILE NG124	Private Land Mobile (90)
39.5-39.986 FIXED MOBILE		39.5-39.986 FIXED MOBILE RADIOLOCATION 5.132A			
39.986-40.02 FIXED MOBILE Space research		39.986-40 FIXED MOBILE RADIOLOCATION 5.132A Space research			
		40-40.02 FIXED MOBILE Space research	40-41.015 FIXED MOBILE 5.150 US210 US220	40-41.015 5.150 US210 US220	ISM Equipment (18) Private Land Mobile (90)
40.02-40.98 FIXED MOBILE 5.150					

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Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
40.98-41.015 FIXED MOBILE Space research 5.160 5.161			(See previous page)		
41.015-42 FIXED MOBILE 5.160 5.161 5.161A			41.015-41.665 FIXED MOBILE RADIOLOCATION US132A US220	41.015-41.665 RADIOLOCATION US132A US220	Private Land Mobile (90)
			41.665-42 FIXED MOBILE US220	41.665-42 US220	
42-42.5 FIXED MOBILE Radiolocation 5.132A 5.160 5.161B	42-42.5 FIXED MOBILE 5.161		42-43.35	42-43.35 FIXED LAND MOBILE NG124 NG141	Public Mobile (22) Private Land Mobile (90)
42.5-44 FIXED MOBILE 5.160 5.161 5.161A			43.35-44 RADIOLOCATION US132A	43.35-43.69 FIXED LAND MOBILE RADIOLOCATION US132A NG124	
				43.69-44 LAND MOBILE RADIOLOCATION US132A NG124	Private Land Mobile (90)
44-47 FIXED MOBILE 5.162 5.162A			44-46.6	44-46.6 LAND MOBILE NG124 NG141	
			46.6-47 FIXED MOBILE	46.6-47	
47-68 BROADCASTING	47-50 FIXED MOBILE	47-50 FIXED MOBILE BROADCASTING 5.162A	47-49.6	47-49.6 LAND MOBILE NG124	Private Land Mobile (90)
			49.6-50 FIXED MOBILE	49.6-50	
	50-54 AMATEUR 5.162A 5.167 5.167A 5.168 5.170		50-73	50-54 AMATEUR	Amateur Radio (97)

5.162A 5.163 5.164 5.165 5.169 5.171	54-68 BROADCASTING Fixed Mobile 5.172	54-68 FIXED MOBILE BROADCASTING 5.162A		54-72 BROADCASTING NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/ Booster (74G) Low Power Auxiliary (74H)
68-74.8 FIXED MOBILE except aeronautical mobile	68-72 BROADCASTING Fixed Mobile 5.173	68-74.8 FIXED MOBILE			
	72-73 FIXED MOBILE			72-73 FIXED MOBILE NG3 NG16 NG56	Public Mobile (22) Maritime (80) Aviation (87) Private Land Mobile (90) Personal Radio (95)
	73-74.6 RADIO ASTRONOMY 5.178		73-74.6 RADIO ASTRONOMY US74 US246		
	74.6-74.8 FIXED MOBILE		74.6-74.8 FIXED MOBILE US273		Private Land Mobile (90)
5.149 5.175 5.177 5.179		5.149 5.176 5.179			
74.8-75.2 AERONAUTICAL RADIONAVIGATION 5.180 5.181			74.8-75.2 AERONAUTICAL RADIONAVIGATION 5.180		Aviation (87)
75.2-87.5 FIXED MOBILE except aeronautical mobile	75.2-75.4 FIXED MOBILE 5.179		75.2-75.4 FIXED MOBILE US273		Private Land Mobile (90)
	75.4-76 FIXED MOBILE	75.4-87 FIXED MOBILE	75.4-88	75.4-76 FIXED MOBILE NG3 NG16 NG56	Public Mobile (22) Maritime (80) Aviation (87) Private Land Mobile (90) Personal Radio (95)
	76-88 BROADCASTING Fixed Mobile 5.185	5.182 5.183 5.188 87-100 FIXED MOBILE BROADCASTING		76-88 BROADCASTING NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/ Booster (74G) Low Power Auxiliary (74H)
5.175 5.179 5.187 87.5-100 BROADCASTING 5.190	88-100 BROADCASTING		88-108 US93	88-108 BROADCASTING NG2 US93 NG5	Broadcast Radio (FM)(73) FM Translator/Booster (74L)
100-108 BROADCASTING 5.192 5.194					
108-117.975 AERONAUTICAL RADIONAVIGATION 5.197 5.197A			108-117.975 AERONAUTICAL RADIONAVIGATION 5.197A US93		Aviation (87)

International Table			United States Table		FCC Rule Part(s)
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117.975-137 AERONAUTICAL MOBILE (R)			117.975-121.9375 AERONAUTICAL MOBILE (R) 5.111 5.200 US26 US28 US36		Aviation (87)
			121.9375-123.0875 US30 US31 US33 US80 US102 US213	121.9375-123.0875 AERONAUTICAL MOBILE US30 US31 US33 US80 US102 US213	
			123.0875-123.5875 AERONAUTICAL MOBILE 5.200 US32 US33 US112		
			123.5875-128.8125 AERONAUTICAL MOBILE (R) US26 US36		
			128.8125-132.0125	128.8125-132.0125 AERONAUTICAL MOBILE (R)	
			132.0125-136 AERONAUTICAL MOBILE (R) US26		
			136-137 US244	136-137 AERONAUTICAL MOBILE (R) US244	
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137-137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			137-137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US319 US320 SPACE RESEARCH (space-to-Earth) 5.208		Satellite Communications (25)
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				FIXED	Private Land Mobile (90)
				LAND MOBILE	
				US116 US268	
				936.5-939.5	
				FIXED	Wireless Communications (27)
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				US116 US268	
				939.5-940	
5.323	5.325	5.327	US116 US268 G2	FIXED	Private Land Mobile (90)

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				940-941 FIXED MOBILE US116 US268	Personal Communications (24)
942-960 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 5.323	942-960 FIXED MOBILE 5.317A	942-960 FIXED MOBILE 5.317A BROADCASTING 5.320	941-944 FIXED US84 US268 US301 G2	941-944 FIXED US84 US268 US301 NG30 NG35	Public Mobile (22) Aural Broadcast Auxiliary (74E) Low Power Auxiliary (74H) Fixed Microwave (101)
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1164-1215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.328A			1164-1215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328A US224		
1215-1240 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) 5.330 5.331 5.332			1215-1240 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G56 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) G132 SPACE RESEARCH (active) 5.332	1215-1240 Earth exploration-satellite (active) Space research (active)	
1240-1300 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) Amateur 5.282 5.330 5.331 5.332 5.335 5.335A			1240-1300 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G56 SPACE RESEARCH (active) AERONAUTICAL RADIONAVIGATION 5.332 5.335	1240-1300 AERONAUTICAL RADIONAVIGATION Amateur Earth exploration-satellite (active) Space research (active) 5.282	Amateur Radio (97)
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			1390-1395 5.339 US79 US342 US385	1390-1395 FIXED MOBILE except aeronautical mobile 5.339 US79 US342 US385 NG338A	Wireless Communications (27)
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1427-1429 SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 5.341A 5.341B 5.341C 5.338A 5.341			1427-1429.5 LAND MOBILE (medical telemetry and medical telecommand) US350 5.341 US79	1427-1429.5 LAND MOBILE (telemetry and telecommand) Fixed (telemetry) 5.341 US79 US350 NG338A	Private Land Mobile (90) Personal Radio (95)
1429-1452 FIXED MOBILE except aeronautical mobile 5.341A 5.338A 5.341 5.342	1429-1452 FIXED MOBILE 5.341B 5.341C 5.343 5.338A 5.341		1429.5-1432 5.341 US79 US350	1429.5-1432 FIXED (telemetry and telecommand) LAND MOBILE (telemetry and telecommand) 5.341 US79 US350 NG338A	
			1432-1435 5.341 US83	1432-1435 FIXED MOBILE except aeronautical mobile 5.341 US83 NG338A	Wireless Communications (27)
1452-1492 FIXED MOBILE except aeronautical mobile 5.346 BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.342 5.345	1452-1492 FIXED MOBILE 5.341B 5.343 5.346A BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.344 5.345		1435-1525 MOBILE (aeronautical telemetry) US338A 5.341 US84 US343		Aviation (87)
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1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A Earth exploration-satellite Fixed Mobile except aeronautical mobile 5.341 5.342 5.351 5.354	1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354		5.341 5.351	
1535-1559 MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A			1535-1559 MOBILE-SATELLITE (space-to-Earth) US308 US309 US315 US380 5.341 5.351 5.356	Satellite Communications (25) Maritime (80) Aviation (87)
1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.208B 5.328B 5.329A 5.341			1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth)(space-to-space) 5.341 US85 US208 US260	Aviation (87)
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1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) 5.149 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) US319 US380 RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.372 US208 US342	
1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) US319 US380 AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.341 5.364 5.365 5.366 5.367 5.368 5.372 US208	Page 34

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1660-1660.5 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY 5.149 5.341 5.351 5.354 5.362A 5.376A			1660-1660.5 MOBILE-SATELLITE (Earth-to-space) US308 US309 US380 RADIO ASTRONOMY 5.341 5.351 US342		Satellite Communications (25) Aviation (87)
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1668-1668.4 MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A			5.341 US246		
1668.4-1670 METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C RADIO ASTRONOMY 5.149 5.341 5.379D 5.379E			1668.4-1670 METEOROLOGICAL AIDS (radiosonde) RADIO ASTRONOMY US74 5.341 US99 US342		
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1675-1690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341			1675-1695 METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (space-to-Earth) US88 5.341 US211 US289		
1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile 5.289 5.341 5.382	1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341 5.381		1695-1710 METEOROLOGICAL-SATELLITE (space-to-Earth) US88	1695-1710 FIXED MOBILE except aeronautical mobile	Wireless Communications (27)

1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341		1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341 5.384	5.341	5.341 US88	
1710-1930 FIXED MOBILE 5.384A 5.388A 5.388B 5.149 5.341 5.385 5.386 5.387 5.388			1710-1761 5.341 US91 US378 US385 1761-1780 SPACE OPERATION (Earth-to-space) G42 US91	1710-1780 FIXED MOBILE 5.341 US91 US378 US385	
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1930-1970 FIXED MOBILE 5.388A 5.388B 5.388	1930-1970 FIXED MOBILE 5.388A 5.388B Mobile-satellite (Earth-to-space) 5.388	1930-1970 FIXED MOBILE 5.388A 5.388B 5.388	1850-2025	1850-2000 FIXED MOBILE	RF Devices (15) Personal Communications (24) Wireless Communications (27) Fixed Microwave (101)
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2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F				2180-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)	Satellite Communications (25) Wireless Communications (27)
2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392			2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) US96 EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED (line-of-sight only) MOBILE (line-of-sight only including aeronautical telemetry, but excluding flight testing of manned aircraft) 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392 US303	2200-2290 US96 US303	
2290-2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)			2290-2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)	2290-2300 SPACE RESEARCH (deep space) (space-to-Earth)	
2300-2450 FIXED MOBILE 5.384A Amateur Radiolocation	2300-2450 FIXED MOBILE 5.384A RADIOLOCATION Amateur		2300-2305 G122	2300-2305 Amateur	Amateur Radio (97)
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		2310-2320 Fixed Mobile US100 Radiolocation G2 US97 US327	2310-2320 FIXED MOBILE BROADCASTING-SATELLITE RADIOLOCATION 5.396 US97 US100 US327	Wireless Communications (27)
		2320-2345 Fixed Radiolocation G2 US327	2320-2345 BROADCASTING-SATELLITE 5.396 US327	Satellite Communications (25)
		2345-2360 Fixed Mobile US100 Radiolocation G2 US327	2345-2360 FIXED MOBILE US100 BROADCASTING-SATELLITE RADIOLOCATION 5.396 US327	Wireless Communications (27)
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2655-2670 FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.208B 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412	2655-2670 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.208B	2655-2670 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.208B 5.420	2655-2690 Earth exploration-satellite (passive) Radio astronomy US385 Space research (passive)	2655-2690 FIXED US205 MOBILE except aeronautical mobile Earth exploration-satellite (passive) Radio astronomy Space research (passive)	

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				4000-4200 FIXED FIXED-SATELLITE (space-to-Earth) NG457A NG182	Satellite Communications (25)
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7900-8025 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.461	7900-8025 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Fixed G117		
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8175-8215 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	8175-8215 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Mobile-satellite (Earth-to-space)(no airborne transmissions) US258 G104 G117		
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Footnotes

International Footnotes

5.53 Administrations authorizing the use of frequencies below 8.3 kHz shall ensure that no harmful interference is caused to services to which the bands above 8.3 kHz are allocated. (WRC-12)

5.54 Administrations conducting scientific research using frequencies below 8.3 kHz are urged to advise other administrations that may be concerned in order that such research may be afforded all practicable protection from harmful interference. (WRC-12)

5.54A Use of the 8.3-11.3 kHz frequency band by stations in the meteorological aids service is limited to passive use only. In the band 9-11.3 kHz, meteorological aids stations shall not claim protection from stations of the radionavigation service submitted for notification to the Bureau prior to 1 January 2013. For sharing between stations of the meteorological aids service and stations in the radionavigation service submitted for notification after this date, the most recent version of Recommendation ITU-R RS.1881 should be applied. (WRC-12)

5.54B *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Egypt, the United Arab Emirates, the Russian Federation, Iran (Islamic Republic of), Iraq, Kuwait, Lebanon, Morocco, Qatar, the Syrian Arab Republic, Sudan and Tunisia, the frequency band 8.3-9 kHz is also allocated to the radionavigation, fixed and mobile services on a primary basis. (WRC-15)

5.54C *Additional allocation:* in China, the frequency band 8.3-9 kHz is also allocated to the maritime radionavigation and maritime mobile services on a primary basis. (WRC-12)

5.55 *Additional allocation:* in Armenia, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the frequency band 14-17 kHz is also allocated to the radionavigation service on a primary basis. (WRC-15)

5.56 The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions. (WRC-12)

5.57 The use of the bands 14-19.95 kHz, 20.05-70 kHz and 70-90 kHz (72-84 kHz and 86-90 kHz in Region 1) by the maritime mobile service is limited to coast radiotelegraph stations (A1A and F1B only). Exceptionally, the use of class J2B or J7B emissions is authorized subject to the necessary bandwidth not exceeding that normally used for class A1A or F1B emissions in the band concerned.

5.58 *Additional allocation:* in Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan, the band 67-70 kHz is also allocated to the radionavigation service on a primary basis.

5.59 *Different category of service:* in Bangladesh and Pakistan, the allocation of the bands 70-72 kHz and 84-86 kHz to the fixed and maritime mobile services is on a primary basis (see No. 5.33).

5.60 In the bands 70-90 kHz (70-86 kHz in Region 1) and 110-130 kHz (112-130 kHz in Region 1), pulsed radionavigation systems may be used on condition that they do not cause harmful interference to other services to which these bands are allocated.

5.61 In Region 2, the establishment and operation of stations in the maritime radionavigation service in the bands 70-90 kHz and 110-130 kHz shall be subject to agreement obtained under No. 9.21 with administrations whose services, operating in accordance with the Table, may be affected. However, stations

of the fixed, maritime mobile and radiolocation services shall not cause harmful interference to stations in the maritime radionavigation service established under such agreements.

5.62 Administrations which operate stations in the radionavigation service in the band 90-110 kHz are urged to coordinate technical and operating characteristics in such a way as to avoid harmful interference to the services provided by these stations.

5.64 Only classes A1A or F1B, A2C, A3C, F1C or F3C emissions are authorized for stations of the fixed service in the bands allocated to this service between 90 kHz and 160 kHz (148.5 kHz in Region 1) and for stations of the maritime mobile service in the bands allocated to this service between 110 kHz and 160 kHz (148.5 kHz in Region 1). Exceptionally, class J2B or J7B emissions are also authorized in the bands between 110 kHz and 160 kHz (148.5 kHz in Region 1) for stations of the maritime mobile service.

5.65 *Different category of service:* in Bangladesh, the allocation of the bands 112-117.6 kHz and 126-129 kHz to the fixed and maritime mobile services is on a primary basis (see No. 5.33).

5.66 *Different category of service:* in Germany, the allocation of the band 115-117.6 kHz to the fixed and maritime mobile services is on a primary basis (see No. 5.33) and to the radionavigation service on a secondary basis (see No. 5.32).

5.67 *Additional allocation:* in Mongolia, Kyrgyzstan and Turkmenistan, the band 130-148.5 kHz is also allocated to the radionavigation service on a secondary basis. Within and between these countries this service shall have an equal right to operate. (WRC-07)

5.67A Stations in the amateur service using frequencies in the band 135.7-137.8 kHz shall not exceed a maximum radiated power of 1 W (e.i.r.p.) and shall not cause harmful interference to stations of the radionavigation service operating in countries listed in No. 5.67. (WRC-07)

5.67B The use of the band 135.7-137.8 kHz in Algeria, Egypt, Iran (Islamic Republic of), Iraq, Lebanon, Syrian Arab Republic, Sudan, South Sudan and Tunisia is limited to the fixed and maritime mobile services. The amateur service shall not be used in the above-mentioned countries in the band 135.7-137.8 kHz, and this should be taken into account by the countries authorizing such use. (WRC-12)

5.68 *Alternative allocation:* in Congo (Rep. of the), the Dem. Rep. of the Congo and South Africa, the frequency band 160-200 kHz is allocated to the fixed service on a primary basis. (WRC-15)

5.69 *Additional allocation:* in Somalia, the band 200-255 kHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.70 *Alternative allocation:* in Angola, Botswana, Burundi, the Central African Rep., Congo (Rep. of the), Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, the Dem. Rep. of the Congo, South Africa, Swaziland, Tanzania, Chad, Zambia and Zimbabwe, the band 200-283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis. (WRC-12)

5.71 *Alternative allocation:* in Tunisia, the band 255-283.5 kHz is allocated to the broadcasting service on a primary basis.

5.73 The band 285-325 kHz (283.5-325 kHz in Region 1) in the maritime radionavigation service may be used to transmit supplementary navigational information using narrow-band techniques, on condition that no harmful interference is caused to radiobeacon stations operating in the radionavigation service.

5.74 *Additional allocation:* in Region 1, the frequency band 285.3-285.7 kHz is also allocated to the maritime radionavigation service (other than radiobeacons) on a primary basis.

5.75 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Moldova, Kyrgyzstan, Tajikistan, Turkmenistan, Ukraine and the Black Sea areas of Romania, the allocation of the band 315-325 kHz to the maritime radionavigation service is on a primary basis under the condition that in the Baltic Sea area, the assignment of frequencies in this band to new stations in the

maritime or aeronautical radionavigation services shall be subject to prior consultation between the administrations concerned. (WRC-07)

5.76 The frequency 410 kHz is designated for radio direction-finding in the maritime radionavigation service. The other radionavigation services to which the band 405-415 kHz is allocated shall not cause harmful interference to radio direction-finding in the band 406.5-413.5 kHz.

5.77 *Different category of service:* in Australia, China, the French overseas communities of Region 3, Korea (Rep. of), India, Iran (Islamic Republic of), Japan, Pakistan, Papua New Guinea and Sri Lanka, the allocation of the frequency band 415-495 kHz to the aeronautical radionavigation service is on a primary basis. In Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Latvia, Uzbekistan and Kyrgyzstan, the allocation of the frequency band 435-495 kHz to the aeronautical radionavigation service is on a primary basis. Administrations in all the aforementioned countries shall take all practical steps necessary to ensure that aeronautical radionavigation stations in the frequency band 435-495 kHz do not cause interference to reception by coast stations of transmissions from ship stations on frequencies designated for ship stations on a worldwide basis. (WRC-12)

5.78 *Different category of service:* in Cuba, the United States of America and Mexico, the allocation of the band 415-435 kHz to the aeronautical radionavigation service is on a primary basis.

5.79 The use of the bands 415-495 kHz and 505-526.5 kHz (505-510 kHz in Region 2) by the maritime mobile service is limited to radiotelegraphy.

5.79A When establishing coast stations in the NAVTEX service on the frequencies 490 kHz, 518 kHz and 4209.5 kHz, administrations are strongly recommended to coordinate the operating characteristics in accordance with the procedures of the International Maritime Organization (IMO) (see Resolution 339 (Rev.WRC-07)). (WRC-07)

5.80 In Region 2, the use of the band 435-495 kHz by the aeronautical radionavigation service is limited to non-directional beacons not employing voice transmission.

5.80A The maximum equivalent isotropically radiated power (e.i.r.p.) of stations in the amateur service using frequencies in the band 472-479 kHz shall not exceed 1 W. Administrations may increase this limit of e.i.r.p. to 5 W in portions of their territory which are at a distance of over 800 km from the borders of Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates, the Russian Federation, Iran (Islamic Republic of), Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia, Ukraine and Yemen. In this frequency band, stations in the amateur service shall not cause harmful interference to, or claim protection from, stations of the aeronautical radionavigation service. (WRC-12)

5.80B The use of the frequency band 472-479 kHz in Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates, the Russian Federation, Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia and Yemen is limited to the maritime mobile and aeronautical radionavigation services. The amateur service shall not be used in the above-mentioned countries in this frequency band, and this should be taken into account by the countries authorizing such use. (WRC-12)

5.82 In the maritime mobile service, the frequency 490 kHz is to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use of the frequency 490 kHz are prescribed in Articles 31 and 52. In using the frequency band 415-495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz. In using the frequency band 472-479 kHz for the amateur service, administrations shall ensure that no harmful interference is caused to the frequency 490 kHz. (WRC-12)

5.84 The conditions for the use of the frequency 518 kHz by the maritime mobile service are prescribed in Articles 31 and 52. (WRC-07)

5.86 In Region 2, in the band 525-535 kHz the carrier power of broadcasting stations shall not exceed 1 kW during the day and 250 W at night.

5.87 *Additional allocation:* in Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, Niger and Swaziland, the band 526.5-535 kHz is also allocated to the mobile service on a secondary basis. (WRC-12)

5.87A *Additional allocation:* in Uzbekistan, the band 526.5-1606.5 kHz is also allocated to the radionavigation service on a primary basis. Such use is subject to agreement obtained under No. 9.21 with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime.

5.88 *Additional allocation:* in China, the band 526.5-535 kHz is also allocated to the aeronautical radionavigation service on a secondary basis.

5.89 In Region 2, the use of the band 1605-1705 kHz by stations of the broadcasting service is subject to the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

The examination of frequency assignments to stations of the fixed and mobile services in the band 1625-1705 kHz shall take account of the allotments appearing in the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

5.90 In the band 1605-1705 kHz, in cases where a broadcasting station of Region 2 is concerned, the service area of the maritime mobile stations in Region 1 shall be limited to that provided by ground-wave propagation.

5.91 *Additional allocation:* in the Philippines and Sri Lanka, the band 1606.5-1705 kHz is also allocated to the broadcasting service on a secondary basis.

5.92 Some countries of Region 1 use radiodetermination systems in the bands 1606.5-1625 kHz, 1635-1800 kHz, 1850-2160 kHz, 2194-2300 kHz, 2502-2850 kHz and 3500-3800 kHz, subject to agreement obtained under No. 9.21. The radiated mean power of these stations shall not exceed 50 W.

5.93 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Mongolia, Nigeria, Uzbekistan, Poland, Kyrgyzstan, Slovakia, Tajikistan, Chad, Turkmenistan and Ukraine, the frequency bands 1625-1635 kHz, 1800-1810 kHz and 2160-2170 kHz are also allocated to the fixed and land mobile services on a primary basis, subject to agreement obtained under No. 9.21. (WRC-15)

5.96 In Germany, Armenia, Austria, Azerbaijan, Belarus, Croatia, Denmark, Estonia, the Russian Federation, Finland, Georgia, Hungary, Ireland, Iceland, Israel, Kazakhstan, Latvia, Liechtenstein, Lithuania, Malta, Moldova, Norway, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., the United Kingdom, Sweden, Switzerland, Tajikistan, Turkmenistan and Ukraine, administrations may allocate up to 200 kHz to their amateur service in the frequency bands 1715-1800 kHz and 1850-2000 kHz. However, when allocating the frequency bands within this range to their amateur service, administrations shall, after prior consultation with administrations of neighbouring countries, take such steps as may be necessary to prevent harmful interference from their amateur service to the fixed and mobile services of other countries. The mean power of any amateur station shall not exceed 10 W. (WRC-15)

5.97 In Region 3, the Loran system operates either on 1850 kHz or 1950 kHz, the bands occupied being 1825-1875 kHz and 1925-1975 kHz respectively. Other services to which the band 1800-2000 kHz is allocated may use any frequency therein on condition that no harmful interference is caused to the Loran system operating on 1850 kHz or 1950 kHz.

5.98 *Alternative allocation:* in Armenia, Azerbaijan, Belarus, Belgium, Cameroon, Congo (Rep. of the),

Denmark, Egypt, Eritrea, Spain, Ethiopia, the Russian Federation, Georgia, Greece, Italy, Kazakhstan, Lebanon, Lithuania, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Tunisia, Turkmenistan and Turkey, the frequency band 1810-1830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-15)

5.99 *Additional allocation:* in Saudi Arabia, Austria, Iraq, Libya, Uzbekistan, Slovakia, Romania, Slovenia, Chad, and Togo, the band 1810-1830 kHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.100 In Region 1, the authorization to use the band 1810-1830 kHz by the amateur service in countries situated totally or partially north of 40° N shall be given only after consultation with the countries mentioned in Nos. 5.98 and 5.99 to define the necessary steps to be taken to prevent harmful interference between amateur stations and stations of other services operating in accordance with Nos. 5.98 and 5.99.

5.102 *Alternative allocation:* in Bolivia, Chile, Paraguay and Peru, the frequency band 1850-2000 kHz is allocated to the fixed, mobile except aeronautical mobile, radiolocation and radionavigation services on a primary basis. (WRC-15)

5.103 In Region 1, in making assignments to stations in the fixed and mobile services in the bands 1850-2045 kHz, 2194-2498 kHz, 2502-2625 kHz and 2650-2850 kHz, administrations should bear in mind the special requirements of the maritime mobile service.

5.104 In Region 1, the use of the band 2025-2045 kHz by the meteorological aids service is limited to oceanographic buoy stations.

5.105 In Region 2, except in Greenland, coast stations and ship stations using radiotelephony in the band 2065-2107 kHz shall be limited to class J3E emissions and to a peak envelope power not exceeding 1 kW. Preferably, the following carrier frequencies should be used: 2065.0 kHz, 2079.0 kHz, 2082.5 kHz, 2086.0 kHz, 2093.0 kHz, 2096.5 kHz, 2100.0 kHz and 2103.5 kHz. In Argentina and Uruguay, the carrier frequencies 2068.5 kHz and 2075.5 kHz are also used for this purpose, while the frequencies within the band 2072-2075.5 kHz are used as provided in No. 52.165.

5.106 In Regions 2 and 3, provided no harmful interference is caused to the maritime mobile service, the frequencies between 2065 kHz and 2107 kHz may be used by stations of the fixed service communicating only within national borders and whose mean power does not exceed 50 W. In notifying the frequencies, the attention of the Bureau should be drawn to these provisions.

5.107 *Additional allocation:* in Saudi Arabia, Eritrea, Ethiopia, Iraq, Libya, Somalia and Swaziland, the band 2160-2170 kHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. The mean power of stations in these services shall not exceed 50 W. (WRC-12)

5.108 The carrier frequency 2182 kHz is an international distress and calling frequency for radiotelephony. The conditions for the use of the band 2173.5-2190.5 kHz are prescribed in Articles 31 and 52. (WRC-07)

5.109 The frequencies 2187.5 kHz, 4207.5 kHz, 6312 kHz, 8414.5 kHz, 12 577 kHz and 16 804.5 kHz are international distress frequencies for digital selective calling. The conditions for the use of these frequencies are prescribed in Article 31.

5.110 The frequencies 2174.5 kHz, 4177.5 kHz, 6268 kHz, 8376.5 kHz, 12 520 kHz and 16 695 kHz are international distress frequencies for narrow-band direct-printing telegraphy. The conditions for the use of these frequencies are prescribed in Article 31.

5.111 The carrier frequencies 2182 kHz, 3023 kHz, 5680 kHz, 8364 kHz and the frequencies 121.5 MHz, 156.525 MHz, 156.8 MHz and 243 MHz may also be used, in accordance with the procedures in force for terrestrial radiocommunication services, for search and rescue operations concerning manned space vehicles. The conditions for the use of the frequencies are prescribed in Article 31.

The same applies to the frequencies 10 003 kHz, 14 993 kHz and 19 993 kHz, but in each of these cases emissions must be confined in a band of ± 3 kHz about the frequency. (WRC-07)

5.112 *Alternative allocation:* in Denmark and Sri Lanka, the band 2194-2300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.113 For the conditions for the use of the bands 2300-2495 kHz (2498 kHz in Region 1), 3200-3400 kHz, 4750-4995 kHz and 5005-5060 kHz by the broadcasting service, see Nos. 5.16 to 5.20, 5.21 and 23.3 to 23.10.

5.114 *Alternative allocation:* in Denmark and Iraq, the band 2502-2625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.115 The carrier (reference) frequencies 3023 kHz and 5680 kHz may also be used, in accordance with Article 31, by stations of the maritime mobile service engaged in coordinated search and rescue operations. (WRC-07)

5.116 Administrations are urged to authorize the use of the band 3155-3195 kHz to provide a common worldwide channel for low power wireless hearing aids. Additional channels for these devices may be assigned by administrations in the bands between 3155 kHz and 3400 kHz to suit local needs.
It should be noted that frequencies in the range 3000 kHz to 4000 kHz are suitable for hearing aid devices which are designed to operate over short distances within the induction field.

5.117 *Alternative allocation:* in Côte d'Ivoire, Denmark, Egypt, Liberia, Sri Lanka and Togo, the band 3155-3200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.118 *Additional allocation:* in the United States, Mexico, Peru and Uruguay, the band 3230-3400 kHz is also allocated to the radiolocation service on a secondary basis.

5.119 *Additional allocation:* in Peru, the frequency band 3500-3750 kHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.122 *Alternative allocation:* in Bolivia, Chile, Ecuador, Paraguay and Peru, the frequency band 3750-4000 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-15)

5.123 *Additional allocation:* in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the band 3900-3950 kHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. 9.21.

5.125 *Additional allocation:* in Greenland, the band 3950-4000 kHz is also allocated to the broadcasting service on a primary basis. The power of the broadcasting stations operating in this band shall not exceed that necessary for a national service and shall in no case exceed 5 kW.

5.126 In Region 3, the stations of those services to which the band 3995-4005 kHz is allocated may transmit standard frequency and time signals.

5.127 The use of the band 4000-4063 kHz by the maritime mobile service is limited to ship stations using radiotelephony (see No. 52.220 and Appendix 17).

5.128 Frequencies in the bands 4063-4123 kHz and 4130-4438 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W, on condition that harmful interference is not caused to the maritime mobile service. In addition, in Afghanistan, Argentina, Armenia, Azerbaijan, Belarus, Botswana, Burkina Faso, the Central African Rep., China, the Russian Federation, Georgia, India, Kazakhstan, Mali, Niger, Pakistan, Kyrgyzstan, Tajikistan, Chad, Turkmenistan and Ukraine, in the bands 4063-4123 kHz, 4130-4133 kHz and 4408-4438 kHz, stations in the fixed service, with a mean power not exceeding 1 kW,

can be operated on condition that they are situated at least 600 km from the coast and that harmful interference is not caused to the maritime mobile service. (WRC-12)

5.130 The conditions for the use of the carrier frequencies 4125 kHz and 6215 kHz are prescribed in Articles 31 and 52. (WRC-07)

5.131 The frequency 4209.5 kHz is used exclusively for the transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of narrow-band direct-printing techniques.

5.132 The frequencies 4210 kHz, 6314 kHz, 8416.5 kHz, 12 579 kHz, 16 806.5 kHz, 19 680.5 kHz, 22 376 kHz and 26 100.5 kHz are the international frequencies for the transmission of maritime safety information (MSI) (see Appendix 17).

5.132A Stations in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the fixed or mobile services. Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution 612 (Rev.WRC-12). (WRC-12)

5.132B *Alternative allocation:* in Armenia, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 4438-4488 kHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. (WRC-15)

5.133 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Lithuania, Niger, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 5130-5250 kHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. 5.33). (WRC-12)

5.133A *Alternative allocation:* in Armenia, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency bands 5250-5275 kHz and 26 200-26 350 kHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-15)

5.133B Stations in the amateur service using the frequency band 5351.5-5366.5 kHz shall not exceed a maximum radiated power of 15 W (e.i.r.p.). However, in Region 2 in Mexico, stations in the amateur service using the frequency band 5351.5-5366.5 kHz shall not exceed a maximum radiated power of 20 W (e.i.r.p.). In the following Region 2 countries: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Dominica, El Salvador, Ecuador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela, as well as the overseas territories of the Netherlands in Region 2, stations in the amateur service using the frequency band 5351.5-5366.5 kHz shall not exceed a maximum radiated power of 25 W (e.i.r.p.). (WRC-15)

5.134 The use of the bands 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 13 570-13 600 kHz, 13 800-13 870 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz by the broadcasting service is subject to the application of the procedure of Article 12. Administrations are encouraged to use these bands to facilitate the introduction of digitally modulated emissions in accordance with the provisions of Resolution 517 (Rev.WRC-15). (FCC)

5.136 *Additional allocation:* frequencies in the band 5900-5950 kHz may be used by stations in the following services, communicating only within the boundary of the country in which they are located: fixed service (in all three Regions), land mobile service (in Region 1), mobile except aeronautical mobile (R) service (in Regions 2 and 3), on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-07)

5.137 On condition that harmful interference is not caused to the maritime mobile service, the bands 6200-6213.5 kHz and 6220.5-6525 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W. At the time of notification of these frequencies, the attention of the Bureau will be drawn to the above conditions.

5.138 The following bands:

6765-6795 kHz (centre frequency 6780 kHz),
433.05-434.79 MHz (centre frequency 433.92 MHz) in Region 1 except in the countries mentioned in No. 5.280,
61-61.5 GHz (centre frequency 61.25 GHz),
122-123 GHz (centre frequency 122.5 GHz), and
244-246 GHz (centre frequency 245 GHz)

are designated for industrial, scientific and medical (ISM) applications. The use of these frequency bands for ISM applications shall be subject to special authorization by the administration concerned, in agreement with other administrations whose radiocommunication services might be affected. In applying this provision, administrations shall have due regard to the latest relevant ITU-R Recommendations.

5.140 *Additional allocation:* in Angola, Iraq, Somalia and Togo, the frequency band 7000-7050 kHz is also allocated to the fixed service on a primary basis. (WRC-15)

5.141 *Alternative allocation:* in Egypt, Eritrea, Ethiopia, Guinea, Libya, Madagascar and Niger, the band 7000-7050 kHz is allocated to the fixed service on a primary basis. (WRC-12)

5.141A *Additional allocation:* in Uzbekistan and Kyrgyzstan, the bands 7000-7100 kHz and 7100-7200 kHz are also allocated to the fixed and land mobile services on a secondary basis.

5.141B *Additional allocation:* in Algeria, Saudi Arabia, Australia, Bahrain, Botswana, Brunei Darussalam, China, Comoros, Korea (Rep. of), Diego Garcia, Djibouti, Egypt, United Arab Emirates, Eritrea, Guinea, Indonesia, Iran (Islamic Republic of), Japan, Jordan, Kuwait, Libya, Mali, Morocco, Mauritania, Niger, New Zealand, Oman, Papua New Guinea, Qatar, the Syrian Arab Republic, Singapore, Sudan, South Sudan, Tunisia, Viet Nam and Yemen, the frequency band 7100-7200 kHz is also allocated to the fixed and the mobile, except aeronautical mobile (R), services on a primary basis. (WRC-15)

5.142 The use of the band 7200-7300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. (WRC-12)

5.143 *Additional allocation:* frequencies in the band 7300-7350 kHz may be used by stations in the fixed service and in the land mobile service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-07)

5.143A In Region 3, frequencies in the band 7350-7450 kHz may be used by stations in the fixed service on a primary basis and land mobile service on a secondary basis, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-12)

5.143B In Region 1, frequencies in the band 7350-7450 kHz may be used by stations in the fixed and land mobile services communicating only within the boundary of the country in which they are located on condition that harmful interference is not caused to the broadcasting service. The total radiated power of each station shall not exceed 24 dBW. (WRC-12)

5.143C *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Iran (Islamic Republic of), Jordan, Kuwait, Libya, Morocco, Mauritania, Niger, Oman, Qatar, the Syrian Arab Republic, Sudan, South Sudan, Tunisia and Yemen, the bands 7350-7400 kHz and 7400-7450 kHz are also allocated to the fixed service on a primary basis. (WRC-12)

5.143D In Region 2, frequencies in the band 7350-7400 kHz may be used by stations in the fixed service and in the land mobile service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-12)

5.144 In Region 3, the stations of those services to which the band 7995-8005 kHz is allocated may transmit standard frequency and time signals.

5.145 The conditions for the use of the carrier frequencies 8291 kHz, 12 290 kHz and 16 420 kHz are prescribed in Articles 31 and 52. (WRC-07)

5.145A Stations in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the fixed service. Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution 612 (Rev.WRC-12). (WRC-12)

5.145B *Alternative allocation:* in Armenia, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency bands 9305-9355 kHz and 16 100-16 200 kHz are allocated to the fixed service on a primary basis. (WRC-15)

5.146 *Additional allocation:* frequencies in the bands 9400-9500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz may be used by stations in the fixed service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies in the fixed service, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-07)

5.147 On condition that harmful interference is not caused to the broadcasting service, frequencies in the bands 9775-9900 kHz, 11 650-11 700 kHz and 11 975-12 050 kHz may be used by stations in the fixed service communicating only within the boundary of the country in which they are located, each station using a total radiated power not exceeding 24 dBW.

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

13 360-13 410 kHz,
25 550-25 670 kHz,
37.5-38.25 MHz,
73-74.6 MHz in Regions 1 and 3,
150.05-153 MHz in Region 1,
322-328.6 MHz,
406.1-410 MHz,
608-614 MHz in Regions 1 and 3,
1330-1400 MHz,
1610.6-1613.8 MHz,
1660-1670 MHz,
1718.8-1722.2 MHz,
2655-2690 MHz,
3260-3267 MHz,
3332-3339 MHz,
3345.8-3352.5 MHz,
4825-4835 MHz,
4950-4990 MHz,
4990-5000 MHz,
6650-6675.2 MHz,
10.6-10.68 GHz,
14.47-14.5 GHz,
22.01-22.21 GHz,
22.21-22.5 GHz,
22.81-22.86 GHz,
23.07-23.12 GHz,
31.2-31.3 GHz,
31.5-31.8 GHz in Regions 1 and 3,
36.43-36.5 GHz,
42.5-43.5 GHz,
48.94-49.04 GHz,
76-86 GHz,
92-94 GHz,
94.1-100 GHz,
102-109.5 GHz,
111.8-114.25 GHz,
128.33-128.59 GHz,
129.23-129.49 GHz,
130-134 GHz,
136-148.5 GHz,
151.5-158.5 GHz,
168.59-168.93 GHz,
171.11-171.45 GHz,
172.31-172.65 GHz,
173.52-173.85 GHz,
195.75-196.15 GHz,
209-226 GHz,
241-250 GHz,
252-275 GHz

are allocated, administrations are urged to take all practicable steps 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 Nos. 4.5 and 4.6 and Article 29). (WRC-07)

5.149A *Alternative allocation:* in Armenia, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 13 450-13 550 kHz is allocated to the fixed service on a primary basis and to the mobile, except aeronautical mobile (R), service on a secondary basis. (WRC-15)

5.150 The following bands:

13 553-13 567 kHz (centre frequency 13 560 kHz),
26 957-27 283 kHz (centre frequency 27 120 kHz),
40.66-40.70 MHz (centre frequency 40.68 MHz),
902-928 MHz in Region 2 (centre frequency 915 MHz),
2400-2500 MHz (centre frequency 2450 MHz),
5725-5875 MHz (centre frequency 5800 MHz), and
24-24.25 GHz (centre frequency 24.125 GHz)

are also designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within these bands must accept harmful interference which may be caused by these applications. ISM equipment operating in these bands is subject to the provisions of No. 15.13.

5.151 *Additional allocation:* frequencies in the bands 13 570-13 600 kHz and 13 800-13 870 kHz may be used by stations in the fixed service and in the mobile except aeronautical mobile (R) service, communicating only within the boundary of the country in which they are located, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies in these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-07)

5.152 *Additional allocation:* in Armenia, Azerbaijan, China, Côte d'Ivoire, the Russian Federation, Georgia, Iran (Islamic Republic of), Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 14 250-14 350 kHz is also allocated to the fixed service on a primary basis. Stations of the fixed service shall not use a radiated power exceeding 24 dBW.

5.153 In Region 3, the stations of those services to which the band 15 995-16 005 kHz is allocated may transmit standard frequency and time signals.

5.154 *Additional allocation:* in Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 18 068-18 168 kHz is also allocated to the fixed service on a primary basis for use within their boundaries, with a peak envelope power not exceeding 1 kW.

5.155 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, Tajikistan, Turkmenistan and Ukraine, the band 21 850-21 870 kHz is also allocated to the aeronautical mobile (R) service on a primary basis. (WRC-07)

5.155A In Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, Tajikistan, Turkmenistan and Ukraine, the use of the band 21 850-21 870 kHz by the fixed service is limited to provision of services related to aircraft flight safety. (WRC-07)

5.155B The band 21 870-21 924 kHz is used by the fixed service for provision of services related to aircraft flight safety.

5.156 *Additional allocation:* in Nigeria, the band 22 720-23 200 kHz is also allocated to the meteorological aids service (radiosondes) on a primary basis.

5.156A The use of the band 23 200-23 350 kHz by the fixed service is limited to provision of services related to aircraft flight safety.

5.157 The use of the band 23 350-24 000 kHz by the maritime mobile service is limited to inter-ship radiotelegraphy.

5.158 *Alternative allocation:* in Armenia, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 24 450-24 600 kHz is allocated to the fixed and land mobile services on a primary basis. (WRC-15)

5.159 *Alternative allocation:* in Armenia, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 39-39.5 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.160 *Additional allocation:* in Botswana, Burundi, Dem. Rep. of the Congo and Rwanda, the band 41-44 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-12)

5.161 *Additional allocation:* in Iran (Islamic Republic of) and Japan, the band 41-44 MHz is also allocated to the radiolocation service on a secondary basis.

5.161A *Additional allocation:* in Korea (Rep. of) and the United States, the frequency bands 41.015-41.665 MHz and 43.35-44 MHz are also allocated to the radiolocation service on a primary basis. Stations in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the fixed or mobile services. Applications of the radiolocation service are limited to oceanographic radars operating in accordance with Resolution 612 (Rev.WRC-12). (WRC-12)

5.161B *Alternative allocation:* in Albania, Germany, Armenia, Austria, Belarus, Belgium, Bosnia and Herzegovina, Cyprus, Vatican, Croatia, Denmark, Spain, Estonia, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Rep. of Macedonia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Norway, Uzbekistan, Netherlands, Portugal, Kyrgyzstan, Slovakia, Czech Rep., Romania, United Kingdom, San Marino, Slovenia, Sweden,

Switzerland, Turkey and Ukraine, the frequency band 42-42.5 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.162 *Additional allocation:* in Australia, the band 44-47 MHz is also allocated to the broadcasting service on a primary basis. (WRC-12)

5.162A *Additional allocation:* in Germany, Austria, Belgium, Bosnia and Herzegovina, China, Vatican, Denmark, Spain, Estonia, the Russian Federation, Finland, France, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Luxembourg, Monaco, Montenegro, Norway, the Netherlands, Poland, Portugal, the Czech Rep., the United Kingdom, Serbia, Slovenia, Sweden and Switzerland the band 46-68 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution 217 (WRC-97). (WRC-12)

5.163 *Additional allocation:* in Armenia, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the bands 47-48.5 MHz and 56.5-58 MHz are also allocated to the fixed and land mobile services on a secondary basis. (WRC-12)

5.164 *Additional allocation:* in Albania, Algeria, Germany, Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Côte d'Ivoire, Croatia, Denmark, Spain, Estonia, Finland, France, Gabon, Greece, Ireland, Israel, Italy, Jordan, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Montenegro, Nigeria, Norway, the Netherlands, Poland, Syrian Arab Republic, Slovakia, Czech Rep., Romania, the United Kingdom, Serbia, Slovenia, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the frequency band 47-68 MHz, in South Africa the frequency band 47-50 MHz, and in Latvia the frequency band 48.5-56.5 MHz, are also allocated to the land mobile service on a primary basis. However, stations of the land mobile service in the countries mentioned in connection with each frequency band referred to in this footnote shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations of countries other than those mentioned in connection with the frequency band. (WRC-15)

5.165 *Additional allocation:* in Angola, Cameroon, Congo (Rep. of the), Madagascar, Mozambique, Niger, Somalia, Sudan, South Sudan, Tanzania and Chad, the band 47-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.167 *Alternative allocation:* in Bangladesh, Brunei Darussalam, India, Iran (Islamic Republic of), Pakistan and Singapore, the frequency band 50-54 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis. (WRC-15)

5.167A *Additional allocation:* in Indonesia and Thailand, the frequency band 50-54 MHz is also allocated to the fixed, mobile and broadcasting services on a primary basis. (WRC-15)

5.168 *Additional allocation:* in Australia, China and the Dem. People's Rep. of Korea, the band 50-54 MHz is also allocated to the broadcasting service on a primary basis.

5.169 *Alternative allocation:* in Botswana, Lesotho, Malawi, Namibia, the Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Zambia and Zimbabwe, the band 50-54 MHz is allocated to the amateur service on a primary basis. In Senegal, the band 50-51 MHz is allocated to the amateur service on a primary basis. (WRC-12)

5.170 *Additional allocation:* in New Zealand, the frequency band 51-54 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.171 *Additional allocation:* in Botswana, Lesotho, Malawi, Mali, Namibia, Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Zambia and Zimbabwe, the band 54-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.172 *Different category of service:* in the French overseas departments and communities in Region 2 and Guyana, the allocation of the frequency band 54-68 MHz to the fixed and mobile services is on a primary basis (see No. 5.33). (WRC-15)

5.173 *Different category of service:* in the French overseas departments and communities in Region 2 and Guyana, the allocation of the frequency band 68-72 MHz to the fixed and mobile services is on a primary basis (see No. 5.33). (WRC-15)

5.175 *Alternative allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the bands 68-73 MHz and 76-87.5 MHz are allocated to the broadcasting service on a primary basis. In Latvia and Lithuania, the bands 68-73 MHz and 76-87.5 MHz are allocated to the broadcasting and mobile, except aeronautical mobile, services on a primary basis. The services to which these bands are allocated in other countries and the broadcasting service in the countries listed above are subject to agreements with the neighbouring countries concerned. (WRC-07)

5.176 *Additional allocation:* in Australia, China, Korea (Rep. of), the Philippines, the Dem. People's Rep. of Korea and Samoa, the band 68-74 MHz is also allocated to the broadcasting service on a primary basis. (WRC-07)

5.177 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 73-74 MHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. 9.21. (WRC-07)

5.178 *Additional allocation:* in Colombia, Cuba, El Salvador, Guatemala, Guyana, Honduras and Nicaragua, the band 73-74.6 MHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-12)

5.179 *Additional allocation:* in Armenia, Azerbaijan, Belarus, China, the Russian Federation, Georgia, Kazakhstan, Lithuania, Mongolia, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the bands 74.6-74.8 MHz and 75.2-75.4 MHz are also allocated to the aeronautical radionavigation service, on a primary basis, for ground-based transmitters only. (WRC-12)

5.180 The frequency 75 MHz is assigned to marker beacons. Administrations shall refrain from assigning frequencies close to the limits of the guardband to stations of other services which, because of their power or geographical position, might cause harmful interference or otherwise place a constraint on marker beacons.

Every effort should be made to improve further the characteristics of airborne receivers and to limit the power of transmitting stations close to the limits 74.8 MHz and 75.2 MHz.

5.181 *Additional allocation:* in Egypt, Israel and the Syrian Arab Republic, the band 74.8-75.2 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. 9.21. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. 9.21.

5.182 *Additional allocation:* in Western Samoa, the band 75.4-87 MHz is also allocated to the broadcasting service on a primary basis.

5.183 *Additional allocation:* in China, Korea (Rep. of), Japan, the Philippines and the Dem. People's Rep. of Korea, the band 76-87 MHz is also allocated to the broadcasting service on a primary basis.

5.185 *Different category of service:* in the United States, the French overseas departments and communities in Region 2, Guyana and Paraguay, the allocation of the frequency band 76-88 MHz to the fixed and mobile services is on a primary basis (see No. 5.33). (WRC-15)

5.187 *Alternative allocation:* in Albania, the band 81-87.5 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions contained in the Final Acts of the Special Regional Conference (Geneva, 1960).

5.188 *Additional allocation:* in Australia, the band 85-87 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service in Australia is subject to special agreements between the administrations concerned.

5.190 *Additional allocation:* in Monaco, the band 87.5-88 MHz is also allocated to the land mobile service on a primary basis, subject to agreement obtained under No. 9.21.

5.192 *Additional allocation:* in China and Korea (Rep. of), the band 100-108 MHz is also allocated to the fixed and mobile services on a primary basis.

5.194 *Additional allocation:* in Azerbaijan, Kyrgyzstan, Somalia and Turkmenistan, the band 104-108 MHz is also allocated to the mobile, except aeronautical mobile (R), service on a secondary basis. (WRC-07)

5.197 *Additional allocation:* in the Syrian Arab Republic, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. 9.21. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. 9.21. (WRC-12)

5.197A *Additional allocation:* the band 108-117.975 MHz is also allocated on a primary basis to the aeronautical mobile (R) service, limited to systems operating in accordance with recognized international aeronautical standards. Such use shall be in accordance with Resolution 413 (Rev.WRC-12). The use of the band 108-112 MHz by the aeronautical mobile (R) service shall be limited to systems composed of ground-based transmitters and associated receivers that provide navigational information in support of air navigation functions in accordance with recognized international aeronautical standards. (FCC)

5.200 In the band 117.975-137 MHz, the frequency 121.5 MHz is the aeronautical emergency frequency and, where required, the frequency 123.1 MHz is the aeronautical frequency auxiliary to 121.5 MHz. Mobile stations of the maritime mobile service may communicate on these frequencies under the conditions laid down in Article 31 for distress and safety purposes with stations of the aeronautical mobile service. (WRC-07)

5.201 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq (Republic of), Japan, Kazakhstan, Moldova, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the frequency band 132-136 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-15)

5.202 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Bulgaria, the United Arab Emirates, the Russian Federation, Georgia, Iran (Islamic Republic of), Jordan, Oman, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the frequency band 136-137 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC-15)

5.204 *Different category of service:* in Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, China, Cuba, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Kuwait, Montenegro, Oman, Pakistan, the Philippines, Qatar, Serbia, Singapore, Thailand and Yemen, the band 137-138 MHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (see No. 5.33). (WRC-07)

5.205 *Different category of service:* in Israel and Jordan, the allocation of the band 137-138 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. 5.33).

5.206 *Different category of service:* in Armenia, Azerbaijan, Belarus, Bulgaria, Egypt, the Russian Federation, Finland, France, Georgia, Greece, Kazakhstan, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, the Syrian Arab Republic, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 137-138 MHz to the aeronautical mobile (OR) service is on a primary basis (see No. 5.33).

5.207 *Additional allocation:* in Australia, the band 137-144 MHz is also allocated to the broadcasting service on a primary basis until that service can be accommodated within regional broadcasting allocations.

5.208 The use of the band 137-138 MHz by the mobile-satellite service is subject to coordination under No. 9.11A.

5.208A In making assignments to space stations in the mobile-satellite service in the bands 137-138 MHz, 387-390 MHz and 400.15-401 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions. The threshold levels of interference detrimental to the radio astronomy service are shown in the relevant ITU-R Recommendation. (WRC-07)

5.208B In the frequency bands:
137-138 MHz,
387-390 MHz,
400.15-401 MHz,
1452-1492 MHz,
1525-1610 MHz,
1613.8-1626.5 MHz,
2655-2690 MHz,
21.4-22 GHz,
Resolution 739 (Rev.WRC-15) applies. (FCC)

5.209 The use of the bands 137-138 MHz, 148-150.05 MHz, 399.9-400.05 MHz, 400.15-401 MHz, 454-456 MHz and 459-460 MHz by the mobile-satellite service is limited to non-geostationary-satellite systems.

5.210 *Additional allocation:* in Italy, the Czech Rep. and the United Kingdom, the bands 138-143.6 MHz and 143.65-144 MHz are also allocated to the space research service (space-to-Earth) on a secondary basis. (WRC-07)

5.211 *Additional allocation:* in Germany, Saudi Arabia, Austria, Bahrain, Belgium, Denmark, the United Arab Emirates, Spain, Finland, Greece, Guinea, Ireland, Israel, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lebanon, Liechtenstein, Luxembourg, Mali, Malta, Montenegro, Norway, the Netherlands, Qatar, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sweden, Switzerland, Tanzania, Tunisia and Turkey, the frequency band 138-144 MHz is also allocated to the maritime mobile and land mobile services on a primary basis. (WRC--15)

5.212 *Alternative allocation:* in Angola, Botswana, Cameroon, the Central African Rep., Congo (Rep. of the), Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Lesotho, Liberia, Libya, Malawi, Mozambique, Namibia, Niger, Oman, Uganda, Syrian Arab Republic, the Dem. Rep. of the Congo, Rwanda, Sierra Leone,

South Africa, Swaziland, Chad, Togo, Zambia and Zimbabwe, the band 138-144 MHz is allocated to the fixed and mobile services on a primary basis. (WRC-12)

5.213 *Additional allocation:* in China, the band 138-144 MHz is also allocated to the radiolocation service on a primary basis.

5.214 *Additional allocation:* in Eritrea, Ethiopia, Kenya, The Former Yugoslav Republic of Macedonia, Montenegro, Serbia, Somalia, Sudan, South Sudan and Tanzania, the band 138-144 MHz is also allocated to the fixed service on a primary basis. (WRC-12)

5.216 *Additional allocation:* in China, the band 144-146 MHz is also allocated to the aeronautical mobile (OR) service on a secondary basis.

5.217 *Alternative allocation:* in Afghanistan, Bangladesh, Cuba, Guyana and India, the band 146-148 MHz is allocated to the fixed and mobile services on a primary basis.

5.218 *Additional allocation:* the band 148-149.9 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. 9.21. The bandwidth of any individual transmission shall not exceed ± 25 kHz.

5.219 The use of the band 148-149.9 MHz by the mobile-satellite service is subject to coordination under No. 9.11A. The mobile-satellite service shall not constrain the development and use of the fixed, mobile and space operation services in the band 148-149.9 MHz.

5.220 The use of the frequency bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service is subject to coordination under No. 9.11A. (WRC-15)

5.221 Stations of the mobile-satellite service in the frequency band 148-149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Croatia, Cuba, Denmark, Djibouti, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, the Russian Federation, Finland, France, Gabon, Georgia, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland, Iceland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Montenegro, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, the Philippines, Poland, Portugal, Qatar, the Syrian Arab Republic, Kyrgyzstan, Dem. People's Rep. of Korea, Slovakia, Romania, the United Kingdom, Senegal, Serbia, Sierra Leone, Singapore, Slovenia, Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia and Zimbabwe. (WRC-15)

5.225 *Additional allocation:* in Australia and India, the band 150.05-153 MHz is also allocated to the radio astronomy service on a primary basis.

5.225A *Additional allocation:* in Algeria, Armenia, Azerbaijan, Belarus, China, the Russian Federation, France, Iran (Islamic Republic of), Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Ukraine and Viet Nam, the frequency band 154-156 MHz is also allocated to the radiolocation service on a primary basis. The usage of the frequency band 154-156 MHz by the radiolocation service shall be limited to space-object detection systems operating from terrestrial locations. The operation of stations in the radiolocation service in the frequency band 154-156 MHz shall be subject to agreement obtained under No. 9.21. For the identification of potentially affected administrations in Region 1, the instantaneous field-strength value of 12 dB(μV/m) for 10% of the time produced at 10 m above ground level in the 25 kHz reference frequency band at the border of the territory of any other administration shall be used. For the

identification of potentially affected administrations in Region 3, the interference-to-noise ratio (I/N) value of −6 dB (N = −161 dBW/4 kHz), or −10 dB for applications with greater protection requirements, such as public protection and disaster relief (PPDR (N = −161 dBW/4 kHz)), for 1% of the time produced at 60 m above ground level at the border of the territory of any other administration shall be used. In the frequency bands 156.7625-156.8375 MHz, 156.5125-156.5375 MHz, 161.9625-161.9875 MHz, 162.0125-162.0375 MHz, out-of-band e.i.r.p. of space surveillance radars shall not exceed −16 dBW. Frequency assignments to the radiolocation service under this allocation in Ukraine shall not be used without the agreement of Moldova. (WRC-12)

5.226 The frequency 156.525 MHz is the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service using digital selective calling (DSC). The conditions for the use of this frequency and the band 156.4875-156.5625 MHz are contained in Articles 31 and 52, and in Appendix 18.

The frequency 156.8 MHz is the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service. The conditions for the use of this frequency and the band 156.7625-156.8375 MHz are contained in Article 31 and Appendix 18.

In the bands 156-156.4875 MHz, 156.5625-156.7625 MHz, 156.8375-157.45 MHz, 160.6-160.975 MHz and 161.475-162.05 MHz, each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by the administration (see Articles 31 and 52, and Appendix 18).

Any use of frequencies in these bands by stations of other services to which they are allocated should be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radiocommunication service.

However, the frequencies 156.8 MHz and 156.525 MHz and the frequency bands in which priority is given to the maritime mobile service may be used for radiocommunications on inland waterways subject to agreement between interested and affected administrations and taking into account current frequency usage and existing agreements. (WRC-07)

5.227 *Additional allocation:* the bands 156.4875-156.5125 MHz and 156.5375-156.5625 MHz are also allocated to the fixed and land mobile services on a primary basis. The use of these bands by the fixed and land mobile services shall not cause harmful interference to nor claim protection from the maritime mobile VHF radiocommunication service. (WRC-07)

5.228 The use of the frequency bands 156.7625-156.7875 MHz and 156.8125-156.8375 MHz by the mobile-satellite service (Earth-to-space) is limited to the reception of automatic identification system (AIS) emissions of long-range AIS broadcast messages (Message 27, see the most recent version of Recommendation ITU-R M.1371). With the exception of AIS emissions, emissions in these frequency bands by systems operating in the maritime mobile service for communications shall not exceed 1 W. (WRC-12)

5.228A The frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz may be used by aircraft stations for the purpose of search and rescue operations and other safety-related communications. (WRC-12)

5.228AA The use of the frequency bands 161.9375-161.9625 MHz and 161.9875-162.0125 MHz by the maritime mobile-satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix 18. (WRC-15)

5.228B The use of the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the fixed and land mobile services shall not cause harmful interference to, or claim protection from, the maritime mobile service. (WRC-12)

5.228C The use of the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the maritime mobile service and the mobile-satellite (Earth-to-space) service is limited to the automatic

identification system (AIS). The use of these frequency bands by the aeronautical mobile (OR) service is limited to AIS emissions from search and rescue aircraft operations. The AIS operations in these frequency bands shall not constrain the development and use of the fixed and mobile services operating in the adjacent frequency bands. (WRC-12)

5.228D The frequency bands 161.9625-161.9875 MHz (AIS 1) and 162.0125-162.0375 MHz (AIS 2) may continue to be used by the fixed and mobile services on a primary basis until 1 January 2025, at which time this allocation shall no longer be valid. Administrations are encouraged to make all practicable efforts to discontinue the use of these bands by the fixed and mobile services prior to the transition date. During this transition period, the maritime mobile service in these frequency bands has priority over the fixed, land mobile and aeronautical mobile services. (WRC-12)

5.228E The use of the automatic identification system in the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the aeronautical mobile (OR) service is limited to aircraft stations for the purpose of search and rescue operations and other safety-related communications. (WRC-12)

5.228F The use of the frequency bands 161.9625-161.9875 MHz and 162.0125-162.0375 MHz by the mobile-satellite service (Earth-to-space) is limited to the reception of automatic identification system emissions from stations operating in the maritime mobile service. (WRC-12)

5.229 *Alternative allocation:* in Morocco, the band 162-174 MHz is allocated to the broadcasting service on a primary basis. The use of this band shall be subject to agreement with administrations having services, operating or planned, in accordance with the Table which are likely to be affected. Stations in existence on 1 January 1981, with their technical characteristics as of that date, are not affected by such agreement.

5.230 *Additional allocation:* in China, the band 163-167 MHz is also allocated to the space operation service (space-to-Earth) on a primary basis, subject to agreement obtained under No. 9.21.

5.231 *Additional allocation:* in Afghanistan and China, the band 167-174 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service into this band shall be subject to agreement with the neighbouring countries in Region 3 whose services are likely to be affected. (WRC-12)

5.233 *Additional allocation:* in China, the band 174-184 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis, subject to agreement obtained under No. 9.21. These services shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations.

5.235 *Additional allocation:* in Germany, Austria, Belgium, Denmark, Spain, Finland, France, Israel, Italy, Liechtenstein, Malta, Monaco, Norway, the Netherlands, the United Kingdom, Sweden and Switzerland, the band 174-223 MHz is also allocated to the land mobile service on a primary basis. However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

5.237 *Additional allocation:* in Congo (Rep. of the), Egypt, Eritrea, Ethiopia, Gambia, Guinea, Libya, Mali, Sierra Leone, Somalia and Chad, the band 174-223 MHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-12)

5.238 *Additional allocation:* in Bangladesh, India, Pakistan and the Philippines, the band 200-216 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.240 *Additional allocation:* in China and India, the band 216-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

5.241 In Region 2, no new stations in the radiolocation service may be authorized in the band 216-225 MHz. Stations authorized prior to 1 January 1990 may continue to operate on a secondary basis.

5.242 *Additional allocation:* in Canada, the band 216-220 MHz is also allocated to the land mobile service on a primary basis.

5.243 *Additional allocation:* in Somalia, the band 216-225 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to not causing harmful interference to existing or planned broadcasting services in other countries.

5.245 *Additional allocation:* in Japan, the band 222-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

5.246 *Alternative allocation:* in Spain, France, Israel and Monaco, the band 223-230 MHz is allocated to the broadcasting and land mobile services on a primary basis (see No. 5.33) on the basis that, in the preparation of frequency plans, the broadcasting service shall have prior choice of frequencies; and allocated to the fixed and mobile, except land mobile, services on a secondary basis. However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations in Morocco and Algeria.

5.247 *Additional allocation:* in Saudi Arabia, Bahrain, the United Arab Emirates, Jordan, Oman, Qatar and Syrian Arab Republic, the band 223-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.250 *Additional allocation:* in China, the band 225-235 MHz is also allocated to the radio astronomy service on a secondary basis.

5.251 *Additional allocation:* in Nigeria, the band 230-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to agreement obtained under No. 9.21.

5.252 *Alternative allocation:* in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the bands 230-238 MHz and 246-254 MHz are allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. 9.21.

5.254 The bands 235-322 MHz and 335.4-399.9 MHz may be used by the mobile-satellite service, subject to agreement obtained under No. 9.21, on condition that stations in this service do not cause harmful interference to those of other services operating or planned to be operated in accordance with the Table of Frequency Allocations except for the additional allocation made in footnote No. 5.256A.

5.255 The bands 312-315 MHz (Earth-to-space) and 387-390 MHz (space-to-Earth) in the mobile-satellite service may also be used by non-geostationary-satellite systems. Such use is subject to coordination under No. 9.11A.

5.256 The frequency 243 MHz is the frequency in this band for use by survival craft stations and equipment used for survival purposes. (WRC-07)

5.256A *Additional allocation:* in China, the Russian Federation and Kazakhstan, the frequency band 258-261 MHz is also allocated to the space research service (Earth-to-space) and space operation service (Earth-to-space) on a primary basis. Stations in the space research service (Earth-to-space) and space operation service (Earth-to-space) shall not cause harmful interference to, or claim protection from, or constrain the use and development of, the mobile service systems and mobile-satellite service systems operating in the frequency band. Stations in space research service (Earth-to-space) and space operation service (Earth-to-space) shall not constrain the future development of fixed service systems of other countries. (WRC-15)

5.257 The band 267-272 MHz may be used by administrations for space telemetry in their countries on a primary basis, subject to agreement obtained under No. 9.21.

5.258 The use of the band 328.6-335.4 MHz by the aeronautical radionavigation service is limited to Instrument Landing Systems (glide path).

5.259 *Additional allocation:* in Egypt and the Syrian Arab Republic, the band 328.6-335.4 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. 9.21. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. 9.21. (WRC-12)

5.261 Emissions shall be confined in a band of ± 25 kHz about the standard frequency 400.1 MHz.

5.262 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Botswana, Colombia, Cuba, Egypt, the United Arab Emirates, Ecuador, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Liberia, Malaysia, Moldova, Oman, Uzbekistan, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Kyrgyzstan, Singapore, Somalia, Tajikistan, Chad, Turkmenistan and Ukraine, the band 400.05-401 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

5.263 The band 400.15-401 MHz is also allocated to the space research service in the space-to-space direction for communications with manned space vehicles. In this application, the space research service will not be regarded as a safety service.

5.264 The use of the band 400.15-401 MHz by the mobile-satellite service is subject to coordination under No. 9.11A. The power flux-density limit indicated in Annex 1 of Appendix 5 shall apply until such time as a competent world radiocommunication conference revises it.

5.265 In the frequency band 403-410 MHz, Resolution 205 (Rev.WRC-15) applies. (WRC-15)

5.266 The use of the band 406-406.1 MHz by the mobile-satellite service is limited to low power satellite emergency position-indicating radiobeacons (see also Article 31). (WRC-07)

5.267 Any emission capable of causing harmful interference to the authorized uses of the band 406-406.1 MHz is prohibited.

5.268 Use of the frequency band 410-420 MHz by the space research service is limited to space-to-space communication links with an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from transmitting stations of the space research service (space-to-space) in the frequency band 410-420 MHz shall not exceed -153 dB(W/m²) for $0° \le \delta \le 5°$, $-153 + 0.077\ (\delta - 5)$ dB(W/m²) for $5° \le \delta \le 70°$ and -148 dB(W/m²) for $70° \le \delta \le 90°$, where δ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. In this frequency band, stations of the space research service (space-to-space) shall not claim protection from, nor constrain the use and development of, stations of the fixed and mobile services. No. 4.10 does not apply. (WRC-15)

5.269 *Different category of service:* in Australia, the United States, India, Japan and the United Kingdom, the allocation of the bands 420-430 MHz and 440-450 MHz to the radiolocation service is on a primary basis (see No. 5.33).

5.270 *Additional allocation:* in Australia, the United States, Jamaica and the Philippines, the bands 420-430 MHz and 440-450 MHz are also allocated to the amateur service on a secondary basis.

5.271 *Additional allocation:* in Belarus, China, India, Kyrgyzstan and Turkmenistan, the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis. (WRC-07)

5.274 *Alternative allocation:* in Denmark, Norway, Sweden and Chad, the bands 430-432 MHz and 438-440 MHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.275 *Additional allocation:* in Croatia, Estonia, Finland, Libya, The Former Yugoslav Republic of Macedonia, Montenegro and Serbia, the frequency bands 430-432 MHz and 438-440 MHz are also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-15)

5.276 *Additional allocation:* in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burkina Faso, Djibouti, Egypt, the United Arab Emirates, Ecuador, Eritrea, Ethiopia, Greece, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Italy, Jordan, Kenya, Kuwait, Libya, Malaysia, Niger, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Switzerland, Thailand, Togo, Turkey and Yemen, the frequency band 430-440 MHz is also allocated to the fixed service on a primary basis and the frequency bands 430-435 MHz and 438-440 MHz are also allocated, except in Ecuador, to the mobile, except aeronautical mobile, service on a primary basis. (WRC-15)

5.277 *Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo (Rep. of the), Djibouti, the Russian Federation, Georgia, Hungary, Israel, Kazakhstan, Mali, Mongolia, Uzbekistan, Poland, the Dem. Rep. of the Congo, Kyrgyzstan, Slovakia, Romania, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the band 430-440 MHz is also allocated to the fixed service on a primary basis. (WRC-12)

5.278 *Different category of service:* in Argentina, Colombia, Costa Rica, Cuba, Guyana, Honduras, Panama and Venezuela, the allocation of the band 430-440 MHz to the amateur service is on a primary basis (see No. 5.33).

5.279 *Additional allocation:* in Mexico, the bands 430-435 MHz and 438-440 MHz are also allocated on a primary basis to the land mobile service, subject to agreement obtained under No. 9.21.

5.279A The use of the frequency band 432-438 MHz by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU-R RS.1260-1. Additionally, the Earth exploration-satellite service (active) in the frequency band 432-438 MHz shall not cause harmful interference to the aeronautical radionavigation service in China. The provisions of this footnote in no way diminish the obligation of the Earth exploration-satellite service (active) to operate as a secondary service in accordance with Nos. 5.29 and 5.30. (WRC-15)

5.280 In Germany, Austria, Bosnia and Herzegovina, Croatia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Montenegro, Portugal, Serbia, Slovenia and Switzerland, the band 433.05-434.79 MHz (centre frequency 433.92 MHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication services of these countries operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 15.13. (WRC-07)

5.281 *Additional allocation:* in the French overseas departments and communities in Region 2 and India, the band 433.75-434.25 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis. In France and in Brazil, the band is allocated to the same service on a secondary basis.

5.282 In the bands 435-438 MHz, 1260-1270 MHz, 2400-2450 MHz, 3400-3410 MHz (in Regions 2 and 3 only) and 5650-5670 MHz, the amateur-satellite service may operate subject to not causing harmful interference to other services operating in accordance with the Table (see No. 5.43). Administrations authorizing such use shall ensure that any harmful interference caused by emissions from a station in the amateur-satellite service is immediately eliminated in accordance with the provisions of No. 25.11. The use of the bands 1260-1270 MHz and 5650-5670 MHz by the amateur-satellite service is limited to the Earth-to-space direction.

5.283 *Additional allocation:* in Austria, the band 438-440 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.284 *Additional allocation:* in Canada, the band 440-450 MHz is also allocated to the amateur service on a secondary basis.

5.285 *Different category of service:* in Canada, the allocation of the band 440-450 MHz to the radiolocation service is on a primary basis (see No. 5.33).

5.286 The band 449.75-450.25 MHz may be used for the space operation service (Earth-to-space) and the space research service (Earth-to-space), subject to agreement obtained under No. 9.21.

5.286A The use of the bands 454-456 MHz and 459-460 MHz by the mobile-satellite service is subject to coordination under No. 9.11A.

5.286AA The frequency band 450-470 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). See Resolution 224 (Rev.WRC-15). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.286B The use of the band 454-455 MHz in the countries listed in No. 5.286D, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. 5.286E, by stations in the mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations.

5.286C The use of the band 454-455 MHz in the countries listed in No. 5.286D, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. 5.286E, by stations in the mobile-satellite service, shall not constrain the development and use of the fixed and mobile services operating in accordance with the Table of Frequency Allocations.

5.286D *Additional allocation:* in Canada, the United States and Panama, the band 454-455 MHz is also allocated to the mobile-satellite service (Earth-to-space) on a primary basis. (WRC-07)

5.286E *Additional allocation:* in Cape Verde, Nepal and Nigeria, the bands 454-456 MHz and 459-460 MHz are also allocated to the mobile-satellite (Earth-to-space) service on a primary basis. (WRC-07)

5.287 Use of the frequency bands 457.5125-457.5875 MHz and 467.5125-467.5875 MHz by the maritime mobile service is limited to on-board communication stations. The characteristics of the equipment and the channelling arrangement shall be in accordance with Recommendation ITU-R M.1174-3. The use of these frequency bands in territorial waters is subject to the national regulations of the administration concerned. (WRC-15)

5.288 In the territorial waters of the United States and the Philippines, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600 MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-3. (WRC-15)

5.289 Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460-470 MHz and 1690-1710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table.

5.290 *Different category of service:* in Afghanistan, Azerbaijan, Belarus, China, the Russian Federation, Japan, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 460-470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC-12)

5.291 *Additional allocation:* in China, the band 470-485 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis subject to agreement obtained under No. 9.21 and subject to not causing harmful interference to existing and planned

broadcasting stations.

5.291A *Additional allocation:* in Germany, Austria, Denmark, Estonia, Liechtenstein, the Czech Rep., Serbia and Switzerland, the frequency band 470-494 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution 217 (WRC-97). (WRC-15)

5.292 *Different category of service:* in Argentina, Uruguay and Venezuela, the allocation of the frequency band 470-512 MHz to the mobile service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC-15)

5.293 *Different category of service:* in Canada, Chile, Cuba, the United States, Guyana, Jamaica and Panama, the allocation of the frequency bands 470-512 MHz and 614-806 MHz to the fixed service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. In the Bahamas, Barbados, Canada, Chile, Cuba, the United States, Guyana, Jamaica, Mexico and Panama, the allocation of the frequency bands 470-512 MHz and 614-698 MHz to the mobile service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. In Argentina and Ecuador, the allocation of the frequency band 470-512 MHz to the fixed and mobile services is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC-15)

5.294 *Additional allocation:* in Saudi Arabia, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Israel, Libya, the Syrian Arab Republic, Chad and Yemen, the frequency band 470-582 MHz is also allocated to the fixed service on a secondary basis. (WRC-15)

5.295 In the Bahamas, Barbados, Canada, the United States and Mexico, the frequency band 470-608 MHz, or portions thereof, is identified for International Mobile Telecommunications (IMT) – see Resolution 224 (Rev.WRC-15). This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. Mobile service stations of the IMT system within the frequency band are subject to agreement obtained under No. 9.21 and shall not cause harmful interference to, or claim protection from, the broadcasting service of neighbouring countries. Nos. 5.43 and 5.43A apply. In Mexico, the use of IMT in this frequency band will not start before 31 December 2018 and may be extended if agreed by the neighbouring countries. (WRC-15)

5.296 *Additional allocation:* in Albania, Germany, Angola, Saudi Arabia, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Burundi, Cameroon, Vatican, Congo (Rep. of the), Côte d'Ivoire, Croatia, Denmark, Djibouti, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Gabon, Georgia, Ghana, Hungary, Iraq, Ireland, Iceland, Israel, Italy, Jordan, Kenya, Kuwait, Lesotho, Latvia, The Former Yugoslav Republic of Macedonia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Malawi, Mali, Malta, Morocco, Mauritius, Mauritania, Moldova, Monaco, Mozambique, Namibia, Niger, Nigeria, Norway, Oman, Uganda, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Slovakia, the Czech Republic, the United Kingdom, Rwanda, San Marino, Serbia, Sudan, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Togo, Tunisia, Turkey, Ukraine, Zambia and Zimbabwe, the frequency band 470-694 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting and programme-making. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote. (WRC-15)

5.296A In Micronesia, the Solomon Islands, Tuvalu and Vanuatu, the frequency band 470-698 MHz, or portions thereof, and in Bangladesh, Maldives and New Zealand, the frequency band 610-698 MHz, or portions thereof, are identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT) – see Resolution 224 (Rev.WRC-15). This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does

not establish priority in the Radio Regulations. The mobile allocation in this frequency band shall not be used for IMT systems unless subject to agreement obtained under No. 9.21 and shall not cause harmful interference to, or claim protection from, the broadcasting service of neighbouring countries. Nos. 5.43 and 5.43A apply. (WRC-15)

5.297 *Additional allocation:* in Canada, Costa Rica, Cuba, El Salvador, the United States, Guatemala, Guyana and Jamaica, the frequency band 512-608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement obtained under No. 9.21. In the Bahamas, Barbados and Mexico, the frequency band 512-608 MHz is also allocated to the mobile service on a primary basis, subject to agreement obtained under No. 9.21. (WRC-15)

5.298 *Additional allocation:* in India, the band 549.75-550.25 MHz is also allocated to the space operation service (space-to-Earth) on a secondary basis.

5.300 *Additional allocation:* in Saudi Arabia, Cameroon, Egypt, United Arab Emirates, Israel, Jordan, Libya, Oman, Qatar, the Syrian Arab Republic and Sudan, the frequency band 582-790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-15)

5.304 *Additional allocation:* in the African Broadcasting Area (see Nos. 5.10 to 5.13), the band 606-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.305 *Additional allocation:* in China, the band 606-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.306 *Additional allocation:* in Region 1, except in the African Broadcasting Area (see Nos. 5.10 to 5.13), and in Region 3, the band 608-614 MHz is also allocated to the radio astronomy service on a secondary basis.

5.307 *Additional allocation:* in India, the band 608-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.308 *Additional allocation:* in Belize and Colombia, the frequency band 614-698 MHz is also allocated to the mobile service on a primary basis. Stations of the mobile service within the frequency band are subject to agreement obtained under No. 9.21. (WRC-15)

5.308A In the Bahamas, Barbados, Belize, Canada, Colombia, the United States and Mexico, the frequency band 614-698 MHz, or portions thereof, is identified for International Mobile Telecommunications (IMT) – see Resolution 224 (Rev.WRC-15). This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. Mobile service stations of the IMT system within the frequency band are subject to agreement obtained under No. 9.21 and shall not cause harmful interference to or claim protection from the broadcasting service of neighbouring countries. Nos. 5.43 and 5.43A apply. In Belize and Mexico, the use of IMT in this frequency band will not start before 31 December 2018 and may be extended if agreed by the neighbouring countries. (WRC-15)

5.309 *Different category of service:* in El Salvador, the allocation of the frequency band 614-806 MHz to the fixed service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC-15)

5.311A For the frequency band 620-790 MHz, see also Resolution 549 (WRC-07). (WRC-07)

5.312 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the frequency band 645-862 MHz, in Bulgaria the frequency bands 646-686 MHz, 726-758 MHz, 766-814 MHz and 822-862 MHz, and in Poland the frequency band 860-862 MHz until 31 December 2017, are also allocated to the aeronautical radionavigation service on a primary basis. (WRC-15)

5.312A In Region 1, the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service is subject to the provisions of Resolution 760 (WRC-15). See also Resolution 224 (Rev.WRC-15). (WRC-15)

5.313A The frequency band, or portions of the frequency band 698-790 MHz, in Australia, Bangladesh, Brunei Darussalam, Cambodia, China, Korea (Rep. of), Fiji, India, Indonesia, Japan, Kiribati, Lao P.D.R., Malaysia, Myanmar (Union of), New Zealand, Pakistan, Papua New Guinea, the Philippines, Solomon Islands, Samoa, Singapore, Thailand, Tonga, Tuvalu, Vanuatu and Viet Nam, are identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. In China, the use of IMT in this frequency band will not start until 2015. (WRC-15)

5.316B In Region 1, the allocation to the mobile, except aeronautical mobile, service in the frequency band 790-862 MHz is subject to agreement obtained under No. 9.21 with respect to the aeronautical radionavigation service in countries mentioned in No. 5.312. For countries party to the GE06 Agreement, the use of stations of the mobile service is also subject to the successful application of the procedures of that Agreement. Resolutions 224 (Rev.WRC-15) and 749 (Rev.WRC-15) shall apply, as appropriate. (WRC-15)

5.317 *Additional allocation:* in Region 2 (except Brazil, the United States and Mexico), the frequency band 806-890 MHz is also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. 9.21. The use of this service is intended for operation within national boundaries. (WRC-15)

5.317A The parts of the frequency band 698-960 MHz in Region 2 and the frequency bands 694-790 MHz in Region 1 and 790-960 MHz in Regions 1 and 3 which are allocated to the mobile service on a primary basis are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) – see Resolutions 224 (Rev.WRC-15), 760 (WRC-15) and 749 (Rev.WRC-15), where applicable. This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC−15)

5.318 *Additional allocation:* in Canada, the United States and Mexico, the bands 849-851 MHz and 894-896 MHz are also allocated to the aeronautical mobile service on a primary basis, for public correspondence with aircraft. The use of the band 849-851 MHz is limited to transmissions from aeronautical stations and the use of the band 894-896 MHz is limited to transmissions from aircraft stations.

5.319 *Additional allocation:* in Belarus, the Russian Federation and Ukraine, the bands 806-840 MHz (Earth-to-space) and 856-890 MHz (space-to-Earth) are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service. The use of these bands by this service shall not cause harmful interference to, or claim protection from, services in other countries operating in accordance with the Table of Frequency Allocations and is subject to special agreements between the administrations concerned.

5.320 *Additional allocation:* in Region 3, the bands 806-890 MHz and 942-960 MHz are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service on a primary basis, subject to agreement obtained under No. 9.21. The use of this service is limited to operation within national boundaries. In seeking such agreement, appropriate protection shall be afforded to services operating in accordance with the Table, to ensure that no harmful interference is caused to such services.

5.322 In Region 1, in the band 862-960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. 5.10 to 5.13) excluding Algeria, Burundi, Egypt, Spain, Lesotho, Libya, Morocco, Malawi, Namibia, Nigeria, South Africa, Tanzania, Zimbabwe and Zambia, subject to agreement obtained under No. 9.21. (WRC-12)

5.323 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 862-960 MHz, in Bulgaria the bands 862-890.2 MHz and 900-935.2 MHz, in Poland the band 862-876 MHz until 31 December 2017, and in Romania the bands 862-880 MHz and 915-925 MHz, are also allocated to the aeronautical radionavigation service on a primary basis. Such use is subject to agreement obtained under No. 9.21 with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime. (WRC-12)

5.325 *Different category of service:* in the United States, the allocation of the band 890-942 MHz to the radiolocation service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21.

5.325A *Different category of service:* in Argentina, Brazil, Costa Rica, Cuba, Dominican Republic, El Salvador, Ecuador, the French overseas departments and communities in Region 2, Guatemala, Mexico, Paraguay, Uruguay and Venezuela, the frequency band 902-928 MHz is allocated to the land mobile service on a primary basis. In Colombia, the frequency band 902-905 MHz is allocated to the land mobile service on a primary basis. (WRC-15)

5.326 *Different category of service:* in Chile, the band 903-905 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis, subject to agreement obtained under No. 9.21.

5.327 *Different category of service:* in Australia, the allocation of the band 915-928 MHz to the radiolocation service is on a primary basis (see No. 5.33).

5.327A The use of the frequency band 960-1164 MHz by the aeronautical mobile (R) service is limited to systems that operate in accordance with recognized international aeronautical standards. Such use shall be in accordance with Resolution 417 (Rev.WRC-15). (WRC-15)

5.328 The use of the band 960-1215 MHz by the aeronautical radionavigation service is reserved on a worldwide basis for the operation and development of airborne electronic aids to air navigation and any directly associated ground-based facilities.

5.328A Stations in the radionavigation-satellite service in the band 1164-1215 MHz shall operate in accordance with the provisions of Resolution 609 (Rev.WRC-07) and shall not claim protection from stations in the aeronautical radionavigation service in the band 960-1215 MHz. No. 5.43A does not apply.The provisions of No. 21.18 shall apply. (WRC-07)

5.328AA The frequency band 1087.7-1092.3 MHz is also allocated to the aeronautical mobile-satellite (R) service (Earth-to-space) on a primary basis, limited to the space station reception of Automatic Dependent Surveillance-Broadcast (ADS-B) emissions from aircraft transmitters that operate in accordance with recognized international aeronautical standards. Stations operating in the aeronautical mobile-satellite (R) service shall not claim protection from stations operating in the aeronautical radionavigation service. Resolution 425 (WRC-15) shall apply. (WRC-15)

5.328B The use of the bands 1164-1300 MHz, 1559-1610 MHz and 5010-5030 MHz by systems and networks in the radionavigation-satellite service for which complete coordination or notification information, as appropriate, is received by the Radiocommunication Bureau after 1 January 2005 is subject to the application of the provisions of Nos. 9.12, 9.12A and 9.13. Resolution 610 (WRC-03) shall also apply; however, in the case of radionavigation-satellite service (space-to-space) networks and systems, Resolution 610 (WRC-03) shall only apply to transmitting space stations. In accordance with No. 5.329A, for systems and networks in the radionavigation-satellite service (space-to-space) in the bands 1215-1300 MHz and 1559-1610 MHz, the provisions of Nos. 9.7, 9.12, 9.12A and 9.13 shall only apply with respect to other systems and networks in the radionavigation-satellite service (space-to-space). (WRC-07)

5.329 Use of the radionavigation-satellite service in the band 1215-1300 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under No. 5.331. Furthermore, the use of the radionavigation-satellite service in the

band 1215-1300 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. No. 5.43 shall not apply in respect of the radiolocation service. Resolution 608 (Rev.WRC-15) shall apply. (FCC)

5.329A Use of systems in the radionavigation-satellite service (space-to-space) operating in the bands 1215-1300 MHz and 1559-1610 MHz is not intended to provide safety service applications, and shall not impose any additional constraints on radionavigation-satellite service (space-to-Earth) systems or on other services operating in accordance with the Table of Frequency Allocations. (WRC-07)

5.330 *Additional allocation:* in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Nepal, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the band 1215-1300 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

5.331 *Additional allocation:* in Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, China, Korea (Rep. of), Croatia, Denmark, Egypt, the United Arab Emirates, Estonia, the Russian Federation, Finland, France, Ghana, Greece, Guinea, Equatorial Guinea, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Jordan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritania, Montenegro, Nigeria, Norway, Oman, Pakistan, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sudan, South Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the band 1215-1300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the band 1240-1300 MHz is also allocated to the radionavigation service, and use of the radionavigation service shall be limited to the aeronautical radionavigation service. (WRC-12)

5.332 In the band 1215-1260 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the radionavigation-satellite service and other services allocated on a primary basis.

5.334 *Additional allocation:* in Canada and the United States, the band 1350-1370 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.335 In Canada and the United States in the band 1240-1300 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause interference to, claim protection from, or otherwise impose constraints on operation or development of the aeronautical radionavigation service.

5.335A In the band 1260-1300 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service and other services allocated by footnotes on a primary basis.

5.337 The use of the bands 1300-1350 MHz, 2700-2900 MHz and 9000-9200 MHz by the aeronautical radionavigation service is restricted to ground-based radars and to associated airborne transponders which transmit only on frequencies in these bands and only when actuated by radars operating in the same band.

5.337A The use of the band 1300-1350 MHz by earth stations in the radionavigation-satellite service and by stations in the radiolocation service shall not cause harmful interference to, nor constrain the operation and development of, the aeronautical-radionavigation service.

5.338 In Kyrgyzstan, Slovakia and Turkmenistan, existing installations of the radionavigation service may continue to operate in the band 1350-1400 MHz. (WRC-12)

5.338A In the frequency bands 1350-1400 MHz, 1427-1452 MHz, 22.55-23.55 GHz, 30-31.3 GHz, 49.7-

50.2 GHz, 50.4-50.9 GHz, 51.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution 750 (Rev.WRC-15) applies. (WRC-15)

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.

5.340 All emissions are prohibited in the following bands:
1400-1427 MHz,
2690-2700 MHz, except those provided for by No. 5.422,
10.68-10.7 GHz, except those provided for by No. 5.483,
15.35-15.4 GHz, except those provided for by No. 5.511,
23.6-24 GHz,
31.3-31.5 GHz,
31.5-31.8 GHz, in Region 2,
48.94-49.04 GHz, from airborne stations
50.2-50.4 GHz[2],
52.6-54.25 GHz,
86-92 GHz,
100-102 GHz,
109.5-111.8 GHz,
114.25-116 GHz,
148.5-151.5 GHz,
164-167 GHz,
182-185 GHz,
190-191.8 GHz,
200-209 GHz,
226-231.5 GHz,
250-252 GHz.

5.341 In the bands 1400-1727 MHz, 101-120 GHz and 197-220 GHz, passive research is being conducted by some countries in a programme for the search for intentional emissions of extraterrestrial origin.

5.341A In Region 1, the frequency bands 1427-1452 MHz and 1492-1518 MHz are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-15). This identification does not preclude the use of these frequency bands by any other application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of IMT stations is subject to agreement obtained under No. 9.21 with respect to the aeronautical mobile service used for aeronautical telemetry in accordance with No. 5.342. (WRC-15)

5.341B In Region 2, the frequency band 1427-1518 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-15). This identification does not preclude the use of this frequency band by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.341C The frequency bands 1427-1452 MHz and 1492-1518 MHz are identified for use by

[2] **5.340.1** The allocation to the Earth exploration-satellite service (passive) and the space research service (passive) in the band 50.2-50.4 GHz should not impose undue constraints on the use of the adjacent bands by the primary allocated services in those bands.

administrations in Region 3 wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-15). The use of these frequency bands by the above administrations for the implementation of IMT in the frequency bands 1429-1452 MHz and 1492-1518 MHz is subject to agreement obtained under No. 9.21 from countries using stations of the aeronautical mobile service. This identification does not preclude the use of these frequency bands by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.342 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Uzbekistan, Kyrgyzstan and Ukraine, the frequency band 1429-1535 MHz is also allocated to the aeronautical mobile service on a primary basis, exclusively for the purposes of aeronautical telemetry within the national territory. As of 1 April 2007, the use of the frequency band 1452-1492 MHz is subject to agreement between the administrations concerned. (WRC-15)

5.343 In Region 2, the use of the band 1435-1535 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

5.344 *Alternative allocation:* in the United States, the band 1452-1525 MHz is allocated to the fixed and mobile services on a primary basis (see also No. 5.343).

5.345 Use of the band 1452-1492 MHz by the broadcasting-satellite service, and by the broadcasting service, is limited to digital audio broadcasting and is subject to the provisions of Resolution 528 (Rev.WRC-15). (FCC)

5.346 In Algeria, Angola, Saudi Arabia, Bahrain, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Congo (Rep. of the), Côte d'Ivoire, Djibouti, Egypt, United Arab Emirates, Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Kenya, Kuwait, Lesotho, Lebanon, Liberia, Madagascar, Malawi, Mali, Morocco, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Uganda, Palestine, Qatar, Dem. Rep. of the Congo, Rwanda, Senegal, Seychelles, Sudan, South Sudan, South Africa, Swaziland, Tanzania, Chad, Togo, Tunisia, Zambia, and Zimbabwe, the frequency band 1452-1492 MHz is identified for use by administrations listed above wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-15). This identification does not preclude the use of this frequency band by any other application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of this frequency band for the implementation of IMT is subject to agreement obtained under No. 9.21 with respect to the aeronautical mobile service used for aeronautical telemetry in accordance with No. 5.342. See also Resolution 761 (WRC-15). (WRC-15)

NOTE: The use by Palestine of the allocation to the mobile service in the frequency band 1452-1492 MHz identified for IMT is noted, pursuant to Resolution 99 (Rev. Busan, 2014) and taking into account the Israeli-Palestinian Interim Agreement of 28 September 1995.

5.346A The frequency band 1452-1492 MHz is identified for use by administrations in Region 3 wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-15) and Resolution 761 (WRC-15). The use of this frequency band by the above administrations for the implementation of IMT is subject to agreement obtained under No. 9.21 from countries using stations of the aeronautical mobile service. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.348 The use of the band 1518-1525 MHz by the mobile-satellite service is subject to coordination under No. 9.11A. In the band 1518-1525 MHz stations in the mobile-satellite service shall not claim protection from the stations in the fixed service. No. 5.43A does not apply.

5.348A In the band 1518-1525 MHz, the coordination threshold in terms of the power flux-density levels at the surface of the Earth in application of No. 9.11A for space stations in the mobile-satellite (space-to-Earth) service, with respect to the land mobile service use for specialized mobile radios or used in

conjunction with public switched telecommunication networks (PSTN) operating within the territory of Japan, shall be −150 dB(W/m²) in any 4 kHz band for all angles of arrival, instead of those given in Table 5-2 of Appendix 5. In the band 1518-1525 MHz stations in the mobile-satellite service shall not claim protection from stations in the mobile service in the territory of Japan. No. 5.43A does not apply.

5.348B In the band 1518-1525 MHz, stations in the mobile-satellite service shall not claim protection from aeronautical mobile telemetry stations in the mobile service in the territory of the United States (see Nos. 5.343 and 5.344) and in the countries listed in No. 5.342. No. 5.43A does not apply.

5.349 *Different category of service:* in Saudi Arabia, Azerbaijan, Bahrain, Cameroon, Egypt, France, Iran (Islamic Republic of), Iraq, Israel, Kazakhstan, Kuwait, The Former Yugoslav Republic of Macedonia, Lebanon, Morocco, Qatar, Syrian Arab Republic, Kyrgyzstan, Turkmenistan and Yemen, the allocation of the band 1525-1530 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. 5.33). (WRC-07)

5.350 *Additional allocation:* in Azerbaijan, Kyrgyzstan and Turkmenistan, the band 1525-1530 MHz is also allocated to the aeronautical mobile service on a primary basis.

5.351 The bands 1525-1544 MHz, 1545-1559 MHz, 1626.5-1645.5 MHz and 1646.5-1660.5 MHz shall not be used for feeder links of any service. In exceptional circumstances, however, an earth station at a specified fixed point in any of the mobile-satellite services may be authorized by an administration to communicate via space stations using these bands.

5.351A For the use of the bands 1518-1544 MHz, 1545-1559 MHz, 1610-1645.5 MHz, 1646.5-1660.5 MHz, 1668-1675 MHz, 1980-2010 MHz, 2170-2200 MHz, 2483.5-2520 MHz and 2670-2690 MHz by the mobile-satellite service, see Resolutions 212 (Rev.WRC-15) and 225 (Rev.WRC-12). (FCC)

5.352A In the frequency band 1525-1530 MHz, stations in the mobile-satellite service, except stations in the maritime mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed service in Algeria, Saudi Arabia, Egypt, France and French overseas communities of Region 3, Guinea, India, Israel, Italy, Jordan, Kuwait, Mali, Morocco, Mauritania, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Viet Nam and Yemen notified prior to 1 April 1998. (WRC-15)

5.353A In applying the procedures of Section II of Article 9 to the mobile-satellite service in the bands 1530-1544 MHz and 1626.5-1645.5 MHz, priority shall be given to accommodating the spectrum requirements for distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS). Maritime mobile-satellite distress, urgency and safety communications shall have priority access and immediate availability over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, distress, urgency and safety communications of the GMDSS. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution 222 (Rev.WRC-12) shall apply.) (FCC)

5.354 The use of the bands 1525-1559 MHz and 1626.5-1660.5 MHz by the mobile-satellite services is subject to coordination under No. 9.11A.

5.355 *Additional allocation:* in Bahrain, Bangladesh, Congo (Rep. of the), Djibouti, Egypt, Eritrea, Iraq, Israel, Kuwait, Qatar, Syrian Arab Republic, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the bands 1540-1559 MHz, 1610-1645.5 MHz and 1646.5-1660 MHz are also allocated to the fixed service on a secondary basis. (WRC-12)

5.356 The use of the band 1544-1545 MHz by the mobile-satellite service (space-to-Earth) is limited to distress and safety communications (see Article 31).

5.357 Transmissions in the band 1545-1555 MHz from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links.

5.357A In applying the procedures of Section II of Article 9 to the mobile-satellite service in the frequency bands 1545-1555 MHz and 1646.5-1656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article 44. Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44 shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution 222 (Rev.WRC-12) shall apply.) (WRC-12)

5.359 *Additional allocation:* in Germany, Saudi Arabia, Armenia, Azerbaijan, Belarus, Benin, Cameroon, the Russian Federation, France, Georgia, Guinea, Guinea-Bissau, Jordan, Kazakhstan, Kuwait, Lithuania, Mauritania, Uganda, Uzbekistan, Pakistan, Poland, the Syrian Arab Republic, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Tajikistan, Tunisia, Turkmenistan and Ukraine, the frequency bands 1550-1559 MHz, 1610-1645.5 MHz and 1646.5-1660 MHz are also allocated to the fixed service on a primary basis. Administrations are urged to make all practicable efforts to avoid the implementation of new fixed-service stations in these frequency bands. (WRC-15)

5.362A In the United States, in the bands 1555-1559 MHz and 1656.5-1660.5 MHz, the aeronautical mobile-satellite (R) service shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

5.364 The use of the band 1610-1626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to coordination under No. 9.11A. A mobile earth station operating in either of the services in this band shall not produce a peak e.i.r.p. density in excess of −15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. 5.366 (to which No. 4.10 applies), unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, the mean e.i.r.p. density of a mobile earth station shall not exceed −3 dB(W/4 kHz). Stations of the mobile-satellite service shall not claim protection from stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. 5.366 and stations in the fixed service operating in accordance with the provisions of No. 5.359. Administrations responsible for the coordination of mobile-satellite networks shall make all practicable efforts to ensure protection of stations operating in accordance with the provisions of No. 5.366.

5.365 The use of the band 1613.8-1626.5 MHz by the mobile-satellite service (space-to-Earth) is subject to coordination under No. 9.11A.

5.366 The band 1610-1626.5 MHz is reserved on a worldwide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities. Such satellite use is subject to agreement obtained under No. 9.21.

5.367 *Additional allocation:* The frequency band 1610-1626.5 MHz is also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. 9.21. (WRC-12)

5.368 With respect to the radiodetermination-satellite and mobile-satellite services the provisions of No. 4.10 do not apply in the band 1610-1626.5 MHz, with the exception of the aeronautical radionavigation-satellite service.

5.369 *Different category of service:* in Angola, Australia, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Israel, Lebanon, Liberia, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, the Dem. Rep. of the Congo, Sudan, South Sudan, Togo and Zambia, the allocation of the band 1610-1626.5 MHz to the radiodetermination-satellite service (Earth-to-space) is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21 from countries not listed in this provision. (WRC-12)

5.370 *Different category of service:* in Venezuela, the allocation to the radiodetermination-satellite service in the band 1610-1626.5 MHz (Earth-to-space) is on a secondary basis.

5.371 *Additional allocation:* in Region 1, the band 1610-1626.5 MHz (Earth-to-space) is also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. 9.21. (WRC-12)

5.372 Harmful interference shall not be caused to stations of the radio astronomy service using the band 1610.6-1613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. 29.13 applies).

5.374 Mobile earth stations in the mobile-satellite service operating in the bands 1631.5-1634.5 MHz and 1656.5-1660 MHz shall not cause harmful interference to stations in the fixed service operating in the countries listed in No. 5.359.

5.375 The use of the band 1645.5-1646.5 MHz by the mobile-satellite service (Earth-to-space) and for inter-satellite links is limited to distress and safety communications (see Article 31).

5.376 Transmissions in the band 1646.5-1656.5 MHz from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

5.376A Mobile earth stations operating in the band 1660-1660.5 MHz shall not cause harmful interference to stations in the radio astronomy service.

5.379 *Additional allocation:* in Bangladesh, India, Indonesia, Nigeria and Pakistan, the band 1660.5-1668.4 MHz is also allocated to the meteorological aids service on a secondary basis.

5.379A Administrations are urged to give all practicable protection in the band 1660.5-1668.4 MHz for future research in radio astronomy, particularly by eliminating air-to-ground transmissions in the meteorological aids service in the band 1664.4-1668.4 MHz as soon as practicable.

5.379B The use of the band 1668-1675 MHz by the mobile-satellite service is subject to coordination under No. 9.11A. In the band 1668-1668.4 MHz, Resolution 904 (WRC-07) shall apply. (WRC-07)

5.379C In order to protect the radio astronomy service in the band 1668-1670 MHz, the aggregate power flux-density values produced by mobile earth stations in a network of the mobile-satellite service operating in this band shall not exceed −181 dB(W/m²) in 10 MHz and −194 dB(W/m²) in any 20 kHz at any radio astronomy station recorded in the Master International Frequency Register, for more than 2% of integration periods of 2000 s.

5.379D For sharing of the band 1668.4-1675 MHz between the mobile-satellite service and the fixed and mobile services, Resolution 744 (Rev.WRC-07) shall apply. (WRC-07)

5.379E In the band 1668.4-1675 MHz, stations in the mobile-satellite service shall not cause harmful interference to stations in the meteorological aids service in China, Iran (Islamic Republic of), Japan and Uzbekistan. In the band 1668.4-1675 MHz, administrations are urged not to implement new systems in the meteorological aids service and are encouraged to migrate existing meteorological aids service operations to other bands as soon as practicable.

5.380A In the band 1670-1675 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, existing earth stations in the meteorological-satellite

service notified before 1 January 2004. Any new assignment to these earth stations in this band shall also be protected from harmful interference from stations in the mobile-satellite service. (WRC-07)

5.381 *Additional allocation:* in Afghanistan, Cuba, India, Iran (Islamic Republic of) and Pakistan, the band 1690-1700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.382 *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Guinea, Iraq, Israel, Jordan, Kazakhstan, Kuwait, the Former Yugoslav Republic of Macedonia, Lebanon, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Turkmenistan, Ukraine and Yemen, the allocation of the frequency band 1690-1700 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. 5.33), and in the Dem. People's Rep. of Korea, the allocation of the frequency band 1690-1700 MHz to the fixed service is on a primary basis (see No. 5.33) and to the mobile, except aeronautical mobile, service on a secondary basis. (WRC-15)

5.384 *Additional allocation:* in India, Indonesia and Japan, the band 1700-1710 MHz is also allocated to the space research service (space-to-Earth) on a primary basis.

5.384A The frequency bands, 1710-1885 MHz, 2300-2400 MHz and 2500-2690 MHz, or portions thereof, are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-15). This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.385 *Additional allocation:* the band 1718.8-1722.2 MHz is also allocated to the radio astronomy service on a secondary basis for spectral line observations.

5.386 *Additional allocation:* the frequency band 1750-1850 MHz is also allocated to the space operation (Earth-to-space) and space research (Earth-to-space) services in Region 2 (except in Mexico), in Australia, Guam, India, Indonesia and Japan on a primary basis, subject to agreement obtained under No. 9.21, having particular regard to troposcatter systems. (WRC-15)

5.387 *Additional allocation:* in Belarus, Georgia, Kazakhstan, Kyrgyzstan, Romania, Tajikistan and Turkmenistan, the band 1770-1790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under No. 9.21. (WRC-12)

5.388 The frequency bands 1885-2025 MHz and 2110-2200 MHz are intended for use, on a worldwide basis, by administrations wishing to implement International Mobile Telecommunications (IMT). Such use does not preclude the use of these frequency bands by other services to which they are allocated. The frequency bands should be made available for IMT in accordance with Resolution 212 (Rev.WRC-15) (see also Resolution 223 (Rev.WRC-15)). (WRC-15)

5.388A In Regions 1 and 3, the bands 1885-1980 MHz, 2010-2025 MHz and 2110-2170 MHz and, in Region 2, the bands 1885-1980 MHz and 2110-2160 MHz may be used by high altitude platform stations as base stations to provide International Mobile Telecommunications (IMT), in accordance with Resolution 221 (Rev.WRC-07). Their use by IMT applications using high altitude platform stations as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-12)

5.388B In Algeria, Saudi Arabia, Bahrain, Benin, Burkina Faso, Cameroon, Comoros, Côte d'Ivoire, China, Cuba, Djibouti, Egypt, United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, India, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Libya, Mali, Morocco, Mauritania, Nigeria, Oman, Uganda, Pakistan, Qatar, the Syrian Arab Republic, Senegal, Singapore, Sudan, South Sudan, Tanzania, Chad, Togo, Tunisia, Yemen, Zambia and Zimbabwe, for the purpose of protecting fixed and mobile services, including

IMT mobile stations, in their territories from co-channel interference, a high altitude platform station (HAPS) operating as an IMT base station in neighbouring countries, in the bands referred to in No. 5.388A, shall not exceed a co-channel power flux-density of −127 dB(W/(m² · MHz)) at the Earth's surface outside a country's borders unless explicit agreement of the affected administration is provided at the time of the notification of HAPS. (WRC-12)

5.389A The use of the bands 1980-2010 MHz and 2170-2200 MHz by the mobile-satellite service is subject to coordination under No. 9.11A and to the provisions of Resolution 716 (Rev.WRC-12). (FCC)

5.389B The use of the band 1980-1990 MHz by the mobile-satellite service shall not cause harmful interference to or constrain the development of the fixed and mobile services in Argentina, Brazil, Canada, Chile, Ecuador, the United States, Honduras, Jamaica, Mexico, Peru, Suriname, Trinidad and Tobago, Uruguay and Venezuela.

5.389C The use of the bands 2010-2025 MHz and 2160-2170 MHz in Region 2 by the mobile-satellite service is subject to coordination under No. 9.11A and to the provisions of Resolution 716 (Rev.WRC-12). (FCC)

5.389E The use of the bands 2010-2025 MHz and 2160-2170 MHz by the mobile-satellite service in Region 2 shall not cause harmful interference to or constrain the development of the fixed and mobile services in Regions 1 and 3.

5.389F In Algeria, Benin, Cape Verde, Egypt, Iran (Islamic Republic of), Mali, Syrian Arab Republic and Tunisia, the use of the bands 1980-2010 MHz and 2170-2200 MHz by the mobile-satellite service shall neither cause harmful interference to the fixed and mobile services, nor hamper the development of those services prior to 1 January 2005, nor shall the former service request protection from the latter services.

5.391 In making assignments to the mobile service in the frequency bands 2025-2110 MHz and 2200-2290 MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154-0, and shall take that Recommendation into account for the introduction of any other type of mobile system. (WRC-15)

5.392 Administrations are urged to take all practicable measures to ensure that space-to-space transmissions between two or more non-geostationary satellites, in the space research, space operations and Earth exploration-satellite services in the bands 2025-2110 MHz and 2200-2290 MHz, shall not impose any constraints on Earth-to-space, space-to-Earth and other space-to-space transmissions of those services and in those bands between geostationary and non-geostationary satellites.

5.393 *Additional allocation:* in Canada, the United States and India, the frequency band 2310-2360 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial sound broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution 528 (Rev.WRC-15), with the exception of *resolves* 3 in regard to the limitation on broadcasting-satellite systems in the upper 25 MHz. (WRC-15)

5.394 In the United States, the use of the band 2300-2390 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services. In Canada, the use of the band 2360-2400 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services. (WRC-07)

5.395 In France and Turkey, the use of the band 2310-2360 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

5.396 Space stations of the broadcasting-satellite service in the band 2310-2360 MHz operating in accordance with No. 5.393 that may affect the services to which this band is allocated in other countries shall be coordinated and notified in accordance with Resolution 33 (Rev.WRC-15). Complementary terrestrial broadcasting stations shall be subject to bilateral coordination with neighbouring countries prior to their bringing into use. (FCC)

5.398 In respect of the radiodetermination-satellite service in the band 2483.5-2500 MHz, the provisions of No. 4.10 do not apply.

5.398A *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan and Ukraine, the band 2483.5-2500 MHz is allocated on a primary basis to the radiolocation service. The radiolocation stations in these countries shall not cause harmful interference to, or claim protection from, stations of the fixed, mobile and mobile-satellite services operating in accordance with the Radio Regulations in the frequency band 2483.5-2500 MHz. (WRC-12)

5.399 Except for cases referred to in No. 5.401, stations of the radiodetermination-satellite service operating in the frequency band 2483.5-2500 MHz for which notification information is received by the Bureau after 17 February 2012, and the service area of which includes Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan and Ukraine, shall not cause harmful interference to, and shall not claim protection from stations of the radiolocation service operating in these countries in accordance with No. 5.398A. (WRC-12)

5.401 In Angola, Australia, Bangladesh, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, Dem. Rep. of the Congo, Sudan, Swaziland, Togo and Zambia, the frequency band 2483.5-2500 MHz was already allocated on a primary basis to the radiodetermination-satellite service before WRC-12, subject to agreement obtained under No. 9.21 from countries not listed in this provision. Systems in the radiodetermination-satellite service for which complete coordination information has been received by the Radiocommunication Bureau before 18 February 2012 will retain their regulatory status, as of the date of receipt of the coordination request information. (WRC-15)

5.402 The use of the band 2483.5-2500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the coordination under No. 9.11A. Administrations are urged to take all practicable steps to prevent harmful interference to the radio astronomy service from emissions in the 2483.5-2500 MHz band, especially those caused by second-harmonic radiation that would fall into the 4990-5000 MHz band allocated to the radio astronomy service worldwide.

5.403 Subject to agreement obtained under No. 9.21, the band 2520-2535 MHz may also be used for the mobile-satellite (space-to-Earth), except aeronautical mobile-satellite, service for operation limited to within national boundaries. The provisions of No. 9.11A apply. (WRC-07)

5.404 *Additional allocation:* in India and Iran (Islamic Republic of), the band 2500-2516.5 MHz may also be used for the radiodetermination-satellite service (space-to-Earth) for operation limited to within national boundaries, subject to agreement obtained under No. 9.21.

5.407 In the band 2500-2520 MHz, the power flux-density at the surface of the Earth from space stations operating in the mobile-satellite (space-to-Earth) service shall not exceed −152 dB (W/(m² · 4 kHz)) in Argentina, unless otherwise agreed by the administrations concerned.

5.410 The band 2500-2690 MHz may be used for tropospheric scatter systems in Region 1, subject to agreement obtained under No. 9.21. No. 9.21 does not apply to tropospheric scatter links situated entirely outside Region 1. Administrations shall make all practicable efforts to avoid developing new tropospheric scatter systems in this band. When planning new tropospheric scatter radio-relay links in this band, all possible measures shall be taken to avoid directing the antennas of these links towards the geostationary-satellite orbit. (WRC-12)

5.412 *Alternative allocation:* in Kyrgyzstan and Turkmenistan, the band 2500-2690 MHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-12)

5.413 In the design of systems in the broadcasting-satellite service in the bands between 2500 MHz and 2690 MHz, administrations are urged to take all necessary steps to protect the radio astronomy service in the band 2690-2700 MHz.

5.414 The allocation of the frequency band 2500-2520 MHz to the mobile-satellite service (space-to-Earth) is subject to coordination under No. 9.11A. (WRC-07)

5.414A In Japan and India, the use of the bands 2500-2520 MHz and 2520-2535 MHz, under No. 5.403, by a satellite network in the mobile-satellite service (space-to-Earth) is limited to operation within national boundaries and subject to the application of No. 9.11A. The following pfd values shall be used as a threshold for coordination under No. 9.11A, for all conditions and for all methods of modulation, in an area of 1000 km around the territory of the administration notifying the mobile-satellite service network:

-136 dB(W/(m² · MHz)) for $0° \le \theta \le 5°$

$-136 + 0.55\ (\theta - 5)$ dB(W/(m² · MHz)) for $5° < \theta \le 25°$

-125 dB(W/(m² · MHz)) for $25° < \theta \le 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. Outside this area Table 21-4 of Article 21 shall apply. Furthermore, the coordination thresholds in Table 5-2 of Annex 1 to Appendix 5 of the Radio Regulations (Edition of 2004), in conjunction with the applicable provisions of Articles 9 and 11 associated with No. 9.11A, shall apply to systems for which complete notification information has been received by the Radicommunication Bureau by 14 November 2007 and that have been brought into use by that date. (WRC-07)

5.415 The use of the bands 2500-2690 MHz in Region 2 and 2500-2535 MHz and 2655-2690 MHz in Region 3 by the fixed-satellite service is limited to national and regional systems, subject to agreement obtained under No. 9.21, giving particular attention to the broadcasting-satellite service in Region 1. (WRC-07)

5.415A *Additional allocation:* in India and Japan, subject to agreement obtained under No. 9.21, the band 2515-2535 MHz may also be used for the aeronautical mobile-satellite service (space-to-Earth) for operation limited to within their national boundaries.

5.416 The use of the band 2520-2670 MHz by the broadcasting-satellite service is limited to national and regional systems for community reception, subject to agreement obtained under No. 9.21. The provisions of No. 9.19 shall be applied by administrations in this band in their bilateral and multilateral negotiations. (WRC-07)

5.418 *Additional allocation:* in India, the frequency band 2535-2655 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution 528 (Rev.WRC-15). The provisions of No. 5.416 and Table 21-4 of Article 21, do not apply to this additional allocation. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) is subject to Resolution 539 (Rev.WRC-15). Geostationary broadcasting-satellite service (sound) systems for which complete Appendix 4 coordination information has been received after 1 June 2005 are limited to systems intended for national coverage. The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the frequency band 2630-2655 MHz, and for which complete Appendix 4 coordination information has been received after 1 June 2005, shall not exceed the following limits, for all conditions and for all methods of modulation:

-130 dB(W/(m² · MHz)) for $0° \le \theta \le 5°$

$-130 + 0.4\ (\theta - 5)$ dB(W/(m² · MHz)) for $5° < \theta \le 25°$

-122 dB(W/(m² · MHz)) for $25° < \theta \le 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. As an exception to the limits above, the pfd value of -122 dB(W/(m² · MHz)) shall be used as a threshold for coordination under No. 9.11 in an area of 1500 km around the territory of the administration notifying the broadcasting-satellite service (sound) system.

In addition, an administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. 5.416 for systems for which complete Appendix 4 coordination information has been received after 1 June 2005. (WRC-15)

5.418A In certain Region 3 countries listed in No. 5.418, use of the band 2630-2655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound) for which complete Appendix 4 coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. 9.12A, in respect of geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received after 2 June 2000, and No. 22.2 does not apply. No. 22.2 shall continue to apply with respect to geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received before 3 June 2000.

5.418B Use of the band 2630-2655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.418, for which complete Appendix 4 coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. 9.12.

5.418C Use of the band 2630-2655 MHz by geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, has been received after 2 June 2000 is subject to the application of the provisions of No. 9.13 with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.418 and No. 22.2 does not apply.

5.419 When introducing systems of the mobile-satellite service in the band 2670-2690 MHz, administrations shall take all necessary steps to protect the satellite systems operating in this band prior to 3 March 1992. The coordination of mobile-satellite systems in the band shall be in accordance with No. 9.11A. (WRC-07)

5.420 The band 2655-2670 MHz may also be used for the mobile-satellite (Earth-to-space), except aeronautical mobile-satellite, service for operation limited to within national boundaries, subject to agreement obtained under No. 9.21. The coordination under No. 9.11A applies. (WRC-07)

5.422 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Brunei Darussalam, Congo (Rep. of the), Côte d'Ivoire, Cuba, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Georgia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Mauritania, Mongolia, Montenegro, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, the Dem. Rep. of the Congo, Romania, Somalia, Tajikistan, Tunisia, Turkmenistan, Ukraine and Yemen, the band 2690-2700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985. (WRC-12)

5.423 In the band 2700-2900 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the aeronautical radionavigation service.

5.424 *Additional allocation:* in Canada, the band 2850-2900 MHz is also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars.

5.424A In the band 2900-3100 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the radionavigation service.

5.425 In the band 2900-3100 MHz, the use of the shipborne interrogator-transponder (SIT) system shall be confined to the sub-band 2930-2950 MHz.

5.426 The use of the band 2900-3100 MHz by the aeronautical radionavigation service is limited to ground-based radars.

5.427 In the bands 2900-3100 MHz and 9300-9500 MHz, the response from radar transponders shall not be capable of being confused with the response from radar beacons (racons) and shall not cause interference to ship or aeronautical radars in the radionavigation service, having regard, however, to No. 4.9.

5.428 *Additional allocation:* in Azerbaijan, Kyrgyzstan and Turkmenistan, the frequency band 3100-3300 MHz is also allocated to the radionavigation service on a primary basis. (WRC-15)

5.429 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Benin, Brunei Darussalam, Cambodia, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Oman, Uganda, Pakistan, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea, Sudan and Yemen, the frequency band 3300-3400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service. (WRC-15)

5.429A *Additional allocation:* in Angola, Benin, Botswana, Burkina Faso, Burundi, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Malawi, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sudan, South Sudan, South Africa, Swaziland, Tanzania, Chad, Togo, Zambia and Zimbabwe, the frequency band 3300-3400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. Stations in the mobile service operating in the frequency band 3300-3400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. (WRC-15)

5.429B In the following countries of Region 1 south of 30° parallel north: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Congo (Rep. of the), Côte d'Ivoire, Egypt, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Malawi, Mauritania, Mozambique, Namibia, Niger, Nigeria, Uganda, the Dem. Rep. of the Congo, Rwanda, Sudan, South Sudan, South Africa, Swaziland, Tanzania, Chad, Togo, Zambia and Zimbabwe, the frequency band 3300-3400 MHz is identified for the implementation of International Mobile Telecommunications (IMT). The use of this frequency band shall be in accordance with Resolution 223 (Rev.WRC-15). The use of the frequency band 3300-3400 MHz by IMT stations in the mobile service shall not cause harmful interference to, or claim protection from, systems in the radiolocation service, and administrations wishing to implement IMT shall obtain the agreement of neighbouring countries to protect operations within the radiolocation service. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.429C *Different category of service:* in Argentina, Brazil, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Paraguay and Uruguay, the frequency band 3300-3400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. In Argentina, Brazil, Guatemala, Mexico and Paraguay, the frequency band 3300-3400 MHz is also allocated to the fixed service on a primary basis. Stations in the fixed and mobile services operating in the frequency band 3300-3400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. (WRC-15)

5.429D In the following countries in Region 2: Argentina, Colombia, Costa Rica, Ecuador, Mexico and Uruguay, the use of the frequency band 3300-3400 MHz is identified for the implementation of International Mobile Telecommunications (IMT). Such use shall be in accordance with Resolution 223 (Rev.WRC-15). This use in Argentina and Uruguay is subject to the application of No. 9.21. The use of the frequency band 3300-3400 MHz by IMT stations in the mobile service shall not cause harmful interference to, or claim protection from, systems in the radiolocation service, and administrations wishing to implement IMT shall obtain the agreement of neighbouring countries to protect operations within the radiolocation service. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.429E *Additional allocation:* in Papua New Guinea, the frequency band 3300-3400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. Stations in the mobile service operating in the frequency band 3300-3400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. (WRC-15)

5.429F In the following countries in Region 3: Cambodia, India, Lao P.D.R., Pakistan, the Philippines and Viet Nam, the use of the frequency band 3300-3400 MHz is identified for the implementation of International Mobile Telecommunications (IMT). Such use shall be in accordance with Resolution 223 (Rev.WRC-15). The use of the frequency band 3300-3400 MHz by IMT stations in the mobile service shall not cause harmful interference to, or claim protection from, systems in the radiolocation service. Before an administration brings into use a base or mobile station of an IMT system in this frequency band, it shall seek agreement under No. 9.21 with neighbouring countries to protect the radiolocation service. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-15)

5.430 *Additional allocation:* in Azerbaijan, Kyrgyzstan and Turkmenistan, the frequency band 3300-3400 MHz is also allocated to the radionavigation service on a primary basis. (WRC-15)

5.430A The allocation of the frequency band 3400-3600 MHz to the mobile, except aeronautical mobile, service is subject to agreement obtained under No. 9.21. This frequency band is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. The provisions of Nos. 9.17 and 9.18 shall also apply in the coordination phase. Before an administration brings into use a (base or mobile) station of the mobile service in this frequency band, it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m² · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station) and with the assistance of the Bureau if so requested. In case of disagreement, calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the frequency band 3400-3600 MHz shall not claim more protection from space stations than that provided in Table 21-4 of the Radio Regulations (Edition of 2004). This allocation is effective from 17 November 2010. (WRC-15)

5.431 *Additional allocation:* in Germany and Israel, the frequency band 3400-3475 MHz is also allocated to the amateur service on a secondary basis. (WRC-15)

5.431A In Region 2, the allocation of the frequency band 3400-3500 MHz to the mobile, except aeronautical mobile, service on a primary basis is subject to agreement obtained under No. 9.21. (WRC-15)

5.431B In Region 2, the frequency band 3400-3600 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a base or mobile station of an IMT system, it shall seek agreement under No. 9.21 with other administrations and ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m² · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the

administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service, including IMT systems, in the frequency band 3400-3600 MHz shall not claim more protection from space stations than that provided in Table 21-4 of the Radio Regulations (Edition of 2004). (WRC-15)

5.432 *Different category of service:* in Korea (Rep. of), Japan and Pakistan, the allocation of the band 3400-3500 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. 5.33).

5.432A In Korea (Rep. of), Japan and Pakistan, the band 3400-3500 MHz is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a (base or mobile) station of the mobile service in this band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m² · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the band 3400-3500 MHz shall not claim more protection from space stations than that provided in Table 21-4 of the Radio Regulations (Edition of 2004). (WRC-07)

5.432B *Different category of service:* in Australia, Bangladesh, China, French overseas communities of Region 3, India, Iran (Islamic Republic of), New Zealand, the Philippines and Singapore, the frequency band 3400-3500 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis, subject to agreement obtained under No. 9.21 with other administrations and is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a (base or mobile) station of the mobile service in this frequency band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m² · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the frequency band 3400-3500 MHz shall not claim more protection from space stations than that provided in Table 21-4 of the Radio Regulations (Edition of 2004). (WRC-15)

5.433 In Regions 2 and 3, in the band 3400-3600 MHz the radiolocation service is allocated on a primary basis. However, all administrations operating radiolocation systems in this band are urged to cease operations by 1985. Thereafter, administrations shall take all practicable steps to protect the fixed-satellite service and coordination requirements shall not be imposed on the fixed-satellite service.

5.433A In Australia, Bangladesh, China, French overseas communities of Region 3, Korea (Rep. of), India, Iran (Islamic Republic of), Japan, New Zealand, Pakistan and the Philippines, the frequency band 3500-

3600 MHz is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a (base or mobile) station of the mobile service in this frequency band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB (W/(m² · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the frequency band 3500-3600 MHz shall not claim more protection from space stations than that provided in Table 21-4 of the Radio Regulations (Edition of 2004). (WRC-15)

5.434 In Canada, Colombia, Costa Rica and the United States, the frequency band 3600-3700 MHz, or portions thereof, is identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a base or mobile station of an IMT system, it shall seek agreement under No. 9.21 with other administrations and ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m² · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service, including IMT systems, in the frequency band 3600-3700 MHz shall not claim more protection from space stations than that provided in Table 21-4 of the Radio Regulations (Edition of 2004). (WRC-15)

5.435 In Japan, in the band 3620-3700 MHz, the radiolocation service is excluded.

5.436 Use of the frequency band 4200-4400 MHz by stations in the aeronautical mobile (R) service is reserved exclusively for wireless avionics intra-communication systems that operate in accordance with recognized international aeronautical standards. Such use shall be in accordance with Resolution 424 (WRC-15). (WRC-15)

5.437 Passive sensing in the Earth exploration-satellite and space research services may be authorized in the frequency band 4200-4400 MHz on a secondary basis. (WRC-15)

5.438 Use of the frequency band 4200-4400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the ground. (WRC-15)

5.439 *Additional allocation:* in Iran (Islamic Republic of), the band 4200-4400 MHz is also allocated to the fixed service on a secondary basis. (WRC-12)

5.440 The standard frequency and time signal-satellite service may be authorized to use the frequency 4202 MHz for space-to-Earth transmissions and the frequency 6427 MHz for Earth-to-space transmissions. Such

transmissions shall be confined within the limits of ± 2 MHz of these frequencies, subject to agreement obtained under No. 9.21.

5.440A In Region 2 (except Brazil, Cuba, French overseas departments and communities, Guatemala, Paraguay, Uruguay and Venezuela), and in Australia, the band 4400-4940 MHz may be used for aeronautical mobile telemetry for flight testing by aircraft stations (see No. 1.83). Such use shall be in accordance with Resolution 416 (WRC-07) and shall not cause harmful interference to, nor claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of this band by other mobile service applications or by other services to which this band is allocated on a co-primary basis and does not establish priority in the Radio Regulations. (WRC-07)

5.441 The use of the bands 4500-4800 MHz (space-to-Earth), 6725-7025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix 30B. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix 30B. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. 5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

5.441A In Uruguay, the frequency band 4800-4900 MHz, or portions thereof, is identified for the implementation of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of this frequency band for the implementation of IMT is subject to agreement obtained with neighbouring countries, and IMT stations shall not claim protection from stations of other applications of the mobile service. Such use shall be in accordance with Resolution 223 (Rev.WRC-15). (WRC-15)

5.441B In Cambodia, Lao P.D.R. and Viet Nam, the frequency band 4800-4990 MHz, or portions thereof, is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of this frequency band for the implementation of IMT is subject to agreement obtained under No. 9.21 with concerned administrations, and IMT stations shall not claim protection from stations of other applications of the mobile service. In addition, before an administration brings into use an IMT station in the mobile service, it shall ensure that the power flux-density produced by this station does not exceed −155 dB(W/(m² · 1 MHz)) produced up to 19 km above sea level at 20 km from the coast, defined as the low-water mark, as officially recognized by the coastal State. This criterion is subject to review at WRC-19. See Resolution 223 (Rev.WRC-15). This identification shall be effective after WRC-19. (WRC-15)

5.442 In the frequency bands 4825-4835 MHz and 4950-4990 MHz, the allocation to the mobile service is restricted to the mobile, except aeronautical mobile, service. In Region 2 (except Brazil, Cuba, Guatemala, Mexico, Paraguay, Uruguay and Venezuela), and in Australia, the frequency band 4825-4835 MHz is also allocated to the aeronautical mobile service, limited to aeronautical mobile telemetry for

flight testing by aircraft stations. Such use shall be in accordance with Resolution 416 (WRC-07) and shall not cause harmful interference to the fixed service. (WRC-15)

5.443 *Different category of service:* in Argentina, Australia and Canada, the allocation of the bands 4825-4835 MHz and 4950-4990 MHz to the radio astronomy service is on a primary basis (see No. 5.33).

5.443AA In the frequency bands 5000-5030 MHz and 5091-5150 MHz, the aeronautical mobile-satellite (R) service is subject to agreement obtained under No. 9.21. The use of these bands by the aeronautical mobile-satellite (R) service is limited to internationally standardized aeronautical systems. (WRC-12)

5.443B In order not to cause harmful interference to the microwave landing system operating above 5030 MHz, the aggregate power flux-density produced at the Earth's surface in the frequency band 5030-5150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the frequency band 5010-5030 MHz shall not exceed −124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the frequency band 4990-5000 MHz, radionavigation-satellite service systems operating in the frequency band 5010-5030 MHz shall comply with the limits in the frequency band 4990-5000 MHz defined in Resolution 741 (Rev.WRC-15). (WRC-15)

5.443C The use of the frequency band 5030-5091 MHz by the aeronautical mobile (R) service is limited to internationally standardized aeronautical systems. Unwanted emissions from the aeronautical mobile (R) service in the frequency band 5030-5091 MHz shall be limited to protect RNSS system downlinks in the adjacent 5010-5030 MHz band. Until such time that an appropriate value is established in a relevant ITU-R Recommendation, the e.i.r.p. density limit of −75 dBW/MHz in the frequency band 5010-5030 MHz for any AM(R)S station unwanted emission should be used. (WRC-12)

5.443D In the frequency band 5030-5091 MHz, the aeronautical mobile-satellite (R) service is subject to coordination under No. 9.11A. The use of this frequency band by the aeronautical mobile-satellite (R) service is limited to internationally standardized aeronautical systems. (WRC-12)

5.444 The frequency band 5030-5150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. In the frequency band 5030-5091 MHz, the requirements of this system shall have priority over other uses of this frequency band. For the use of the frequency band 5091-5150 MHz, No. 5.444A and Resolution 114 (Rev.WRC-15) apply. (WRC-15)

5.444A The use of the allocation to the fixed-satellite service (Earth-to-space) in the frequency band 5091-5150 MHz is limited to feeder links of non-geostationary satellite systems in the mobile-satellite service and is subject to coordination under No. 9.11A. The use of the frequency band 5091-5150 MHz by feeder links of non-geostationary satellite systems in the mobile-satellite service shall be subject to application of Resolution 114 (Rev.WRC-15). Moreover, to ensure that the aeronautical radionavigation service is protected from harmful interference, coordination is required for feeder-link earth stations of the non-geostationary satellite systems in the mobile-satellite service which are separated by less than 450 km from the territory of an administration operating ground stations in the aeronautical radionavigation service. (WRC-15)

5.444B The use of the frequency band 5091-5150 MHz by the aeronautical mobile service is limited to:

– systems operating in the aeronautical mobile (R) service and in accordance with international aeronautical standards, limited to surface applications at airports. Such use shall be in accordance with Resolution 748 (Rev.WRC-15);

– aeronautical telemetry transmissions from aircraft stations (see No. 1.83) in accordance with Resolution 418 (Rev.WRC-15). (WRC-15)

5.446 *Additional allocation:* in the countries listed in No. 5.369, the frequency band 5150-5216 MHz is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis, subject to

agreement obtained under No. 9.21. In Region 2 (except in Mexico), the frequency band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis. In Regions 1 and 3, except those countries listed in No. 5.369 and Bangladesh, the frequency band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a secondary basis. The use by the radiodetermination-satellite service is limited to feeder links in conjunction with the radiodetermination-satellite service operating in the frequency bands 1610-1626.5 MHz and/or 2483.5-2500 MHz. The total power flux-density at the Earth's surface shall in no case exceed −159 dB (W/m²) in any 4 kHz band for all angles of arrival. (WRC-15)

5.446A The use of the bands 5150-5350 MHz and 5470-5725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution 229 (Rev.WRC-12). (WRC-12)

5.446B In the band 5150-5250 MHz, stations in the mobile service shall not claim protection from earth stations in the fixed-satellite service. No. 5.43A does not apply to the mobile service with respect to fixed-satellite service earth stations.

5.446C *Additional allocation:* in Region 1 (except in Algeria, Saudi Arabia, Bahrain, Egypt, United Arab Emirates, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Syrian Arab Republic, Sudan, South Sudan and Tunisia) and in Brazil, the band 5150-5250 MHz is also allocated to the aeronautical mobile service on a primary basis, limited to aeronautical telemetry transmissions from aircraft stations (see No. 1.83), in accordance with Resolution 418 (Rev.WRC-15). These stations shall not claim protection from other stations operating in accordance with Article 5. No. 5.43A does not apply. (FCC)

5.447 *Additional allocation:* in Côte d'Ivoire, Egypt, Israel, Lebanon, the Syrian Arab Republic and Tunisia, the band 5150-5250 MHz is also allocated to the mobile service, on a primary basis, subject to agreement obtained under No. 9.21. In this case, the provisions of Resolution 229 (Rev.WRC-12) do not apply. (WRC-12)

5.447A The allocation to the fixed-satellite service (Earth-to-space) in the band 5150-5250 MHz is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to coordination under No. 9.11A.

5.447B *Additional allocation:* the band 5150-5216 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. This allocation is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to provisions of No. 9.11A. The power flux-density at the Earth's surface produced by space stations of the fixed-satellite service operating in the space-to-Earth direction in the band 5150-5216 MHz shall in no case exceed −164 dB(W/m²) in any 4 kHz band for all angles of arrival.

5.447C Administrations responsible for fixed-satellite service networks in the band 5150-5250 MHz operated under Nos. 5.447A and 5.447B shall coordinate on an equal basis in accordance with No. 9.11A with administrations responsible for non-geostationary-satellite networks operated under No. 5.446 and brought into use prior to 17 November 1995. Satellite networks operated under No. 5.446 brought into use after 17 November 1995 shall not claim protection from, and shall not cause harmful interference to, stations of the fixed-satellite service operated under Nos. 5.447A and 5.447B.

5.447D The allocation of the band 5250-5255 MHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis.

5.447E *Additional allocation:* The frequency band 5250-5350 MHz is also allocated to the fixed service on a primary basis in the following countries in Region 3: Australia, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Papua New Guinea, the Philippines, Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam. The use of this frequency band by the fixed service is intended for the implementation of fixed wireless access systems and shall comply with Recommendation ITU-R F.1613-0.

In addition, the fixed service shall not claim protection from the radiodetermination, Earth exploration-satellite (active) and space research (active) services, but the provisions of No. 5.43A do not apply to the fixed service with respect to the Earth exploration-satellite (active) and space research (active) services. After implementation of fixed wireless access systems in the fixed service with protection for the existing radiodetermination systems, no more stringent constraints should be imposed on the fixed wireless access systems by future radiodetermination implementations. (WRC-15)

5.447F In the frequency band 5250-5350 MHz, stations in the mobile service shall not claim protection from the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active). These services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU-R M.1638-0 and ITU-R RS.1632-0. (WRC-15)

5.448 *Additional allocation:* in Azerbaijan, Kyrgyzstan, Romania and Turkmenistan, the band 5250-5350 MHz is also allocated to the radionavigation service on a primary basis. (WRC-12)

5.448A The Earth exploration-satellite (active) and space research (active) services in the frequency band 5250-5350 MHz shall not claim protection from the radiolocation service. No. 5.43A does not apply.

5.448B The Earth exploration-satellite service (active) operating in the band 5350-5570 MHz and space research service (active) operating in the band 5460-5570 MHz shall not cause harmful interference to the aeronautical radionavigation service in the band 5350-5460 MHz, the radionavigation service in the band 5460-5470 MHz and the maritime radionavigation service in the band 5470-5570 MHz.

5.448C The space research service (active) operating in the band 5350-5460 MHz shall not cause harmful interference to nor claim protection from other services to which this band is allocated.

5.448D In the frequency band 5350-5470 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the aeronautical radionavigation service operating in accordance with No. 5.449.

5.449 The use of the band 5350-5470 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons.

5.450 *Additional allocation:* in Austria, Azerbaijan, Iran (Islamic Republic of), Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 5470-5650 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-12)

5.450A In the frequency band 5470-5725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. Radiodetermination services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendation ITU-R M.1638-0. (WRC-15)

5.450B In the frequency band 5470-5650 MHz, stations in the radiolocation service, except ground-based radars used for meteorological purposes in the band 5600-5650 MHz, shall not cause harmful interference to, nor claim protection from, radar systems in the maritime radionavigation service.

5.451 *Additional allocation:* in the United Kingdom, the band 5470-5850 MHz is also allocated to the land mobile service on a secondary basis. The power limits specified in Nos. 21.2, 21.3, 21.4 and 21.5 shall apply in the band 5725-5850 MHz.

5.452 Between 5600 MHz and 5650 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the maritime radionavigation service.

5.453 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Djibouti, Egypt, the United Arab Emirates, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Madagascar, Malaysia, Niger, Nigeria, Oman, Uganda, Pakistan, the

Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sri Lanka, Swaziland, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the band 5650-5850 MHz is also allocated to the fixed and mobile services on a primary basis. In this case, the provisions of Resolution 229 (Rev.WRC-12) do not apply. (WRC-12)

5.454 *Different category of service:* in Azerbaijan, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 5670-5725 MHz to the space research service is on a primary basis (see No. 5.33). (WRC-12)

5.455 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 5670-5850 MHz is also allocated to the fixed service on a primary basis. (WRC-07)

5.457 In Australia, Burkina Faso, Cote d'Ivoire, Mali and Nigeria, the allocation to the fixed service in the bands 6440-6520 MHz (HAPS-to-ground direction) and 6560-6640 MHz (ground-to-HAPS direction) may also be used by gateway links for high-altitude platform stations (HAPS) within the territory of these countries. Such use is limited to operation in HAPS gateway links and shall not cause harmful interference to, and shall not claim protection from, existing services, and shall be in compliance with Resolution 150 (WRC-12). Existing services shall not be constrained in future development by HAPS gateway links. The use of HAPS gateway links in these bands requires explicit agreement with other administrations whose territories are located within 1000 kilometres from the border of an administration intending to use the HAPS gateway links. (WRC-12)

5.457A In the frequency bands 5925-6425 MHz and 14-14.5 GHz, earth stations located on board vessels may communicate with space stations of the fixed-satellite service. Such use shall be in accordance with Resolution 902 (WRC-03). In the frequency band 5925-6425 MHz, earth stations located on board vessels and communicating with space stations of the fixed-satellite service may employ transmit antennas with minimum diameter of 1.2 m and operate without prior agreement of any administration if located at least 330 km away from the low-water mark as officially recognized by the coastal State. All other provisions of Resolution 902 (WRC-03) shall apply. (WRC-15)

5.457B In the frequency bands 5925-6425 MHz and 14-14.5 GHz, earth stations located on board vessels may operate with the characteristics and under the conditions contained in Resolution 902 (WRC-03) in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Jordan, Kuwait, Libya, Morocco, Mauritania, Oman, Qatar, the Syrian Arab Republic, Sudan, Tunisia and Yemen, in the maritime mobile-satellite service on a secondary basis. Such use shall be in accordance with Resolution 902 (WRC-03). (WRC-15)

5.457C In Region 2 (except Brazil, Cuba, French overseas departments and communities, Guatemala, Mexico, Paraguay, Uruguay and Venezuela), the frequency band 5925-6700 MHz may be used for aeronautical mobile telemetry for flight testing by aircraft stations (see No. 1.83). Such use shall be in accordance with Resolution 416 (WRC-07) and shall not cause harmful interference to, or claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of this frequency band by other mobile service applications or by other services to which this frequency band is allocated on a co-primary basis and does not establish priority in the Radio Regulations. (WRC-15)

5.458 In the band 6425-7075 MHz, passive microwave sensor measurements are carried out over the oceans. In the band 7075-7250 MHz, passive microwave sensor measurements are carried out. Administrations should bear in mind the needs of the Earth exploration-satellite (passive) and space research (passive) services in their future planning of the bands 6425-7075 MHz and 7075-7250 MHz.

5.458A In making assignments in the band 6700-7075 MHz to space stations of the fixed-satellite service, administrations are urged to take all practicable steps to protect spectral line observations of the radio astronomy service in the band 6650-6675.2 MHz from harmful interference from unwanted emissions.

5.458B The space-to-Earth allocation to the fixed-satellite service in the band 6700-7075 MHz is limited to feeder links for non-geostationary satellite systems of the mobile-satellite service and is subject to coordination under No. 9.11A. The use of the band 6700-7075 MHz (space-to-Earth) by feeder links for non-geostationary satellite systems in the mobile-satellite service is not subject to No. 22.2.

5.459 *Additional allocation:* in the Russian Federation, the frequency bands 7100-7155 MHz and 7190-7235 MHz are also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. 9.21. In the frequency band 7190-7235 MHz, with respect to the Earth exploration-satellite service (Earth-to-space), No. 9.21 does not apply. (WRC-15)

5.460 No emissions from space research service (Earth-to-space) systems intended for deep space shall be effected in the frequency band 7190-7235 MHz. Geostationary satellites in the space research service operating in the frequency band 7190-7235 MHz shall not claim protection from existing and future stations of the fixed and mobile services and No. 5.43A does not apply. (WRC-15)

5.460A The use of the frequency band 7190-7250 MHz (Earth-to-space) by the Earth exploration-satellite service shall be limited to tracking, telemetry and command for the operation of spacecraft. Space stations operating in the Earth exploration-satellite service (Earth-to-space) in the frequency band 7190-7250 MHz shall not claim protection from existing and future stations in the fixed and mobile services, and No. 5.43A does not apply. No. 9.17 applies. Additionally, to ensure protection of the existing and future deployment of fixed and mobile services, the location of earth stations supporting spacecraft in the Earth exploration-satellite service in non-geostationary orbits or geostationary orbit shall maintain a separation distance of at least 10 km and 50 km, respectively, from the respective border(s) of neighbouring countries, unless a shorter distance is otherwise agreed between the corresponding administrations. (WRC-15)

5.460B Space stations on the geostationary orbit operating in the Earth exploration-satellite service (Earth-to-space) in the frequency band 7190-7235 MHz shall not claim protection from existing and future stations of the space research service, and No. 5.43A does not apply. (WRC-15)

5.461 *Additional allocation:* the bands 7250-7375 MHz (space-to-Earth) and 7900-8025 MHz (Earth-to-space) are also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. 9.21.

5.461A The use of the band 7450-7550 MHz by the meteorological-satellite service (space-to-Earth) is limited to geostationary-satellite systems. Non-geostationary meteorological-satellite systems in this band notified before 30 November 1997 may continue to operate on a primary basis until the end of their lifetime.

5.461AA The use of the frequency band 7375-7750 MHz by the maritime mobile-satellite service is limited to geostationary-satellite networks. (WRC-15)

5.461AB In the frequency band 7375-7750 MHz, earth stations in the maritime mobile-satellite service shall not claim protection from, nor constrain the use and development of, stations in the fixed and mobile, except aeronautical mobile, services. No. 5.43A does not apply. (WRC-15)

5.461B The use of the band 7750-7900 MHz by the meteorological-satellite service (space-to-Earth) is limited to non-geostationary satellite systems. (WRC-12)

5.462A In Regions 1 and 3 (except for Japan), in the band 8025-8400 MHz, the Earth exploration-satellite service using geostationary satellites shall not produce a power flux-density in excess of the following values for angles of arrival (θ), without the consent of the affected administration:

-135 dB(W/m^2) in a 1 MHz band for $0 \le \theta < 5^\circ$

$-135 + 0.5\,(\theta - 5)$ dB(W/m^2) in a 1 MHz band for $5 \le \theta < 25^\circ$

-125 dB(W/m^2) in a 1 MHz band for $25 \le \theta \le 90^\circ$ (WRC-12)

5.463 Aircraft stations are not permitted to transmit in the band 8025-8400 MHz.

5.465 In the space research service, the use of the band 8400-8450 MHz is limited to deep space.

5.466 *Different category of service:* in Singapore and Sri Lanka, the allocation of the band 8400-8500 MHz to the space research service is on a secondary basis (see No. 5.32). (WRC-12)

5.468 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, Congo (Rep. of the), Djibouti, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Uganda, Pakistan, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Senegal, Singapore, Somalia, Sudan, Swaziland, Chad, Togo, Tunisia and Yemen, the frequency band 8500-8750 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.469 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Lithuania, Mongolia, Uzbekistan, Poland, Kyrgyzstan, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 8500-8750 MHz is also allocated to the land mobile and radionavigation services on a primary basis. (WRC-12)

5.469A In the band 8550-8650 MHz, stations in the Earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radiolocation service.

5.470 The use of the band 8750-8850 MHz by the aeronautical radionavigation service is limited to airborne Doppler navigation aids on a centre frequency of 8800 MHz.

5.471 *Additional allocation:* in Algeria, Germany, Bahrain, Belgium, China, Egypt, the United Arab Emirates, France, Greece, Indonesia, Iran (Islamic Republic of), Libya, the Netherlands, Qatar and Sudan, the frequency bands 8825-8850 MHz and 9000-9200 MHz are also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars only. (WRC-15)

5.472 In the bands 8850-9000 MHz and 9200-9225 MHz, the maritime radionavigation service is limited to shore-based radars.

5.473 *Additional allocation:* in Armenia, Austria, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the bands 8850-9000 MHz and 9200-9300 MHz are also allocated to the radionavigation service on a primary basis. (WRC-07)

5.473A In the band 9000-9200 MHz, stations operating in the radiolocation service shall not cause harmful interference to, nor claim protection from, systems identified in No. 5.337 operating in the aeronautical radionavigation service, or radar systems in the maritime radionavigation service operating in this band on a primary basis in the countries listed in No. 5.471. (WRC-07)

5.474 In the band 9200-9500 MHz, search and rescue transponders (SART) may be used, having due regard to the appropriate ITU-R Recommendation (see also Article 31).

5.474A The use of the frequency bands 9200-9300 MHz and 9900-10 400 MHz by the Earth exploration-satellite service (active) is limited to systems requiring necessary bandwidth greater than 600 MHz that cannot be fully accommodated within the frequency band 9300-9900 MHz. Such use is subject to agreement to be obtained under No. 9.21 from Algeria, Saudi Arabia, Bahrain, Egypt, Indonesia, Iran (Islamic Republic of), Lebanon and Tunisia. An administration that has not replied under No. 9.52 is considered as not having agreed to the coordination request. In this case, the notifying administration of the satellite system operating in the Earth exploration-satellite service (active) may request the assistance of the Bureau under Sub-Section IID of Article 9. (WRC-15)

5.474B Stations operating in the Earth exploration-satellite (active) service shall comply with Recommendation ITU-R RS.2066-0. (WRC-15)

5.474C Stations operating in the Earth exploration-satellite (active) service shall comply with

Recommendation ITU-R RS.2065-0. (WRC-15)

5.474D Stations in the Earth exploration-satellite service (active) shall not cause harmful interference to, or claim protection from, stations of the maritime radionavigation and radiolocation services in the frequency band 9200-9300 MHz, the radionavigation and radiolocation services in the frequency band 9900-10 000 MHz and the radiolocation service in the frequency band 10.0-10.4 GHz. (WRC-15)

5.475 The use of the band 9300-9500 MHz by the aeronautical radionavigation service is limited to airborne weather radars and ground-based radars. In addition, ground-based radar beacons in the aeronautical radionavigation service are permitted in the band 9300-9320 MHz on condition that harmful interference is not caused to the maritime radionavigation service. (WRC-07)

5.475A The use of the band 9300-9500 MHz by the Earth exploration-satellite service (active) and the space research service (active) is limited to systems requiring necessary bandwidth greater than 300 MHz that cannot be fully accommodated within the 9500-9800 MHz band. (WRC-07)

5.475B In the band 9300-9500 MHz, stations operating in the radiolocation service shall not cause harmful interference to, nor claim protection from, radars operating in the radionavigation service in conformity with the Radio Regulations. Ground-based radars used for meteorological purposes have priority over other radiolocation uses. (WRC-07)

5.476A In the band 9300-9800 MHz, stations in the Earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, nor claim protection from, stations of the radionavigation and radiolocation services. (WRC-07)

5.477 *Different category of service:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Japan, Jordan, Kuwait, Lebanon, Liberia, Malaysia, Nigeria, Oman, Uganda, Pakistan, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Trinidad and Tobago, and Yemen, the allocation of the frequency band 9800-10 000 MHz to the fixed service is on a primary basis (see No. 5.33). (WRC-15)

5.478 *Additional allocation:* in Azerbaijan, Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 9800-10 000 MHz is also allocated to the radionavigation service on a primary basis. (WRC-07)

5.478A The use of the band 9800-9900 MHz by the Earth exploration-satellite service (active) and the space research service (active) is limited to systems requiring necessary bandwidth greater than 500 MHz that cannot be fully accommodated within the 9300-9800 MHz band. (WRC-07)

5.478B In the band 9800-9900 MHz, stations in the Earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, nor claim protection from stations of the fixed service to which this band is allocated on a secondary basis. (WRC-07)

5.479 The band 9975-10 025 MHz is also allocated to the meteorological-satellite service on a secondary basis for use by weather radars.

5.480 *Additional allocation:* in Argentina, Brazil, Chile, Cuba, El Salvador, Ecuador, Guatemala, Honduras, Paraguay, the Netherlands Antilles, Peru and Uruguay, the frequency band 10-10.45 GHz is also allocated to the fixed and mobile services on a primary basis. In Colombia, Costa Rica, Mexico and Venezuela, the frequency band 10-10.45 GHz is also allocated to the fixed service on a primary basis. (WRC-15)

5.481 *Additional allocation:* in Algeria, Germany, Angola, Brazil, China, Côte d'Ivoire, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Pakistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Romania and Uruguay, the frequency band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis. In Costa Rica, the frequency band 10.45-10.5 GHz is also allocated to the fixed service on a primary basis. (WRC-15)

5.482 In the band 10.6-10.68 GHz, the power delivered to the antenna of stations of the fixed and mobile, except aeronautical mobile, services shall not exceed −3 dBW. This limit may be exceeded, subject to agreement obtained under No. 9.21. However, in Algeria, Saudi Arabia, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, Egypt, United Arab Emirates, Georgia, India, Indonesia, Iran (Islamic Republic of), Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Moldova, Nigeria, Oman, Uzbekistan, Pakistan, Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, Singapore, Tajikistan, Tunisia, Turkmenistan and Viet Nam, this restriction on the fixed and mobile, except aeronautical mobile, services is not applicable. (WRC-07)

5.482A For sharing of the band 10.6-10.68 GHz between the Earth exploration-satellite (passive) service and the fixed and mobile, except aeronautical mobile, services, Resolution 751 (WRC-07) applies. (WRC-07)

5.483 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, China, Colombia, Korea (Rep. of), Costa Rica, Egypt, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Lebanon, Mongolia, Qatar, Kyrgyzstan, the Dem. People's Rep. of Korea, Tajikistan, Turkmenistan and Yemen, the band 10.68-10.7 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985. (WRC-12)

5.484 In Region 1, the use of the band 10.7-11.7 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service.

5.484A The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 13.75-14.5 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. 5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

5.484B Resolution 155 (WRC-15) shall apply. (WRC-15)

5.485 In Region 2, in the band 11.7-12.2 GHz, transponders on space stations in the fixed-satellite service may be used additionally for transmissions in the broadcasting-satellite service, provided that such transmissions do not have a maximum e.i.r.p. greater than 53 dBW per television channel and do not cause greater interference or require more protection from interference than the coordinated fixed-satellite service frequency assignments. With respect to the space services, this band shall be used principally for the fixed-satellite service.

5.486 *Different category of service:* in the United States, the allocation of the frequency band 11.7-12.1 GHz to the fixed service is on a secondary basis (see No. 5.32). (WRC-15)

5.487 In the band 11.7-12.5 GHz in Regions 1 and 3, the fixed, fixed-satellite, mobile, except aeronautical mobile, and broadcasting services, in accordance with their respective allocations, shall not cause harmful interference to, or claim protection from, broadcasting-satellite stations operating in accordance with the Regions 1 and 3 Plan in Appendix 30.

5.487A *Additional allocation:* in Region 1, the band 11.7-12.5 GHz, in Region 2, the band 12.2-12.7 GHz and, in Region 3, the band 11.7-12.2 GHz, are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to non-geostationary systems and subject to application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the broadcasting-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. 5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

5.488 The use of the band 11.7-12.2 GHz by geostationary-satellite networks in the fixed-satellite service in Region 2 is subject to application of the provisions of No. 9.14 for coordination with stations of terrestrial services in Regions 1, 2 and 3. For the use of the band 12.2-12.7 GHz by the broadcasting-satellite service in Region 2, see Appendix 30.

5.489 *Additional allocation:* in Peru, the band 12.1-12.2 GHz is also allocated to the fixed service on a primary basis.

5.490 In Region 2, in the band 12.2-12.7 GHz, existing and future terrestrial radiocommunication services shall not cause harmful interference to the space services operating in conformity with the broadcasting-satellite Plan for Region 2 contained in Appendix 30.

5.492 Assignments to stations of the broadcasting-satellite service which are in conformity with the appropriate regional Plan or included in the Regions 1 and 3 List in Appendix 30 may also be used for transmissions in the fixed-satellite service (space-to-Earth), provided that such transmissions do not cause more interference, or require more protection from interference, than the broadcasting-satellite service transmissions operating in conformity with the Plan or the List, as appropriate.

5.493 The broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3 is limited to a power flux-density not exceeding −111 dB(W/(m² · 27 MHz)) for all conditions and for all methods of modulation at the edge of the service area.

5.494 *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Cameroon, the Central African Rep., Congo (Rep. of the), Côte d'Ivoire, Djibouti, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Madagascar, Mali, Morocco, Mongolia, Nigeria, Oman, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the frequency band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-15)

5.495 *Additional allocation:* in France, Greece, Monaco, Montenegro, Uganda, Romania and Tunisia, the frequency band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-15)

5.496 *Additional allocation:* in Austria, Azerbaijan, Kyrgyzstan and Turkmenistan, the band 12.5-12.75 GHz is also allocated to the fixed service and the mobile, except aeronautical mobile, service on a primary basis. However, stations in these services shall not cause harmful interference to fixed-satellite service earth stations of countries in Region 1 other than those listed in this footnote. Coordination of these earth stations is not required with stations of the fixed and mobile services of the countries listed in this footnote. The power flux-density limit at the Earth's surface given in Table 21-4 of Article 21, for the fixed-satellite service shall apply on the territory of the countries listed in this footnote.

5.497 The use of the band 13.25-13.4 GHz by the aeronautical radionavigation service is limited to Doppler navigation aids.

5.498A The Earth exploration-satellite (active) and space research (active) services operating in the band 13.25-13.4 GHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service.

5.499 *Additional allocation:* in Bangladesh and India, the band 13.25-14 GHz is also allocated to the fixed service on a primary basis. In Pakistan, the band 13.25-13.75 GHz is allocated to the fixed service on a primary basis. (WRC-12)

5.499A The use of the frequency band 13.4-13.65 GHz by the fixed-satellite service (space-to-Earth) is limited to geostationary-satellite systems and is subject to agreement obtained under No. 9.21 with respect to satellite systems operating in the space research service (space-to-space) to relay data from space stations in the geostationary-satellite orbit to associated space stations in non-geostationary satellite orbits for which advance publication information has been received by the Bureau by 27 November 2015. (WRC-15)

5.499B Administrations shall not preclude the deployment and operation of transmitting earth stations in the standard frequency and time signal-satellite service (Earth-to-space) allocated on a secondary basis in the frequency band 13.4-13.65 GHz due to the primary allocation to FSS (space-to-Earth). (WRC-15)

5.499C The allocation of the frequency band 13.4-13.65 GHz to the space research service on a primary basis is limited to:

– satellite systems operating in the space research service (space-to-space) to relay data from space stations in the geostationary-satellite orbit to associated space stations in non-geostationary satellite orbits for which advance publication information has been received by the Bureau by 27 November 2015,

– active spaceborne sensors,

– satellite systems operating in the space research service (space-to-Earth) to relay data from space stations in the geostationary-satellite orbit to associated earth stations.

Other uses of the frequency band by the space research service are on a secondary basis. (WRC-15)

5.499D In the frequency band 13.4-13.65 GHz, satellite systems in the space research service (space-to-Earth) and/or the space research service (space-to-space) shall not cause harmful interference to, nor claim protection from, stations in the fixed, mobile, radiolocation and Earth exploration-satellite (active) services. (WRC-15)

5.499E In the frequency band 13.4-13.65 GHz, geostationary-satellite networks in the fixed-satellite service (space-to-Earth) shall not claim protection from space stations in the Earth exploration-satellite service (active) operating in accordance with these Regulations, and No. 5.43A does not apply. The provisions of No. 22.2 do not apply to the Earth exploration-satellite service (active) with respect to the fixed-satellite service (space-to-Earth) in this frequency band. (WRC-15)

5.500 *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Madagascar, Malaysia, Mali, Morocco, Mauritania, Niger, Nigeria, Oman, Qatar, the Syrian Arab Republic, Singapore, Sudan, South Sudan, Chad and Tunisia, the frequency band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis. In Pakistan, the frequency band 13.4-13.75 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.501 *Additional allocation:* in Azerbaijan, Hungary, Japan, Kyrgyzstan, Romania and Turkmenistan, the band 13.4-14 GHz is also allocated to the radionavigation service on a primary basis. (WRC-12)

5.501A The allocation of the frequency band 13.65-13.75 GHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the frequency band by the space research service are on a secondary basis. (WRC-15)

5.501B In the band 13.4-13.75 GHz, the Earth exploration-satellite (active) and space research (active) services shall not cause harmful interference to, or constrain the use and development of, the radiolocation service.

5.502 In the band 13.75-14 GHz, an earth station of a geostationary fixed-satellite service network shall have a minimum antenna diameter of 1.2 m and an earth station of a non-geostationary fixed-satellite service system shall have a minimum antenna diameter of 4.5 m. In addition, the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services shall not exceed 59 dBW for elevation angles above 2° and 65 dBW at lower angles. Before an administration brings into use an earth station in a geostationary-satellite network in the fixed-satellite service in this band with an antenna diameter smaller than 4.5 m, it shall ensure that the power flux-density produced by this earth station does not exceed:

– −115 dB(W/(m² · 10 MHz)) for more than 1% of the time produced at 36 m above sea level at the low water mark, as officially recognized by the coastal State;

– −115 dB(W/(m² · 10 MHz)) for more than 1% of the time produced 3 m above ground at the border of the territory of an administration deploying or planning to deploy land mobile radars in this band, unless prior agreement has been obtained.

For earth stations within the fixed-satellite service having an antenna diameter greater than or equal to 4.5 m, the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW.

5.503 In the band 13.75-14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

– in the band 13.77-13.78 GHz, the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed:

i) $4.7D + 28$ dB (W/40 kHz), where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 1.2 m and less than 4.5 m;

ii) $49.2 + 20 \log (D/4.5)$ dB(W/40 kHz), where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 4.5 m and less than 31.9 m;

iii) 66.2 dB(W/40 kHz) for any fixed-satellite service earth station for antenna diameters (m) equal to or greater than 31.9 m;

iv) 56.2 dB(W/4 kHz) for narrow-band (less than 40 kHz of necessary bandwidth) fixed-satellite service earth station emissions from any fixed-satellite service earth station having an antenna diameter of 4.5 m or greater;

– the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in the 6 MHz band from 13.772 to 13.778 GHz.

Automatic power control may be used to increase the e.i.r.p. density in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. meeting the above limits in clear-sky conditions.

5.504 The use of the band 14-14.3 GHz by the radionavigation service shall be such as to provide sufficient protection to space stations of the fixed-satellite service.

5.504A In the band 14-14.5 GHz, aircraft earth stations in the secondary aeronautical mobile-satellite service may also communicate with space stations in the fixed-satellite service. The provisions of Nos. 5.29, 5.30 and 5.31 apply.

5.504B Aircraft earth stations operating in the aeronautical mobile-satellite service in the frequency band 14-14.5 GHz shall comply with the provisions of Annex 1, Part C of Recommendation ITU-R M.1643-0, with respect to any radio astronomy station performing observations in the 14.47-14.5 GHz frequency band located on the territory of Spain, France, India, Italy, the United Kingdom and South Africa. (WRC-15)

5.504C In the frequency band 14-14.25 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Bahrain, Botswana, Côte d'Ivoire, Egypt, Guinea, India, Iran (Islamic Republic of), Kuwait, Nigeria, Oman, the Syrian Arab Republic and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643-0, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29. (WRC-15)

5.505 *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Djibouti, Egypt, the United Arab Emirates, Gabon, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Swaziland, Chad, Viet Nam and Yemen, the frequency band 14-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-15)

5.506 The band 14-14.5 GHz may be used, within the fixed-satellite service (Earth-to-space), for feeder links for the broadcasting-satellite service, subject to coordination with other networks in the fixed-satellite service. Such use of feeder links is reserved for countries outside Europe.

5.506A In the band 14-14.5 GHz, ship earth stations with an e.i.r.p. greater than 21 dBW shall operate under the same conditions as earth stations located on board vessels, as provided in Resolution 902 (WRC-03). This footnote shall not apply to ship earth stations for which the complete Appendix 4 information has been received by the Bureau prior to 5 July 2003.

5.506B Earth stations located on board vessels communicating with space stations in the fixed-satellite service may operate in the frequency band 14-14.5 GHz without the need for prior agreement from Cyprus and Malta, within the minimum distance given in Resolution 902 (WRC-03) from these countries. (WRC-15)

5.508 *Additional allocation:* in Germany, France, Italy, Libya, The Former Yugoslav Rep. of Macedonia and the United Kingdom, the band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-12)

5.508A In the frequency band 14.25-14.3 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Bahrain, Botswana, China, Côte d'Ivoire, Egypt, France, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643-0, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29. (WRC-15)

5.509A In the frequency band 14.3-14.5 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Bahrain, Botswana, Cameroon, China, Côte d'Ivoire, Egypt, France, Gabon, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Morocco, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom, Sri Lanka, Tunisia and Viet Nam by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643-0, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite

service to operate as a secondary service in accordance with No. 5.29. (WRC-15)

5.509B The use of the frequency bands 14.5-14.75 GHz in countries listed in Resolution 163 (WRC-15) and 14.5-14.8 GHz in countries listed in Resolution 164 (WRC-15) by the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service is limited to geostationary-satellites. (WRC-15)

5.509C For the use of the frequency bands 14.5-14.75 GHz in countries listed in Resolution 163 (WRC-15) and 14.5-14.8 GHz in countries listed in Resolution 164 (WRC-15) by the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service, the fixed-satellite service earth stations shall have a minimum antenna diameter of 6 m and a maximum power spectral density of −44.5 dBW/Hz at the input of the antenna. The earth stations shall be notified at known locations on land. (WRC-15)

5.509D Before an administration brings into use an earth station in the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service in the frequency bands 14.5-14.75 GHz (in countries listed in Resolution 163 (WRC-15)) and 14.5-14.8 GHz (in countries listed in Resolution 164 (WRC-15)), it shall ensure that the power flux-density produced by this earth station does not exceed −151.5 dB(W/(m^2 · 4 kHz)) produced at all altitudes from 0 m to 19000 m above sea level at 22 km seaward from all coasts, defined as the low-water mark, as officially recognized by each coastal State. (WRC-15)

5.509E In the frequency bands 14.50-14.75 GHz in countries listed in Resolution 163 (WRC-15) and 14.50-14.8 GHz in countries listed in Resolution 164 (WRC-15), the location of earth stations in the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service shall maintain a separation distance of at least 500 km from the border(s) of other countries unless shorter distances are explicitly agreed by those administrations. No. 9.17 does not apply. When applying this provision, administrations should consider the relevant parts of these Regulations and the latest relevant ITU-R Recommendations. (WRC-15)

5.509F In the frequency bands 14.50-14.75 GHz in countries listed in Resolution 163 (WRC-15) and 14.50-14.8 GHz in countries listed in Resolution 164 (WRC-15), earth stations in the fixed-satellite service (Earth-to-space) not for feeder links for the broadcasting-satellite service shall not constrain the future deployment of the fixed and mobile services. (WRC-15)

5.509G The frequency band 14.5-14.8 GHz is also allocated to the space research service on a primary basis. However, such use is limited to the satellite systems operating in the space research service (Earth-to-space) to relay data to space stations in the geostationary-satellite orbit from associated earth stations. Stations in the space research service shall not cause harmful interference to, or claim protection from, stations in the fixed and mobile services and in the fixed-satellite service limited to feeder links for the broadcasting-satellite service and associated space operations functions using the guardbands under Appendix 30A and feeder links for the broadcasting-satellite service in Region 2. Other uses of this frequency band by the space research service are on a secondary basis. (WRC-15)

5.510 Except for use in accordance with Resolution 163 (WRC-15) and Resolution 164 (WRC-15), the use of the frequency band 14.5-14.8 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. This use is reserved for countries outside Europe. Uses other than feeder links for the broadcasting-satellite service are not authorized in Regions 1 and 2 in the frequency band 14.75-14.8 GHz. (WRC-15)

5.511 *Additional allocation:* in Saudi Arabia, Bahrain, Cameroon, Egypt, the United Arab Emirates, Guinea, Iran (Islamic Republic of), Iraq, Israel, Kuwait, Lebanon, Oman, Pakistan, Qatar, the Syrian Arab Republic and Somalia, the band 15.35-15.4 GHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-12)

5.511A Use of the frequency band 15.43-15.63 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links of non-geostationary systems in the mobile-satellite service, subject to coordination under No. 9.11A. (WRC-15)

5.511C Stations operating in the aeronautical radionavigation service shall limit the effective e.i.r.p. in accordance with Recommendation ITU-R S.1340-0. The minimum coordination distance required to protect the aeronautical radionavigation stations (No. 4.10 applies) from harmful interference from feeder-link earth stations and the maximum e.i.r.p. transmitted towards the local horizontal plane by a feeder-link earth station shall be in accordance with Recommendation ITU-R S.1340-0. (WRC-15)

5.511E In the frequency band 15.4-15.7 GHz, stations operating in the radiolocation service shall not cause harmful interference to, or claim protection from, stations operating in the aeronautical radionavigation service. (WRC-12)

5.511F In order to protect the radio astronomy service in the frequency band 15.35-15.4 GHz, radiolocation stations operating in the frequency band 15.4-15.7 GHz shall not exceed the power flux-density level of −156 dB(W/m^2) in a 50 MHz bandwidth in the frequency band 15.35-15.4 GHz, at any radio astronomy observatory site for more than 2 per cent of the time. (WRC-12)

5.512 *Additional allocation:* in Algeria, Saudi Arabia, Austria, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Congo (Rep. of the), Egypt, El Salvador, the United Arab Emirates, Eritrea, Finland, Guatemala, India, Indonesia, Iran (Islamic Republic of), Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Montenegro, Nepal, Nicaragua, Niger, Oman, Pakistan, Qatar, Syrian Arab Republic, the Dem. Rep. of the Congo, Singapore, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the frequency band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-15)

5.513 *Additional allocation:* in Israel, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. These services shall not claim protection from or cause harmful interference to services operating in accordance with the Table in countries other than those included in No. 5.512.

5.513A Spaceborne active sensors operating in the band 17.2-17.3 GHz shall not cause harmful interference to, or constrain the development of, the radiolocation and other services allocated on a primary basis.

5.514 *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Cameroon, El Salvador, the United Arab Emirates, Guatemala, India, Iran (Islamic Republic of), Iraq, Israel, Italy, Japan, Jordan, Kuwait, Libya, Lithuania, Nepal, Nicaragua, Nigeria, Oman, Uzbekistan, Pakistan, Qatar, Kyrgyzstan, Sudan and South Sudan, the frequency band 17.3-17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. 21.3 and 21.5 shall apply. (WRC-15)

5.515 In the band 17.3-17.8 GHz, sharing between the fixed-satellite service (Earth-to-space) and the broadcasting-satellite service shall also be in accordance with the provisions of § 1 of Annex 4 of Appendix 30A.

5.516 The use of the band 17.3-18.1 GHz by geostationary-satellite systems in the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. The use of the band 17.3-17.8 GHz in Region 2 by systems in the fixed-satellite service (Earth-to-space) is limited to geostationary satellites. For the use of the band 17.3-17.8 GHz in Region 2 by feeder links for the broadcasting-satellite service in the band 12.2-12.7 GHz, see Article 11. The use of the bands 17.3-18.1 GHz (Earth-to-space) in Regions 1 and 3 and 17.8-18.1 GHz (Earth-to-space) in Region 2 by non-geostationary-satellite systems in the fixed-satellite service is subject to application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the

Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. 5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

5.516A In the band 17.3-17.7 GHz, earth stations of the fixed-satellite service (space-to-Earth) in Region 1 shall not claim protection from the broadcasting-satellite service feeder-link earth stations operating under Appendix 30A, nor put any limitations or restrictions on the locations of the broadcasting-satellite service feeder-link earth stations anywhere within the service area of the feeder link.

5.516B The following bands are identified for use by high-density applications in the fixed-satellite service:
17.3-17.7 GHz (space-to-Earth) in Region 1,
18.3-19.3 GHz (space-to-Earth) in Region 2,
19.7-20.2 GHz (space-to-Earth) in all Regions,
39.5-40 GHz (space-to-Earth) in Region 1,
40-40.5 GHz (space-to-Earth) in all Regions,
40.5-42 GHz (space-to-Earth) in Region 2,
47.5-47.9 GHz (space-to-Earth) in Region 1,
48.2-48.54 GHz (space-to-Earth) in Region 1,
49.44-50.2 GHz (space-to-Earth) in Region 1, and
27.5-27.82 GHz (Earth-to-space) in Region 1,
28.35-28.45 GHz (Earth-to-space) in Region 2,
28.45-28.94 GHz (Earth-to-space) in all Regions,
28.94-29.1 GHz (Earth-to-space) in Region 2 and 3,
29.25-29.46 GHz (Earth-to-space) in Region 2,
29.46-30 GHz (Earth-to-space) in all Regions,
48.2-50.2 GHz (Earth-to-space) in Region 2.

This identification does not preclude the use of these bands by other fixed-satellite service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in these Radio Regulations among users of the bands. Administrations should take this into account when considering regulatory provisions in relation to these bands. See Resolution 143 (Rev.WRC-07). (FCC)

5.517 In Region 2, use of the fixed-satellite (space-to-Earth) service in the band 17.7-17.8 GHz shall not cause harmful interference to nor claim protection from assignments in the broadcasting-satellite service operating in conformity with the Radio Regulations. (WRC-07)

5.519 *Additional allocation:* the bands 18-18.3 GHz in Region 2 and 18.1-18.4 GHz in Regions 1 and 3 are also allocated to the meteorological-satellite service (space-to-Earth) on a primary basis. Their use is limited to geostationary satellites. (WRC-07)

5.520 The use of the band 18.1-18.4 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links of geostationary-satellite systems in the broadcasting-satellite service.

5.521 *Alternative allocation:* in the United Arab Emirates and Greece, the frequency band 18.1-18.4 GHz is allocated to the fixed, fixed-satellite (space-to-Earth) and mobile services on a primary basis (see No. 5.33). The provisions of No. 5.519 also apply. (WRC-15)

5.522A The emissions of the fixed service and the fixed-satellite service in the band 18.6-18.8 GHz are limited to the values given in Nos. 21.5A and 21.16.2, respectively.

5.522B The use of the band 18.6-18.8 GHz by the fixed-satellite service is limited to geostationary systems and systems with an orbit of apogee greater than 20 000 km.

5.522C In the band 18.6-18.8 GHz, in Algeria, Saudi Arabia, Bahrain, Egypt, the United Arab Emirates, Jordan, Lebanon, Libya, Morocco, Oman, Qatar, the Syrian Arab Republic, Tunisia and Yemen, fixed-service systems in operation at the date of entry into force of the Final Acts of WRC-2000 are not subject to the limits of No. 21.5A.

5.523A The use of the bands 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space) by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. 9.11A and No. 22.2 does not apply. Administrations having geostationary-satellite networks under coordination prior to 18 November 1995 shall cooperate to the maximum extent possible to coordinate pursuant to No. 9.11A with non-geostationary-satellite networks for which notification information has been received by the Bureau prior to that date, with a view to reaching results acceptable to all the parties concerned. Non-geostationary-satellite networks shall not cause unacceptable interference to geostationary fixed-satellite service networks for which complete Appendix 4 notification information is considered as having been received by the Bureau prior to 18 November 1995.

5.523B The use of the band 19.3-19.6 GHz (Earth-to-space) by the fixed-satellite service is limited to feeder links for non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. 9.11A, and No. 22.2 does not apply.

5.523C No. 22.2 shall continue to apply in the bands 19.3-19.6 GHz and 29.1-29.4 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix 4 coordination information, or notification information, is considered as having been received by the Bureau prior to 18 November 1995.

5.523D The use of the band 19.3-19.7 GHz (space-to-Earth) by geostationary fixed-satellite service systems and by feeder links for non-geostationary-satellite systems in the mobile-satellite service is subject to the application of the provisions of No. 9.11A, but not subject to the provisions of No. 22.2. The use of this band for other non-geostationary fixed-satellite service systems, or for the cases indicated in Nos. 5.523C and 5.523E, is not subject to the provisions of No. 9.11A and shall continue to be subject to Articles 9 (except No. 9.11A) and 11 procedures, and to the provisions of No. 22.2.

5.523E No. 22.2 shall continue to apply in the bands 19.6-19.7 GHz and 29.4-29.5 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix 4 coordination information, or notification information, is considered as having been received by the Bureau by 21 November 1997.

5.524 *Additional allocation:* in Afghanistan, Algeria, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Chad, Togo and Tunisia, the frequency band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux- density of space stations in the fixed-satellite service in the frequency band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the frequency band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter frequency band. (WRC-15)

5.525 In order to facilitate interregional coordination between networks in the mobile-satellite and fixed-satellite services, carriers in the mobile-satellite service that are most susceptible to interference shall, to the extent practicable, be located in the higher parts of the bands 19.7-20.2 GHz and 29.5-30 GHz.

5.526 In the bands 19.7-20.2 GHz and 29.5-30 GHz in Region 2, and in the bands 20.1-20.2 GHz and 29.9-30 GHz in Regions 1 and 3, networks which are both in the fixed-satellite service and in the mobile-satellite service may include links between earth stations at specified or unspecified points or while in motion, through one or more satellites for point-to-point and point-to-multipoint communications.

5.527 In the bands 19.7-20.2 GHz and 29.5-30 GHz, the provisions of No. 4.10 do not apply with respect to the mobile-satellite service.

5.527A The operation of earth stations in motion communicating with the FSS is subject to Resolution 156 (WRC-15). (WRC-15)

5.528 The allocation to the mobile-satellite service is intended for use by networks which use narrow spot-beam antennas and other advanced technology at the space stations. Administrations operating systems in the mobile-satellite service in the band 19.7-20.1 GHz in Region 2 and in the band 20.1-20.2 GHz shall take all practicable steps to ensure the continued availability of these bands for administrations operating fixed and mobile systems in accordance with the provisions of No. 5.524.

5.529 The use of the bands 19.7-20.1 GHz and 29.5-29.9 GHz by the mobile-satellite service in Region 2 is limited to satellite networks which are both in the fixed-satellite service and in the mobile-satellite service as described in No. 5.526.

5.530A Unless otherwise agreed between the administrations concerned, any station in the fixed or mobile services of an administration shall not produce a power flux-density in excess of -120.4 dB(W/(m^2 · MHz)) at 3 m above the ground of any point of the territory of any other administration in Regions 1 and 3 for more than 20% of the time. In conducting the calculations, administrations should use the most recent version of Recommendation ITU-R P.452 (see also the most recent version of Recommendation ITU-R BO.1898). (WRC-15)

5.530B In the band 21.4-22 GHz, in order to facilitate the development of the broadcasting-satellite service, administrations in Regions 1 and 3 are encouraged not to deploy stations in the mobile service and are encouraged to limit the deployment of stations in the fixed service to point-to-point links. (WRC-12)

5.530D See Resolution 555 (Rev.WRC-15). (FCC)

5.531 *Additional allocation:* in Japan, the band 21.4-22 GHz is also allocated to the broadcasting service on a primary basis.

5.532 The use of the band 22.21-22.5 GHz by the Earth exploration-satellite (passive) and space research (passive) services shall not impose constraints upon the fixed and mobile, except aeronautical mobile, services.

5.532A The location of earth stations in the space research service shall maintain a separation distance of at least 54 km from the respective border(s) of neighbouring countries to protect the existing and future deployment of fixed and mobile services unless a shorter distance is otherwise agreed between the corresponding administrations. Nos. 9.17 and 9.18 do not apply. (WRC-12)

5.532B Use of the band 24.65-25.25 GHz in Region 1 and the band 24.65-24.75 GHz in Region 3 by the fixed-satellite service (Earth-to-space) is limited to earth stations using a minimum antenna diameter of 4.5 m. (WRC-12)

5.533 The inter-satellite service shall not claim protection from harmful interference from airport surface detection equipment stations of the radionavigation service.

5.535 In the band 24.75-25.25 GHz, feeder links to stations of the broadcasting-satellite service shall have priority over other uses in the fixed-satellite service (Earth-to-space). Such other uses shall protect and shall not claim protection from existing and future operating feeder-link networks to such broadcasting satellite stations.

5.535A The use of the band 29.1-29.5 GHz (Earth-to-space) by the fixed-satellite service is limited to geostationary-satellite systems and feeder links to non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. 9.11A, but not subject to the provisions of No. 22.2, except as indicated in Nos. 5.523C and 5.523E where such use is not

subject to the provisions of No. 9.11A and shall continue to be subject to Articles 9 (except No. 9.11A) and 11 procedures, and to the provisions of No. 22.2.

5.536 Use of the 25.25-27.5 GHz band by the inter-satellite service is limited to space research and Earth exploration-satellite applications, and also transmissions of data originating from industrial and medical activities in space.

5.536A Administrations operating earth stations in the Earth exploration-satellite service or the space research service shall not claim protection from stations in the fixed and mobile services operated by other administrations. In addition, earth stations in the Earth exploration-satellite service or in the space research service should be operated taking into account the most recent version of Recommendation ITU-R SA.1862. (WRC-12)

5.536B In Saudi Arabia, Austria, Bahrain, Belgium, Brazil, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Estonia, Finland, Hungary, India, Iran (Islamic Republic of), Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Sweden, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the frequency band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-15)

5.536C In Algeria, Saudi Arabia, Bahrain, Botswana, Brazil, Cameroon, Comoros, Cuba, Djibouti, Egypt, United Arab Emirates, Estonia, Finland, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Lithuania, Malaysia, Morocco, Nigeria, Oman, Qatar, Syrian Arab Republic, Somalia, Sudan, South Sudan, Tanzania, Tunisia, Uruguay, Zambia and Zimbabwe, earth stations operating in the space research service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-12)

5.537 Space services using non-geostationary satellites operating in the inter-satellite service in the band 27-27.5 GHz are exempt from the provisions of No. 22.2.

5.537A In Bhutan, Cameroon, Korea (Rep. of), the Russian Federation, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sudan, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.9-28.2 GHz may also be used by high altitude platform stations (HAPS) within the territory of these countries. Such use of 300 MHz of the fixed-service allocation by HAPS in the above countries is further limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. Furthermore, the development of these other services shall not be constrained by HAPS. See Resolution 145 (Rev.WRC-12). (WRC-12)

5.538 *Additional allocation:* the bands 27.500-27.501 GHz and 29.999-30.000 GHz are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for the beacon transmissions intended for up-link power control. Such space-to-Earth transmissions shall not exceed an equivalent isotropically radiated power (e.i.r.p.) of +10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. (WRC-07)

5.539 The band 27.5-30 GHz may be used by the fixed-satellite service (Earth-to-space) for the provision of feeder links for the broadcasting-satellite service.

5.540 *Additional allocation:* the band 27.501-29.999 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis for beacon transmissions intended for up-link power control.

5.541 In the band 28.5-30 GHz, the earth exploration-satellite service is limited to the transfer of data between stations and not to the primary collection of information by means of active or passive sensors.

5.541A Feeder links of non-geostationary networks in the mobile-satellite service and geostationary networks in the fixed-satellite service operating in the band 29.1-29.5 GHz (Earth-to-space) shall employ uplink adaptive power control or other methods of fade compensation, such that the earth station transmissions shall be conducted at the power level required to meet the desired link performance while reducing the level of mutual interference between both networks. These methods shall apply to networks for which Appendix 4 coordination information is considered as having been received by the Bureau after 17 May 1996 and until they are changed by a future competent world radiocommunication conference. Administrations submitting Appendix 4 information for coordination before this date are encouraged to utilize these techniques to the extent practicable.

5.542 *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guinea, India, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Oman, Pakistan, Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Somalia, Sudan, South Sudan, Sri Lanka and Chad, the band 29.5-31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. 21.3 and 21.5 shall apply. (WRC-12)

5.543 The band 29.95-30 GHz may be used for space-to-space links in the Earth exploration-satellite service for telemetry, tracking, and control purposes, on a secondary basis.

5.543A In Bhutan, Cameroon, Korea (Rep. of), the Russian Federation, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sudan, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the frequency band 31-31.3 GHz may also be used by systems using high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the frequency band 31-31.3 GHz by systems using HAPS is limited to the territory of the countries listed above and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems, systems in the mobile service and systems operated under No. 5.545. Furthermore, the development of these services shall not be constrained by HAPS. Systems using HAPS in the frequency band 31-31.3 GHz shall not cause harmful interference to the radio astronomy service having a primary allocation in the frequency band 31.3-31.8 GHz, taking into account the protection criterion as given in the most recent version of Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into a HAPS ground station antenna in the frequency band 31.3-31.8 GHz shall be limited to −106 dB(W/MHz) under clear-sky conditions, and may be increased up to −100 dB(W/MHz) under rainy conditions to mitigate fading due to rain, provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions. See Resolution 145 (Rev.WRC-12). (WRC-15)

5.544 In the band 31-31.3 GHz the power flux-density limits specified in Article 21, Table 21-4 shall apply to the space research service.

5.545 *Different category of service:* in Armenia, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 31-31.3 GHz to the space research service is on a primary basis (see No. 5.33). (WRC-12)

5.546 *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Egypt, the United Arab Emirates, Spain, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Israel, Jordan, Lebanon, Moldova, Mongolia, Oman, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Romania, the United Kingdom, South Africa, Tajikistan, Turkmenistan and Turkey, the allocation of the band 31.5-31.8 GHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. 5.33). (WRC-12)

5.547 The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolution 75 (WRC-12)). Administrations should take this into account when considering regulatory provisions in relation to these

bands. Because of the potential deployment of high-density applications in the fixed-satellite service in the bands 39.5-40 GHz and 40.5-42 GHz (see No. 5.516B), administrations should further take into account potential constraints to high-density applications in the fixed service, as appropriate. (FCC)

5.547A Administrations should take practical measures to minimize the potential interference between stations in the fixed service and airborne stations in the radionavigation service in the 31.8-33.4 GHz band, taking into account the operational needs of the airborne radar systems.

5.547B *Alternative allocation:* in the United States, the band 31.8-32 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis.

5.547C *Alternative allocation:* in the United States, the band 32-32.3 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis.

5.547D *Alternative allocation:* in the United States, the band 32.3-33 GHz is allocated to the inter-satellite and radionavigation services on a primary basis.

5.547E *Alternative allocation:* in the United States, the band 33-33.4 GHz is allocated to the radionavigation service on a primary basis.

5.548 In designing systems for the inter-satellite service in the band 32.3-33 GHz, for the radionavigation service in the band 32-33 GHz, and for the space research service (deep space) in the band 31.8-32.3 GHz, administrations shall take all necessary measures to prevent harmful interference between these services, bearing in mind the safety aspects of the radionavigation service (see Recommendation 707).

5.549 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Singapore, Somalia, Sudan, South Sudan, Sri Lanka, Togo, Tunisia and Yemen, the band 33.4-36 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-12)

5.549A In the band 35.5-36.0 GHz, the mean power flux-density at the Earth's surface, generated by any spaceborne sensor in the Earth exploration-satellite service (active) or space research service (active), for any angle greater than 0.8° from the beam centre shall not exceed −73.3 dB(W/m²) in this band.

5.550 *Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 34.7-35.2 GHz to the space research service is on a primary basis (see No. 5.33). (WRC-12)

5.550A For sharing of the band 36-37 GHz between the Earth exploration-satellite (passive) service and the fixed and mobile services, Resolution 752 (WRC-07) shall apply. (WRC-07)

5.551F *Different category of service:* in Japan, the allocation of the band 41.5-42.5 GHz to the mobile service is on a primary basis (see No. 5.33).

5.551H The equivalent power flux-density (epfd) produced in the frequency band 42.5-43.5 GHz by all space stations in any non-geostationary-satellite system in the fixed-satellite service (space-to-Earth), or in the broadcasting-satellite service operating in the frequency band 42-42.5 GHz, shall not exceed the following values at the site of any radio astronomy station for more than 2% of the time:

−230 dB(W/m²) in 1 GHz and –246 dB(W/m²) in any 500 kHz of the frequency band 42.5-43.5 GHz at the site of any radio astronomy station registered as a single-dish telescope; and

−209 dB(W/m²) in any 500 kHz of the frequency band 42.5-43.5 GHz at the site of any radio astronomy station registered as a very long baseline interferometry station.

These epfd values shall be evaluated using the methodology given in Recommendation ITU-R S.1586-1 and the reference antenna pattern and the maximum gain of an antenna in the radio astronomy service given in Recommendation ITU-R RA.1631-0 and shall apply over the whole sky and for elevation angles higher

than the minimum operating angle θ_{min} of the radiotelescope (for which a default value of 5° should be adopted in the absence of notified information).

These values shall apply at any radio astronomy station that either:

– was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or

– was notified before the date of receipt of the complete Appendix 4 information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution 743 (WRC-03) shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-15)

5.551I The power flux-density in the band 42.5-43.5 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth), or the broadcasting-satellite service operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station:

−137 dB(W/m²) in 1 GHz and −153 dB(W/m²) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and

−116 dB(W/m²) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

These values shall apply at the site of any radio astronomy station that either:

– was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or

– was notified before the date of receipt of the complete Appendix 4 information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution 743 (WRC-03) shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed.

5.552 The allocation of the spectrum for the fixed-satellite service in the bands 42.5-43.5 GHz and 47.2-50.2 GHz for Earth-to-space transmission is greater than that in the band 37.5-39.5 GHz for space-to-Earth transmission in order to accommodate feeder links to broadcasting satellites. Administrations are urged to take all practicable steps to reserve the band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service operating in the band 40.5-42.5 GHz.

5.552A The allocation to the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platform stations. The use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz is subject to the provisions of Resolution 122 (Rev.WRC-07). (WRC-07)

5.553 In the bands 43.5-47 GHz and 66-71 GHz, stations in the land mobile service may be operated subject to not causing harmful interference to the space radiocommunication services to which these bands are allocated (see No. 5.43).

5.554 In the bands 43.5-47 GHz, 66-71 GHz, 95-100 GHz, 123-130 GHz, 191.8-200 GHz and 252-265 GHz, satellite links connecting land stations at specified fixed points are also authorized when used in conjunction with the mobile-satellite service or the radionavigation-satellite service.

5.554A The use of the bands 47.5-47.9 GHz, 48.2-48.54 GHz and 49.44-50.2 GHz by the fixed-satellite service (space-to-Earth) is limited to geostationary satellites.

5.555 *Additional allocation:* the band 48.94-49.04 GHz is also allocated to the radio astronomy service on a primary basis.

5.555B The power flux-density in the band 48.94-49.04 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth) operating in the bands 48.2-48.54 GHz and 49.44-50.2 GHz shall not exceed −151.8 dB(W/m²) in any 500 kHz band at the site of any radio astronomy station.

5.556 In the bands 51.4-54.25 GHz, 58.2-59 GHz and 64-65 GHz, radio astronomy observations may be carried out under national arrangements.

5.556A Use of the bands 54.25-56.9 GHz, 57-58.2 GHz and 59-59.3 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density at all altitudes from 0 km to 1000 km above the Earth's surface produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, shall not exceed −147 dB(W/(m² · 100 MHz)) for all angles of arrival.

5.556B *Additional allocation:* in Japan, the band 54.25-55.78 GHz is also allocated to the mobile service on a primary basis for low-density use.

5.557 *Additional allocation:* in Japan, the band 55.78-58.2 GHz is also allocated to the radiolocation service on a primary basis.

5.557A In the band 55.78-56.26 GHz, in order to protect stations in the Earth exploration-satellite service (passive), the maximum power density delivered by a transmitter to the antenna of a fixed service station is limited to −26 dB(W/MHz).

5.558 In the bands 55.78-58.2 GHz, 59-64 GHz, 66-71 GHz, 122.25-123 GHz, 130-134 GHz, 167-174.8 GHz and 191.8-200 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. 5.43).

5.558A Use of the band 56.9-57 GHz by inter-satellite systems is limited to links between satellites in geostationary-satellite orbit and to transmissions from non-geostationary satellites in high-Earth orbit to those in low-Earth orbit. For links between satellites in the geostationary-satellite orbit, the single entry power flux-density at all altitudes from 0 km to 1000 km above the Earth's surface, for all conditions and for all methods of modulation, shall not exceed −147 dB(W/(m² · 100 MHz)) for all angles of arrival.

5.559 In the band 59-64 GHz, airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. 5.43).

5.559B The use of the frequency band 77.5-78 GHz by the radiolocation service shall be limited to short-range radar for ground-based applications, including automotive radars. The technical characteristics of these radars are provided in the most recent version of Recommendation ITU-R M.2057. The provisions of No. 4.10 do not apply. (WRC-15)

5.560 In the band 78-79 GHz radars located on space stations may be operated on a primary basis in the Earth exploration-satellite service and in the space research service.

5.561 In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the fixed-satellite service or stations of the broadcasting-satellite service operating in accordance with the decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service.

5.561A The 81-81.5 GHz band is also allocated to the amateur and amateur-satellite services on a secondary basis.

5.561B In Japan, use of the band 84-86 GHz, by the fixed-satellite service (Earth-to-space) is limited to feeder links in the broadcasting-satellite service using the geostationary-satellite orbit.

5.562 The use of the band 94-94.1 GHz by the Earth exploration-satellite (active) and space research (active) services is limited to spaceborne cloud radars.

5.562A In the bands 94-94.1 GHz and 130-134 GHz, transmissions from space stations of the Earth exploration-satellite service (active) that are directed into the main beam of a radio astronomy antenna have the potential to damage some radio astronomy receivers. Space agencies operating the transmitters and the radio astronomy stations concerned should mutually plan their operations so as to avoid such occurrences to the maximum extent possible.

5.562B In the bands 105-109.5 GHz, 111.8-114.25 GHz, 155.5-158.5 GHz and 217-226 GHz, the use of this allocation is limited to space-based radio astronomy only.

5.562C Use of the band 116-122.25 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, at all altitudes from 0 km to 1000 km above the Earth's surface and in the vicinity of all geostationary orbital positions occupied by passive sensors, shall not exceed −148 dB(W/(m² · MHz)) for all angles of arrival.

5.562D *Additional allocation:* In Korea (Rep. of), the frequency bands 128-130 GHz, 171-171.6 GHz, 172.2-172.8 GHz and 173.3-174 GHz are also allocated to the radio astronomy service on a primary basis. Radio astronomy stations in Korea (Rep. of) operating in the frequency bands referred to in this footnote shall not claim protection from, or constrain the use and development of, services in other countries operating in accordance with the Radio Regulations. (WRC-15)

5.562E The allocation to the Earth exploration-satellite service (active) is limited to the band 133.5-134 GHz.

5.562F In the band 155.5-158.5 GHz, the allocation to the Earth exploration-satellite (passive) and space research (passive) services shall terminate on 1 January 2018.

5.562G The date of entry into force of the allocation to the fixed and mobile services in the band 155.5-158.5 GHz shall be 1 January 2018.

5.562H Use of the bands 174.8-182 GHz and 185-190 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, at all altitudes from 0 to 1000 km above the Earth's surface and in the vicinity of all geostationary orbital positions occupied by passive sensors, shall not exceed −144 dB(W/(m² · MHz)) for all angles of arrival.

5.563A In the bands 200-209 GHz, 235-238 GHz, 250-252 GHz and 265-275 GHz, ground-based passive atmospheric sensing is carried out to monitor atmospheric constituents.

5.563B The band 237.9-238 GHz is also allocated to the Earth exploration-satellite service (active) and the space research service (active) for spaceborne cloud radars only.

5.565 The following frequency bands in the range 275-1000 GHz are identified for use by administrations for passive service applications:

– radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;

– Earth exploration-satellite service (passive) and space research service (passive): 275-286 GHz, 296-306 GHz, 313-356 GHz, 361-365 GHz, 369-392 GHz, 397-399 GHz, 409-411 GHz, 416-434 GHz, 439-467 GHz, 477-502 GHz, 523-527 GHz, 538-581 GHz, 611-630 GHz, 634-654 GHz, 657-692 GHz, 713-718 GHz, 729-733 GHz, 750-754 GHz, 771-776 GHz, 823-846 GHz, 850-854 GHz, 857-862 GHz, 866-882 GHz, 905-928 GHz, 951-956 GHz, 968-973 GHz and 985-990 GHz.

The use of the range 275-1000 GHz by the passive services does not preclude use of this range by active services. Administrations wishing to make frequencies in the 275-1000 GHz range available for active service applications are urged to take all practicable steps to protect these passive services from harmful interference until the date when the Table of Frequency Allocations is established in the above-mentioned

275-1000 GHz frequency range.

All frequencies in the range 1000-3000 GHz may be used by both active and passive services. (WRC-12)

United States (US) Footnotes

(These footnotes, each consisting of the letters "US" followed by one or more digits, denote stipulations applicable to both Federal and non-Federal operations and thus appear in both the Federal Table and the non-Federal Table.)

US1 The bands 2501-2502 kHz, 5003-5005 kHz, 10 003-10 005 kHz, 15 005-15 010 kHz, 19 990-19 995 kHz, 20 005-20 010 kHz, and 25 005-25 010 kHz are also allocated to the space research service on a secondary basis for Federal use. In the event of interference to the reception of the standard frequency and time broadcasts, these space research transmissions are subject to immediate temporary or permanent shutdown.

US2 In the band 9-490 kHz, electric utilities operate Power Line Carrier (PLC) systems on power transmission lines for communications important to the reliability and security of electric service to the public. These PLC systems operate under the provisions of 47 CFR part 15, or Chapter 8 of the *NTIA Manual*, on an unprotected and non-interference basis with respect to authorized radio users. Notification of intent to place new or revised radio frequency assignments or PLC frequency uses in the band 9-490 kHz is to be made in accordance with the Rules and Regulations of the FCC and NTIA, and users are urged to minimize potential interference to the extent practicable. This footnote does not provide any allocation status to PLC radio frequency uses.

US8 The use of the frequencies 170.475, 171.425, 171.575, and 172.275 MHz east of the Mississippi River, and 170.425, 170.575, 171.475, 172.225 and 172.375 MHz west of the Mississippi River may be authorized to fixed, land and mobile stations operated by non-Federal forest firefighting agencies. In addition, land stations and mobile stations operated by non-Federal conservation agencies, for mobile relay operation only, may be authorized to use the frequency 172.275 MHz east of the Mississippi River and the frequency 171.475 MHz west of the Mississippi River. The use of any of the foregoing nine frequencies shall be on the condition that no harmful interference will be caused to Government stations.

US11 On the condition that harmful interference is not caused to present or future Federal stations in the band 162-174 MHz, the frequencies 166.25 MHz and 170.15 MHz may be authorized to non-Federal stations, as follows:

(a) Eligibles in the Public Safety Radio Pool may be authorized to operate in the fixed and land mobile services for locations within 150 miles (241.4 kilometers) of New York City; and

(b) Remote pickup broadcast stations may be authorized to operate in the land mobile service for locations within the conterminous United States, excluding locations within 150 miles of New York City and the Tennessee Valley Authority Area (TVA Area). The TVA Area is bounded on the west by the Mississippi River, on the north by the parallel of latitude 37° 30' N, and on the east and south by that arc of the circle with center at Springfield, IL, and radius equal to the airline distance between Springfield, IL and Montgomery, AL, subtended between the foregoing west and north boundaries.

US13 The following center frequencies, each with a channel bandwidth not greater than 12.5 kHz, are available for assignment to non-Federal fixed stations for the specific purpose of transmitting hydrological and meteorological data in cooperation with Federal agencies, subject to the condition that harmful interference will not be caused to Federal stations:

Hydro Channels (MHz)			
169.4250	170.2625	171.1000	406.1250
169.4375	170.2750	171.1125	406.1750
169.4500	170.2875	171.1250	412.6625
169.4625	170.3000	171.8250	412.6750
169.4750	170.3125	171.8375	412.6875
169.4875	170.3250	171.8500	412.7125
169.5000	171.0250	171.8625	412.7250
169.5125	171.0375	171.8750	412.7375
169.5250	171.0500	171.8875	412.7625
170.2250	171.0625	171.9000	412.7750
170.2375	171.0750	171.9125	415.1250
170.2500	171.0875	171.9250	415.1750

New assignments on the frequencies 406.125 MHz and 406.175 MHz are to be primarily for paired operations with the frequencies 415.125 MHz and 415.175 MHz, respectively.

US14 When 500 kHz is being used for distress purposes, ship and coast stations using morse telegraph may use 512 kHz for calling.

US18 In the bands 9-14 kHz, 90-110 kHz, 190-415 kHz, 510-535 kHz, and 2700-2900 MHz, navigation aids in the U.S. and its insular areas are normally operated by the Federal Government. However, authorizations may be made by the FCC for non-Federal operations in these bands subject to the conclusion of appropriate arrangements between the FCC and the Federal agencies concerned and upon special showing of need for service which the Federal Government is not yet prepared to render.

US22 The following provisions shall apply to non-Federal use of 68 carrier frequencies in the range 2-8 MHz, which are not coordinated with NTIA:

(a) The frequencies authorized pursuant to 47 CFR 90.264 (Disaster Communications) and 47 CFR 90.266 (Long Distance Communications) are listed in columns 1-2 and columns 3-5, respectively. All stations are restricted to emission designator 2K80J3E, upper sideband transmissions, a maximum transmitter output power of 1 kW PEP, and to the class of station(s) listed in the column heading (*i.e.*, fixed (FX) for all frequencies; base and mobile (FB and ML) for the frequencies in column 1 and 3; itinerant FX for the frequencies in columns 4-5).

(b) *Use, Geographic, and Time Restrictions*. Letter(s) to the right of a frequency indicate that the frequency is available only for the following purpose(s):

– A or I: *A*lternate channel or *I*nterstate coordination.

– C, E, M, or W: For stations located in the *C*onterminous U.S., *E*ast of 108° West Longitude (WL), West of the *M*ississippi River, or *W*est of 90° WL.

– D or N: From two hours after local sunrise until two hours before local sunset (*i.e.*, *D*ay only operations) or from two hours prior to local sunset until two hours after local sunrise (*i.e.*, *N*ight only operations).

Preferred Carrier Frequencies (kHz)				
Disaster Communications		Long Distance Communications		
FX, FB, ML	FX	FX, FB, ML	FX (including itinerant)	
2326 … I	5135 … A	2289	5046.6 … E	7480.1
2411	5140 … A, I	2292	5052.6 … E	7483.1
2414	5192 … I	2395	5055.6 … E	7486.1 … E
2419	5195 … I	2398	5061.6 … W	7549.1 … D
2422	7477 … A	3170	5067.6	7552.1

2439	7480 … A	4538.6 … N	5074.6 … E	7555.1 … W
2463	7802 … D	4548.6 … N	5099.1	7558.1 … W
2466	7805 … I	4575	5102.1	7559.1 … W
2471	7932	4610.5	5313.6	7562.1 … W
2474	7935 … C,	4613.5	6800.1 … N	7697.1
2487	D	4634.5	6803.1	
2511		4637.5	6806.1 … W	
2535		4647	6855.1 … N,	
2569			M	
2587			6858.1 … N	
2801			6861.1 … W	
2804 … A			6885.1 … N	
2812			6888.1 … N	

NOTE: To determine the assigned frequency, add 1.4 kHz to the carrier frequency. Other emission designators may be authorized within the 2.8 kHz maximum necessary bandwidth pursuant to 47 CFR 90.264 and 90.266.

US23 In the band 5330.5-5406.4 kHz (60 m band), the assigned frequencies 5332, 5348, 5358.5, 5373, and 5405 kHz are allocated to the amateur service on a secondary basis. Amateur service use of the 60 m band frequencies is restricted to a maximum effective radiated power of 100 W PEP and to the following emission types and designators: phone (2K80J3E), data (2K80J2D), RTTY (60H0J2B), and CW (150HA1A). Amateur operators using the data and RTTY emissions must exercise care to limit the length of transmissions so as to avoid causing harmful interference to Federal stations.

US25 The use of frequencies in the band 25.85-26.175 MHz may be authorized in any area to non-Federal remote pickup broadcast base and mobile stations on the condition that harmful interference is not caused to stations of the broadcasting service in the band 25.85-26.1 MHz and to stations of the maritime mobile service in the band 26.1-26.175 MHz. Frequencies within the band 26.1-26.175 MHz may also be assigned for use by low power auxiliary stations.

US26 The bands 117.975-121.4125 MHz, 123.5875-128.8125 MHz and 132.0125-136.0 MHz are for air traffic control communications.

US28 The band 121.5875-121.9375 MHz is for use by aeronautical utility land and mobile stations, and for air traffic control communications.

US30 The band 121.9375-123.0875 MHz is available to FAA aircraft for communications pursuant to flight inspection functions in accordance with the Federal Aviation Act of 1958.

US31 The frequencies 122.700, 122.725, 122.750, 122.800, 122.950, 122.975, 123.000, 123.050 and 123.075 MHz may be assigned to aeronautical advisory stations. In addition, at landing areas having a part-time or no airdrome control tower or FAA flight service station, these frequencies may be assigned on a secondary non-interference basis to aeronautical utility mobile stations, and may be used by FAA ground vehicles for safety related communications during inspections conducted at such landing areas.

The frequencies 122.850, 122.900 and 122.925 MHz may be assigned to aeronautical multicom stations. In addition, 122.850 MHz may be assigned on a secondary noninterference basis to aeronautical utility mobile stations. In case of 122.925 MHz, US213 applies.

Air carrier aircraft stations may use 122.000 and 122.050 MHz for communication with aeronautical stations of the Federal Aviation Administration and 122.700, 122.800, 122.900 and 123.000 MHz for communications with aeronautical stations pertaining to safety of flight with and in the vicinity of landing areas not served by a control tower.

Frequencies in the band 121.9375-122.6875 MHz may be used by aeronautical stations of the Federal

Aviation Administration for communication with aircraft stations.

US32 Except for the frequencies 123.3 and 123.5 MHz, which are not authorized for Federal use, the band 123.1125-123.5875 MHz is available for FAA communications incident to flight test and inspection activities pertinent to aircraft and facility certification on a secondary basis.

US33 The band 123.1125-123.5875 MHz is for use by flight test and aviation instructional stations. The frequency 121.950 MHz is available for aviation instructional stations.

US36 In Hawaii, the bands 120.647-120.653 MHz and 127.047-127.053 MHz are also allocated to the aeronautical mobile service on a primary basis for non-Federal aircraft air-to-air communications on 120.65 MHz (Maui) and 127.05 MHz (Hawaii and Kauai) as specified in 47 CFR 87.187.

US41 In the band 2450-2500 MHz, the Federal radiolocation service is permitted on condition that harmful interference is not caused to non-Federal services.

US44 In the band 2900-3100 MHz, the non-Federal radiolocation service may be authorized on the condition that no harmful interference is caused to Federal services.

US49 In the band 5460-5470 MHz, the non-Federal radiolocation service may be authorized on the condition that it does not cause harmful interference to the aeronautical or maritime radionavigation services or to the Federal radiolocation service.

US50 In the band 5470-5650 MHz, the radiolocation service may be authorized for non-Federal use on the condition that harmful interference is not caused to the maritime radionavigation service or to the Federal radiolocation service.

US52 In the VHF maritime mobile band (156-162 MHz), the following provisions shall apply:

(a) Except as provided for below, the use of the bands 161.9625-161.9875 MHz (AIS 1 with center frequency 161.975 MHz) and 162.0125-162.0375 MHz (AIS 2 with center frequency 162.025 MHz) by the maritime mobile and mobile-satellite (Earth-to-space) services is restricted to Automatic Identification Systems (AIS). The use of these bands by the aeronautical mobile (OR) service is restricted to AIS emissions from search and rescue aircraft operations. Frequencies in the AIS 1 band may continue to be used by non-Federal base, fixed, and land mobile stations until March 2, 2024.

(b) Except as provided for below, the use of the bands 156.7625-156.7875 MHz (AIS 3 with center frequency 156.775 MHz) and 156.8125-156.8375 MHz (AIS 4 with center frequency 156.825 MHz) by the mobile-satellite service (Earth-to-space) is restricted to the reception of long-range AIS broadcast messages from ships (Message 27; see most recent version of Recommendation ITU-R M.1371). The frequencies 156.775 MHz and 156.825 MHz may continue to be used by non-Federal ship and coast stations for navigation-related port operations or ship movement until August 26, 2019.

(c) The frequency 156.3 MHz may also be used by aircraft stations for the purpose of search and rescue operations and other safety-related communication.

(d) Federal stations in the maritime mobile service may also be authorized as follows: (1) Vessel traffic services under the control of the U.S. Coast Guard on a simplex basis by coast and ship stations on the frequencies 156.25, 156.55, 156.6 and 156.7 MHz; (2) Inter-ship use of the frequency 156.3 MHz on a simplex basis; (3) Navigational bridge-to-bridge and navigational communications on a simplex basis by coast and ship stations on the frequencies 156.375 and 156.65 MHz; (4) Port operations use on a simplex basis by coast and ship stations on the frequencies 156.6 and 156.7 MHz; (5) Environmental communications on the frequency 156.75 MHz in accordance with the national plan; and (6) Duplex port operations use of the frequencies 157 MHz for ship stations and 161.6 MHz for coast stations.

US53 In view of the fact that the band 13.25-13.4 GHz is allocated to doppler navigation aids, Federal and non-Federal airborne doppler radars in the aeronautical radionavigation service are permitted in the band 8750-8850 MHz only on the condition that they must accept any interference that may be experienced from stations in the radiolocation service in the band 8500-10000 MHz.

US55 In the bands 162.0375-173.2 MHz and 406.1-420 MHz, the FCC may authorize public safety applicants to use the 40 Federal Interoperability Channels that are designated for joint Federal/non-Federal operations for law enforcement, public safety, emergency response and disaster response in Section 4.3.16 of the NTIA Manual, subject to the condition that that these non-Federal mobile (including portable) interoperability communications shall conform to the national plans specified therein, and in particular, shall not cause harmful interference to Federal stations. The procedure for authorizing such use is set forth in 47 CFR 90.25.

US59 The band 10.5-10.55 GHz is restricted to systems using type NON (AO) emission with a power not to exceed 40 watts into the antenna.

US64 (a) In the band 401-406 MHz, the mobile, except aeronautical mobile, service is allocated on a secondary basis and is limited to, with the exception of military tactical mobile stations, Medical Device Radiocommunication Service (MedRadio) operations. MedRadio stations are authorized by rule on the condition that harmful interference is not caused to stations in the meteorological aids, meteorological-satellite, and Earth exploration-satellite services, and that MedRadio stations accept interference from stations in the meteorological aids, meteorological-satellite, and Earth exploration-satellite services.

(b) The bands 413-419 MHz, 426-432 MHz, 438-444 MHz, and 451-457 MHz are also allocated on a secondary basis to the mobile, except aeronautical mobile, service. The use of this allocation is limited to MedRadio operations. MedRadio stations are authorized by rule and operate in accordance with 47 CFR part 95.

US65 The use of the band 5460-5650 MHz by the maritime radionavigation service is limited to shipborne radars.

US67 The use of the band 9300-9500 MHz by the meteorological aids service is limited to ground-based radars. Radiolocation installations will be coordinated with the meteorological aids service and, insofar as practicable, will be adjusted to meet the requirements of the meteorological aids service.

US69 In the band 31.8-33.4 GHz, ground-based radionavigation aids are not permitted except where they operate in cooperation with airborne or shipborne radionavigation devices.

US70 The meteorological aids service allocation in the band 400.15-406.0 MHz does not preclude the operation therein of associated ground transmitters.

US71 In the band 9300-9320 MHz, low-powered maritime radionavigation stations shall be protected from harmful interference caused by the operation of land-based equipment.

US73 The frequencies 150.775, 150.79, 152.0075, and 163.25 MHz, and the bands 462.94-463.19675 and 467.94-468.19675 MHz shall be authorized for the purpose of delivering or rendering medical services to individuals (medical radiocommunication systems), and shall be authorized on a primary basis for Federal and non-Federal use. The frequency 152.0075 MHz may also be used for the purpose of conducting public safety radio communications that include, but are not limited to, the delivering or rendering of medical services to individuals.

(a) The use of the frequencies 150.775 and 150.79 MHz is restricted to mobile stations operating with a maximum e.r.p. of 100 watts. Airborne operations are prohibited.

(b) The use of the frequencies 152.0075 and 163.25 MHz is restricted to base stations that are authorized only for one-way paging communications to mobile receivers. Transmissions for the purpose of activating or controlling remote objects on these frequencies shall not be authorized.

(c) Non-Federal licensees in the Public Safety Radio Pool holding a valid authorization on May 27, 2005, to operate on the frequencies 150.7825 and 150.7975 MHz may, upon proper renewal application, continue to be authorized for such operation; provided that harmful interference is not caused to present or future Federal stations in the band 150.05-150.8 MHz and, should harmful interference result, that the interfering non-Federal operation shall immediately terminate.

US74 In the bands 25.55-25.67, 73-74.6, 406.1-410, 608-614, 1400-1427, 1660.5-1670, 2690-2700, and 4990-5000 MHz, and in the bands 10.68-10.7, 15.35-15.4, 23.6-24.0, 31.3-31.5, 86-92, 100-102, 109.5-111.8, 114.25-116, 148.5-151.5, 164-167, 200-209, and 250-252 GHz, the radio astronomy service shall be protected from unwanted emissions only to the extent that such radiation exceeds the level which would be present if the offending station were operating in compliance with the technical standards or criteria applicable to the service in which it operates. Radio astronomy observations in these bands are performed at the locations listed in US385.

US79 In the bands 1390-1400 MHz and 1427-1432 MHz, the following provisions shall apply:
(a) Airborne and space-to-Earth operations are prohibited.
(b) Federal operations (except for devices authorized by the FCC for the Wireless Medical Telemetry Service) are on a non-interference basis to non-Federal operations and shall not constrain implementation of non-Federal operations.

US80 Federal stations may use the frequency 122.9 MHz subject to the following conditions: (a) All operations by Federal stations shall be restricted to the purpose for which the frequency is authorized to non-Federal stations, and shall be in accordance with the appropriate provisions of the Commission's Rules and Regulations, Part 87, Aviation Services; (b) Use of the frequency is required for coordination of activities with Commission licensees operating on this frequency; and (c) Federal stations will not be authorized for operation at fixed locations.

US81 The band 38-38.25 MHz is used by both Federal and non-Federal radio astronomy observatories. No new fixed or mobile assignments are to be made and Federal stations in the band 38-38.25 MHz will be moved to other bands on a case-by-case basis, as required, to protect radio astronomy observations from harmful interference. As an exception, however, low powered military transportable and mobile stations used for tactical and training purposes will continue to use the band. To the extent practicable, the latter operations will be adjusted to relieve such interference as may be caused to radio astronomy observations. In the event of harmful interference from such local operations, radio astronomy observatories may contact local military commands directly, with a view to effecting relief. A list of military commands, areas of coordination, and points of contact for purposes of relieving interference may be obtained upon request from the Office of Engineering and Technology, FCC, Washington, DC 20554.

US82 In the bands 4146-4152 kHz, 6224-6233 kHz, 8294-8300 kHz, 12 353-12 368 kHz, 16 528-16 549 kHz, 18 825-18 846 kHz, 22 159-22 180 kHz, and 25 100-25 121 kHz, the assignable frequencies may be authorized on a shared non-priority basis to Federal and non-Federal ship and coast stations (SSB telephony, with peak envelope power not to exceed 1 kW).

US83 In the 1432-1435 MHz band, Federal stations in the fixed and mobile services may operate indefinitely on a primary basis at the 22 sites listed in the table below. The first 21 sites are in the United States and the last site is in Guam (GU). All other Federal stations in the fixed and mobile services shall operate in the band 1432-1435 MHz on a primary basis until reaccommodated in accordance with the National Defense Authorization Act of 1999.

State	Site	North	West	Radius
AK	Fort Greely	63° 47'	145° 52'	80
AL	Redstone Arsenal	34° 35'	086° 35'	80
AZ	Fort Huachuca	31° 33'	110° 18'	80
AZ	Yuma Proving Ground	32° 29'	114° 20'	160
CA	China Lake/Edwards AFB	35° 29'	117° 16'	100
CA	Lemoore	36° 20'	119° 57'	120
FL	Eglin AFB/Ft Rucker, AL	30° 28'	086° 31'	140
FL	NAS Cecil Field	30° 13'	081° 52'	160
MD	Patuxent River	38° 17'	076° 24'	70

ME	Naval Space Operations Center	44° 24'	068° 01'	80
MI	Alpene Range	44° 23'	083° 20'	80
MS	Camp Shelby	31° 20'	089° 18'	80
NC	MCAS Cherry Point	34° 54'	076° 53'	100
NM	White Sands Missile Range/Holloman AFB	32° 11'	106° 20'	160
NV	NAS Fallon	39° 30'	118° 46'	100
NV	Nevada Test and Training Range (NTTR)	37° 29'	114° 14'	130
SC	Beaufort MCAS	32° 26'	080° 40'	160
SC	Savannah River	33° 15'	081° 39'	3
UT	Utah Test & Training Range/Dugway Proving Ground, Hill AFB	40° 57'	113° 05'	160
VA	NAS Oceana	36° 49'	076° 01'	100
WA	NAS Whidbey Island	48° 21'	122° 39'	70
GU	NCTAMS	13° 35'	144° 51'	80

NOTE: The coordinates (North latitude and West longitude) are listed under the headings North and West. The Guam entry under the West heading is actually 144° 51' East longitude. The operating radii in kilometers are listed under the heading Radius.

US84 In the bands 941.5-944 MHz and 1435-1525 MHz, low power auxiliary stations may be authorized on a secondary basis, subject to the terms and conditions set forth in 47 CFR part 74, subpart H.

US85 Differential-Global-Positioning-System (DGPS) Stations, limited to ground-based transmitters, may be authorized on a primary basis in the band 1559-1610 MHz for the specific purpose of transmitting DGPS information intended for aircraft navigation.

US87 The band 449.75-450.25 MHz may be used by Federal and non-Federal stations for space telecommand (Earth-to-space) at specific locations, subject to such conditions as may be applied on a case-by-case basis. Operators shall take all practical steps to keep the carrier frequency close to 450 MHz.

US88 In the bands 1675-1695 MHz and 1695-1710 MHz, the following provisions shall apply:

(a) Non-Federal use of the band 1695-1710 MHz by the fixed and mobile except aeronautical mobile services is restricted to stations in the Advanced Wireless Service (AWS). Base stations that enable AWS mobile and portable stations to operate in the band 1695-1710 MHz must be successfully coordinated prior to operation as follows: (i) all base stations within the 27 protection zones listed in paragraph (b) that enable mobiles to operate at a maximum e.i.r.p. of 20 dBm, and (ii) nationwide for base stations that enable mobiles to operate with a maximum e.i.r.p. greater than 20 dBm, up to a maximum e.i.r.p. of 30 dBm, unless otherwise specified by Commission rule, order, or notice.

(b) Forty-seven Federal earth stations located within the protection zones listed below operate on a co-equal, primary basis with AWS operations. All other Federal earth stations operate on a secondary basis.

(1) Protection zones for Federal earth stations receiving in the band 1695-1710 MHz:

State	Location	Latitude	Longitude	Radius (km)
AK	Barrow ……...	71° 19' 22"	156° 36' 41"	……..... 35
AK	Elmendorf AFB …….	61° 14' 08"	149° 55' 31"	……..... 98
AK	Fairbanks ……...	64° 58' 22"	147° 30' 02"	……..... 20
AZ	Yuma …….	32° 39' 24"	114° 36' 22"	……..... 95
CA	Monterey ……...	36° 35' 34"	121° 51' 20"	……..... 76
CA	Twenty-Nine Palms...	34° 17' 46"	116° 09' 44"	……..... 80
FL	Miami ……	25° 44' 05"	080° 09' 45"	……..... 51
HI	Hickam AFB …….	21° 19' 18"	157° 57' 30"	……..... 28
MD	Suitland …….	38° 51' 07"	076° 56' 12"	……..... 98

MS	Stennis Space Center	30° 21' 23"	089° 36' 41"	……..... 57
SD	Sioux Falls ……	43° 44' 09"	096° 37' 33"	……..... 42
VA	Wallops Island ……..	37° 56' 45"	075° 27' 45"	……..... 30
GU	Andersen AFB ……..	13° 34' 52"	144° 55' 28"	……..... 42

(2) Protection zones for Federal earth stations receiving in the band 1675-1695 MHz:

State	Location	Latitude	Longitude	Radius (km)
CA	Sacramento ……	38° 35' 50"	121° 32' 34"	……..... 55
CO	Boulder ……..	39° 59' 26"	105° 15' 51"	……..... 02
ID	Boise …….	43° 35' 42"	116° 13' 49"	……..... 39
IL	Rock Island …….....	41° 31' 04"	090° 33' 46"	……..... 19
MO	Kansas City ……...	39° 16' 40"	094° 39' 44"	……..... 40
MO	St. Louis ……..……	38° 35' 26"	090° 12' 25"	……..... 34
MS	Columbus Lake …….	33° 32' 04"	088° 30' 06"	……..... 03
MS	Vicksburg ……...…..	32° 20' 47"	090° 50' 10"	……..... 16
NE	Omaha ……..….....	41° 20' 56"	095° 57' 34"	……..... 30
OH	Cincinnati …...……....	39° 06' 10"	084° 30' 35"	……..... 32
OK	Norman …….…….	35° 10' 52"	097° 26' 21"	……..... 03
TN	Knoxville ……...	35° 57' 58"	083° 55' 13"	……..... 50
WV	Fairmont ……	39° 26' 02"	080° 11' 33"	……..... 04
PR	Guaynabo ……..	18° 25' 26"	066° 06' 50"	……..... 48

NOTE: The coordinates are specified in the conventional manner (North latitude, West longitude), except that the Guam (GU) entry is specified in terms of East longitude.

US90 In the band 2025-2110 MHz, the power flux-density at the Earth's surface produced by emissions from a space station in the space operation, Earth exploration-satellite, or space research service that is transmitting in the space-to-space direction, for all conditions and all methods of modulation, shall not exceed the following values in any 4 kHz sub-band:

(a) −154 dBW/m^2 for angles of arrival above the horizontal plane (δ) of 0° to 5°,

(b) −154 + 0.5(δ-5) dBW/m^2 for δ of 5° to 25°, and

(c) −144 dBW/m^2 for δ of 25° to 90°.

US91 In the band 1755-1780 MHz, the following provisions shall apply:

(a) Non-Federal use of the band 1755-1780 MHz by the fixed and mobile services is restricted to stations in the Advanced Wireless Service (AWS). Base stations that enable AWS mobile and portable stations to operate in the band 1755-1780 MHz must be successfully coordinated on a nationwide basis prior to operation, unless otherwise specified by Commission rule, order, or notice.

(b) In the band 1755-1780 MHz, the Federal systems listed below operate on a co-equal, primary basis with AWS stations. All other Federal stations in the fixed and mobile services identified in an approved Transition Plan will operate on a primary basis until reaccommodated in accordance with 47 CFR part 301.

(1) Joint Tactical Radio Systems (JTRS) may operate indefinitely at the following locations:

State	Training area	Latitude	Longitude
AZ	Yuma Proving Ground ….....	33° 12' 14"	114° 13' 47"
CA	Fort Irwin ……..……	35° 23' 19"	116° 37' 43"
LA	Fort Polk ……..…….....	31° 08' 38"	093° 06' 52"
NC	Fort Bragg (including Camp MacKall)....	35° 09' 04"	078° 59' 13"
NM	White Sands Missile Range…….	32° 52' 50"	106° 23' 10"
TX	Fort Hood ……..….....	31° 13' 50"	097° 45' 23"

(2) Air combat training system (ACTS) stations may operate on two frequencies within two geographic zones that are defined by the following coordinates:

Geographic Zone	Latitude	Longitude
Polygon 1	41° 52' 00"	117° 49' 00"
	42° 00' 00"	115° 05' 00"
	43° 31' 13"	115° 47' 18"
Polygon 2	47° 29' 00"	111° 22' 00"
	48° 13' 00"	110° 00' 00"
	47° 30' 00"	107° 00' 00"
	44° 11' 00"	103° 06' 00"

NOTE: ACTS transmitters may cause interference to AWS base stations between separation distances of 285 km (minimum) and 415 km (maximum).

(3) In the sub-band 1761-1780 MHz, Federal earth stations in the space operation service (Earth-to-space) may transmit at the following 25 sites and non-Federal base stations must accept harmful interference caused by the operation of these earth stations:

State	Site	Latitude	Longitude
AK	Fairbanks ……..…..…..	64° 58' 20"	147° 30' 59"
CA	Camp Parks ……..….	37° 43' 51"	121° 52' 50"
CA	Huntington Beach ……..	33° 44' 50"	118° 02' 04"
CA	Laguna Peak ……...…....	34° 06' 31"	119° 03' 53"
CA	Monterey ……...….	36° 35' 42"	121° 52' 28"
CA	Sacramento ……..….	38° 39' 59"	121° 23' 33"
CA	Vandenberg AFB ……...	34° 49' 23"	120° 30' 07"
CO	Buckley ……..	39° 42' 55"	104° 46' 29"
CO	Schriever AFB …….....	38° 48' 22"	104° 31' 41"
FL	Cape Canaveral AFS ….....	28° 29' 09"	080° 34' 33"
FL	Cape GA, CCAFB …….	28° 29' 03"	080° 34' 21"
FL	JIATF-S Key West …...….	24° 32' 36"	081° 48' 17"
HI	Kaena Point, Oahu …….	21° 33' 43"	158° 14' 31"
MD	Annapolis ……...……	38° 59' 27"	076° 29' 25"
MD	Blossom Point ……...….	38° 25' 53"	077° 05' 06"
MD	Patuxent River NAS …..…	38° 16' 28"	076° 24' 45"
ME	Prospect Harbor …….....	44° 24' 16"	068° 00' 46"
NC	Ft Bragg ……....	35° 09' 04"	078° 59' 13"
NH	New Boston AFS ……..…	42° 56' 46"	071° 37' 44"
NM	Kirtland AFB …….....	34° 59' 06"	106° 30' 28"
TX	Ft Hood ……..…	31° 08' 57"	097° 46' 12"
VA	Fort Belvoir …….....	38° 44' 04"	077° 09' 12"
WA	Joint Base Lewis-McChord	47° 06' 11"	122° 33' 11"
GU	Andersen AFB ……..….....	13° 36' 54"	144° 51' 22"
GU	NAVSOC Det. Charlie …..	13° 34' 58"	144° 50' 32"

NOTE: The coordinates are specified in the conventional manner (North latitude, West longitude), except that the Guam (GU) entries are specified in terms of East longitude. Use at Cape Canaveral AFS is restricted to launch support only. If required, successfully coordinated with all affected AWS licensees, and authorized by NTIA, reasonable modifications of these grandfathered Federal systems beyond their current authorizations or the addition of new earth station locations may be permitted. The details of the coordination must be filed with NTIA and FCC.

(c) In the band 1755-1780 MHz, the military services may conduct Electronic Warfare (EW) operations

on Federal ranges and within associated airspace on a non-interference basis with respect to non-Federal AWS operations and shall not constrain implementation of non-Federal AWS operations. This use is restricted to Research, Development, Test and Evaluation (RDT&E), training, and Large Force Exercise (LFE) operations.

US92 In the band 2025-2110 MHz, Federal use of the co-primary fixed and mobile services is restricted to the military services and the following provisions apply:

(a) Federal use shall not cause harmful interference to, nor constrain the deployment and use of the band by, the Television Broadcast Auxiliary Service, the Cable Television Relay Service, or the Local Television Transmission Service. To facilitate compatible operations, coordination is required in accordance with a Memorandum of Understanding between Federal and non-Federal fixed and mobile operations. Non-Federal licensees shall make all reasonable efforts to accommodate military mobile and fixed operations; however, the use of the band 2025-2110 MHz by the non-Federal fixed and mobile services has priority over military fixed and mobile operations.

(b) Military stations should, to the extent practicable, employ frequency agile technologies and techniques, including the capability to tune to other frequencies and the use of a modular retrofit capability, to facilitate sharing of this band with incumbent Federal and non-Federal operations.

US93 In the conterminous United States, the frequency 108.0 MHz may be authorized for use by VOR test facilities, the operation of which is not essential for the safety of life or property, subject to the condition that no interference is caused to the reception of FM broadcasting stations operating in the band 88-108 MHz. In the event that such interference does occur, the licensee or other agency authorized to operate the facility shall discontinue operation on 108 MHz and shall not resume operation until the interference has been eliminated or the complaint otherwise satisfied. VOR test facilities operating on 108 MHz will not be protected against interference caused by FM broadcasting stations operating in the band 88-108 MHz nor shall the authorization of a VOR test facility on 108 MHz preclude the Commission from authorizing additional FM broadcasting stations.

US96 The band 2200-2290 MHz is allocated to the space operation service (space-to-Earth) on a secondary basis for non-Federal use subject to the following conditions. Non-Federal stations shall be:

(a) restricted to transmissions from the launch vehicle in the sub-bands 2208.5-2213.5 MHz, 2212.5-2217.5 MHz, 2270-2275 MHz, and 2285-2290 MHz (necessary bandwidth shall be contained within these ranges);

(b) restricted to use for pre-launch testing and space launch operations, except as provided under US303; and

(c) subject to coordination with NTIA prior to each launch.

US97 The following provisions shall apply in the band 2305-2320 MHz:

(a) In the sub-band 2305-2310 MHz, space-to-Earth operations are prohibited.

(b) Within 145 km of Goldstone, CA (35° 25' 33" N, 116° 53' 23" W), Wireless Communications Service (WCS) licensees operating base stations in the band 2305-2320 MHz shall, prior to operation of those base stations, achieve a mutually satisfactory coordination agreement with the National Aeronautics and Space Administration (NASA).

NOTE: NASA operates a deep space facility in Goldstone in the band 2290-2300 MHz.

US99 In the band 1668.4-1670 MHz, the meteorological aids service (radiosonde) will avoid operations to the maximum extent practicable. Whenever it is necessary to operate radiosondes in the band 1668.4-1670 MHz within the United States, notification of the operations shall be sent as far in advance as possible to the National Science Foundation, Division of Astronomical Sciences, Electromagnetic Spectrum Management Unit, 2415 Eisenhower Avenue, Alexandria, VA 22314; Email: esm@nsf.gov.

US100 The following provisions shall apply to the bands 2310-2320 MHz and 2345-2360 MHz:

(a) The bands 2310-2320 and 2345-2360 MHz are available for Federal aeronautical telemetering and associated telecommand operations for flight testing of manned or unmanned aircraft, missiles, or major

components thereof, on a secondary basis to the Wireless Communications Service (WCS). The frequencies 2312.5 MHz and 2352.5 MHz are shared on a co-equal basis by Federal stations for telemetering and associated telecommand operations of expendable and reusable launch vehicles, irrespective of whether such operations involve flight testing. Other Federal mobile telemetering uses may be provided in the bands 2310-2320 and 2345-2360 MHz on a non-interference basis to all other uses authorized pursuant to this footnote.

(b) The band 2345-2360 MHz is available for non-Federal aeronautical telemetering and associated telecommand operations for flight testing of manned or unmanned aircraft, missiles, or major components thereof, on a secondary basis to the WCS until January 1, 2020. The use of this allocation is restricted to non-Federal licensees in the Aeronautical and Fixed Radio Service holding a valid authorization on April 23, 2015.

US101 The band 2360-2400 MHz is also allocated on a secondary basis to the mobile, except aeronautical mobile, service. The use of this allocation is limited to MedRadio operations. MedRadio stations are authorized by rule and operate in accordance with 47 CFR part 95.

US102 In Alaska only, the frequency 122.1 MHz may also be used for air carrier air traffic control purposes at locations where other frequencies are not available to air carrier aircraft stations for air traffic control.

US103 In the band 3300-3550 MHz, non-Federal stations in the radiolocation service that were licensed (or licensed pursuant to applications accepted for filing) before February 22, 2019 may continue to operate on a secondary basis until 180 days after the issuance of the first flexible-use licenses in the 3.45 GHz Service. No new assignments shall be made. In the band 3300-3500 MHz, stations in the amateur service may continue to operate on a secondary basis until new flexible-use licenses are issued for operation in the band in which they operate. Amateur operations between 3450 MHz and 3500 MHz must cease within 90 days of the public notice announcing the close of the auction for the 3.45 GHz Service. Stations in the amateur service may continue to operate in the band 3300-3450 MHz on a secondary basis while the band's future uses are finalized, but stations in the amateur service may be required to cease operations in the band 3300-3450 MHz at any time if the amateur service causes harmful interference to flexible-use operations.

US104 In the band 90-110 kHz, the LORAN radionavigation system has priority in the United States and its insular areas. Radiolocation land stations making use of LORAN type equipment may be authorized to both Federal and non-Federal licensees on a secondary basis for offshore radiolocation activities only at specific locations and subject to such technical and operational conditions (*e.g.*, power, emission, pulse rate and phase code, hours of operation), including on-the-air testing, as may be required on a case-by-case basis to ensure protection of the LORAN radionavigation system from harmful interference and to ensure mutual compatibility among radiolocation operators. Such authorizations to stations in the radiolocation service are further subject to showing of need for service which is not currently provided and which the Federal Government is not yet prepared to render by way of the radionavigation service.

US105 In the band 3550-3650 MHz, non-Federal stations in the radiolocation service that were licensed or applied for prior to July 23, 2015 may continue to operate on a secondary basis until the end of the equipment's useful lifetime.

US107 In the band 3600-3650 MHz, the following provisions shall apply to earth stations in the fixed-satellite service (space-to-Earth):

(a) Earth stations authorized prior to, or granted as a result of an application filed prior to, July 23, 2015 and constructed within 12 months of initial authorization may continue to operate on a primary basis. Applications for modifications to such earth station facilities filed after July 23, 2015 shall not be accepted, except for changes in polarization, antenna orientation, or ownership; and increases in antenna size for interference mitigation purposes.

(b) The assignment of frequencies to new earth stations after July 23, 2015 shall be authorized on a secondary basis.

US108 In the band 10-10.5 GHz, survey operations, using transmitters with a peak power not to exceed five watts into the antenna, may be authorized for Federal and non-Federal use on a secondary basis to other Federal radiolocation operations.

US109 The band 3650-3700 MHz is also allocated to the Federal radiolocation service on a primary basis at the following sites: St. Inigoes, MD (38° 10' N, 76° 23' W); Pascagoula, MS (30° 22' N, 88° 29' W); and Pensacola, FL (30° 21' 28" N, 87° 16' 26" W). The FCC shall coordinate all non-Federal operations authorized under 47 CFR Part 90 within 80 km of these sites with NTIA on a case-by-case basis. For stations in the Citizens Broadband Radio Service these sites shall be protected consistent with the procedures set forth in 47 CFR 96.15(b) and 96.67.

US110 In the band 9200-9300 MHz, the use of the radiolocation service by non-Federal licensees may be authorized on the condition that harmful interference is not caused to the maritime radionavigation service or to the Federal radiolocation service.

US111 In the band 5091-5150 MHz, aeronautical mobile telemetry operations for flight testing are conducted at the following locations. Flight testing at additional locations may be authorized on a case-by-case basis.

Location	Test Sites	Lat. (N)	Long. (W)
Gulf Area Ranges Complex (GARC)	Eglin AFB, Tyndall AFB, FL; Gulfport ANG Range, MS; Ft. Rucker, Redstone, NASA Marshall Space Flight Center, AL	30° 28'	86° 31'
Utah Ranges Complex (URC)	Dugway PG; Utah Test & Training Range (Hill AFB), UT	40° 57'	113° 05'
Western Ranges Complex (WRC)	Pacific Missile Range; Vandenberg AFB, China Lake NAWS, Pt. Mugu NAWS, Edwards AFB, Thermal, Nellis AFB, Ft. Irwin, NASA Dryden Flight Research Center, Victorville, CA	35° 29'	117° 16'
Southwest Ranges Complex (SRC)	Ft. Huachuca, Tucson, Phoenix, Mesa, Yuma, AZ	31° 33'	110° 18'
Mid-Atlantic Ranges Complex (MARC)	Patuxent River, Aberdeen PG, NASA Langley Research Center, NASA Wallops Flight Facility, MD	38° 17'	76° 24'
New Mexico Ranges Complex (NMRC)	White Sands Missile Range, Holloman AFB, Albuquerque, Roswell, NM; Amarillo, TX	32° 11'	106° 20'
Colorado Ranges Complex (CoRC)	Alamosa, Leadville, CO	37° 26'	105° 52'
Texas Ranges Complex (TRC)	Dallas/Ft. Worth, Greenville, Waco, Johnson Space Flight Center/Ellington Field, TX	32° 53'	97° 02'
Cape Ranges Complex (CRC)	Cape Canaveral, Palm Beach-Dade, FL	28° 33'	80° 34'
Northwest Range Complex (NWRC)	Seattle, Everett, Spokane, Moses Lake, WA; Klamath Falls, Eugene, OR	47° 32'	122° 18'
St. Louis	St Louis, MO	38° 45'	90° 22'
Wichita	Wichita, KS	37° 40'	97° 26'
Marietta	Marietta, GA	33° 54'	84° 31'
Glasgow	Glasgow, MT	48° 25'	106° 32'
Wilmington/Ridley	Wilmington, DE/Ridley, PA	39° 49'	75° 26'
San Francisco Bay Area (SFBA)	NASA Ames Research Center, CA	37° 25'	122° 03'
Charleston	Charleston, SC	32° 52'	80° 02'

US112 The frequency 123.1 MHz is for search and rescue communications. This frequency may be assigned for air traffic control communications at special aeronautical events on the condition that no harmful interference is caused to search and rescue communications during any period of search and rescue operations in the locale involved.

US113 Radio astronomy observations of the formaldehyde line frequencies 4825-4835 MHz and 14.47-14.5 GHz may be made at certain radio astronomy observatories as indicated below:

BANDS TO BE OBSERVED

4 GHz	14 GHz	Observatory
X	…..	National Astronomy and Ionosphere Center (NAIC), Arecibo, PR
X	X	National Radio Astronomy Observatory (NRAO), Green Bank, WV
X	X	NRAO, Socorro, NM
X	…..	Allen Telescope Array (ATA), Hat Creek, CA
X	X	Owens Valley Radio Observatory (OVRO), Big Pine, CA
X	X	NRAO's ten Very Long Baseline Array (VLBA) stations (see US131)
X	X	University of Michigan Radio Astronomy Observatory, Stinchfield Woods, MI
X	…..	Pisgah Astronomical Research Institute, Rosman, NC

Every practicable effort will be made to avoid the assignment of frequencies to stations in the fixed or mobile services in these bands. Should such assignments result in harmful interference to these observations, the situation will be remedied to the extent practicable.

US115 In the bands 5000-5010 MHz and 5010-5030 MHz, the following provisions shall apply:

(a) In the band 5000-5010 MHz, systems in the aeronautical mobile (R) service (AM(R)S) are limited to surface applications at airports that operate in accordance with international aeronautical standards (*i.e.*, AeroMACS).

(b) The band 5010-5030 MHz is also allocated on a primary basis to the AM(R)S, limited to surface applications at airports that operate in accordance with international aeronautical standards. In making assignments for this band, attempts shall first be made to satisfy the AM(R)S requirements in the bands 5000-5010 MHz and 5091-5150 MHz. AM(R)S systems used in the band 5010-5030 MHz shall be designed and implemented to be capable of operational modification if receiving harmful interference from the radionavigation-satellite service. Finally, notwithstanding Radio Regulation No. 4.10, stations in the AM(R)S operating in this band shall be designed and implemented to be capable of operational modification to reduce throughput and/or preclude the use of specific frequencies in order to ensure protection of radionavigation-satellite service systems operating in this band.

(c) Aeronautical fixed communications that are an integral part of the AeroMACS system in the bands 5000-5010 MHz and 5010-5030 MHz are also authorized on a primary basis.

US116 In the bands 890-902 MHz and 935-941 MHz, no new assignments are to be made to Federal radio stations after July 10, 1970, except on case-by-case basis to experimental stations. Federal assignments existing prior to July 10, 1970, shall be on a secondary basis to stations in the non-Federal land mobile service and shall be subject to adjustment or removal from the bands 890-902 MHz, 928-932 MHz, and 935-941 MHz at the request of the FCC.

US117 In the band 406.1-410 MHz, the following provisions shall apply:

(a) Stations in the fixed and mobile services are limited to a transmitter output power of 125 watts, and new authorizations for stations, other than mobile stations, are subject to prior coordination by the applicant in the following areas:

(1) Within Puerto Rico and the U.S. Virgin Islands, contact Spectrum Manager, Arecibo Observatory, HC3 Box 53995, Arecibo, PR 00612. Phone: 787-878-2612, Fax: 787-878-1861, E-mail: prcz@naic.edu.

(2) Within 350 km of the Very Large Array (34° 04' 44" N, 107° 37' 06" W), contact Spectrum Manager, National Radio Astronomy Observatory, P.O. Box O, 1003 Lopezville Road, Socorro, NM 87801. Phone:

505-835-7000, Fax: 505-835-7027, E-mail: nrao-rfi@nrao.edu.

(3) Within 10 km of the Table Mountain Observatory (40° 08' 02" N, 105° 14' 40" W) and for operations only within the sub-band 407-409 MHz, contact Radio Frequency Manager, Department of Commerce, 325 Broadway, Boulder, CO 80305. Phone: 303-497-4619, Fax: 303-497-6982, E-mail: frequencymanager@its.bldrdoc.gov.

(b) Non-Federal use is limited to the radio astronomy service and as provided by footnote US13.

US128 In the band 10-10.5 GHz, pulsed emissions are prohibited, except for weather radars on board meteorological satellites in the sub-band 10-10.025 GHz. The amateur service, the amateur-satellite service, and the non-Federal radiolocation service, which shall not cause harmful interference to the Federal radiolocation service, are the only non-Federal services permitted in this band. The non-Federal radiolocation service is limited to survey operations as specified in footnote US108.

US130 The band 10.6-10.68 GHz is also allocated on a primary basis to the radio astronomy service. However, the radio astronomy service shall not receive protection from stations in the fixed service which are licensed to operate in the one hundred most populous urbanized areas as defined by the 1990 U.S. Census. For the list of observatories operating in this band, see footnote US131.

US131 In the band 10.7-11.7 GHz, non-geostationary satellite orbit licensees in the fixed-satellite service (space-to-Earth), prior to commencing operations, shall coordinate with the following radio astronomy observatories to achieve a mutually acceptable agreement regarding the protection of the radio telescope facilities operating in the band 10.6-10.7 GHz:

Observatory	North latitude	West longitude	Elevation (in meters)
Arecibo Observatory, PR…….....	18° 20' 37"	66° 45' 11"	497
Green Bank Telescope (GBT), WV…..…….....	38° 25' 59"	79° 50' 23"	807
Very Large Array (VLA), Socorro, NM…...…	34° 04' 44"	107° 37' 06"	2115
Very Long Baseline Array (VLBA) Stations:			
Brewster, WA…….……	48° 07' 52"	119° 41' 00"	250
Fort Davis, TX……..…..	30° 38' 06"	103° 56' 41"	1606
Hancock, NH…….....	42° 56' 01"	71° 59' 12"	296
Kitt Peak, AZ…….....	31° 57' 23"	111° 36' 45"	1902
Los Alamos, NM…….....	35° 46' 30"	106° 14' 44"	1962
Mauna Kea, HI…….…….….....	19° 48' 05"	155° 27' 20"	3763
North Liberty, IA……...	41° 46' 17"	91° 34' 27"	222
Owens Valley, CA…….....	37° 13' 54"	118° 16' 37"	1196
Pie Town, NM…….....	34° 18' 04"	108° 07' 09"	2365
St. Croix, VI……..	17° 45' 24"	64° 35' 01"	16

US132A In the bands 26.2-26.42 MHz, 41.015-41.665 MHz, and 43.35-44 MHz, applications of radiolocation service are limited to oceanographic radars operating in accordance with ITU Resolution 612 (Rev.WRC-12). Oceanographic radars shall not cause harmful interference to, or claim protection from, non-Federal stations in the land mobile service in the bands 26.2-26.42 MHz and 43.69-44 MHz, Federal stations in the fixed or mobile services in the band 41.015-41.665 MHz, and non-Federal stations in the fixed or land mobile services in the band 43.35-43.69 MHz.

US133 In the bands 14-14.2 GHz and 14.47-14.5 GHz, the following provisions shall apply to the operations of Earth Stations Aboard Aircraft (ESAA):

(a) In the band 14-14.2 GHz, ESAA licensees proposing to operate within radio line-of-sight of the coordinates specified in 47 CFR 25.228(j)(1) are subject to prior coordination with NTIA in order to minimize harmful interference to the ground terminals of NASA's Tracking and Data Relay Satellite System

(TDRSS).

(b) In the band 14.47-14.5 GHz, operations within radio line-of-sight of the radio astronomy stations specified in 47 CFR 25.228(j)(3) are subject to coordination with the National Science Foundation in accordance with the requirements set forth in that rule section.

US136 The following provisions shall apply in eight HF bands that are allocated to the broadcasting service (HFBC) on a primary basis in all Regions.

(a) In Alaska, the assigned frequency band 7368.48-7371.32 kHz is allocated exclusively to the fixed service (FS) on a primary basis for non-Federal use in accordance with 47 CFR 80.387.

(b) On the condition that harmful interference is not caused to the broadcasting service (NIB operations), Federal and non-Federal stations that communicate wholly within the United States and its insular areas may operate as specified herein. All such stations must take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU Radio Regulations and are limited to the minimum power needed for reliable communications.

(1) *Federal stations*. Frequencies in the 13 HF bands/sub-bands listed in the table below (HF NIB Bands) may be authorized to Federal stations in the FS. In the bands 5.9-5.95, 7.3-7.4, 13.57-13.6, and 13.80-13.87 MHz (6, 7, 13.6, and 13.8 MHz bands), frequencies may also be authorized to Federal stations in the mobile except aeronautical mobile route (R) service (MS except AM(R)S). Federal use of the bands 9.775-9.9, 11.65-11.7, and 11.975-12.05 MHz is restricted to stations in the FS that were authorized as of June 12, 2003, and each grandfathered station is restricted to a total radiated power of 24 dBW. In all other HF NIB Bands (*), new Federal stations may be authorized.

(2) *Non-Federal stations*. Non-Federal use of the HF NIB Bands is restricted to stations in the FS, land mobile service (LMS), and maritime mobile service (MMS) that were licensed prior to March 25, 2007, except that, in the sub-band 7.35-7.4 MHz, use is restricted to stations that were licensed prior to March 29, 2009.

NIB OPERATIONS IN EIGHT HFBC BANDS (MHZ)

HF NIB Band	Federal (*new stations permitted)	Non-Federal	HFBC Band
5.90-5.95	*FS and MS except AM(R)S	MMS …..……	….5.90-6.20
7.30-7.40	*FS and MS except AM(R)S	FS, LMS and MMS	….7.30-7.40
9.40-9.50	*9 MHz: FS …….....	FS and LMS	….9.40-9.90
9.775-9.90	FS (Grandfathered, restricted to 24 dBW)		
11.60-11.65	*11 MHz: FS …….....	FS	11.60-12.10
11.65-11.70	FS (Grandfathered, restricted to 24 dBW)		
11.975-12.05	FS (Grandfathered, restricted to 24 dBW)		
12.05-12.10	*12 MHz: FS ……...……...	FS	
13.57-13.60	*FS and MS except AM(R)S ….....	MMS ….....…….	13.57-13.87
13.80-13.87	*FS and MS except AM(R)S	MMS	
15.60-15.80	*15 MHz: FS ……...…..….	FS …..….....	15.10-15.80
17.48-17.55	*17 MHz: FS ……..……...	…….....	17.48-17.90
18.90-19.02	*19 MHz: FS ……..……..….	MMS ….....	18.90-19.02

NOTE: Non-Federal stations may continue to operate in nine HF NIB Bands as follows: (i) In the 6, 7, 13.6, 13.8, and 19 MHz bands, stations in the MMS; (ii) In the 7 and 9 MHz bands, stations in the FS and LMS; and (iii) In the 11, 12, and 15 MHz band, stations in the FS.

US139 Fixed stations authorized in the band 18.3-19.3 GHz under the provisions of 47 CFR 74.502(c), 74.602(g), 78.18(a)(4), and 101.147(r) may continue operations consistent with the provisions of those sections.

US142 In the bands 7.2-7.3 and 7.4-7.45 MHz, the following provisions shall apply:

(a) In the U.S. Pacific insular areas located in Region 3 (*see* 47 CFR 2.105(a), note 3), the bands 7.2-7.3 and 7.4-7.45 MHz are alternatively allocated to the broadcasting service on a primary basis. Use of this allocation is restricted to international broadcast stations that transmit to geographical zones and areas of reception in Region 1 or Region 3.

(b) The use of the band 7.2-7.3 MHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

US145 The following unwanted emissions power limits for non-geostationary satellites operating in the inter-satellite service that transmit in the band 22.55-23.55 GHz shall apply in any 200 MHz of the passive band 23.6-24 GHz, based on the date that complete advance publication information is received by the ITU's Radiocommunication Bureau:

(a) For information received before January 1, 2020: −36 dBW/200 MHz.

(b) For information received on or after January 1, 2020: −46 dBW/200 MHz.

US151 In the band 37-38 GHz, stations in the fixed and mobile services shall not cause harmful interference to Federal earth stations in the space research service (space-to-Earth) at the following sites: Goldstone, CA; Socorro, NM; and White Sands, NM. Applications for non-Federal use of this band shall be coordinated with NTIA in accordance with 47 CFR 30.205.

US156 In the bands 49.7-50.2 GHz and 50.4-50.9 GHz, for earth stations in the fixed-satellite service (Earth-to-space), the unwanted emissions power in the band 50.2-50.4 GHz shall not exceed −20 dBW/ 200 MHz (measured at the input of the antenna), except that the maximum unwanted emissions power may be increased to −10 dBW/200 MHz for earth stations having an antenna gain greater than or equal to 57 dBi. These limits apply under clear-sky conditions. During fading conditions, the limits may be exceeded by earth stations when using uplink power control.

US157 In the band 51.4-52.6 GHz, for stations in the fixed service, the unwanted emissions power in the band 52.6-54.25 GHz shall not exceed −33 dBW/100 MHz (measured at the input of antenna).

US161 In the bands 81-86 GHz, 92-94 GHz, and 94.1-95 GHz and within the coordination distances indicated below, assignments to allocated services shall be coordinated with the following radio astronomy observatories. New observatories shall not receive protection from fixed stations that are licensed to operate in the one hundred most populous urbanized areas as defined by the U.S. Census Bureau for the year 2000.

(a) Within 25 km of the National Radio Astronomy Observatory's (NRAO's) Very Long Baseline Array (VLBA) Stations:

State	VLBA Station	Lat. (N)	Long. (W)
AZ	Kitt Peak	31° 57' 23"	111° 36' 45"
CA	Owens Valley	37° 13' 54"	118° 16' 37"
HI	Mauna Kea	19° 48' 05"	155° 27' 20"
IA	North Liberty	41° 46' 17"	091° 34' 27"
NH	Hancock	42° 56' 01"	071° 59' 12"
NM	Los Alamos	35° 46' 30"	106° 14' 44"

NM	Pie Town	34° 18' 04"	108° 07' 09"
TX	Fort Davis	30° 38' 06"	103° 56' 41"
VI	Saint Croix	17° 45' 24"	064° 35' 01"
WA	Brewster	48° 07' 52"	119° 41' 00"

(b) Within 150 km of the following observatories:

State	Telescope and site	Lat. (N)	Long. (W)
AZ	Heinrich Hertz Submillimeter Observatory, Mt. Graham	32° 42' 06"	109° 53' 28"
AZ	University of Arizona 12-m Telescope, Kitt Peak	31° 57' 12"	111° 36' 53"
CA	Caltech Telescope, Owens Valley	37° 13' 54"	118° 17' 36"
CA	Combined Array for Research in Millimeter-wave Astronomy (CARMA)	37° 16' 43"	118° 08' 32"
HI	James Clerk Maxwell Telescope, Mauna Kea	19° 49' 33"	155° 28' 47"
MA	Haystack Observatory, Westford	42° 37' 24"	071° 29' 18"
NM	NRAO's Very Large Array, Socorro	34° 04' 44"	107° 37' 06"
WV	NRAO's Robert C. Byrd Telescope, Green Bank	38° 25' 59"	079° 50' 23"

NOTE: Satisfactory completion of the coordination procedure utilizing the automated mechanism, see 47 CFR 101.1523, will be deemed to establish sufficient separation from radio astronomy observatories, regardless of whether the distances set forth above are met.

US205 Tropospheric scatter systems are prohibited in the band 2500-2690 MHz.

US208 Planning and use of the band 1559-1626.5 MHz necessitate the development of technical and/or operational sharing criteria to ensure the maximum degree of electromagnetic compatibility with existing and planned systems within the band.

US209 The use of frequencies 460.6625, 460.6875, 460.7125, 460.7375, 460.7625, 460.7875, 460.8125, 460.8375, 460.8625, 465.6625, 465.6875, 465.7125, 465.7375, 465.7625, 465.7875, 465.8125, 465.8375, and 465.8625 MHz may be authorized, with 100 mW or less output power, to Federal and non-Federal radio stations for one-way, non-voice bio-medical telemetry operations in hospitals, or medical or convalescent centers.

US210 In the bands 40.66-40.7 MHz and 216-220 MHz, frequencies may be authorized to Federal and non-Federal stations on a secondary basis for the tracking of, and telemetering of scientific data from, ocean buoys and wildlife. Operation in these bands is subject to the technical standards specified in: (a) Section 8.2.42 of the NTIA Manual for Federal use, or (b) 47 CFR 90.248 for non-Federal use. After January 1, 2002, no new assignments shall be authorized in the band 216-217 MHz.

US211 In the bands 1670-1690, 5000-5250 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.

US212 In, or within 92.6 km (50 nautical miles) of, the State of Alaska, the carrier frequency 5167.5 kHz (assigned frequency 5168.9 kHz) is designated for emergency communications. This frequency may also be used in the Alaska-Private Fixed Service for calling and listening, but only for establishing communications before switching to another frequency. The maximum power is limited to 150 watts peak envelope power (PEP).

US213 The frequency 122.925 MHz is for use only for communications with or between aircraft when coordinating natural resources programs of Federal or State natural resources, agencies, including forestry management and fire suppression, fish and game management and protection and environmental monitoring and protection.

US214 The frequency 157.1 MHz is the primary frequency for liaison communications between ship stations and stations of the United States Coast Guard.

US218 The band 902-928 MHz is available for Location and Monitoring Service (LMS) systems subject to not causing harmful interference to the operation of all Federal stations authorized in this band. These systems must tolerate interference from the operation of industrial, scientific, and medical (ISM) equipment and the operation of Federal stations authorized in this band.

US220 The frequencies 36.25 and 41.71 MHz may be authorized to Federal stations and non-Federal stations in the petroleum radio service, for oil spill containment and cleanup operations. The use of these frequencies for oil spill containment or cleanup operations is limited to the inland and coastal waterway regions.

US221 Use of the mobile service in the bands 525-535 kHz and 1605-1615 kHz is limited to distribution of public service information from Travelers Information stations operating on 530 kHz and 1610 kHz.

US222 In the band 2025-2035 MHz, geostationary operational environmental satellite (GOES) earth stations in the space research and Earth exploration-satellite services may be authorized on a coequal basis for Earth-to-space transmissions for tracking, telemetry, and telecommand at Honolulu, HI (21° 21' 12" N, 157° 52' 36" W); Seattle, WA (47° 34' 15" N, 122° 33' 10" W); and Wallops Island, VA (37° 56' 44" N, 75° 27' 42" W).

US224 Federal systems utilizing spread spectrum techniques for terrestrial communication, navigation and identification may be authorized to operate in the band 960-1215 MHz on the condition that harmful interference will not be caused to the aeronautical radionavigation service. These systems will be handled on a case-by-case basis. Such systems shall be subject to a review at the national level for operational requirements and electromagnetic compatibility prior to development, procurement or modification.

US225 In addition to its present Federal use, the band 510-525 kHz is available to Federal and non-Federal aeronautical radionavigation stations inland of the Territorial Base Line as coordinated with the military services. In addition, the frequency 510 kHz is available for non-Federal ship-helicopter operations when beyond 100 nautical miles from shore and required for aeronautical radionavigation.

US227 The bands 156.4875-156.5125 MHz and 156.5375-156.5625 MHz are also allocated to the fixed and land mobile services on a primary basis for non-Federal use in VHF Public Coast Station Areas 10-42. The use of these bands by the fixed and land mobile services shall not cause harmful interference to, nor claim protection from, the maritime mobile VHF radiocommunication service.

US230 The bands 422.1875-425.4875 MHz and 427.1875-429.9875 MHz are allocated to the land mobile service on a primary basis for non-Federal use within 80.5 kilometers (50 miles) of Cleveland, OH (41° 29' 51.2" N, 81° 41' 49.5" W) and Detroit, MI (42° 19' 48.1" N, 83° 02' 56.7" W). The bands 423.8125-425.4875 MHz and 428.8125-429.9875 MHz are allocated to the land mobile service on a primary basis for non-Federal use within 80.5 kilometers of Buffalo, NY (42° 52' 52.2" N, 78° 52' 20.1" W).

US231 When an assignment cannot be obtained in the bands between 200 kHz and 525 kHz, which are allocated to aeronautical radionavigation, assignments may be made to aeronautical radiobeacons in the maritime mobile bands at 435-472 kHz and 479-490 kHz, on a secondary basis, subject to the coordination and agreement of those agencies having assignments within the maritime mobile bands which may be affected. Assignments to Federal aeronautical radionavigation radiobeacons in the bands 435-472 kHz and 479-490 kHz shall not be a bar to any required changes to the maritime mobile radio service and shall be limited to non-voice emissions.

US239 Aeronautical radionavigation stations (radiobeacons) may be authorized, primarily for off-shore use, in the band 525-535 kHz on a non-interference basis to travelers information stations.

US240 The bands 1715-1725 and 1740-1750 kHz are allocated on a primary basis and the bands 1705-1715 kHz and 1725-1740 kHz on a secondary basis to the aeronautical radionavigation service (radiobeacons).

US241 The following provision shall apply to Federal operations in the band 216-220.035 MHz:

(a) Use of the fixed and land mobile services in the band 216-220 MHz and of the aeronautical mobile service in the sub-band 217-220 MHz is restricted to telemetry and associated telecommand operations. New stations in the fixed and land mobile services shall not be authorized in the sub-band 216-217 MHz.

(b) The sub-band 216.965-216.995 MHz is also allocated to the Federal radiolocation service on a primary basis and the use of this allocation is restricted to the Air Force Space Surveillance System (AFSSS) radar system. AFSSS stations transmit on the frequency 216.98 MHz and other operations may be affected within: 1) 250 km of Lake Kickapoo (Archer City), TX (33° 2' 48" N, 98° 45' 46" W); and 2) 150 km of Gila River (Phoenix), AZ (33° 6' 32" N, 112° 1' 45" W) and Jordan Lake (Wetumpka), AL (32° 39' 33" N, 86° 15' 52" W). AFSSS reception shall be protected from harmful interference within 50 km of: 1) Elephant Butte, NM (33° 26' 35" N, 106° 59' 50" W); 2) Fort Stewart, GA (31° 58' 36" N, 81° 30' 34" W); 3) Hawkinsville, GA (32° 17' 20" N, 83° 32' 10" W); 4) Red River, AR (33° 19' 48" N, 93° 33' 1" W); 5) San Diego, CA (32° 34' 42" N, 116° 58' 11" W); and 6) Silver Lake, MS (33° 8' 42" N, 91° 1' 16" W).

(c) The sub-band 219.965-220.035 MHz is also allocated to the Federal radiolocation service on a secondary basis and the use of this allocation is restricted to air-search radars onboard Coast Guard vessels.

US242 Use of the fixed and land mobile services in the band 220-222 MHz shall be in accordance with the following plan:

(a) Frequencies are assigned in pairs, with base station transmit frequencies taken from the sub-band 220-221 MHz and with corresponding mobile and control station transmit frequencies being 1 MHz higher and taken from the sub-band 221-222 MHz.

(b) In the non-Federal exclusive sub-bands, temporary fixed geophysical telemetry operations are also permitted on a secondary basis.

(c) The use of Channels 161-170 is restricted to public safety/mutual aid communications.

(d) The use of Channels 181-185 is restricted to emergency medical communications.

220 MHz PLAN

Use	Base Transmit	Mobile Transmit	Channel Nos.
Non-Federal exclusive	220.00-220.55	221.00-221.55	001-110
Federal exclusive…..	220.55-220.60	221.55-221.60	111-120
Non-Federal exclusive	220.60-220.80	221.60-221.80	121-160
Shared……	220.80-220.85	221.80-221.85	161-170
Non-Federal exclusive	220.85-220.90	221.85-221.90	171-180
Shared……	220.90-220.925	221.90-221.925	181-185
Non-Federal exclusive	220.925-221	221.925-222	186-200

US244 The band 136-137 MHz is allocated to the non-Federal aeronautical mobile (R) service on a primary basis, and is subject to pertinent international treaties and agreements. The frequencies 136, 136.025, 136.05, 136.075, 136.1, 136.125, 136.15, 136.175, 136.2, 136.225, 136.25, 136.275, 136.3, 136.325, 136.35, 136.375, 136.4, 136.425, 136.45, and 136.475 MHz are available on a shared basis to the Federal Aviation Administration for air traffic control purposes, such as automatic weather observation stations

(AWOS), automatic terminal information services (ATIS), flight information services-broadcast (FIS-B), and airport control tower communications.

US245 In the bands 3600-3650 MHz (space-to-Earth), 4500-4800 MHz (space-to-Earth), and 5850-5925 MHz (Earth-to-space), the use of the non-Federal fixed-satellite service is limited to international inter-continental systems and is subject to case-by-case electromagnetic compatibility analysis. The FCC's policy for these bands is codified at 47 CFR 2.108.

US246 No station shall be authorized to transmit in the following bands: 73-74.6 MHz, 608-614 MHz, except for medical telemetry equipment[1] and white space devices,[2] 1400-1427 MHz, 1660.5-1668.4 MHz, 2690-2700 MHz, 4990-5000 MHz, 10.68-10.7 GHz, 15.35-15.4 GHz, 23.6-24 GHz, 31.3-31.8 GHz, 50.2-50.4 GHz, 52.6-54.25 GHz, 86-92 GHz, 100-102 GHz, 109.5-111.8 GHz, 114.25-116 GHz, 148.5-151.5 GHz, 164-167 GHz, 182-185 GHz, 190-191.8 GHz, 200-209 GHz, 226-231.5 GHz, 250-252 GHz.

US247 The band 10 100-10 150 kHz is allocated to the fixed service on a primary basis outside the United States and its insular areas. Transmissions from stations in the amateur service shall not cause harmful interference to this fixed service use and stations in the amateur service shall make all necessary adjustments (including termination of transmission) if harmful interference is caused.

US251 The band 12.75-13.25 GHz is also allocated to the space research (deep space) (space-to-Earth) service for reception only at Goldstone, CA (35° 20' N, 116° 53' W).

US252 The band 2110-2120 MHz is also allocated to the space research service (deep space) (Earth-to-space) on a primary basis at Goldstone, CA (35° 20' N, 116° 53' W).

US254 In the band 18.6-18.8 GHz the fixed and mobile services shall be limited to a maximum equivalent isotropically radiated power of +35 dBW and the power delivered to the antenna shall not exceed −3 dBW.

US255 In addition to any other applicable limits, the power flux-density across the 200 MHz band 18.6-18.8 GHz produced at the surface of the Earth by emissions from a space station under assumed free-space propagation conditions shall not exceed −95 dB(W/m²) for all angles of arrival. This limit may be exceeded by up to 3 dB for no more than 5% of the time.

US258 In the bands 8025-8400 MHz and 25.5-27 GHz, the Earth exploration-satellite service (space-to-Earth) is allocated on a primary basis for non-Federal use. Authorizations are subject to a case-by-case electromagnetic compatibility analysis.

US259 In the band 17.3-17.7 GHz, Federal stations in the radiolocation service shall operate with an e.i.r.p. of less than 51 dBW.

US260 Aeronautical mobile communications which are an integral part of aeronautical radionavigation systems may be satisfied in the bands 1559-1626.5 MHz, 5000-5250 MHz and 15.4-15.7 GHz.

US261 The use of the band 4200-4400 MHz by the aeronautical radionavigation service is reserved exclusively for airborne radio altimeters. Experimental stations will not be authorized to develop equipment for operational use in this band other than equipment related to altimeter stations. However, passive sensing in the Earth-exploration satellite and space research services may be authorized in this band on a secondary basis (no protection is provided from the radio altimeters).

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[1] Medical telemetry equipment shall not cause harmful interference to radio astronomy operations in the band 608-614 MHz and shall be coordinated under the requirements found in 47 CFR 95.1119.

[2] White space devices shall not cause harmful interference to radio astronomy operations in the band 608-614 MHz and shall not operate within the areas described in 47 CFR 15.712(h).

US262 The band 7145-7190 MHz is also allocated to the space research service (deep space) (Earth-to-space) on a secondary basis for non-Federal use. Federal and non-Federal use of the bands 7145-7190 MHz and 34.2-34.7 GHz by the space research service (deep space) (Earth-to-space) and of the band 31.8-32.3 GHz by the space research service (deep space) (space-to-Earth) is limited to Goldstone, CA (35° 20' N, 116° 53' W).

US264 In the band 48.94-49.04 GHz, airborne stations shall not be authorized.

US266 Non-Federal licensees in the Public Safety Radio Pool holding a valid authorization on June 30, 1958, to operate in the frequency band 156.27-157.45 MHz or on the frequencies 161.85 MHz or 161.91 MHz may, upon proper application, continue to be authorized for such operation, including expansion of existing systems, until such time as harmful interference is caused to the operation of any authorized station other than those licensed in the Public Safety Radio Pool.

US267 In the band 902-928 MHz, amateur stations shall transmit only in the sub-bands 902-902.4, 902.6-904.3, 904.7-925.3, 925.7-927.3, and 927.7-928 MHz within the States of Colorado and Wyoming, bounded by the area of latitudes 39° N and 42° N and longitudes 103° W and 108° W.

US268 The bands 890-902 MHz and 928-942 MHz are also allocated to the radiolocation service for Federal ship stations (off-shore ocean areas) on the condition that harmful interference is not caused to non-Federal land mobile stations. The provisions of footnote US116 apply.

US269 In the band 420-450 MHz, the following provisions shall apply to the non-Federal radiolocation service:

(a) Pulse-ranging radiolocation systems may be authorized for use along the shoreline of the conterminous United States and Alaska.

(b) In the sub-band 420-435 MHz, spread spectrum radiolocation systems may be authorized within the conterminous United States and Alaska.

(c) All stations operating in accordance with this provision shall be secondary to stations operating in accordance with the Table of Frequency Allocations.

(d) Authorizations shall be granted on a case-by-case basis; however, operations proposed to be located within the areas listed in paragraph (a) of US270 should not expect to be accommodated.

US270 In the band 420-450 MHz, the following provisions shall apply to the amateur service:

(a) The peak envelope power of an amateur station shall not exceed 50 watts in the following areas, unless expressly authorized by the FCC after mutual agreement, on a case-by-case basis, between the Regional Director of the applicable field office and the military area frequency coordinator at the applicable military base. For areas (5) through (7), the appropriate military coordinator is located at Peterson AFB, CO.

(1) Arizona, Florida and New Mexico.

(2) Within those portions of California and Nevada that are south of latitude 37° 10' N.

(3) Within that portion of Texas that is west of longitude 104° W.

(4) Within 322 km of Eglin AFB, FL (30° 30' N, 86° 30' W); Patrick AFB, FL (28° 21' N, 80° 43' W); and the Pacific Missile Test Center, Point Mugu, CA (34° 09' N, 119° 11' W).

(5) Within 240 km of Beale AFB, CA (39° 08' N, 121° 26' W).

(6) Within 200 km of Goodfellow AFB, TX (31° 25' N, 100° 24' W) and Warner Robins AFB, GA (32° 38' N, 83° 35' W).

(7) Within 160 km of Clear AFS, AK (64° 17' N, 149° 10' W); Concrete, ND (48° 43' N, 97° 54' W); and Otis AFB, MA (41° 45' N, 70° 32' W).

(b) In the sub-band 420-430 MHz, the amateur service is not allocated north of Line A (def. § 2.1).

US273 In the bands 74.6-74.8 MHz and 75.2-75.4 MHz, stations in the fixed and mobile services are limited to a maximum power of 1 watt from the transmitter into the antenna transmission line.

US275 The band 902-928 MHz is allocated on a secondary basis to the amateur service subject to not causing harmful interference to the operations of Federal stations authorized in this band or to Location and Monitoring Service (LMS) systems. Stations in the amateur service must tolerate any interference from the operations of industrial, scientific, and medical (ISM) devices, LMS systems, and the operations of Federal stations authorized in this band. Further, the amateur service is prohibited in those portions of Texas and New Mexico bounded on the south by latitude 31° 41' North, on the east by longitude 104° 11' West, and on the north by latitude 34° 30' North, and on the west by longitude 107° 30' West; in addition, outside this area but within 150 miles of these boundaries of White Sands Missile Range the service is restricted to a maximum transmitter peak envelope power output of 50 watts.

US276 Except as otherwise provided for herein, use of the band 2360-2395 MHz by the mobile service is limited to aeronautical telemetering and associated telecommand operations for flight testing of aircraft, missiles or major components thereof. The following three frequencies are shared on a co-equal basis by Federal and non-Federal stations for telemetering and associated telecommand operations of expendable and reusable launch vehicles, whether or not such operations involve flight testing: 2364.5 MHz, 2370.5 MHz, and 2382.5 MHz. All other mobile telemetering uses shall not cause harmful interference to, or claim protection from interference from, the above uses.

US278 In the bands 22.55-23.55 GHz and 32.3-33 GHz, non-geostationary inter-satellite links may operate on a secondary basis to geostationary inter-satellite links.

US279 The frequency 2182 kHz may be authorized to fixed stations associated with the maritime mobile service for the sole purpose of transmitting distress calls and distress traffic, and urgency and safety signals and messages.

US281 In the band 25 070-25 210 kHz, non-Federal stations in the Industrial/Business Pool shall not cause harmful interference to, and must accept interference from, stations in the maritime mobile service operating in accordance with the Table of Frequency Allocations.

US282 In the band 4650-4700 kHz, frequencies may be authorized for non-Federal communication with helicopters in support of off-shore drilling operations on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.

US283 In the bands 2850-3025 kHz, 3400-3500 kHz, 4650-4700 kHz, 5450-5680 kHz, 6525-6685 kHz, 10 005-10 100 kHz, 11 275-11 400 kHz, 13 260-13 360 kHz, and 17 900-17 970 kHz, frequencies may be authorized for non-Federal flight test purposes on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.

US285 Under exceptional circumstances, the carrier frequencies 2635 kHz, 2638 kHz, and 2738 kHz may be authorized to coast stations.

US287 In the maritime mobile service, the frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on-board communications. The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-2.

US288 In the territorial waters of the United States, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600 MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on-board communications. The

characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-2.

US289 In the bands 460-470 MHz and 1690-1695 MHz, the following provisions shall apply:

(a) In the band 460-470 MHz, space stations in the Earth exploration-satellite service (EESS) may be authorized for space-to-Earth transmissions on a secondary basis with respect to the fixed and mobile services. When operating in the meteorological-satellite service, such stations shall be protected from harmful interference from other EESS applications. The power flux density produced at the Earth's surface by any space station in this band shall not exceed −152 dBW/m²/4 kHz.

(b) In the band 1690-1695 MHz, EESS applications, other than the meteorological-satellite service, may also be used for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table of Frequency Allocations.

US296 In the bands designated for ship wide-band telegraphy, facsimile and special transmission systems, the following assignable frequencies are available to non-Federal stations on a shared basis with Federal stations: 2070.5 kHz, 2072.5 kHz, 2074.5 kHz, 2076.5 kHz, 4154 kHz, 4170 kHz, 6235 kHz, 6259 kHz, 8302 kHz, 8338 kHz, 12 370 kHz, 12 418 kHz, 16 551 kHz, 16 615 kHz, 18 848 kHz, 18 868 kHz, 22 182 kHz, 22 238 kHz, 25 123 kHz, and 25 159 kHz.

US297 The bands 47.2-49.2 GHz and 81-82.5 GHz are also available for feeder links for the broadcasting-satellite service.

US298 The assigned frequencies 27.555, 27.615, 27.635, 27.655, 27.765, and 27.860 MHz are available for use by forest product licensees on a secondary basis to Federal operations including experimental stations. Non-Federal operations on these frequencies will not exceed 150 watts output power and are limited to the states of Washington, Oregon, Maine, North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas (eastern portion).

US299 In Alaska, the band 1615-1705 kHz is also allocated to the maritime mobile and Alaska fixed services on a secondary basis to Region 2 broadcast operations.

US300 The frequencies 169.445, 169.505, 169.545, 169.575, 169.605, 169.995, 170.025, 170.055, 170.245, 170.305, 171.045, 171.075, 171.105, 171.845, 171.875, and 171.905 MHz are available for wireless microphone operations on a secondary basis to Federal and non-Federal operations. On center frequencies 169.575 MHz, 170.025 MHz, 171.075 MHz, and 171.875 MHz, the emission bandwidth shall not exceed 200 kHz. On the other center frequencies, the emission bandwidth shall not exceed 54 kHz.

US301 Except as provided in NG30, broadcast auxiliary stations licensed as of November 21, 1984, to operate in the band 942-944 MHz may continue to operate on a co-equal primary basis to other stations and services operating in the band in accordance with the Table of Frequency Allocations.

US303 In the band 2285-2290 MHz, non-Federal space stations in the space research, space operations and Earth exploration-satellite services may be authorized to transmit to the Tracking and Data Relay Satellite System subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to authorized Federal stations. The power flux-density at the Earth's surface from such non-Federal stations shall not exceed −144 to −154 dBW/m²/4 kHz, depending on angle of arrival, in accordance with ITU Radio Regulation 21.16.

US307 The band 5150-5216 MHz is also allocated to the fixed-satellite service (space-to-Earth) for feeder links in conjunction with the radiodetermination-satellite service operating in the bands 1610-1626.5 MHz and 2483.5-2500 MHz. The total power flux-density at the Earth's surface shall in no case exceed −159 dBW/m² per 4 kHz for all angles of arrival.

US308 In the bands 1549.5-1558.5 MHz and 1651-1660 MHz, those requirements of the aeronautical mobile-satellite (R) service that cannot be accommodated in the bands 1545-1549.5 MHz, 1558.5-1559 MHz, 1646.5-1651 MHz and 1660-1660.5 MHz shall have priority access with real-time preemptive

capability for communications in the mobile-satellite service. Systems not interoperable with the aeronautical mobile-satellite (R) service shall operate on a secondary basis. Account shall be taken of the priority of safety-related communications in the mobile-satellite service.

US309 In the bands 1545-1559 MHz, transmissions from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links. In the band 1646.5-1660.5 MHz, transmissions from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

US310 In the band 14.896-15.121 GHz, non-Federal space stations in the space research service may be authorized on a secondary basis to transmit to Tracking and Data Relay Satellites subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to authorized Federal stations. The power flux-density (pfd) produced by such non-Federal stations at the Earth's surface in any 1 MHz band for all conditions and methods of modulation shall not exceed:

-124 dB(W/m²) for $0° < \theta < 5°$

$-124 + (\theta - 5)/2$ dB(W/m²) for $5° < \theta < 25°$

-114 dB(W/m²) for $25° < \theta < 90°$

where θ is the angle of arrival of the radio-frequency wave (degrees above the horizontal). These limits relate to the pfd and angles of arrival which would be obtained under free-space propagation conditions.

US312 The frequency 173.075 MHz may also be authorized on a primary basis to non-Federal stations in the Public Safety Radio Pool, limited to police licensees, for stolen vehicle recovery systems (SVRS). As of May 27, 2005, new SVRS licenses shall be issued for an authorized bandwidth not to exceed 12.5 kHz. Stations that operate as part of a stolen vehicle recovery system that was authorized and in operation prior to May 27, 2005 may operate with an authorized bandwidth not to exceed 20 kHz until May 27, 2019. After that date, all SVRS shall operate with an authorized bandwidth not to exceed 12.5 kHz.

US315 In the bands 1530-1544 MHz and 1626.5-1645.5 MHz, maritime mobile-satellite distress and safety communications, *e.g.*, GMDSS, shall have priority access with real-time preemptive capability in the mobile-satellite service. Communications of mobile-satellite system stations not participating in the GMDSS shall operate on a secondary basis to distress and safety communications of stations operating in the GMDSS. Account shall be taken of the priority of safety-related communications in the mobile-satellite service.

US316 The band 2900-3000 MHz is also allocated to the meteorological aids service on a primary basis for Federal use. Operations in this service are limited to Next Generation Weather Radar (NEXRAD) systems where accommodation in the band 2700-2900 MHz is not technically practical and are subject to coordination with existing authorized stations.

US319 In the bands 137-138 MHz, 148-149.9 MHz, 149.9-150.05 MHz, 399.9-400.05 MHz, 400.15-401 MHz, 1610-1626.5 MHz, and 2483.5-2500 MHz, Federal stations in the mobile-satellite service shall be limited to earth stations operating with non-Federal space stations.

US320 The use of the bands 137-138 MHz, 148-150.05 MHz, 399.9-400.05 MHz, and 400.15-401 MHz by the mobile-satellite service is limited to non-voice, non-geostationary satellite systems and may include satellite links between land earth stations at fixed locations.

US323 In the band 148-149.9 MHz, no individual mobile earth station shall transmit on the same frequency being actively used by fixed and mobile stations and shall transmit no more than 1% of the time during any 15 minute period; except, individual mobile earth stations in this band that do not avoid frequencies actively being used by the fixed and mobile services shall not exceed a power density of -16 dBW/4 kHz and shall transmit no more than 0.25% of the time during any 15 minute period. Any single transmission from any individual mobile earth station operating in this band shall not exceed 450 ms in duration and consecutive

transmissions from a single mobile earth station on the same frequency shall be separated by at least 15 seconds. Land earth stations in this band shall be subject to electromagnetic compatibility analysis and coordination with terrestrial fixed and mobile stations.

US324 In the band 400.15-401 MHz, Federal and non-Federal satellite systems shall be subject to electromagnetic compatibility analysis and coordination.

US325 In the band 148-149.9 MHz fixed and mobile stations shall not claim protection from land earth stations in the mobile-satellite service that have been previously coordinated; Federal fixed and mobile stations exceeding 27 dBW EIRP, or an emission bandwidth greater than 38 kHz, will be coordinated with existing mobile-satellite service space stations.

US327 The band 2310-2360 MHz is allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution 528.

US334 In the bands between 17.7 GHz and 20.2 GHz, the following provisions shall apply:

(a) In the bands between 17.8 GHz and 20.2 GHz, Federal space stations in both geostationary (GSO) and non-geostationary satellite orbits (NGSO) and associated earth stations in the fixed-satellite service (FSS) (space-to-Earth) may be authorized on a primary basis. For a Federal GSO FSS network to operate on a primary basis, the space station shall be located outside the arc, measured from east to west, 70-120° West longitude. Coordination between Federal FSS systems and non-Federal space and terrestrial systems operating in accordance with the United States Table of Frequency Allocations is required.

(b) In the bands between 17.8 GHz and 20.2 GHz, Federal earth stations operating with Federal space stations shall be authorized on a primary basis only in the following areas: Denver, Colorado; Washington, DC; San Miguel, California; and Guam. Prior to the commencement of non-Federal terrestrial operations in these areas, the FCC shall coordinate with NTIA all applications for new stations and modifications to existing stations as specified in 47 CFR 1.924(f), 74.32, and 78.19(f). In the band 17.7-17.8 GHz, the FCC shall also coordinate with NTIA all applications for new stations and modifications to existing stations that support the operations of Multichannel Video Programming Distributors (MVPD) in these areas, as specified in the aforementioned regulations.

(c) In the bands between 17.8 GHz and 19.7 GHz, the power flux-density (pfd) at the surface of the Earth produced by emissions from a Federal GSO space station or from a Federal space station in a NGSO constellation of 50 or fewer satellites, for all conditions and for all methods of modulation, shall not exceed the following values in any 1 MHz band:

(1) -115 dB(W/m^2) for angles of arrival above the horizontal plane (δ) between 0° and 5°,

(2) $-115 + 0.5(\delta - 5)$ dB(W/m^2) for δ between 5° and 25°, and

(3) -105 dB(W/m^2) for δ between 25° and 90°.

(d) In the bands between 17.8 GHz and 19.3 GHz, the pfd at the surface of the Earth produced by emissions from a Federal space station in an NGSO constellation of 51 or more satellites, for all conditions and for all methods of modulation, shall not exceed the following values in any 1 MHz band:

(1) $-115 - X$ dB(W/m^2) for δ between 0° and 5°,

(2) $-115 - X + ((10 + X)/20)(\delta - 5)$ dB(W/m^2) for δ between 5° and 25°, and

(3) -105 dB(W/m^2) for δ between 25° and 90°; where X is defined as a function of the number of satellites, n, in an NGSO constellation as follows:

For $n \leq 288$, $X = (5/119)(n - 50)$ dB; and

For $n > 288$, $X = (1/69)(n + 402)$ dB.

US337 In the band 13.75-13.8 GHz, the FCC shall coordinate earth stations in the fixed-satellite service with NTIA on a case-by-case basis in order to minimize harmful interference to the Tracking and Data Relay Satellite System's forward space-to-space link (TDRSS forward link-to-LEO).

US338A In the band 1435-1452 MHz, operators of aeronautical telemetry stations are encouraged to take all reasonable steps to ensure that the unwanted emissions power does not exceed −28 dBW/27 MHz in the band 1400-1427 MHz. Operators of aeronautical telemetry stations that do not meet this limit shall first attempt to operate in the band 1452-1525 MHz prior to operating in the band 1435-1452 MHz.

US340 The band 2-30 MHz is available on a non-interference basis to Federal and non-Federal maritime and aeronautical stations for the purposes of measuring the quality of reception on radio channels. See 47 CFR 87.149 for the list of protected frequencies and bands within this frequency range. Actual communications shall be limited to those frequencies specifically allocated to the maritime mobile and aeronautical mobile services.

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

13 360-13 410 kHz	42.77-42.87 GHz*
25 550-25 670 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).

US343 In the mobile service, the frequencies between 1435 and 1525 MHz will be assigned for aeronautical telemetry and associated telecommand operations for flight testing of manned or unmanned aircraft and missiles, or their major components. Permissible usage includes telemetry associated with launching and reentry into the Earth's atmosphere as well as any incidental orbiting prior to reentry of manned objects undergoing flight tests. The following frequencies are shared on a co-equal basis with flight telemetering mobile stations: 1444.5, 1453.5, 1501.5, 1515.5, and 1524.5 MHz.

US344 In the band 5091-5250 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 5000-5091 MHz, non-Federal tracking and telecommand operations should be conducted in the band 5150-5250 MHz.

US346 Except as provided for below and by US222, Federal use of the band 2025-2110 MHz by the space operation service (Earth-to-space), Earth exploration-satellite service (Earth-to-space), and space research

service (Earth-to-space) shall not constrain the deployment of the Television Broadcast Auxiliary Service, the Cable Television Relay Service, or the Local Television Transmission Service. To facilitate compatible operations between non-Federal terrestrial receiving stations at fixed sites and Federal earth station transmitters, coordination is required. To facilitate compatible operations between non-Federal terrestrial transmitting stations and Federal spacecraft receivers, the terrestrial transmitters in the band 2025-2110 MHz shall not be high-density systems (see Recommendations ITU-R SA.1154 and ITU-R F.1247). Military satellite control stations at the following sites shall operate on a co-equal, primary basis with non-Federal operations:

Facility	Coordinates	
Naval Satellite Control Network, Prospect Harbor, ME	44° 24' 16" N	068° 00' 46" W
New Hampshire Tracking Station, New Boston AFS, NH	42° 56' 52" N	071° 37' 36" W
Eastern Vehicle Check-out Facility & GPS Ground Antenna & Monitoring Station, Cape Canaveral, FL	28° 29' 09" N	080° 34' 33" W
Buckley AFB, CO	39° 42' 55" N	104° 46' 36" W
Colorado Tracking Station, Schriever AFB, CO	38° 48' 21" N	104° 31' 43" W
Kirtland AFB, NM	34° 59' 46" N	106° 30' 28" W
Camp Parks Communications Annex, Pleasanton, CA	37° 43' 51" N	121° 52' 50" W
Naval Satellite Control Network, Laguna Peak, CA	34° 06' 31" N	119° 03' 53" W
Vandenberg Tracking Station, Vandenberg AFB, CA	34° 49' 21" N	120° 30' 07" W
Hawaii Tracking Station, Kaena Pt, Oahu, HI	21° 33' 44" N	158° 14' 31" W
Guam Tracking Stations, Anderson AFB, and Naval CTS, Guam	13° 36' 54" N	144° 51' 18" E

US347 In the band 2025-2110 MHz, non-Federal Earth-to-space and space-to-space transmissions may be authorized in the space research and Earth exploration-satellite services subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to Federal and non-Federal stations operating in accordance with the Table of Frequency Allocations.

US349 The band 3650-3700 MHz is also allocated to the Federal radiolocation service on a non-interference basis for use by ship stations located at least 44 nautical miles in off-shore ocean areas on the condition that harmful interference is not caused to non-Federal operations.

US350 In the band 1427-1432 MHz, Federal use of the land mobile service and non-Federal use of the fixed and land mobile services is limited to telemetry and telecommand operations as described further:

(a) *Medical operations*. The use of the band 1427-1432 MHz for medical telemetry and telecommand operations (medical operations) shall be authorized for both Federal and non-Federal stations.

(1) Medical operations shall be authorized in the band 1427-1429.5 MHz in the United States and its insular areas, except in the following locations: Austin/Georgetown, Texas; Detroit and Battle Creek, Michigan; Pittsburgh, Pennsylvania; Richmond/Norfolk, Virginia; Spokane, Washington; and Washington DC metropolitan area (collectively, the "carved-out" locations). See Section 47 C.F.R. 90.259(b)(4) for a detailed description of these areas.

(2) In the carved-out locations, medical operations shall be authorized in the band 1429-1431.5 MHz.

(3) Medical operations may operate on frequencies in the band 1427-1432 MHz other than those described in paragraphs (a)(1) and (2) only if the operations were registered with a designated frequency coordinator prior to April 14, 2010.

(b) *Non-medical operations*. The use of the band 1427-1432 MHz for non-medical telemetry and telecommand operations (non-medical operations) shall be limited to non-Federal stations.

(1) Non-medical operations shall be authorized on a secondary basis to the Wireless Medical Telemetry Service (WMTS) in the band 1427-1429.5 MHz and on a primary basis in the band 1429.5-1432 MHz in the United States and its insular areas, except in the carved-out locations.

(2) In the carved-out locations, non-medical operations shall be authorized on a secondary basis in the band 1429-1431.5 MHz and on a primary basis in the bands 1427-1429 MHz and 1431.5-1432 MHz.

US353 In the bands 56.24-56.29 GHz, 58.422-58.472 GHz, 59.139-59.189 GHz, 59.566-59.616 GHz, 60.281-60.331 GHz, 60.41-60.46 GHz, and 62.461-62.511 GHz, space-based radio astronomy observations may be made on an unprotected basis.

US354 In the band 58.422-58.472 GHz, airborne stations and space stations in the space-to-Earth direction shall not be authorized.

US356 In the band 13.75-14 GHz, an earth station in the fixed-satellite service shall have a minimum antenna diameter of 4.5 m and the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. In addition the e.i.r.p., averaged over one second, radiated by a station in the radiolocation service shall not exceed 59 dBW. Receiving space stations in the fixed-satellite service shall not claim protection from radiolocation transmitting stations operating in accordance with the United States Table of Frequency Allocations. ITU Radio Regulation No. 5.43A does not apply.

US357 In the band 13.75-14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the ITU Radiocommunication Bureau (Bureau) prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

a) the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed 71 dBW in any 6 MHz band from 13.77 to 13.78 GHz;

b) the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in any 6 MHz band from 13.77 to 13.78 GHz.

Automatic power control may be used to increase the e.i.r.p. density in any 6 MHz band in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. of 71 dBW or 51 dBW, as appropriate, in any 6 MHz band in clear-sky conditions.

US359 In the band 15.43-15.63 GHz, use of the fixed-satellite service (Earth-to-space) is limited to non-Federal feeder links of non-geostationary systems in the mobile-satellite service. The FCC shall coordinate earth stations in this band with NTIA (see Annex 3 of Recommendation ITU-R S.1340).

US360 The band 33-36 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for Federal use. Coordination between Federal fixed-satellite service systems and non-Federal systems operating in accordance with the United States Table of Frequency Allocations is required.

US362 The band 1670-1675 MHz is allocated to the meteorological-satellite service (space-to-Earth) on a primary basis for Federal use. Earth station use of this allocation is limited to Wallops Island, VA (37° 56' 44" N, 75° 27' 37" W), Fairbanks, AK (64° 58' 22" N, 147° 30' 04" W), and Greenbelt, MD (39° 00' 02" N, 76° 50' 29" W). Applicants for non-Federal stations within 100 kilometers of the Wallops Island or Fairbanks coordinates and within 65 kilometers of the Greenbelt coordinates shall notify NOAA in accordance with the procedures specified in 47 CFR 1.924.

US364 Consistent with US18, stations may be authorized on a primary basis in the band 285-325 kHz for the specific purpose of transmitting differential global positioning system information.

US378 In the band 1710-1755 MHz, the following provisions apply:

(a) Federal fixed and tactical radio relay stations may operate indefinitely on a primary basis within 80 km of Cherry Point, NC (34° 58' N, 76° 56' W) and Yuma, AZ (32° 32' N, 113° 58' W).

(b) Federal fixed and tactical radio relay stations shall operate on a secondary basis to primary non-Federal operations at the 14 sites listed below:

80 km radius of operation centered on:		
State	Location	Coordinates
CA	China Lake	35° 41' N, 117° 41' W
CA	Pacific Missile Test Range/Point Mugu	34° 07' N, 119° 30' W
FL	Eglin AFB	30° 29' N, 086° 31' W
MD	Patuxent River	38° 17' N, 076° 25' W
NM	White Sands Missile Range	33° 00' N, 106° 30' W
NV	Nellis AFB	36° 14' N, 115° 02' W
UT	Hill AFB	41° 07' N, 111° 58' W
50 km radius of operation centered on:		
AL	Fort Rucker	31° 13' N, 085° 49' W
CA	Fort Irwin	35° 16' N, 116° 41' W
GA	Fort Benning	32° 22' N, 084° 56' W
GA	Fort Stewart	31° 52' N, 081° 37' W
KY	Fort Campbell	36° 41' N, 087° 28' W
NC	Fort Bragg	35° 09' N, 079° 01' W
WA	Fort Lewis	47° 05' N, 122° 36' W

(c) In the sub-band 1710-1720 MHz, precision guided munitions shall operate on a primary basis until inventory is exhausted or until December 31, 2008, whichever is earlier.

(d) All other Federal stations in the fixed and mobile services shall operate on a primary basis until reaccommodated in accordance with the Commercial Spectrum Enhancement Act.

US379 In the band 55.78-56.26 GHz, in order to protect stations in the Earth exploration-satellite service (passive), the maximum power density delivered by a transmitter to the antenna of a fixed service station is limited to −28.5 dB(W/MHz).

US380 In the bands 1525-1544 MHz, 1545-1559 MHz, 1610-1645.5 MHz, 1646.5-1660.5 MHz, and 2483.5-2500 MHz, a non-Federal licensee in the mobile-satellite service (MSS) may also operate an ancillary terrestrial component in conjunction with its MSS network, subject to the Commission's rules for ancillary terrestrial components and subject to all applicable conditions and provisions of its MSS authorization.

US382 In the band 39.5-40 GHz, Federal earth stations in the mobile-satellite service (space-to-Earth) shall not claim protection from non-Federal stations in the fixed and mobile services. ITU Radio Regulation No. 5.43A does not apply.

US384 In the band 401-403 MHz, the non-Federal Earth exploration-satellite (Earth-to-space) and meteorological-satellite (Earth-to-space) services are limited to earth stations transmitting to Federal space stations.

US385 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, and in the band 2655-2690 MHz on a secondary 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.	

(a) 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.

(b) In the band 2655-2690 MHz, for radio astronomy observations performed at the locations listed above, licensees are urged to coordinate their systems through the National Science Foundation, Division of Astronomical Sciences, Electromagnetic Spectrum Management Unit, 2415 Eisenhower Avenue, Alexandria, VA 22314; Email: esm@nsf.gov.

US389 In the bands 71-76 GHz and 81-86 GHz, stations in the fixed, mobile, and broadcasting services shall not cause harmful interference to, nor claim protection from, Federal stations in the fixed-satellite service at any of the following 28 military installations:

Military Installation	State	Nearby city

Redstone Arsenal…….....	AL	Huntsville
Fort Huachuca……..…	AZ	Sierra Vista
Yuma Proving Ground…….....	AZ	Yuma
Beale AFB…….....	CA	Marysville
Camp Parks Reserve Forces Training Area……...……..……	CA	Dublin
China Lake Naval Air Weapons Station……..……	CA	Ridgecrest
Edwards AFB……..….	CA	Rosamond
Fort Irwin……...……..…	CA	Barstow
Marine Corps Air Ground Combat Center……..…...	CA	Twentynine Palms
Buckley AFB……..……..……..….	CO	Aurora (Denver)
Schriever AFB……....…	CO	Colorado Springs
Fort Gordon…….....	GA	Augusta
Naval Satellite Operations Center……..….....	GU	Finegayan (Guam)
Naval Computer and Telecommunications Area Master Station, Pacific	HI	Wahiawa (Oahu Is.)
Fort Detrick……..……	MD	Frederick
Nellis AFB……..….	NV	Las Vegas
Nevada Test Site……..…	NV	Amargosa Valley
Tonapah Test Range Airfield……...…….....	NV	Tonapah
Cannon AFB…….....	NM	Clovis
White Sands Missile Range…….....	NM	White Sands
Dyess AFB……..….	TX	Abilene
Fort Bliss……..…	TX	El Paso
Fort Sam Houston…….....	TX	San Antonio
Goodfellow AFB……..……	TX	San Angelo
Kelly AFB…….……...……..…..	TX	San Antonio
Utah Test and Training Range…….…….....	UT	…..
Fort Belvoir……..……	VA	Alexandria
Naval Satellite Operations Center.……...…..….	VA	Chesapeake

US390 Federal stations in the space research service (active) operating in the band 5350-5460 MHz shall not cause harmful interference to, nor claim protection from, Federal and non-Federal stations in the aeronautical radionavigation service nor Federal stations in the radiolocation service.

US391 In the band 2495-2500 MHz, the mobile-satellite service (space-to-Earth) shall not receive protection from non-Federal stations in the fixed and mobile except aeronautical mobile services operating in that band.

US397 In the band 432-438 MHz, the Earth exploration-satellite service (active) is allocated on a secondary basis for Federal use. Stations in the Earth exploration-satellite service (active) shall not be operated within line-of-sight of the United States except for the purpose of short duration pre-operational testing. Operations under this allocation shall not cause harmful interference to, nor claim protection from, any other services allocated in the band 432-438 MHz in the United States, including secondary services and the amateur-satellite service.

US402 In the band 17.3-17.7 GHz, existing Federal satellites and associated earth stations in the fixed-satellite service (Earth-to-space) are authorized to operate on a primary basis in the frequency bands and areas listed below. Non Federal Receiving earth stations in the broadcasting-satellite service and fixed satellite service within the bands and areas listed below shall not claim protection from Federal earth stations in the fixed-satellite service.

(a) 17.600-17.700 GHz for stations within a 120 km radius of 38° 49' N latitude and 76° 52' W longitude.

(b) 17.375-17.475 GHz for stations within a 160 km radius of 39° 42' N latitude and 104° 45' W longitude.

US431B The band 3450-3550 MHz is allocated on a primary basis to the Federal radiolocation service and to the non-Federal fixed and mobile, except aeronautical mobile, services on a nationwide basis. Federal operations in the band 3450-3550 MHz shall not cause harmful interference to non-Federal operations, except under the following circumstances.

(a) *Cooperative Planning Areas*. Cooperative Planning Areas (CPAs) are geographic locations in which non-Federal operations shall coordinate with Federal systems in the band to deploy non-Federal operations in a manner that shall not cause harmful interference to Federal systems operating in the band. In addition, operators of non-Federal stations may be required to modify their operations (*e.g.*, reduce power, filtering, adjust antenna pointing angles, shielding, *etc.*) to protect Federal operations against harmful interference and to avoid, where possible, interference and potential damage to the non-Federal operators' systems. In these areas, non-Federal operations may not claim interference protection from Federal systems. Federal and non-Federal operators may reach mutually acceptable operator-to-operator agreements to permit more extensive non-Federal use by identifying and mutually agreeing upon a technical approach that mitigates the interference risk to Federal operations. To the extent possible, Federal use in CPAs will be chosen to minimize operational impact on non-Federal users. The table in paragraph (d) identifies the locations of CPAs, including, for information, those with high powered Federal operations. CPAs may also be Periodic Use Areas as described below. Coordination between Federal users and non-Federal licensees in CPAs shall be consistent with rules and procedures established by the FCC and NTIA.

(b) *Periodic Use Areas*. Periodic Use Areas (PUAs) are geographic locations in which non-Federal operations in the band shall not cause harmful interference to Federal systems operating in the band for episodic periods. During these times and in these areas, Federal users will require interference protection from non-Federal operations. Operators of non-Federal stations may be required to temporarily modify their operations (*e.g.*, reduce power, filtering, adjust antenna pointing angles, shielding, *etc.*) to protect Federal operations from harmful interference, which may include restrictions on non-Federal stations' ability to radiate at certain locations during specific periods of time. During such episodic use, non-Federal users in PUAs must alter their operations to avoid harmful interference to Federal systems' temporary use of the band, and during such times, non-Federal operations may not claim interference protection from Federal systems. Federal and non-Federal operators may reach mutually acceptable operator-to-operator agreements such that a Federal operator may not need to activate a PUA if a mutually agreeable technical approach mitigates the interference risk to Federal operations. To the extent possible, Federal use in PUAs will be chosen to minimize operational impact on non-Federal users. Coordination between Federal users and non-Federal licensees in PUAs shall be consistent with rules and procedures established by the FCC and NTIA. While all PUAs are co-located with CPAs, the exact geographic area used during periodic use may differ from the co-located CPA. The geographic locations of PUAs are identified in the table in paragraph (d). Restrictions and authorizations for the CPAs remain in effect during periodic use unless specifically relieved in the coordination process.

(c) For the CPA at Little Rock, AR, after approximately 12 months from the close of the auction, non-Federal operations shall coordinate with Federal systems in only the 3450-3490 MHz band segment and the 3490-3550 MHz band segment will be available for non-federal use without coordination. At Fort Bragg, NC, non-Federal operations shall coordinate with Federal systems in only the 3450-3490 MHz band segment.

(d) The following table identifies the coordinates for the location of each CPA and PUA. An area may be represented as either a polygon made up of several corresponding coordinates or a circle represented by a center point and a radius. If a CPA has a corresponding PUA, the PUA coordinates are provided. A location marked with an asterisk (*) indicates a high-power federal radiolocation facility. If a location includes a Shipboard Electronic Systems Evaluation Facility (SESEF) attached to a homeport, it specifies the associated SESEF.

Table: Department of Defense Cooperative Planning Areas and Periodic Use Areas

Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Little Rock	AR	Yes	-	37° 28’ 34” 37° 42’ 55” 36° 38’ 29” 34° 57’ 57” 32° 09’ 36” 31° 51’ 52” 32° 12’ 11” 33° 42’ 22” 35° 17’ 35” 36° 12’ 18”	94° 28’ 24” 88° 54’ 36” 87° 52’ 34” 88° 09’ 26” 92° 06’ 54” 93° 10’ 35” 94° 37’ 07” 95° 49’ 52” 96° 23’ 06” 96° 08’ 46”	N/A
Yuma Complex (includes Yuma Proving Grounds and MCAS Yuma)	AZ	Yes	Yes	33° 36' 44" 34° 03' 08" 34° 03' 56" 33° 26' 54" 32° 51' 17" 32° 16' 54" 32° 14' 39" 32° 20' 06" 32° 28' 30" 32° 53' 20"	115° 10' 44" 114° 41' 08" 114° 05' 56" 113° 03' 54" 113° 02' 17" 113° 45' 54" 114° 40' 39" 114° 55' 06" 115° 02' 30" 115° 09' 20"	N/A
Camp Pendleton	CA	Yes	-	33° 21’ 46”	117° 25’25”	50
Edwards Air Force Base	CA	Yes	Yes	35º 19’ 16” 35º 17’ 54” 35º 11’ 43” 35º 00’ 52” 34º 44’ 17” 34º 34’ 16” 34º 26’ 55” 34º 28’ 59” 34º 41’ 36” 35º 07’ 32”	118º 03’ 16” 117º 26’ 54” 117º 15’ 43” 117º 10’ 52” 117º 10’ 17” 117º 19’ 16” 117º 47’ 55” 118º 16’ 59” 118º 28’ 36” 118º 25’ 32”	N/A
National Training Center	CA	Yes	Yes	36°0 3' 31" 36° 03' 09" 35° 41' 46" 35° 07' 24" 34° 42' 43" 34° 44' 22" 35° 02' 28" 35° 34' 49"	117° 00' 45" 116° 20' 43" 115° 44' 31" 115° 44' 09" 116° 17' 58" 117° 05' 19" 117° 35' 18" 117° 27' 37"	N/A

Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Naval Air Weapons Station, China Lake*	CA	Yes	Yes	36º 36’ 42” 35º 54’ 45” 35º 00’ 01” 34º 54’ 34” 35º 44’ 22” 36º 30’ 18”	117º 20’ 42” 116º 31’ 45” 116º 39’ 01” 117º 26’ 34” 118º 17’ 22” 118º 07’ 18”	N/A
Point Mugu	CA	Yes	Yes	34° 06’ 44”	119° 06’ 36”	38
San Diego* (includes Point Loma SESEF range)	CA	Yes	-	33° 4' 10" 32° 27' 19" 32° 33' 29" 32° 47' 16" 33° 1' 20" 33° 20' 36" 33° 24' 36" 32° 52' 54" 33° 04' 10"	117° 35' 40" 118° 0' 37" 116° 51' 8" 116° 28' 5" 116° 31' 5" 116° 47' 10" 117° 0' 51" 117° 9' 35" 117° 35' 40"	N/A
Twentynine Palms	CA	Yes	-	34° 06’ 44”	116° 06' 36"	75
Eglin Air Force Base (includes Santa Rosa Island & Cape San Blas site)	FL	Yes	Yes	Eglin and Santa Rosa Island: 30º 29’ 28.5” Cape San Blas: 29º 40’ 37”	Eglin and Santa Rosa Island: 86º 45’ 00” Cape San Blas: 85º 20’ 50”	35
Mayport* (includes Mayport SESEF range)	FL	Yes	-	30° 23’ 42”	81° 24’ 41”	64
Pensacola*	FL	Yes	Yes	30° 20' 50	87° 18' 40"	93
Joint Readiness Training Center	LA	Yes	Yes	31° 54' 23" 31° 50' 54" 31° 18' 13" 30° 46' 33" 30° 29' 14" 30° 46' 22" 31° 25' 16"	93° 20' 53" 92° 52' 46" 92° 26' 31" 92° 28' 32" 93° 4' 1" 93° 41' 26" 94° 3' 19"	N/A
Chesapeake Beach*	MD	Yes	Yes	38° 39' 24"	76° 31' 41"	95
Naval Air Station, Patuxent River CPA	MD	Yes	Yes	38° 26' 22" 38° 51' 51" 38° 28' 11" 38° 03' 40" 37° 45' 33" 37° 34' 34" 37° 38' 10" 38° 09' 32" 38° 18' 46" 38° 26' 59"	76° 14' 12" 75° 48' 34" 75° 28' 53" 75° 30' 31" 75° 45' 50" 76° 20' 09" 76° 44' 37" 76° 29' 28" 76° 34' 36" 76° 26' 27"	N/A

Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
PUA				38° 33’ 38” 39° 11’ 10” 38° 38’ 51” 37° 52’ 13” 37° 29’ 44” 37° 10’ 24” 37° 20’ 05” 38° 01’ 11” 38° 20’ 54” 38° 35’ 47”	76° 07’ 29” 75° 29’ 28” 75° 00’ 40” 75° 03’ 24” 75° 22’ 25” 76° 16’ 42” 77° 06’ 52” 76° 36’ 06” 76° 46’ 41” 76° 30’ 02”	
St. Inigoes*	MD	Yes	Yes	38° 08' 41"	76° 26' 03"	87
Bath*	ME	Yes	Yes	44° 02' 29" 43° 52' 27" 43° 48' 53" 43° 32' 50" 43° 27' 16" 43° 44' 26" 43° 54' 57" 44° 06' 56" 44° 17' 2" 44° 26' 54" 44° 36' 16" 44° 33' 45" 44° 57' 05" 44° 56' 27" 44° 32' 13" 44° 24' 08" 44° 02' 29"	70° 10' 41" 70° 10' 29" 70° 01' 6" 69° 57' 30" 69° 42' 52" 69° 13' 52" 69° 24' 50" 69° 25' 13" 69° 16' 56" 69° 45' 13" 69° 56' 50" 70° 04' 01" 70° 14' 55" 70° 19' 38" 70° 08' 17" 70° 36' 36" 70° 10' 41"	N/A
Pascagoula*	MS	Yes	Yes	30° 20' 42"	88° 34' 17"	80
Camp Lejeune	NC	Yes	-	34° 37’ 51”	77° 24’ 28”	54
Cherry Point	NC	Yes	-	34° 54’ 57”	76° 53’ 24”	38
Fort Bragg	NC	Yes	-	37° 35’ 01” 37° 45’ 56” 37° 22’ 33” 36° 38’ 56” 34° 43’ 13” 33° 29’ 44” 33° 24’ 04” 34° 01’ 05” 35° 27’ 24” 36° 27’ 46”	79° 31’ 19” 77° 14’ 14” 76° 18’ 30” 75° 51’ 26” 76° 15’ 37” 78° 29’ 53” 80° 29’ 07” 81° 23’ 49” 81° 37’ 00” 81° 22’ 49”	N/A

Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Portsmouth*	NH	Yes	Yes	42° 23' 06" 42° 25' 05" 42° 21' 36" 42° 18' 28" 42° 13' 01" 42° 06' 30" 42° 02' 54" 42° 08' 03" 42° 10' 25" 42° 15' 39" 42° 22' 44" 42° 34' 56" 42° 52' 26" 43° 13' 48" 43° 31' 21" 43° 45' 21" 43° 59' 20" 43° 36' 10" 43° 49' 27" 43° 27' 40" 43° 00' 57" 42° 44' 40" 42° 51' 47" 42° 33' 46" 42° 24' 24" 42° 23' 06"	71° 10' 23" 71° 05' 43" 71° 00' 54" 70° 54' 35" 70° 44' 53" 70° 41' 11" 70° 37' 44" 70° 33' 35" 70° 20' 54" 70° 02' 39" 69° 48' 42" 69° 36' 01" 69° 26' 24" 69° 28' 18" 69° 40' 13" 70° 01' 31" 70° 30' 21" 70° 52' 5" 71° 15' 22" 71° 24' 47" 71° 53' 01" 71° 56' 37" 71° 27' 07" 71° 27' 12" 71° 21' 10" 71° 10' 23"	N/A
Moorestown*	NJ	Yes	Yes	40° 27' 26" 40° 02' 54" 39° 48' 19" 39° 38' 27" 39° 24' 59" 39° 17' 18" 39° 22' 16" 39° 29' 35" 39° 54' 43" 40° 15' 03" 40° 23' 29" 40° 42' 46" 40° 50' 59" 40° 52' 49" 40° 47' 42" 40° 33' 25" 40° 27' 26"	75° 42' 60" 75° 55' 12" 75° 55' 55" 75° 51' 48" 75° 21' 41" 74° 54' 09" 74° 27' 56" 74° 12' 59" 74° 00' 05" 74° 06' 20" 74° 08' 28" 74° 21’ 54" 74° 31' 36" 74° 42' 53" 75° 03' 00" 75° 28' 15" 75° 42' 60"	N/A

Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
White Sands Missile Range	NM	Yes	Yes	34° 35' 05" 34° 43' 50" 34° 43' 17" 34° 26' 28" 32° 36' 02" 31° 45' 47" 31° 18' 18" 31° 27' 23" 32° 38' 49" 33° 32' 40"	107° 06' 05" 106° 46' 50" 106° 03' 17" 105° 26' 28" 104° 55' 02" 105° 22' 47" 106° 06' 18" 106° 54' 23" 107° 25' 49" 107° 27' 40"	N/A
Nevada Test and Training Range	NV	Yes	Yes	35° 58' 48" 36° 38' 22" 36° 22' 37" 36° 54' 03" 37° 58' 01" 38° 59' 48" 38° 58' 35" 37° 52' 34" 36° 20' 30" 36° 21' 15"	115° 31' 55" 116° 23' 51" 117° 41' 35" 117° 59' 18" 118° 01' 17" 116° 46' 01" 114° 49' 25" 113° 35' 46" 113° 39' 51" 115° 14' 23"	N/A
Fort Sill	OK	Yes	Yes	35° 03' 39" 35° 10' 31" 34° 42' 54" 34° 13' 49" 34° 13' 46" 34° 38' 26"	99° 02' 38" 98° 05' 47" 97° 45' 20" 98° 05' 49" 98° 56' 09" 99° 16' 57"	N/A
Tobyhanna Army Depot	PA	Yes	-	41° 30' 25" 41° 38' 51" 41° 31' 41" 41° 11' 31" 40° 52' 07" 40° 44' 53" 40° 51' 43" 41° 07' 40"	75° 51' 60" 75° 26' 33" 75° 1' 39" 74° 50' 07" 75° 1' 2" 75° 23' 50" 75° 48' 52" 76° 00' 38"	N/A

Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Dahlgren*	VA	Yes	Yes	38° 23' 10" 38° 41' 25" 38° 46' 14" 38° 49' 37" 38° 50' 16" 38° 46' 30" 38° 49' 42" 38° 54' 42" 38° 55' 37" 38° 56' 05" 38° 44' 45" 38° 44' 22" 38° 35' 14" 38° 51' 04" 38° 26' 52" 38° 22' 59" 37° 59' 27" 37° 47' 08" 37° 54' 01" 38° 23' 10"	76° 23' 21" 76° 35' 56" 76° 44' 44" 76° 54' 57" 76° 58' 18" 77° 01' 57" 77° 04' 08" 77° 7' 35" 77° 12' 04" 77° 23' 5" 77° 25' 23" 77° 28' 48" 77° 36' 11" 78° 12' 06" 78° 29' 02" 77° 42' 19" 77° 28' 26" 76° 53' 47" 76° 06' 14" 76° 23' 21"	N/A
Newport News*	VA	Yes	Yes	36° 58' 24"	76° 26' 07"	93
Norfolk* (includes Fort Story SESEF range)	VA	Yes	-	36° 56’ 24”	76° 19’ 55”	74
Wallops Island*	VA	Yes	Yes	37° 51' 25"	75° 27' 59"	76
Bremerton*	WA	Yes	Yes	47° 28' 40" 47° 31' 16" 47° 31' 13" 47° 34' 12" 47° 45' 36" 47° 59' 07" 48° 12' 20" 47° 39' 46" 47° 39' 12" 47° 45' 23" 47° 44' 48" 47° 57' 40" 47° 31' 15" 47° 35' 53" 47° 27' 33" 47° 27' 07" 47° 24' 25" 47° 23' 07" 47° 28' 33" 46° 50' 25" 46° 53' 09" 47° 28' 40"	122° 31' 22" 122° 31' 26" 122° 32' 37" 122° 31' 52" 121° 32' 28" 121° 34' 09" 121° 44' 51" 122° 29' 60" 122° 34' 35" 122° 38' 09" 122° 45' 18" 122° 59' 06" 123° 16' 23" 122° 49' 28" 122° 55' 25" 122° 46' 16" 122° 42' 48" 122° 39' 18" 122° 33' 44" 121° 49' 24" 121° 44' 01" 122° 31' 22"	N/A

Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Everett* (includes Ediz Hook SESEF range)	WA	Yes	-	47° 51' 11" 47° 25' 13" 47° 54' 45" 47° 36' 60” 47° 51' 57" 48° 35' 49" 48° 00' 8" 47° 51' 10"	122° 57' 47" 123° 18' 6" 122° 10' 13" 121° 37' 60" 121° 22' 57" 122° 08' 13" 123° 29' 33" 122° 57' 47"	N/A

US433 In the band 3550-3650 MHz, the following provisions shall apply to Federal use of the aeronautical radionavigation (ground-based) and radiolocation services and to non-Federal use of the fixed and mobile except aeronautical mobile services:

(a) Non-Federal stations in the fixed and mobile except aeronautical mobile services are restricted to stations in the Citizens Broadband Radio Service and shall not cause harmful interference to, or claim protection from, Federal stations in the aeronautical radionavigation (ground-based) and radiolocation services at the locations listed at: ntia.doc.gov/category/3550-3650-mhz. New and modified federal stations shall be allowed at current or new locations, subject only to approval through the National Telecommunications and Information Administration frequency assignment process with new locations added to the list at: ntia.doc.gov/category/3550-3650-mhz. Coordination of the Federal stations with Citizens Broadband Radio Service licensees or users is not necessary. Federal operations, other than airborne radiolocation systems, shall be protected consistent with the procedures set forth in 47 CFR 96.15 and 96.67.

(b) Non-federal fixed and mobile stations shall not claim protection from federal airborne radar systems.

(c) Federal airborne radar systems shall not claim protection from non-Federal stations in the fixed and mobile except aeronautical mobile services operating in the band.

US444 The frequency band 5030-5150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. In the frequency band 5030-5091 MHz, the requirements of this system shall have priority over other uses of this band. For the use of the frequency band 5091-5150 MHz, US444A and Resolution 114 (Rev.WRC-12) of the ITU Radio Regulations apply.

US444A The band 5091-5150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis for non-Federal use. This allocation is limited to feeder links of non-geostationary satellite systems in the mobile-satellite service and is subject to coordination under No. 9.11A of the ITU Radio Regulations. In the band 5091-5150 MHz, the following conditions also apply:

(a) Prior to January 1, 2018, the use of the band 5091-5150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution 114 (Rev.WRC-12);

(b) After January 1, 2016, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems; and

(c) After January 1, 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service.

US444B In the band 5091-5150 MHz, the following provisions shall apply to the aeronautical mobile service:

(a) Use is restricted to: (1) Systems operating in the aeronautical mobile (R) service (AM(R)S) in accordance with international aeronautical standards, limited to surface applications at airports, and in

accordance with Resolution 748 (Rev.WRC-12) (*i.e.*, AeroMACS); and (2) Aeronautical telemetry transmissions from aircraft stations (AMT) in accordance with Resolution 418 (Rev.WRC-12).

(b) Consistent with Radio Regulation No. 4.10, airport surface wireless systems operating in the AM(R)S have priority over AMT systems in the band.

(c) Operators of AM(R)S and AMT systems at the following airports are urged to cooperate with each other in the exchange of information about planned deployments of their respective systems so that the prospects for compatible sharing of the band are enhanced: 1) Boeing Field/King County Intl Airport, Seattle, WA; 2) Lambert-St. Louis Intl Airport, St. Louis, MO; 3) Charleston AFB/Intl Airport, Charleston, SC; 4) Wichita Dwight D. Eisenhower National Airport, Wichita, KS; 5) Roswell Intl Air Center Airport, Roswell, NM; and 6) William P. Gwinn Airport, Jupiter, FL. Other airports may be addressed on a case-by-case basis.

(d) Aeronautical fixed communications that are an integral part of the AeroMACS system authorized in paragraph (a)(1) are also authorized on a primary basis.

US475 The use of the band 9300-9500 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons. In addition, ground-based radar beacons in the aeronautical radionavigation service are permitted in the band 9300-9320 MHz on the condition that harmful interference is not caused to the maritime radionavigation service.

US476A In the band 9300-9500 MHz, Federal stations in the Earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, nor claim protection from, stations of the radionavigation and Federal radiolocation services.

US482 In the band 10.6-10.68 GHz, the following provisions and urgings apply:

(a) Non-Federal use of the fixed service shall be restricted to point-to-point stations, with each station supplying not more than −3 dBW of transmitter power to the antenna, producing not more than 40 dBW of EIRP, and radiating at an antenna main beam elevation angle of 20° or less. Licensees holding a valid authorization on August 6, 2015 to operate in this band may continue to operate as authorized, subject to proper license renewal.

(b) In order to minimize interference to the Earth exploration-satellite service (passive) receiving in this band, licensees of stations in the fixed service are urged to: (1) limit the maximum transmitter power supplied to the antenna to −15 dBW; and (2) employ automatic transmitter power control (ATPC). The maximum transmitter power supplied to the antenna of stations using ATPC may be increased by a value corresponding to the ATPC range, up to a maximum of −3 dBW.

US511E The use of the band 15.4-15.7 GHz by the radiolocation service is limited to Federal systems requiring a necessary bandwidth greater than 1600 MHz that cannot be accommodated within the band 15.7-17.3 GHz except as described below. In the band 15.4-15.7 GHz, stations operating in the radiolocation service shall not cause harmful interference to, nor claim protection from, radars operating in the aeronautical radionavigation service. Radar systems operating in the radiolocation service shall not be developed solely for operation in the band 15.4-15.7 GHz. Radar systems requiring use of the band 15.4-15.7 GHz for testing, training, and exercises may be accommodated on a case-by-case basis.

US519 The band 18-18.3 GHz is also allocated to the meteorological-satellite service (space-to-Earth) on a primary basis. Its use is limited to geostationary satellites and shall be in accordance with the provisions of Article 21, Table 21-4 of the ITU Radio Regulations.

US532 In the bands 21.2-21.4 GHz, 22.21-22.5 GHz, and 56.26-58.2 GHz, the space research and Earth exploration-satellite services shall not receive protection from the fixed and mobile services operating in accordance with the Table of Frequency Allocations.

US550A In the band 36-37 GHz, the following provisions shall apply:

(a) For stations in the mobile service, the transmitter power supplied to the antenna shall not exceed −10 dBW, except that the maximum transmitter power may be increased to −3 dBW for stations used for public safety and disaster management.

(b) For stations in the fixed service, the elevation angle of the antenna main beam shall not exceed 20° and the transmitter power supplied to the antenna shall not exceed:

(1) −5 dBW for hub stations of point-to-multipoint systems; or

(2) −10 dBW for all other stations, except that the maximum transmitter power of stations using automatic transmitter power control (ATPC) may be increased by a value corresponding to the ATPC range, up to a maximum of −7 dBW.

US565 The following frequency bands in the range 275-1000 GHz are identified for passive service applications:

– Radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;

– Earth exploration-satellite service (passive) and space research service (passive): 275-286 GHz, 296-306 GHz, 313-356 GHz, 361-365 GHz, 369-392 GHz, 397-399 GHz, 409-411 GHz, 416-434 GHz, 439-467 GHz, 477-502 GHz, 523-527 GHz, 538-581 GHz, 611-630 GHz, 634-654 GHz, 657-692 GHz, 713-718 GHz, 729-733 GHz, 750-754 GHz, 771-776 GHz, 823-846 GHz, 850-854 GHz, 857-862 GHz, 866-882 GHz, 905-928 GHz, 951-956 GHz, 968-973 GHz and 985-990 GHz.

The use of the range 275-1000 GHz by the passive services does not preclude use of this range by active services. This provision does not establish priority of use in the United States Table of Frequency Allocations, and does not preclude or constrain any active service use or future allocation of frequency bands in the 275-3000 GHz range.

Non-Federal Government (NG) Footnotes

(These footnotes, each consisting of the letters ‘‘NG’’ followed by one or more digits, denote stipulations applicable only to non-Federal operations and thus appear solely in the non-Federal Table.)

NG1 The band 535-1705 kHz is also allocated to the mobile service on a secondary basis for the distribution of public service information from Travelers Information Stations operating in accordance with the provisions of 47 CFR 90.242 on 10 kilohertz spaced channels from 540 kHz to 1700 kHz.

NG2 Facsimile broadcasting stations may be authorized in the band 88-108 MHz.

NG3 Control stations in the domestic public mobile radio service may be authorized frequencies in the band 72-73 and 75.4-76 MHz on the condition that harmful interference will not be caused to operational fixed stations.

NG4 The use of the frequencies in the band 152.84-153.38 MHz may be authorized, in any area, to remote pickup broadcast base and mobile stations on the condition that harmful interference will not be caused to stations operating in accordance with the Table of Frequency Allocations.

NG5 In the band 535-1705 kHz, AM broadcast licensees and permittees may use their AM carrier on a secondary basis to transmit signals intended for both broadcast and non-broadcast purposes. In the band 88-108 MHz, FM broadcast licensees and permittees are permitted to use subcarriers on a secondary basis to transmit signals intended for both broadcast and non-broadcast purposes. In the bands 54-72, 76-88, 174-216, 470-608, and 614-698 MHz, TV broadcast licensees and permittees are permitted to use subcarriers on a secondary basis for both broadcast and non-broadcast purposes. Use of the band 614-698 MHz is subject to the provisions specified in NG33.

NG6 Stations in the public safety radio services authorized as of June 30, 1958, to use frequencies in the band 159.51-161.79 MHz in areas other than Puerto Rico and the Virgin Islands may continue such operation, including expansion of existing systems, on the condition that harmful interference will not be

caused to stations in the services to which these bands are allocated. In Puerto Rico and the Virgin Islands this authority is limited to frequencies in the band 160.05-161.37 MHz. No new public radio service system will be authorized to operate on these frequencies.

NG7 In the bands 2000-2065, 2107-2170, and 2194-2495 kHz, fixed stations associated with the maritime mobile service may be authorized, for purposes of communication with coast stations, to use frequencies assignable to ship stations in these bands on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations. *See* 47 CFR 80.371(a) for the list of available carrier frequencies.

NG8 In the band 472-479 kHz, non-Federal stations in the maritime mobile service that were licensed or applied for prior to July 14, 2017 may continue to operate on a primary basis, subject to periodic license renewals.

NG14 TV broadcast stations authorized to operate in the bands 54-72, 76-88, 174-216, 470-608, and 614-698 MHz may use a portion of the television vertical blanking interval for the transmission of telecommunications signals, on the condition that harmful interference will not be caused to the reception of primary services, and that such telecommunications services must accept any interference caused by primary services operating in these bands. Use of the band 614-698 MHz is subject to the provisions specified in NG33.

NG16 In the bands 72-73 MHz and 75.4-76 MHz, frequencies may be authorized for mobile operations in the Industrial/Business Radio Pool, subject to not causing interference to the reception of broadcast television signals on channels 4 and 5.

NG17 Stations in the land transportation radio services authorized as of May 15, 1958 to operate on the frequency 161.61 MHz may, upon proper application, continue to be authorized for such operation, including expansion of existing systems, on the condition that harmful interference will not be caused to the operation of any authorized station in the maritime mobile service. No new land transportation radio service system will be authorized to operate on 161.61 MHz.

NG22 The frequencies 156.050 and 156.175 MHz may be assigned to stations in the maritime mobile service for commercial and port operations in the New Orleans Vessel Traffic Service (VTS) area and the frequency 156.250 MHz may be assigned to stations in the maritime mobile service for port operations in the New Orleans and Houston VTS areas.

NG28 In Puerto Rico and the United States Virgin Islands, the band 160.86-161.4 MHz is available for assignment to remote pickup broadcast stations on a shared basis with stations in the Industrial/Business Pool.

NG30 In Puerto Rico, the band 942-944 MHz is alternatively allocated to the fixed service (aural broadcast auxiliary stations).

NG32 Frequencies in the bands 454.6625-454.9875 MHz and 459.6625-459.9875 MHz may be assigned to domestic public land and mobile stations to provide a two-way air-ground public radiotelephone service.

NG33 In the band 614-698 MHz, the following provisions shall apply:

(a) Until July 13, 2020, stations in the broadcasting service and other authorized uses may operate as follows:

(1) Full power and Class A television (TV) stations, i.e., broadcast TV stations, may operate on a co-equal, primary basis with stations in the fixed and mobile services until such stations terminate operations on their pre-auction television channels in accordance with § 73.3700(b)(4).

(2) Low power TV (LPTV) and TV translator stations may operate on a secondary basis to stations in the fixed and mobile services and to broadcast TV stations, and fixed TV broadcast auxiliary stations may operate on a secondary basis to LPTV and TV translator stations, unless such stations are required to terminate their operations earlier in accordance with § 73.3700(g)(4) or § 74.602(h)(5)-(6).

(3) Low power auxiliary stations (LPAS), including wireless assist video devices (WAVDs), may operate on a secondary basis to all other authorized stations in accordance with § 74.802(f) and § 74.870(i).

(4) Unlicensed wireless microphones and white space devices (WSDs) may operate on a non-interference basis, unless such devices are required to terminate operations earlier in accordance with § 15.236(c)(2) or § 15.707(a)(1)-(2), (5), respectively.

(b) After July 13, 2020, only the following types of radiofrequency devices that are authorized in paragraph (a) may continue to operate:

(1) LPTV and TV translator stations may operate on a secondary basis to stations in the fixed and mobile services in the sub-bands 617-652 MHz and 663-698 MHz until required to terminate their operations in accordance with § 73.3700(g)(4).

(2) LPAS may operate in the sub-band 653-657 MHz and unlicensed wireless microphones may operate in the sub-bands 614-616 MHz and 657-663 MHz.

(3) WSDs may operate in: (i) the sub-bands 617-652 MHz and 663-698 MHz, except in those areas where their use is prohibited in accordance with §§ 15.707(a)(5) and 15.713(b)(2)(iv), and (ii) the sub-band 657-663 MHz, in accordance with § 15.707(a)(4).

NG34 The bands 758-775 MHz and 788-805 MHz are available for assignment to the public safety services, as described in 47 CFR part 90.

NG35 Frequencies in the bands 928-929 MHz, 932-932.5 MHz, 941-941.5 MHz, and 952-960 MHz may be assigned for multiple address systems and associated mobile operations on a primary basis.

NG41 In the band 2120-2180 MHz, the following provisions shall apply to grandfathered stations in the fixed service:

(a) In the sub-band 2160-2162 MHz, authorizations in the Broadband Radio Service (BRS) applied for after January 16, 1992 shall be granted on a secondary basis to Advanced Wireless Services (AWS). In the band 2150-2162 MHz, all other BRS stations shall operate on a primary basis until December 9, 2021, and may continue to operate on a secondary basis thereafter, unless said facility is relocated in accordance with 47 CFR 27.1250 through 27.1255.

(b) In the sub-band 2160-2180 MHz, fixed stations authorized pursuant to 47 CFR part 101 may continue to operate on a secondary basis to AWS.

NG50 In the band 10-10.5 GHz, non-Federal stations in the radiolocation service shall not cause harmful interference to the amateur service; and in the sub-band 10.45-10.5 GHz, these stations shall not cause harmful interference to the amateur-satellite service.

NG51 In Puerto Rico and the United States Virgin Islands, the use of band 150.8-151.49 MHz by the fixed and land mobile services is limited to stations in the Industrial/Business Pool.

NG52 Except as provided for by NG527A, use of the bands 10.7-11.7 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary satellites in the fixed-satellite service (FSS) shall be limited to international systems, *i.e.*, other than domestic systems.

NG53 In the band 13.15-13.25 GHz, the following provisions shall apply:

(a) The sub-band 13.15-13.2 GHz is reserved for television pickup (TVPU) and cable television relay service (CARS) pickup stations inside a 50 km radius of the 100 television markets delineated in 47 CFR 76.51; and outside these areas, TVPU stations, CARS stations and non-geostationary satellite orbit fixed-satellite service (NGSO FSS) gateway earth stations shall operate on a co-primary basis.

(b) The sub-band 13.2-13.2125 GHz is reserved for TVPU stations on a primary basis and for CARS pickup stations on a secondary basis inside a 50 km radius of the 100 television markets delineated in 47 CFR 76.51; and outside these areas, TVPU stations and NGSO FSS gateway earth stations shall operate on a co-primary basis and CARS stations shall operate on a secondary basis.

(c) In the band 13.15-13.25 GHz, fixed television auxiliary stations licensed pursuant to applications accepted for filing before September 1, 1979, may continue operation, subject to periodic license renewals.

(d) In the sub-band 13.15-13.2125 GHz, NGSO FSS gateway uplink transmissions shall be limited to a maximum e.i.r.p. of 3.2 dBW towards 0° on the radio horizon.

NOTE: The above provisions shall not apply to geostationary satellite orbit (GSO) FSS operations in the band 12.75-13.25 GHz.

NG56 In the bands 72-73 and 75.4-76 MHz, the use of mobile radio remote control of models is on a secondary basis to all other fixed and mobile operations. Such operations are subject to the condition that interference will not be caused to common carrier domestic public stations, to remote control of industrial equipment operating in the band 72-76 MHz, or to the reception of television signals on channels 4 (66-72 MHz) or 5 (76-82 MHz). Television interference shall be considered to occur whenever reception of regularly used television signals is impaired or destroyed, regardless of the strength of the television signal or the distance to the television station.

NG57 The use of the band 12.75-13.25 GHz by non-geostationary-satellite systems in the fixed-satellite service is limited to communications with individually licensed earth stations.

NG58 In the band 17.3-17.8 GHz, the following provisions shall apply to the broadcasting-satellite, fixed, and fixed-satellite services:

(a) The use of the band 17.3-17.8 GHz by the broadcasting-satellite and fixed-satellite (space-to-Earth) services is limited to geostationary satellites.

(b) The use of the band 17.3-17.8 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for broadcasting-satellite service.

(c) The use of the band 17.7-17.8 GHz by the broadcasting-satellite service is limited to receiving earth stations located outside of the United States and its insular areas.

(d) In the band 17.7-17.8 GHz, earth stations in the fixed-satellite service may be authorized for the reception of FSS emissions from geostationary satellites, subject to the condition that these earth stations shall not claim protection from transmissions of non-Federal stations in the fixed service that operate in that band.

NG59 The frequencies 37.60 and 37.85 MHz may be authorized only for use by base, mobile, and operational fixed stations participating in an interconnected or coordinated power service utility system.

NG60 In the band 31-31.3 GHz, for stations in the fixed service authorized after August 6, 2018, the unwanted emissions power in any 100 MHz of the 31.3-31.5 GHz Earth exploration-satellite service (passive) band shall be limited to −38 dBW (−38 dBW/100 MHz), as measured at the input to the antenna.

NG62 In the bands 28.5-29.1 GHz and 29.25-29.5 GHz, stations in the fixed-satellite service shall not cause harmful interference to, or claim protection from, stations in the fixed service operating under the following call signs: KEB35, KGB72, KGC79, KIL20, KME49, KQG58, KQH74, KSA96, KSE73, KVH83, KYJ33, KZS88, WAX78, WLT380, WMK817, WML443, WMP367, and WSL69.

NG63 In the band 37.5-40 GHz, earth station operations in the fixed-satellite service (space-to-Earth) shall not claim protection from stations in the fixed and mobile services, except where individually licensed earth stations are authorized pursuant to 47 CFR § 25.136.

NG65 In the bands 24.75-25.25 GHz, 47.2-48.2 GHz, and 50.4-51.4 GHz, stations in the fixed and mobile services may not claim protection from individually licensed earth stations authorized pursuant to 47 CFR 25.136. However, nothing in this footnote shall limit the right of Upper Microwave Flexible Use Service licensees to operate in conformance with the technical rules contained in 47 CFR part 30. The Commission reserves the right to monitor developments and to undertake further action concerning interference between Upper Microwave Flexible Use Service and Fixed-Satellite Service, including aggregate interference to satellite receivers, if appropriate.

NG66 The band 470-512 MHz (TV channels 14-20) is allocated to the broadcasting service on an exclusive

basis throughout the United States and its insular areas, except as described below:

(a) In the urbanized areas listed in the table below, the indicated frequency bands are allocated to the land mobile service on an exclusive basis for assignment to eligibles in the Public Mobile Services, the Public Safety Radio Pool, and the Industrial/Business Radio Pool, except that:

(1) Licensees in the land mobile service that are regulated as Commercial Mobile Radio Service (CMRS) providers may also use their assigned spectrum to provide fixed service on a primary basis.

(2) The use of the band 482-488 MHz (TV channel 16) is limited to eligibles in the Public Safety Radio Pool in or near (i) the Los Angeles urbanized area; and (ii) New York City; Nassau, Suffolk, and Westchester Counties in New York State; and Bergen County, NJ.

Urbanized area	Bands (MHz)	TV channels
Boston, MA	470-476, 482-488	14, 16
Chicago, IL-Northwestern IN	470-476, 476-482	14, 15
Cleveland, OH	470-476, 476-482	14, 15
Dallas-Fort Worth, TX	482-488	16
Detroit, MI	476-482, 482-488	15, 16
Houston, TX	488-494	17
Los Angeles, CA	470-476, 482-488, 506-512	14, 16, 20
Miami, FL	470-476	14
New York, NY-Northeastern NJ	470-476, 476-482, 482-488	14, 15, 16
Philadelphia, PA-NJ	500-506, 506-512	19, 20
Pittsburgh, PA	470-476, 494-500	14, 18
San Francisco-Oakland, CA	482-488, 488-494	16, 17
Washington, DC-MD-VA	488-494, 494-500	17, 18

(b) In the Gulf of Mexico offshore from the Louisiana-Texas coast, the band 476-494 MHz (TV channels 15-17) is allocated to the fixed and mobile services on a primary basis for assignment to eligibles in the Public Mobile and Private Land Mobile Radio Services.

(c) In Hawaii, the band 488-494 MHz (TV channel 17) is allocated exclusively to the fixed service for use by common carrier control and repeater stations for point-to-point inter-island communications only.

(d) The use of these allocations is further subject to the conditions set forth in 47 CFR parts 22 and 90.

NG70 In Puerto Rico and the Virgin Islands only, the bands 159.240-159.435 and 160.410-160.620 MHz are also available for assignment to base stations and mobile stations in the special industrial radio service.

NG92 The band 1900-2000 kHz is also allocated on a primary basis to the maritime mobile service in Regions 2 and 3 and to the radiolocation service in Region 2, and on a secondary basis to the radiolocation service in Region 3. The use of these allocations is restricted to radio buoy operations on the open sea and the Great Lakes. Stations in the amateur, maritime mobile, and radiolocation services in Region 2 shall be protected from harmful interference only to the extent that the offending station does not operate in compliance with the technical rules applicable to the service in which it operates.

NG111 The band 157.4375-157.4625 MHz may be used for one way paging operations in the special emergency radio service.

NG112 The frequencies 25.04, 25.08, 150.980, 154.585, 158.445, 159.480, 454.000 and 459.000 MHz may be authorized to stations in the Industrial/Business Pool for use primarily in oil spill containment and cleanup operations and secondarily in regular land mobile communication.

NG115 In the bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-698 MHz, wireless microphones and wireless assist video devices may be authorized on a non-interference basis, subject to the terms and conditions set forth in 47 CFR part 74, subpart H.

NG118 In the bands 2025-2110 MHz, 6875-7125 MHz, and 12.7-13.25 GHz, television translator relay

stations may be authorized to use frequencies on a secondary basis to other stations in the Television Broadcast Auxiliary Service that are operating in accordance with the Table of Frequency Allocations.

NG124 In the bands 30.85-34, 37-38, 39-40, 42-47.41, 150.995-156.25, 158.715-159.465, 453.0125-453.9875, 458.0125-458.9875, 460.0125-465.6375, and 467.9375-467.9875 MHz, police licensees are authorized to operate low power transmitters on a secondary basis in accordance with the provisions of 47 CFR 2.803 and 90.20(e)(5).

NG141 In Alaska, the frequencies 42.4 MHz and 44.1 MHz are authorized on a primary basis for meteor burst communications by fixed stations in the Rural Radio Service operating under the provisions of 47 CFR part 22. In Alaska, the frequencies 44.2 MHz and 45.9 MHz are authorized on a primary basis for meteor burst communications by fixed private radio stations operating under the provisions of 47 CFR part 90. The private radio station frequencies may be used by Common Carrier stations on a secondary, noninterference basis and the Common Carrier frequencies may be used by private radio stations for meteor burst communications on a secondary, noninterference basis. Users shall cooperate to the extent practical to minimize potential interference. Stations utilizing meteor burst communications shall not cause harmful interference to stations of other radio services operating in accordance with the Table of Frequency Allocations.

NG143 In the band 11.7-12.2 GHz, protection from harmful interference shall be afforded to transmissions from space stations not in conformance with ITU Radio Regulation No. 5.488 only if the operations of such space stations impose no unacceptable constraints on operations or orbit locations of space stations in conformance with No. 5.488.

NG147 In the band 2483.5-2500 MHz, non-Federal stations in the fixed and mobile services that are licensed under 47 CFR parts 74, 90, or 101, which were licensed as of July 25, 1985, and those whose initial applications were filed on or before July 25, 1985, may continue to operate on a primary basis with the mobile-satellite and radiodetermination-satellite services, and in the sub-band 2495-2500 MHz, these grandfathered stations may also continue to operate on a primary basis with stations in the fixed and mobile except aeronautical mobile services that are licensed under 47 CFR part 27.

NG148 The frequencies 154.585 MHz, 159.480 MHz, 160.725 MHz, 160.785 MHz, 454.000 MHz and 459.000 MHz may be authorized to maritime mobile stations for offshore radiolocation and associated telecommand operations.

NG149 The bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-512 MHz, 512-608 MHz, and 614-698 MHz are also allocated to the fixed service to permit subscription television operations in accordance with 47 CFR part 73. Use of the band 614-698 MHz is subject to the provisions specified in NG33.

NG152 The use of the band 219-220 MHz by the amateur service is limited to stations participating, as forwarding stations, in point-to-point fixed digital message forwarding systems, including intercity packet backbone networks.

NG155 The bands 159.500-159.675 MHz and 161.375-161.550 MHz are allocated to the maritime service as described in 47 CFR part 80. Additionally, the frequencies 159.550, 159.575 and 159.600 MHz are available for low-power intership communications.

NG159 In the band 698-806 MHz, stations authorized under 47 CFR part 74, subparts F and G may continue to operate indefinitely on a secondary basis to all other stations operating in that band.

NG160 In the band 5895-5925 MHz, the use of the non-Federal mobile service is limited to operations in the Intelligent Transportation System radio service.

NG164 The use of the band 18.6-18.8 GHz by the fixed-satellite service is limited to geostationary-satellite networks.

NG165 In the bands 18.8-19.3 GHz and 28.6-29.1 GHz, geostationary-satellite networks in the fixed-

satellite service shall not cause harmful interference to, or claim protection from, non-geostationary-satellite systems in the fixed-satellite service.

NG166 The use of the bands 19.4-19.6 GHz and 29.1-29.25 GHz by the fixed-satellite service is limited to feeder links for non-geostationary-satellite systems in the mobile-satellite service.

NG169 After December 1, 2000, operations on a primary basis by the fixed-satellite service (space-to-Earth) in the band 3650-3700 MHz shall be limited to grandfathered earth stations. All other fixed-satellite service earth station operations in the band 3650-3700 MHz shall be on a secondary basis. Grandfathered earth stations are those authorized prior to December 1, 2000, or granted as a result of an application filed prior to December 1, 2000, and constructed within 12 months of initial authorization. License applications for primary operations for new earth stations, major amendments to pending earth station applications, or applications for major modifications to earth station facilities filed on or after December 18, 1998, and prior to December 1, 2000, shall not be accepted unless the proposed facilities are within 16.1 kilometers (10 miles) of an authorized primary earth station operating in the band 3650-3700 MHz. License applications for primary operations by new earth stations, major amendments to pending earth station applications, and applications for major modifications to earth station facilities, filed after December 1, 2000, shall not be accepted, except for changes in polarization, antenna orientation or ownership of a grandfathered earth station.

NG171 In the band 6875-7125 MHz, the following two channels should be used for airborne TV pickup stations, wherever possible: 7075-7100 MHz and 7100-7125 MHz.

NG172 In the band 7025-7075 MHz, the fixed-satellite service (space-to-Earth) is allocated on a primary basis, but the use of this allocation shall be limited to two grandfathered satellite systems. Associated earth stations located within 300 meters of the following locations shall be grandfathered: (a) In the band 7025-7075 MHz, Brewster, WA (48º 08' 46.7" N, 119º 42' 8.0" W); and (b) In the sub-band 7025-7055 MHz, Clifton, TX (31º 47' 58.5" N, 97º 36' 46.7" W) and Finca Pascual, PR (17º 58' 41.8" N, 67º 8' 12.6" W).

NG173 In the band 216-220 MHz, secondary telemetry operations are permitted subject to the requirements of 47 CFR 90.259. After January 1, 2002, no new assignments shall be authorized in the sub-band 216-217 MHz.

NG175 In the band 38.6-40 GHz, television pickup stations that were authorized on or before April 16, 2003, may continue to operate on a secondary basis to stations operating in accordance with the Table of Frequency Allocations.

NG182 In the band 3700-4200 MHz, the following provisions shall apply:

(a) Except as provided in paragraph (c)(1), any currently authorized space stations serving the contiguous United States may continue to operate on a primary basis, but no applications for new space station authorizations or new petitions for market access shall be accepted for filing after June 21, 2018, other than applications by existing operators in the band seeking to make more efficient use of the band 4000-4200 MHz. Applications for extension, cancellation, replacement, or modification of existing space station authorizations in the band will continue to be accepted and processed normally.

(b) In areas outside the contiguous United States, the band 3700-4000 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis.

(c) In the contiguous United States, i.e., the contiguous 48 states and the District of Columbia as defined by Partial Economic Areas Nos. 1-41, 43-211, 213-263, 265-297, 299-359, and 361-411, which includes areas within 12 nautical miles of the U.S. Gulf coastline (*see* § 27.6(m) of this chapter), the following provisions apply:

(1) Incumbent use of the fixed-satellite service (space-to-Earth) in the band 3700-4000 MHz is subject to the provisions of §§ 25.138, 25.147, 25.203(n) and part 27, subpart O of this chapter;

(2) Fixed service licensees authorized as of April 19, 2018, pursuant to part 101 of this chapter, must

self-relocate their point-to-point links out of the band 3700-4200 MHz by December 5, 2023;

(3) In the band 3980-4000 MHz, no new fixed or mobile operations will be permitted until specified by Commission rule, order, or notice.

NG185 In the band 3650-3700 MHz, the use of the non-Federal fixed-satellite service (space-to-Earth) is limited to international inter-continental systems.

NG338A In the bands 1390-1395 MHz and 1427-1435 MHz, licensees are encouraged to take all reasonable steps to ensure that unwanted emissions power does not exceed the following levels in the band 1400-1427 MHz:

(a) For stations of point-to-point systems in the fixed service: −45 dBW/27 MHz.

(b) For stations in the mobile service (except for devices authorized by the FCC for the Wireless Medical Telemetry Service): −60 dBW/27 MHz.

NG457A Earth stations on vessels (ESVs), as regulated under 47 CFR part 25, are an application of the fixed-satellite service and the following provisions shall apply:

(a) In the band 3700-4200 MHz, ESVs may be authorized to receive FSS signals from geostationary satellites. ESVs in motion are subject to the condition that these earth stations may not claim protection from transmissions of non-Federal stations in the fixed and mobile except aeronautical mobile services. While docked, ESVs receiving in the band 4000-4200 MHz may be coordinated for up to 180 days, renewable. NG182 applies to incumbent licensees that provide service to ESVs in the band 3700-4000 MHz.

(b) In the band 5925-6425 MHz, ESVs may be authorized to transmit to geostationary satellites on a primary basis.

NG527A Earth Stations in Motion (ESIMs), as regulated under 47 CFR part 25, are an application of the fixed-satellite service (FSS) and the following provisions shall apply:

(a) In the bands 10.7-11.7 GHz, 19.3-19.4 GHz, and 19.6-19.7 GHz, ESIMs may be authorized for the reception of FSS emissions from geostationary and non-geostationary satellites, subject to the conditions that these earth stations may not claim protection from transmissions of non-Federal stations in the fixed service and that non-geostationary-satellite systems not cause unacceptable interference to, or claim protection from, geostationary-satellite networks.

(b) In the bands 11.7-12.2 GHz (space-to-Earth), 14.0-14.5 GHz (Earth-to-space), 18.3-18.8 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 28.35-28.6 GHz (Earth-to-space), and 29.25-30.0 GHz (Earth-to-space), ESIMs may be authorized to communicate with geostationary satellites on a primary basis.

(c) In the bands 11.7-12.2 GHz (space-to-Earth), 14.0-14.5 GHz (Earth-to-space), 18.3-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 28.4-28.6 GHz (Earth-to-space), and 29.5-30.0 GHz (Earth-to-space), ESIMs may be authorized to communicate with non-geostationary satellites, subject to the condition that non-geostationary-satellite systems may not cause unacceptable interference to, or claim protection from, geostationary-satellite networks.

(d) In the band 17.8-18.3 GHz, ESIMs may be authorized for the reception of FSS emissions from geostationary and non-geostationary satellites on a secondary basis, subject to the condition that non-geostationary-satellite systems not cause unacceptable interference to, or claim protection from, geostationary-satellite networks.

(e) In the bands 18.8-19.3 GHz (space to Earth), and 28.6-29.1 GHz (Earth to space), ESIMs may be authorized to communicate with geostationary and non-geostationary satellites, subject to the condition that geostationary-satellite networks may not cause unacceptable interference to, or claim protection from, non-geostationary satellite systems in the fixed-satellite service.

(f) In the band 17.3-17.8 GHz, ESIMs may be authorized for the reception of FSS emissions from geostationary satellites on an unprotected basis.

NG535A The use of the band 29.25-29.5 GHz by the fixed-satellite service is limited to geostationary-satellite networks and to feeder links for non-geostationary-satellite systems in the mobile-satellite service.

Federal Government (G) Footnotes

(These footnotes, each consisting of the letter ‘‘G’’ followed by one or more digits, denote stipulations applicable only to Federal operations and thus appear solely in the Federal Table.)

G2 In the bands 216.965-216.995 MHz, 420-450 MHz (except as provided for in G129), 890-902 MHz, 928-942 MHz, 1300-1390 MHz, 2310-2390 MHz, 2417-2450 MHz, 2700-2900 MHz, 3300-3500 MHz, 5650-5925 MHz, and 9000-9200 MHz, use of the Federal radiolocation service is restricted to the military services.

G5 In the bands 162.0125-173.2, 173.4-174, 406.1-410 and 410-420 MHz, use by the military services is limited by the provisions specified in the channeling plans shown in Sections 4.3.7 and 4.3.9 of the NTIA Manual.

G6 Military tactical fixed and mobile operations may be conducted nationally on a secondary basis: (a) To the meteorological aids service in the band 403-406 MHz; and (b) To the radio astronomy service in the band 406.1-410 MHz. Such fixed and mobile operations are subject to local coordination to ensure that harmful interference will not be caused to the services to which the bands are allocated.

G8 Low power Federal radio control operations are permitted in the band 420-450 MHz.

G11 Federal fixed and mobile radio services, including low power radio control operations, are permitted in the band 902-928 MHz on a secondary basis.

G15 Use of the band 2700-2900 MHz by the military fixed and shipborne air defense radiolocation installations will be fully coordinated with the meteorological aids and aeronautical radionavigation services. The military air defense installations will be moved from the band 2700-2900 MHz at the earliest practicable date. Until such time as military air defense installations can be accommodated satisfactorily elsewhere in the spectrum, such operations will, insofar as practicable, be adjusted to meet the requirements of the aeronautical radionavigation service.

G19 Use of the band 9000-9200 MHz by military fixed and shipborne air defense radiolocation installations will be fully coordinated with the aeronautical radionavigation service, recognizing fully the safety aspects of the latter. Military air defense installations will be accommodated ultimately out-side this band. Until such time as military defense installations can be accommodated satisfactorily elsewhere in the spectrum such operations will, insofar as practicable, be adjusted to meet the requirements of the aeronautical radionavigation services.

G27 In the bands 225-328.6 MHz, 335.4-399.9 MHz, and 1350-1390 MHz, the fixed and mobile services are limited to the military services.

G30 In the bands 138-144 MHz, 148-149.9 MHz, and 150.05-150.8 MHz, the fixed and mobile services are limited primarily to operations by the military services.

G32 Except for weather radars on meteorological satellites in the band 9.975-10.025 GHz and for Federal survey operations (see footnote US108), Federal radiolocation in the band 10-10.5 GHz is limited to the military services.

G34 In the band 34.4-34.5 GHz, weather radars on board meteorological satellites for cloud detection are authorized to operate on the basis of equality with military radiolocation devices. All other non-military radiolocation in the band 33.4-36.0 GHz shall be secondary to the military services.

G42 The space operation service (Earth-to-space) is limited to the band 1761-1842 MHz, and is limited to space command, control, range and range rate systems.

G56 Federal radiolocation in the bands 1215-1300, 2900-3100, 5350-5650 and 9300-9500 MHz is primarily for the military services; however, limited secondary use is permitted by other Federal agencies in support of experimentation and research programs. In addition, limited secondary use is permitted for

survey operations in the band 2900-3100 MHz.

G59 In the bands 902-928 MHz, 3100-3300 MHz, 3500-3650 MHz, 5250-5350 MHz, 8500-9000 MHz, 9200-9300 MHz, 13.4-14.0 GHz, 15.7-17.7 GHz and 24.05-24.25 GHz, all Federal non-military radiolocation shall be secondary to military radiolocation, except in the sub-band 15.7-16.2 GHz airport surface detection equipment (ASDE) is permitted on a co-equal basis subject to coordination with the military departments.

G100 The bands 235-322 MHz and 335.4-399.9 MHz are also allocated on a primary basis to the mobile-satellite service, limited to military operations.

G104 In the bands 7450-7550 and 8175-8215 MHz, it is agreed that although the military space radio communication systems, which include earth stations near the proposed meteorological-satellite installations will precede the meteorological-satellite installations, engineering adjustments to either the military or the meteorological-satellite systems or both will be made as mutually required to assure compatible operations of the systems concerned.

G109 All assignments in the band 157.0375-157.1875 MHz are subject to adjustment to other frequencies in this band as long term U.S. maritime VHF planning develops, particularly that planning incident to support of the National VHF-FM Radiotelephone Safety and Distress System (See Doc. 15624/1-1.9.111/1.9.125).

G110 Federal ground-based stations in the aeronautical radionavigation service may be authorized between 3500-3650 MHz when accommodation in the band 2700-2900 MHz is not technically and/or economically feasible.

G114 The band 1369.05-1390 MHz is also allocated to the fixed-satellite service (space-to-Earth) and to the mobile-satellite service (space-to-Earth) on a primary basis for the relay of nuclear burst data.

G115 In the band 13 360-13 410 kHz, the fixed service is allocated on a primary basis outside the conterminous United States. Within the conterminous United States, assignments in the fixed service are permitted, and will be protected for national defense purposes or, if they are to be used only in an emergency jeopardizing life, public safety, or important property under conditions calling for immediate communication where other means of communication do not exist.

G116 The band 7125-7155 MHz is also allocated for Earth-to-space transmissions in the Space Operations Service at a limited number of sites (not to exceed two), subject to established coordination procedures.

G117 In the bands 7.25-7.75 GHz, 7.9-8.4 GHz, 17.375-17.475 GHz, 17.6-21.2 GHz, 30-31 GHz, 33-36 GHz, 39.5-41 GHz, 43.5-45.5 GHz and 50.4-51.4 GHz, the Federal fixed-satellite and mobile-satellite services are limited to military systems.

G120 Development of airborne primary radars in the band 2360-2390 MHz with peak transmitter power in excess of 250 watts for use in the United States is not permitted.

G122 In the bands 2300-2310 MHz, 2395-2400 MHz, 2400-2417 MHz, and 4940-4990 MHz, Federal operations may be authorized on a non-interference basis to authorized non-Federal operations, and shall not constrain the implementation of any non-Federal operations.

G127 Federal Travelers Information Stations (TIS) on 1610 kHz have co-primary status with AM Broadcast assignments. Federal TIS authorized as of August 4, 1994, preclude subsequent assignment for conflicting allotments.

G128 Use of the band 56.9-57 GHz by inter-satellite systems is limited to transmissions between satellites in geostationary orbit, to transmissions between satellites in geostationary satellite orbit and those in high-Earth orbit, to transmissions from satellites in geostationary satellite orbit to those in low-Earth orbit, and to transmissions from non-geostationary satellites in high-Earth orbit to those in low-Earth orbit. For links between satellites in the geostationary satellite orbit, the single entry power flux-density at all altitudes from 0 km to 1000 km above the Earth's surface, for all conditions and for all methods of modulation, shall not

exceed −147 dB (W/m²/100 MHz) for all angles of arrival.

G129 Federal wind profilers are authorized to operate on a primary basis in the radiolocation service in the frequency band 448-450 MHz with an authorized bandwidth of no more than 2 MHz centered on 449 MHz, subject to the following conditions: 1) wind profiler locations must be pre-coordinated with the military services to protect fixed military radars; and 2) wind profiler operations shall not cause harmful interference to, nor claim protection from, military mobile radiolocation stations that are engaged in critical national defense operations.

G130 Federal stations in the radiolocation service operating in the band 5350-5470 MHz, shall not cause harmful interference to, nor claim protection from, Federal stations in the aeronautical radionavigation service operating in accordance with ITU Radio Regulation No. 5.449.

G131 Federal stations in the radiolocation service operating in the band 5470-5650 MHz, with the exception of ground-based radars used for meteorological purposes operating in the band 5600-5650 MHz, shall not cause harmful interference to, nor claim protection from, Federal stations in the maritime radionavigation service.

G132 Use of the radionavigation-satellite service in the band 1215-1240 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under ITU Radio Regulation No. 5.331. Furthermore, the use of the radionavigation-satellite service in the band 1215-1240 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. ITU Radio Regulation No. 5.43 shall not apply in respect of the radiolocation service. ITU Resolution 608 (Rev.WRC-15) shall apply.

G134 In the band 7190-7235 MHz, Federal earth stations operating in the meteorological-satellite service (Earth-to-space) may be authorized subject to the following conditions:

(a) Earth stations are limited to those communicating with the Department of Commerce Geostationary Operational Environmental Satellites (GOES).

(b) There shall not be more than five earth stations authorized at one time.

(c) The GOES satellite receiver shall not claim protection from existing and future stations in the fixed service (ITU Radio Regulation No. 5.43A does not apply).

4.2 FREQUENCY ALLOTMENTS

4.2.1 Allotment of 27575 and 27585 kHz for Short-Distance Low-Power Service

1. These allotments are to provide for intermittent miscellaneous U.S. Government short-distance low-power radio communications, radio signaling, and the control of remote objects or devices by means of radio (where the radiated power exceeds the limit established under Section 7.9).

2. The designated frequencies are allotted for use by U.S. Government agencies and may be authorized for use by agencies as required upon application. All stations operating on these frequencies shall meet the conditions and standards established for this service.

3. The designated frequencies are available on a shared basis only and will not be authorized for exclusive use of any one agency. No protection from interference can be assured to any station operating in this service. Services involving safety of life and property should not employ these frequencies in view of their unprotected status. All transmissions are to be restricted to official U.S. Government business that requires the use of radio.

4. Stations in this service shall utilize FCC type-accepted or type-approved Citizens Radio Band equipment or the equivalent. The maximum transmitter output power shall be five watts.

5. Stations shall be identified in accordance with the regulations of each agency.

6. The only class of station authorized is Mobile (including portable-type operation).

7. Frequencies 27575 and 27585 kHz with 6KA2A, 6KA2D and 6KA3E emission are designated for

the U.S. Government short-distance low-power radio service.

8. All applications for the use of these frequencies must bear the note S159 which reads, "U.S. Government short-distance low-power service."

4.2.2 Allotments in the Band 1755-1850 MHz for Fixed Security Surveillance Systems

The frequencies 1760, 1780, and 1800 MHz are allotted for use in fixed security surveillance systems, on a secondary basis to other stations operating in accordance with the Federal Table of Frequency Allocations.

4.2.3 Allotments for Wide-Area, Common-Use Frequencies

1. Wide-Area, Common-Use frequencies are allotted for use by all federal agencies and are to provide for radio communications that do not justify the assigning of a radio frequency exclusively to that use, i.e., the frequency can be shared with other users.

a. The following paired frequencies are to be used for wide-area (e.g., county-wide, state-wide, USA or USP) operations of a transient nature that require the use of a repeater station. Unpaired, single frequency operations will be permitted on the repeater transmit frequencies and on the repeater receive frequencies only if all other wide-area, common-use frequencies are in use, but only upon showing that none of the unpaired frequencies in subparagraph b., below, are available.

Frequencies (MHz)	
Repeater Transmit	**Repeater Receive**
163.100	168.350
409.050	418.050
409.3375	418.3375

The frequencies 409.05 and 409.3375 MHz shall not be used in the U.S./Canada Border Areas unless prior coordination has been effected with Canada under the provisions of paragraphs 3.9 and 3.10 of Section 3.4.7 of this Manual, or the output power is 5 watts or less and interference does not occur to Canadian operations.

b. The following frequencies are to be used only for wide-area (e.g., county-wide, state-wide, USA or USP) operations of a transient nature that do not require the use of a repeater station, and shall be used in a simplex mode (use of a base station is allowed):

Frequencies (MHz)	
412.825	412.8375
412.850	412.8625

2. All operations shall be authorized in accordance with Chapter 9 of this Manual. The frequencies are available on a shared, non-priority basis only, and will not be authorized for, nor are they intended for, the exclusive use of any one agency. No protection from interference will be provided to any station operating on these frequencies from other stations operating on the same frequency. The use of equipment with coded squelch is strongly encouraged to reduce nuisance interference from other users.

3. These allotments are for use by federal stations in the Land and Maritime Mobile Services (Table of Services, Station Classes, and Stations, Chapter 6, Section 6.1.4 of this Manual refers), and the following restrictions apply.

a. The minimum ERP necessary to support the intended use shall be employed;

b. The maximum base or mobile station transmitter output power shall not exceed 30 watts;

c. The gain of the base station (or repeater station) antenna shall not exceed 6 dBi;

d. The height of the base station (or repeater station) antenna shall not exceed 6 meters above the

height of the structure supporting the antenna;

e. All equipment shall conform to Section 5.3 of this Manual;

4. Applications for assignments on the frequencies listed in subparagraphs 1.a. and 1.b., above, shall be affixed with Record Note S355, "This assignment is for a wide-area, common-use frequency pursuant to Section 4.2.3 of the NTIA Manual."

4.2.4 Allotments for Local-Area, Common-Use Frequencies

1. Local-Area, Common-Use frequencies are allotted for use by all federal agencies and are to provide for radio communications that do not justify the assigning of a radio frequency exclusively to that use, i.e., the frequency can be shared with other users.

a. The following paired frequencies are to be used only for local area operations requiring the use of a repeater station at a fixed location. Unpaired, single frequency operations will be permitted on the repeater transmit frequencies, and on the repeater receive frequencies, only if all other local-area, common-use frequencies are in use, but only upon showing that none of the unpaired frequencies in subparagraph b., below, are available:

Frequencies (MHz)	
Repeater Transmit	**Repeater Receive**
173.625	167.1375
407.525	416.525
409.075	418.075

The frequency 409.075 MHz shall not be used in the U.S./Canada Border Areas unless prior coordination has been effected with Canada under the provisions of paragraphs 3.9 and 3.10 of Section 3.4.7 of this Manual, or the output power is 5 watts or less and interference does not occur to Canadian operations.

b. The following frequencies shall be used only for local area operations that do not require the use of a repeater station, and shall be used only in a simplex mode (use of base stations is allowed):

Frequencies (MHz)	
168.6125	163.7125
412.875	412.8875
412.9	412.9125

2. All operations shall be authorized in accordance with Chapter 9 of this Manual. The frequencies are available on a shared, non-priority basis only, and will not be authorized for, nor are they intended, for the exclusive use of any one agency. No protection from interference will be provided to any station operating on these frequencies from other stations operating on the same frequency. The use of equipment with coded squelch is strongly encouraged to reduce nuisance interference from other users.

3. These allotments are for use by federal stations in the Land and Maritime Mobile Services (Table of Services, Station Classes, and Stations, Chapter 6, Section 6.1.4 of this Manual refers), and the following restrictions apply.

a. The minimum ERP necessary to support the intended use shall be employed;

b. The maximum base or mobile station transmitter output power shall not exceed 30 watts;

c. The gain of the base station (or repeater station) antenna shall not exceed 6 dBi;

d. The height of the base station (or repeater station) antenna shall not exceed 6 meters above the height of the structure supporting the antenna;

e. All equipment shall conform to Section 5.3 of this Manual;

f. Radius of operation for mobile stations is limited to 50 kilometers.

4. Applications for assignments on the frequencies listed in subparagraphs 1.a. and 1.b., above, shall be

affixed with Record Note S356, “This assignment is for a local-area, common-use frequency pursuant to Section 4.2.4 of the NTIA Manual.”

4.3 FREQUENCY PLANS

4.3.1 CW Phase Comparison Radiolocation Plan

1. This plan provides for the use of frequencies for low power, medium and high frequency radiolocation systems employing harmonically related N0N emission phase comparison frequencies and associated 1KA2D emission data link frequencies. These systems normally operate to distances of approximately 400 kilometers offshore and to considerably lesser distances inland.

2. The following phase comparison frequencies with N0N emission are available for assignment in all areas. Frequency assignments for a band of frequencies shall not be made. Where equipment or other limitations make it impracticable to operate on these channels, applications for other suitable frequencies will be considered on a case-by-case basis.

1650.0-1655.0 kHz				
1650.0	1651.0	1652.0	1653.0	1654.0
1650.1	1651.1	1652.1	1653.1	1654.1
1650.2	1651.2	1652.2	1653.2	1654.2
1650.3	1651.3	1652.3	1653.3	1654.3
1650.4	1651.4	1652.4	1653.4	1654.4
1650.5	1651.5	1652.5	1653.5	1654.5
1650.6	1651.6	1652.6	1653.6	1654.6
1650.7	1651.7	1652.7	1653.7	1654.7
1650.8	1651.8	16528	1653.8	1654.8
1650.9	1651.9	1652.9	1653.9	1654.9
				1655.0

3300.4-3310.4 kHz				
3300.4	3302.4	3304.4	3306.4	3308.4
3300.6	3302.6	3304.6	3306.6	3308.6
3300.8	3302.8	3304.8	3306.8	3308.8
3301.0	3303.0	3305.0	3307.0	3309.0
3301.2	3303.2	3305.2	3307.2	3309.2
3301.4	3303.4	3305.4	3307.4	3309.4
3301.6	3303.6	3305.6	3307.6	3309.6
3301.8	3303.8	3305.8	3307.8	3309.8
3302.0	3304.0	3306.0	3308.0	3310.0
3302.2	3304.2	3306.2	3308.2	3310.2
				3310.4

3. The assignment of suitable frequencies for the associated data links with 1KA2D emission shall be considered on a case-by-case basis.

4. The mean antenna power shall be limited to 100 watts for both N0N and 1KA2D emissions. Only radiolocation land stations and radiolocation mobile stations shall be authorized.5. The designated frequencies shall be authorized on a shared non-priority basis only and shall not be authorized for the exclusive use of any one agency. Any harmful interference that may develop between authorized radiolocation operations shall be resolved locally by coordination between the users involved.

5. Frequency assignments shall be for a temporary period not to exceed two years, and may be renewed.

4.3.2 Plan for Wireless Microphones in the Band 162-174 MHz

1. The following channels have been allotted for use by wireless microphone systems under the conditions listed in (a) through (e) below:

169.445 MHz	171.045 MHz
169.505 MHz	171.105 MHz
170.245 MHz	171.845 MHz
170.305 MHz	171.905 MHz

a. The emission bandwidth shall not exceed 54 kHz.

b. The output power shall not exceed 50 milliWatts.

c. The frequency stability of wireless microphones shall limit the total emission to within 32.5 kHz of the assigned frequency.

d. All wireless microphone use will be on an unprotected basis and further will be on a non-

interference basis to authorized federal and non-federal users with the exception of other wireless microphone users.

e. Assignment applications for wireless microphone use will be considered on a case-by-case basis by the Frequency Assignment Subcommittee (FAS); and, assignment applications do not need to be coordinated with the Hydrology Subcommittee.

4.3.3 Plan for Hydrologic and Meteorological Operations in the Bands 162-174 and 406.1-420 MHz

1. Hydrologic Channels. This plan identifies the center frequencies of channels used primarily for hydrologic operations

MHz	MHz	MHz	MHz
169.425	170.2625	171.1000	406.1250
169.4375	170.2750	171.1125	406.1750
169.4500	170.2875	171.1250	412.6625
169.4625	170.3000	171.8250	412.675
169.4750	170.3125	171.8375	412.6875
169.4875	170.3250	171.8500	412.7125
169.5000	171.025	171.8625	412.7250
169.5125	171.0375	171.8750	412.7375
169.5250	171.0500	171.8875	412.7625
170.2250	171.0625	171.9000	412.775
170.2375	171.0750	171.9125	415.1250
170.2500	171.0875	171.9250	415.1750

a. Use by Federal Agencies.

Federal agencies may use the frequencies listed in the table above only for hydrologic operations, except as indicated in Section 8.3.6 of this Manual.

b. Use by non-Federal agencies. As provided in Allocation footnote US13, non-federal fixed stations may use the frequencies listed in the table above for the specific purpose of transmitting hydrologic and meteorological data in cooperation with agencies of the Federal Government.

c. Coordination. agencies must coordinate with the Hydrology Subcommittee of the Federal Interagency Advisory Committee on Water Data, as prescribed in Section 8.3.6 of this Manual, when applying for an assignment on one of the frequencies listed in the table above.

d. Narrowband Hydrologic Operations. All new hydrologic systems are required to operate with a necessary bandwidth of less than 12.5 kHz, and may use all the frequencies shown in the table above.

e. Wideband Hydrologic Operations.

Existing systems authorized in the 162-174 MHz band may continue using equipment operating with necessary bandwidths equal to, or greater than, 12.5 kHz, using the center frequencies listed in the table above that are spaced 25 kHz apart and in the columns beginning with 169.425, 170.2625, and 171.1000 MHz. New operations must have narrowband equipment operating with a necessary bandwidth of less than 12.5 kHz. All hydrologic systems in the 406.1-420 MHz band must comply with the center frequencies listed in the table above, and new operations must have equipment operating with necessary bandwidths of less than 12.5 kHz. New assignments on frequencies 406.1250 and 406.1750 MHz are to be primarily for paired operations with frequencies 415.1250 and 415.1750 MHz, respectively.

2. Meteorological and Quasi-Hydrologic Operations. The frequency 171.175 MHz is allotted for meteorological and quasi-hydrologic operations. Coordination with the Hydrology Subcommittee is not required.

4.3.4 Telemetering Plans

1. For the band 1435-1535 MHz

a. Ninety-nine one-megahertz channels are designated for use for telemetering and associated telecommand during the flight testing of manned or unmanned aircraft, missiles, or major components thereof (Station Classes MOEA, FLEA, MOD, FLD--see Chapter 6 for definitions).

b. All assignments will be centered on frequencies at standard intervals of 1 MHz, beginning at 1435.5 MHz, and will be authorized bandwidths of 1, 3, or 5 MHz. Assignments with bandwidths greater than 1 MHz will be centered so that they do not extend outside the allocated band.

c. The frequencies 1444.5, 1453.5, 1501.5, 1515.5, 1524.5 and 1525.5 MHz will be shared with flight telemetering mobile stations (Station Classes MOEB, FLEB, MOD, FLD--see Chapter 6). Such uses will be limited to 1 MHz bandwidths except for frequencies 1524.5 and 1525.5 MHz where a bandwidth up to 2 MHz is permitted.

d. Included as permissible use of the 1435-1535 MHz band is telemetry associated with launching and reentry into the Earth's atmosphere, as well as any incidental orbiting prior to reentry, of manned or unmanned objects undergoing flight tests (Station Classes MOEA, FLEA, MOD, FLD apply).

e. Telecommand stations authorized operation in the 1435-1535 MHz band will:

(1) Directly support flight test aeronautical telemetering functions;

(2) Be limited to 1 MHz bandwidth; and,

(3) Use antennas having a half power beamwidth of no more than 8 degrees and a front-to-back ratio of at least 20 dB.

f. In the band 1435-1535 MHz, the channels designated for aeronautical telemetering are also available for space telemetering on a shared basis.

2. For the band 2200-2300 MHz

a. In the band 2200-2290 MHz, 90 one-megahertz narrowband channels are designated, centered on 2200.5 MHz and each 1-megahertz increment thereafter, through and including 2289.5 MHz. The use of emission bandwidths greater than 1 MHz is permitted, provided the assigned frequencies are centered on the center frequencies of narrowband channels. These channels are available for a) telemetering from space research space stations irrespective of their trajectories and b) aeronautical telemetering, including telemetry associated with launch vehicles, missiles, and upper atmosphere research rockets. Such use is on a coequal shared basis with fixed and mobile line-of-sight operations in the band conducted in accordance with the Federal Table of Frequency Allocations. No provision is made in this band for the flight testing of manned aircraft.

b. In the band 2290-2300 MHz, no specific channels have been established.

3. For the band 2310-2395 MHz--The following applies to Mobile Telemetry and Associated Telecommand:

a. Seventy-three 1-megahertz channels are designated for use for telemetering and associated telecommand during the flight testing of manned or unmanned aircraft, missiles, or major components thereof (Station Classes MOEA, FLEA, MOD, FLD--see Chapter 6 for definitions).

b. All assignments will be centered on frequencies at standard intervals of 1 MHz, beginning at 2310.5 MHz, and will normally be authorized bandwidths of 1, 3, or 5 MHz. Wider bandwidths may be authorized on a case-by-case basis to equipment capable of tuning the entire band. Assignments with bandwidths greater than 1 MHz will be centered so that they do not extend outside the allocated band. Telecommand assignments will be limited to 1 MHz bandwidths (see 3.d below)

c. The frequencies 2312.5, 2332.5, 2352.5, 2364.5, 2370.5, and 2382.5 MHz are also designated for use by both federal and non-federal stations on a co-equal basis for telemetering and associated telecommand operations of expendable and re-usable launch vehicles whether or not such operations involve flight testing. Such uses will be limited to 1 MHz bandwidths. (Station classes MOEA, MOEB, MOD, FLEA, FLEB, and FLD apply).

d. Telecommand stations, except as noted in 3c, above, authorized operation in the 2310-2390 MHz band will:

(1) Directly support flight test aeronautical telemetering functions;

(2) Be limited to 1 MHz bandwidth; and,

(3) Use antennas having a half power beamwidth of no more than 8 degrees and a front-to-back ratio of at least 20 dB.

4.3.5 VHF/UHF Plan for Aeronautical Radionavigation

1. TACAN-DME and VOR comprise the short-distance air navigational system in the common civil/military National Airspace System (NAS). TACAN is capable of providing range and azimuth information to aircraft. Normally range-only information is received by civil aircraft. DME provides range only and VOR provides azimuth only.

2. Frequencies at 1-MHz increments in the 960-1215 MHz band are used in airborne interrogating and ground transponder equipment as shown in the channel arrangement depicted below. This channel-pairing arrangement, which has been adopted by ICAO for facilities supporting operations in the international aeronautical service, also serves as a basis for all frequency planning and assignments for the NAS. TACAN and DME frequencies are designated on aeronautical charts by channel numbers 1-126. TACAN channels in the National Airspace System plan are paired with VOR or ILS localizer frequencies in the 108-118 MHz band and with glide slope frequencies in the 328.6-335.4 MHz band, as shown. This pairing arrangement facilitates the employment of a VOR in conjunction with a TACAN-DME beacon to form a VORTAC facility to provide simultaneous azimuth and range information to civil aircraft. Similarly TACAN-DME beacons may be paired with ILS facilities to provide both range and terminal guidance (azimuth and glide slope) information to properly equipped aircraft.

3. When a TACAN or DME transponder is intended to operate in association with a VHF navigational facility (VOR or ILS), the transponder is collocated with the VHF facility and frequency paired with it. If the system is to be used for terminal services such as for airport approach or landing, the facilities are considered to be collocated only if the transponder and VHF antennas are not more than 260 feet (80 meters) apart. For enroute procedures, collocation is considered to exist if the antenna separation does not exceed 2,000 feet (610 meters). Where the separation exceeds these figures, a VOR/ILS frequency from one pair and the TACAN-DME frequency from another pair must be assigned and suitable notations made on aeronautical charts to alert the user that he is not receiving azimuth and range information from the same point.

4. TACAN channels 17-59 and 70-126 are designated for use in the National Airspace System. Frequency assignments on these channels and for VOR and ILS operations are managed by the Aeronautical Assignment Group (AAG) of the FAS, under the provisions of Sections 1.3.2 and 9.14.1. Most of these TACAN channels are used by the FAA to provide air navigation services.

5. Channels 1-16 and 60-69 are designated for the military services for tactical uses and are not used in the NAS. The frequency subbands matching these channel designators are assigned to the military departments for use throughout the U. S. and Possessions. Assignments of specific frequencies to areas and locations are accomplished by individual military departments after appropriate coordination between departments. Land and shipborne beacons operating on these channels, as well as airborne beacons for air-to-air operations provide both azimuth and range information to military aircraft.

6. The FAA recognizes the need of the military services to use NAS frequencies for tactical purposes, including air-to-air operations, on a secondary basis. The military services recognize the need for frequency adjustments to provide protection for new or reclassified facilities of the NAS. Assignments and adjustments in support of these facilities shall be coordinated on a case-by-case basis through the AAG.

7. To minimize the possibility of harmful interference between the NAS and military operations, the FAA shall make every effort to avoid the use of TACAN Channels 17, 59, and 70 in areas of concentrated fleet activity. The military services shall coordinate in advance with the FAA relative to the use of TACAN Channels 16, 60, and 69 for land-based facilities.

8. Assignments of TACAN channels in the operational environment of ground radar facilities equipped with Selective Identification Features (SIF) of Secondary Surveillance Radars (SSR) must be considered

carefully, in order to avoid interference. The ground SIF/SSR interrogator transmits on 1030 MHz (TACAN Channel 6 interrogator frequency) and the airborne SIF/SSR transponder transmits on 1090 MHz (TACAN Channel 66 interrogator frequency).

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code *usec*	Reply Freq. MHz	Pulse Code *usec*	Localizer MHz	Glide Slope MHz
1X		1025	12	962	12		
1Y		1025	36	1088	30		
2X		1026	12	963	12		
2Y		1026	36	1089	30		
3X		1027	12	964	12		
3Y		1027	36	1090	30		
4X		1028	12	965	12		
4Y		1028	36	1091	30		
5X		1029	12	966	12		
5Y		1029	36	1092	30		
6X		1030	12	967	12		
6Y		1030	36	1093	30		
7X		1031	12	968	12		
7Y		1031	36	1094	30		
8X		1032	12	969	12		
8Y		1032	36	1095	30		
9X		1033	12	970	12		
9Y		1033	36	1096	30		
10X		1034	12	971	12		
10Y		1034	36	1097	30		
11X		1035	12	972	12		
11Y		1035	36	1098	30		
12X		1036	12	973	12		
12Y		1036	36	1099	30		
13X		1037	12	974	12		
13Y		1037	36	1100	30		
14X		1038	12	975	12		
14Y		1038	36	1101	30		
15X		1039	12	976	12		
15Y		1039	36	1102	30		
16X		1040	12	977	12		
16Y		1040	36	1103	30		
17X	108.00	1041	12	978	12		
17Y	108.05	1041	36	1104	30		
18X		1042	12	979	12	108.10	334.70
18Y		1042	36	1105	30	108.15	334.55
19X	108.20	1043	12	980	12		
19Y	108.25	1043	36	1106	30		
20X		1044	12	981	12	108.3	334.1
20Y		1044	36	1107	30	108.35	333.95
21X	108.40	1045	12	982	12		
21Y	108.45	1045	36	1108	30		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code *usec*	Reply Freq. MHz	Pulse Code *usec*	Localizer MHz	Glide Slope MHz
22X		1046	12	983	12	108.5	329.9
22Y		1046	36	1109	30	108.55	329.75
23X	108.6	1047	12	984	12		
23Y	108.65	1047	36	1110	30		
24X		1048	12	985	12	108.70	330.50
24Y		1048	36	1111	30	108.75	330.35
25X	108.80	1049	12	986	12		
25Y	108.85	1049	36	1112	30		
26X		1050	12	987	12	108.90	329.30
26Y		1050	36	1113	30	108.95	329.15
27X	109.00	1051	12	988	12		
27Y	109.05	1051	36	1114	30		
28X		1052	12	989	12	109.10	331.40
28Y		1052	36	1115	30	109.15	331.25
29X	109.20	1053	12	990	12		
29Y	109.25	1053	36	1116	30		
30X		1054	12	991	12	109.30	332.00
30Y		1054	36	1117	30	109.35	331.85
31X	109.40	1055	12	992	12		
31Y	109.45	1055	36	1118	30		
32X		1056	12	993	12	109.50	332.60
32Y		1056	36	1119	30	109.55	332.45
33X	109.60	1057	12	994	12		
33Y	109.65	1057	36	1120	30		
34X		1058	12	995	12	109.70	333.20
34Y		1058	36	1121	30	109.75	333.05
35X	109.80	1059	12	996	12		
35Y	109.85	1059	36	1122	30		
36X		1060	12	997	12	109.90	333.80
36Y		1060	36	1123	30	109.95	333.65
37X	110.00	1061	12	998	12		
37Y	110.05	1061	36	1124	30		
38X		1062	12	999	12	110.10	334.40
38Y		1062	36	1125	30	110.15	334.25
39X	110.20	1063	12	1000	12		
39Y	110.25	1063	36	1126	30		
40X		1064	12	1001	12	110.3	335
40Y		1064	36	1127	30	110.35	334.85
41X	110.40	1065	12	1002	12		
41Y	110.45	1065	36	1128	30		
42X		1066	12	1003	12	110.50	329.60
42Y		1066	36	1129	30	110.55	329.45
43X	110.60	1067	12	1004	12		
43Y	110.65	1067	36	1130	30		
44X		1068	12	1005	12	110.70	330.20

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code *usec*	Reply Freq. MHz	Pulse Code *usec*	Localizer MHz	Glide Slope MHz
44Y		1068	36	1131	30	110.75	330.05
45X	110.80	1069	12	1006	12		
45Y	110.85	1069	36	1132	30		
46X		1070	12	1007	12	110.90	330.80
46Y		1070	36	1133	30	110.95	330.65
47X	111.00	1071	12	1008	12		
47Y	111.05	1071	36	1134	30		
48X		1072	12	1009	12	111.10	331.70
48Y		1072	36	1135	30	111.15	331.55
49X	111.20	1073	12	1010	12		
49Y	111.25	1073	36	1136	30		
50X		1074	12	1011	12	111.30	332.30
50Y		1074	36	1137	30	111.35	332.15
51X	111.40	1075	12	1012	12		
51Y	111.45	1075	36	1138	30		
52X		1076	12	1013	12	111.50	332.90
52Y		1076	36	1139	30	111.55	332.75
53X	111.60	1077	12	1014	12		
53Y	111.65	1077	36	1140	30		
54X		1078	12	1015	12	111.70	333.50
54Y		1078	36	1141	30	111.75	333.35
55X	111.80	1079	12	1016	12		
55Y	111.85	1079	36	1142	30		
56X		1080	12	1017	12	111.90	331.10
56Y		1080	36	1143	30	111.95	330.95
57X	112.00	1081	12	1018	12		
57Y	112.05	1081	36	1144	30		
58X	112.10	1082	12	1019	12		
58Y	112.15	1082	36	1145	30		
59X	112.20	1083	12	1020	12		
59Y	112.25	1083	36	1146	30		
60X		1084	12	1021	12		
60Y		1084	36	1147	30		
61X		1085	12	1022	12		
61Y		1085	36	1148	30		
62X		1086	12	1023	12		
62Y		1086	36	1149	30		
63X		1087	12	1024	12		
63Y		1087	36	1150	30		
64X		1088	12	1151	12		
64Y		1088	36	1025	30		
65X		1089	12	1152	12		
65Y		1089	36	1026	30		
66X		1090	12	1153	12		
66Y		1090	36	1027	30		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code *usec*	Reply Freq. MHz	Pulse Code *usec*	Localizer MHz	Glide Slope MHz
67X		1091	12	1154	12		
67Y		1091	36	1028	30		
68X		1092	12	1155	12		
68Y		1092	36	1029	30		
69X		1093	12	1156	12		
69Y		1093	36	1030	30		
70X	112.30	1094	12	1157	12		
70Y	112.35	1094	36	1031	30		
71X	112.40	1095	12	1158	12		
71Y	112.45	1095	36	1032	30		
72X	112.50	1096	12	1159	12		
72Y	112.55	1096	36	1033	30		
73X	112.60	1097	12	1160	12		
73Y	112.65	1097	36	1034	30		
74X	112.70	1098	12	1161	12		
74Y	112.75	1098	36	1035	30		
75X	112.80	1099	12	1162	12		
75Y	112.85	1099	36	1036	30		
76X	112.90	1100	12	1163	12		
76Y	112.95	1100	36	1037	30		
77X	113.00	1101	12	1164	12		
77Y	113.05	1101	36	1038	30		
78X	113.10	1102	12	1165	12		
78Y	113.15	1102	36	1039	30		
79X	113.20	1103	12	1166	12		
79Y	113.25	1103	36	1040	30		
80X	113.30	1104	12	1167	12		
80Y	113.35	1104	36	1041	30		
81X	113.40	1105	12	1168	12		
81Y	113.45	1105	36	1042	30		
82X	113.50	1106	12	1169	12		
82Y	113.55	1106	36	1043	30		
83X	113.60	1107	12	1170	12		
83Y	113.65	1107	36	1044	30		
84X	113.70	1108	12	1171	12		
84Y	113.75	1108	36	1045	30		
85X	113.80	1109	12	1172	12		
85Y	113.85	1109	36	1046	30		
86X	113.90	1110	12	1173	12		
86Y	113.95	1110	36	1047	30		
87X	114.00	1111	12	1174	12		
87Y	114.05	1111	36	1048	30		
88X	114.10	1112	12	1175	12		
88Y	114.15	1112	36	1049	30		
89X	114.20	1113	12	1176	12		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code *usec*	Reply Freq. MHz	Pulse Code *usec*	Localizer MHz	Glide Slope MHz
89Y	114.25	1113	36	1050	30		
90X	114.30	1114	12	1177	12		
90Y	114.35	1114	36	1051	30		
91X	114.40	1115	12	1178	12		
91Y	114.45	1115	36	1052	30		
92X	114.50	1116	12	1179	12		
92Y	114.55	1116	36	1053	30		
93X	114.60	1117	12	1180	12		
93Y	114.65	1117	36	1054	30		
94X	114.70	1118	12	1181	12		
94Y	114.75	1118	36	1055	30		
95X	114.80	1119	12	1182	12		
95Y	114.85	1119	36	1056	30		
96X	114.90	1120	12	1183	12		
96Y	114.95	1120	36	1057	30		
97X	115.00	1121	12	1184	12		
97Y	115.05	1121	36	1058	30		
98X	115.10	1122	12	1185	12		
98Y	115.15	1122	36	1059	30		
99X	115.20	1123	12	1186	12		
99Y	115.25	1123	36	1060	30		
100X	115.30	1124	12	1187	12		
100Y	115.35	1124	36	1061	30		
101X	115.40	1125	12	1188	12		
101Y	115.45	1125	36	1062	30		
102X	115.50	1126	12	1189	12		
102Y	115.55	1126	36	1063	30		
103X	115.60	1127	12	1190	12		
103Y	115.65	1127	36	1064	30		
104X	115.70	1128	12	1191	12		
104Y	115.75	1128	36	1065	30		
105X	115.80	1129	12	1192	12		
105Y	115.85	1129	36	1066	30		
106X	115.90	1130	12	1193	12		
106Y	115.95	1130	36	1067	30		
107X	116.00	1131	12	1194	12		
107Y	116.05	1131	36	1068	30		
108X	116.1	1132	12	1195	12		
108Y	116.15	1132	36	1069	30		
109X	116.20	1133	12	1196	12		
109Y	116.25	1133	36	1070	30		
110X	116.30	1134	12	1197	12		
110Y	116.35	1134	36	1071	30		
111X	116.40	1135	12	1198	12		
111Y	116.45	1135	36	1072	30		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code *usec*	Reply Freq. MHz	Pulse Code *usec*	Localizer MHz	Glide Slope MHz
112X	116.5	1136	12	1199	12		
112Y	116.55	1136	36	1073	30		
113X	116.6	1137	12	1200	12		
113Y	116.65	1137	36	1074	30		
114X	116.70	1138	12	1201	12		
114Y	116.75	1138	36	1075	30		
115X	116.80	1139	12	1202	12		
115Y	116.85	1139	36	1076	30		
116X	116.90	1140	12	1203	12		
116Y	116.95	1140	36	1077	30		
117X	117.00	1141	12	1204	12		
117Y	117.05	1141	36	1078	30		
118X	117.10	1142	12	1205	12		
118Y	117.15	1142	36	1079	30		
119X	117.20	1143	12	1206	12		
119Y	117.25	1143	36	1080	30		
120X	117.30	1144	12	1207	12		
120Y	117.35	1144	36	1081	30		
121X	117.40	1145	12	1208	12		
121Y	117.45	1145	36	1082	30		
122X	117.50	1146	12	1209	12		
122Y	117.55	1146	36	1083	30		
123X	117.60	1147	12	1210	12		
123Y	117.65	1147	36	1084	30		
124X	117.70	1148	12	1211	12		
124Y	117.75	1148	36	1085	30		
125X	117.80	1149	12	1212	12		
125Y	117.85	1149	36	1086	30		
126X	117.90	1150	12	1213	12		
126Y	117.95	1150	36	1087	30		

4.3.6 Channeling Plan for Assignments in the Band 29.89-50 MHz

This plan is a guide for identifying the center frequencies normally used for assignments with necessary bandwidths equal to or less than 16 kHz.

CONDITIONS AND LIMITATIONS

1. Narrowband Operations. Assignments with necessary bandwidths equal to or less than 16 kHz (narrowband assignments) may be authorized on the center frequencies shown in this plan and on qualified interstitial channels. A "qualified interstitial channel" is one which:

a. Has a center frequency which falls exactly halfway between two adjacent center frequencies shown in this plan,

b. Does not overlap an all-government-agencies (AGA) channel,

c. Will result in more efficient use of the spectrum, and

d. Has been properly coordinated with all affected agencies.

2. Wideband Operations. Assignments with necessary bandwidths greater than 16 kHz (wideband assignments) may also be authorized in this band, provided such assignments:

a. Do not exceed 40 kHz of necessary bandwidth,

b. Do not overlap an all-government-agencies (AGA) channel,

c. Are positioned between the center frequencies shown in this plan when this will result in more efficient use of the spectrum,

d. Have been properly coordinated with all affected agencies, and

e. Are needed to satisfy requirements which cannot be accommodated with narrowband state-of-the-art equipment, or

f. Are in direct support of military tactical and training operations which conform to the conditions and limitations of Section 7.15.4.

3. Use of Coded Squelch. Coded squelch (squelch control techniques) will be used whenever this technique will promote more efficient use of the spectrum; (e.g. use of fewer frequencies, sharing of frequencies, reduction or elimination of interference, etc.)

EXCEPTIONS

Exceptions to the above conditions and limitations will be considered by the FAS on a case-by-case basis.

29.9								
30.01	32.01	34.01	36.01		40.01	41.01		
30.03	32.03	34.03	36.03		40.03	41.03		
30.05	32.05	34.05	36.05		40.05	41.05		
30.07	32.07	34.07	36.07		40.07	41.07		
30.09	32.09	34.09	36.09		40.09	41.09		
30.11	32.11	34.11	36.11		40.11	41.11		
30.13	32.13	34.13	36.13		40.13	41.13		
30.15	32.15	34.15	36.15		40.15	41.15		
30.17	32.17	34.17	36.17		40.17	41.17		
30.19	32.19	34.19	36.19		40.19	41.19		
30.21	32.21	34.21	36.21		40.21	41.21		
30.23	32.23	34.23	36.23		40.23	41.23		
30.25	32.25	34.25	36.25		40.25	41.25		
30.27	32.27	34.27	36.27	38.27	40.27	41.27		
30.29	32.29	34.29	36.29	38.29	40.29	41.29		
30.31	32.31	34.31	36.31	38.31	40.31	41.31		
30.33	32.33	34.33	36.33	38.33	40.33	41.33		
30.35	32.35	34.35	36.35	38.35	40.35	41.35		
30.37	32.37	34.37	36.37	38.37	40.37	41.37		
30.39	32.39	34.39	36.39	38.39	40.39	41.39		
30.41	32.41	34.41	36.41	38.41	40.41	41.41		
30.43	32.43	34.43	36.43	38.43	40.43	41.43		
30.45	32.45	34.45	36.45	38.45	40.45	41.45		
30.47	32.47	34.47	36.47	38.47	40.47	41.47		
30.49	32.49	34.49	36.49	38.49	40.49	41.49		
30.51	32.51	34.51	36.51	38.51	40.51	41.51		
30.53	32.53	34.53	36.53	38.53	40.53	41.53		
30.55	32.55	34.55	36.55	38.55	40.55	41.55		
	32.57	34.57	36.57	38.57	40.57	41.57		
	32.59	34.59	36.59	38.59	40.59	41.59		
	32.61	34.61	36.61	38.61	40.61	41.61	46.61	49.61
	32.63	34.63	36.63	38.63	40.63	41.63	46.63	49.63
	32.65	34.65	36.65	38.65	40.65	41.65	46.65	49.65

32.67	34.67	36.67	38.67	40.67	41.67	46.67	49.67
32.69	34.69	36.69	38.69	40.69	41.69	46.69	49.69
32.71	34.71	36.71	38.71	40.71	41.71	46.71	49.71
32.73	34.73	36.73	38.73	40.73	41.73	46.73	49.73
32.75	34.75	36.75	38.75	40.75	41.75	46.75	49.75
32.77	34.77	36.77	38.77	40.77	41.77	46.77	49.77
32.79	34.79	36.79	38.79	40.79	41.79	46.79	49.79
32.81	34.81	36.81	38.81	40.81	41.81	46.81	49.81
32.83	34.83	36.83	38.83	40.83	41.83	46.83	49.83
32.85	34.85	36.85	38.85	40.85	41.85	46.85	49.85
32.87	34.87	36.87	38.87	40.87	41.87	46.87	49.87
32.89	34.89	36.89	38.89	40.89	41.89	46.89	49.89
32.91	34.91	36.91	38.91	40.91	41.91	46.91	49.91
32.93	34.93	36.93	38.93	40.93	41.93	46.93	49.93
32.95	34.95	36.95	38.95	40.95	41.95	46.95	49.95
32.97	34.97	36.97	38.97	40.97	41.97	46.97	49.97
32.99	34.99	36.99	38.99	40.99	41.99	46.99	49.99

4.3.7 Channeling Plan for Assignments in the Band 162-174 MHz

This channeling plan is a guide for identifying the center frequencies for assignments used with necessary bandwidths of 6.25 kHz or 12.5 kHz. The channeling plan contains two tables, Table 1 contains center frequencies for channel pairs and Table 2 contains center frequencies for single frequency operations. This plan also includes conditions and limitations for use of assignments in the band 162-174 MHz. The addition of the 6.25 kHz channel spacing supports agencies purchasing equipment capable of using this bandwidth. There is no requirement for agencies to transition to 6.25 kHz channels.

CONDITIONS AND LIMITATIONS

1. Narrowband Operations. Narrowband assignments (with a necessary bandwidth of less than 12.5 kHz) may be authorized on the center frequencies identified in this plan.

2. Wideband Operations. Wideband assignments (with necessary bandwidths equal to or greater than 12.5 kHz) for new systems are not authorized. Renewals for wideband assignments may be granted with the understanding that operations are subject to the provisions set forth in paragraph 2a below and Section 5.3.5 of this Manual. As an exception, NOAA Weather Radio operations on channels in the frequency range 162.359375-162.590625 MHz may continue to operate with necessary bandwidths equal to 16 kHz. The Automatic Identification System (AIS) (162.025 MHz) will also continue to operate with a 25 kHz bandwidth pursuant to the International Telecommunication Union (ITU) and International Maritime Organization (IMO). The ground-to-ground portion of the FAA Remote Radio Control System (RRCS) will operate as an on-demand, non-continuous, one-way transmitter with a necessary bandwidth up to 14.5 kHz using 165.7625 MHz, unless restricted by Canadian coordination.

Wideband operations may continue after December 31, 2006 with the understanding that an agency with wideband operations ultimately bears responsibility to mitigate harmful interference (e.g. change to narrowband operations, alter technical operating characteristics, change frequency, or assist the narrowband user to find another frequency) within 180[1] days of notification of an adjacent narrowband use requirement. Agencies requiring use of frequencies for narrowband operations, where wideband operations overlap the proposed narrowband operations shall submit a frequency proposal as formal notice through the FAS assignment process after concluding that they do not have other available options. Prior to formal

[1] For the purpose of this paragraph 180 days begins when the frequency proposal for the specific narrowband frequency first appears on an NTIA FAS Agenda.

notification the agency requesting narrowband operations shall inform the agency(ies) with wideband operations of the intended use of the adjacent narrowband frequency (Section 8.2.2). If at any time prior to or within 60 days of formal notification, either agency concludes that they cannot identify between them a resolution, the agency with wideband operations shall submit documentation to the FAS substantiating the requirement for continued wideband operations and describing the options considered in their discussions with the narrowband user. Agencies with wideband operations who do not submit substantiating documentation to the FAS shall be considered in concurrence with the proposed narrowband operation. The FAS will evaluate the documentation and identify any options not previously considered or possibly not available to the two agencies involved. If the subcommittee cannot identify a solution that can be agreed by the two parties, the issue will be referred in accordance with Section 8.1.1 paragraph 4. In cases where no solution can be found, the wideband operations may continue on a non-interference basis.

3. Use of Coded Squelch. Coded squelch (squelch control techniques) will be used whenever this technique will promote more efficient use of the spectrum; e.g. use of fewer frequencies, sharing of frequencies, reduction or elimination of interference, etc.

4. Time Division Multiple Access (TDMA) Operations. TDMA systems, with at least 1 voice channel per 12.5 kHz, will be allowed and can be accommodated on adjacent 12.5 kHz channels listed in this channeling plan. The center frequency of the TDMA channel must be offset midway between the existing narrowband channels to avoid adjacent channel interference problems with existing or planned narrowband systems. Refer to Section 5.3.5 for technical standards.

5. Paired Frequency Operations. The channeling plan identifies 280 (12.5 kHz) and 560 (6.25 kHz) pairs of frequencies that are intended to be used for two-frequency simplex operations using equipment operating with a necessary bandwidth less than 12.5 kHz. The paired-use portion includes 359 (12.5 kHz) and 718 (6.25 kHz) channels, however 79 (12.5 kHz) and 158 (6.25 kHz) of these channels cannot be used for paired use due to existing limitations on the use of one of the frequencies that comprise these pairs (i.e., the 19 frequencies allotted for the NOAA weather radios, the 17 frequencies contained within the non-federal sub-band 173.2-173.4 MHz, and 43 (12.5 kHz) and 86 (6.25 kHz) frequencies designated for other specified use by US footnote).

a. For paired frequency operations, the frequencies in the range 162.0500-166.4875 MHz (12.5 kHz) and 162.009375-166.490625 MHz (6.25 kHz) will be used for land station receive (or mobile transmit), and frequencies in the range 169.5125-173.9875 MHz (12.5 kHz) and 169.509375-173.990625 MHz (6.25 kHz) will be used for land station transmissions (or mobile receive).

b. Base stations with a power not greater than 125 watts are permitted to transmit in the range 162.0500-166.4875 MHz (12.5 kHz) and 162.009375-166.490625 MHz (6.25 kHz) for access to the repeater.

c. Mobile and base stations are permitted to use repeater transmit frequencies for talk-around communications.

d. Unpaired single frequency operations may be authorized using either of the paired frequencies, except pairs allotted AGA, if the requesting agency believes it to be a more effective use of the spectrum. All such assignments must bear the Record Note S396 (see Annex A). However, as long as an agency has assignments for unpaired single frequency operations on frequencies designated for paired operations, that agency shall not be authorized paired frequency assignments on designated paired frequencies allotted AGA, unless justified otherwise.

e . An agency may use any of their allotted frequencies in the range 162.0500-166.4875 MHz (12.5 kHz) and 162.009375-166.490625 MHz (6.25 kHz) and any of their allotted frequencies in the range 169.5125-173.9875 MHz (12.5 kHz) and 169.509375-173.990625 MHz (6.25 kHz) to make up a single channel pair.

f. An agency may use any of their allotted frequencies in the range 166.5-169.5 MHz (12.5 kHz) and 166.496875-169.503125 MHz (6.25 kHz) and any of their allotted frequencies in the ranges 162.0500-166.4875 MHz (12.5 kHz) and 162.009375-166.490625 MHz (6.25 kHz) and 169.5125-173.9875 MHz (12.5 kHz) and 169.509375-173.990625 MHz (6.25 kHz) to make up a single channel pair if the requesting agency believes it to be more effective use of the spectrum and if it complies, in part, to the provisions of

paragraph 5.a.

6. Single Frequency Operations. The channeling plan identifies 382 (12.5 kHz) and 764 (6.25 kHz) center frequencies that are intended to be used for single frequency operations with necessary bandwidths less than 12.5 kHz. The number of frequencies available for single frequency operations includes the 241 (12.5 kHz) and 484 (6.25 kHz) center frequencies contained in the frequency range 166.5-169.5 MHz (12.5 kHz) and 166.496875-169.503125 MHz (6.25 kHz) plus those that cannot be used for paired operations in the remainder of the band.

Unpaired single frequency operations may be authorized using either of the paired frequency sub-bands (162.009375-166.490625 MHz and 169.509375-173.990625 MHz), except pairs allotted AGA, if the requesting agency believes it to be more effective use of the spectrum. All such assignments must bear the Record Note S396 (see Annex A). However, as long as an agency has assignments for unpaired single frequency operations on frequencies listed in Table 1, that agency shall not be authorized paired frequency assignments on those frequencies in Table 1 allotted AGA, unless justified.

7. Grandfathered Operations. Existing assignments that did not conform to (1) the provisions of paragraphs 2, 5 and 6 and (2) assignments that were converted or are converting to comply with the narrowband mandate are grandfathered until a replacement to those systems are necessary. Those assignments shall bear Record Note S391. Additionally, expansion of existing systems will continue to be authorized on the system's current operating frequencies.

8. Use of the Band by Military Agencies. Use of the band 162-174 MHz by the military agencies is limited to non-tactical or intra-base radio operations with the following provisions:

a. Frequency assignments may be authorized on the center frequencies designated AF/AR.

b. Frequency assignments for certified trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, subject to the conditions imposed on the NTIA certification of spectrum support and coordination between the affected agencies. The priority note P074 shall be applied to assignments on center frequencies allotted primarily for non-military agencies and those allotted for shared use, unless the agency(ies) to which the frequency is primarily allotted agrees to waive this requirement. Applicant agencies obtaining waivers to the imposition of P074 on any assignment shall include in the assignment application the coordination note C095 (see Section 9.8.2, paragraph 18, and Annex A). If a waiver agreement contains any special arrangements, the terms or text of the arrangements must be submitted to the FAS Secretary, where an FAS administrative document number will be assigned. Reference to these arrangements (using the FAS administrative document number as a reference) also shall be included in the frequency assignment application as an *M002 note entry in the Circuit Remarks (see Section 9.8.2, paragraph 39k, Annex A).

c. Frequency assignments for purposes other than trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, provided the proper selection and coordination procedures have been followed, and provided the priority note P074 is applied to each such assignment.

9. Exceptions to the above conditions, limitations, and frequency selection/coordination procedures will be considered by the FAS on a case-by-case basis.

TABLE 1: Paired Operations Mobile Station Transmit

Center Frequency 12.5 kHz	Center Frequency 6.25 kHz
162.0125	162.009375
	162.015625
162.0250	162.021875
	162.028125

TABLE 1: Paired Operations Mobile Station Transmit

Center Frequency 12.5 kHz	Center Frequency 6.25 kHz
162.0375	162.034375
	162.040625
162.0500	162.046875
	162.053125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
162.0625	162.059375
	162.065625
162.0750	162.071875
	162.078125
162.0875	162.084375
	162.090625
162.1000	162.096875
	162.103125
162.1125	162.109375
	162.115625
162.1250	162.121875
	162.128125
162.1375	162.134375
	162.140625
162.1500	162.146875
	162.153125
162.1625	162.159375
	162.165625
162.1750	162.171875
	162.178125
162.1875	162.184375
	162.190625
162.2000	162.196875
	162.203125
162.2125	162.209375
	162.215625
162.2250	162.221875
	162.228125
162.2375	162.234375
	162.240625
162.2500	162.246875
	162.253125
162.2625	162.259375
	162.265625
162.2750	162.271875
	162.278125
162.2875	162.284375
	162.290625
162.3000	162.296875
	162.303125
162.3125	162.309375
	162.315625

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
162.3250	162.321875
	162.328125
162.3375	162.334375
	162.340625
162.3500	162.346875
	162.353125
162.3625	162.359375
	162.365625
162.3750	162.371875
	162.378125
162.3875	162.384375
	162.390625
162.4000	162.396875
	162.403125
162.4125	162.409375
	162.415625
162.4250	162.421875
	162.428125
162.4375	162.434375
	162.440625
162.4500	162.446875
	162.453125
162.4625	162.459375
	162.465625
162.4750	162.471875
	162.478125
162.4875	162.484375
	162.490625
162.5000	162.496875
	162.503125
162.5125	162.509375
	162.515625
162.5250	162.521875
	162.528125
162.5375	162.534375
	162.540625
162.5500	162.546875
	162.553125
162.5625	162.559375
	162.565625
162.5750	162.571875
	162.578125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
162.5875	162.584375
	162.590625
162.6000	162.596875
	162.603125
162.6125	162.609375
	162.615625
162.6250	162.621875
	162.628125
162.6375	162.634375
	162.640625
162.6500	162.646875
	162.653125
162.6625	162.659375
	162.665625
162.6750	162.671875
	162.678125
162.6875	162.684375
	162.690625
162.7000	162.696875
	162.703125
162.7125	162.709375
	162.715625
162.7250	162.721875
	162.728125
162.7375	162.734375
	162.740625
162.7500	162.746875
	162.753125
162.7625	162.759375
	162.765625
162.7750	162.771875
	162.778125
162.7875	162.784375
	162.790625
162.8000	162.796875
	162.803125
162.8125	162.809375
	162.815625
162.8250	162.821875
	162.828125
162.8375	162.834375
	162.840625

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
162.8500	162.846875
	162.853125
162.8625	162.859375
	162.865625
162.8750	162.871875
	162.878125
162.8875	162.884375
	162.890625
162.9000	162.896875
	162.903125
162.9125	162.909375
	162.915625
162.9250	162.921875
	162.928125
162.9375	162.934375
	162.940625
162.9500	162.946875
	162.953125
162.9625	162.959375
	162.965625
162.9750	162.971875
	162.978125
162.9875	162.984375
	162.990625
163.0000	162.996875
	163.003125
163.0125	163.009375
	163.015625
163.0250	163.021875
	163.028125
163.0375	163.034375
	163.040625
163.0500	163.046875
	163.053125
163.0625	163.059375
	163.065625
163.0750	163.071875
	163.078125
163.0875	163.084375
	163.090625
163.1000	163.096875
	163.103125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
163.1125	163.109375
	163.115625
163.1250	163.121875
	163.128125
163.1375	163.134375
	163.140625
163.1500	163.146875
	163.153125
163.1625	163.159375
	163.165625
163.1750	163.171875
	163.178125
163.1875	163.184375
	163.190625
163.2000	163.196875
	163.203125
163.2125	163.209375
	163.215625
163.2250	163.221875
	163.228125
163.2375	163.234375
	163.240625
163.2500	163.246875
	163.253125
163.2625	163.259375
	163.265625
163.2750	163.271875
	163.278125
163.2875	163.284375
	163.290625
163.3000	163.296875
	163.303125
163.3125	163.309375
	163.315625
163.3250	163.321875
	163.328125
163.3375	163.334375
	163.340625
163.3500	163.346875
	163.353125
163.3625	163.359375
	163.365625

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
163.3750	163.371875
	163.378125
163.3875	163.384375
	163.390625
163.4000	163.396875
	163.403125
163.4125	163.409375
	163.415625
163.4250	163.421875
	163.428125
163.4375	163.434375
	163.440625
163.4500	163.446875
	163.453125
163.4625	163.459375
	163.465625
163.4750	163.471875
	163.478125
163.4875	163.484375
	163.490625
163.5000	163.496875
	163.503125
163.5125	163.509375
	163.515625
163.5250	163.521875
	163.528125
163.5375	163.534375
	163.540625
163.5500	163.546875
	163.553125
163.5625	163.559375
	163.565625
163.5750	163.571875
	163.578125
163.5875	163.584375
	163.590625
163.6000	163.596875
	163.603125
163.6125	163.609375
	163.615625
163.6250	163.621875
	163.628125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
163.6375	163.634375
	163.640625
163.6500	163.646875
	163.653125
163.6625	163.659375
	163.665625
163.6750	163.671875
	163.678125
163.6875	163.684375
	163.690625
163.7000	163.696875
	163.703125
163.7125	163.709375
	163.715625
163.7250	163.721875
	163.728125
163.7375	163.734375
	163.740625
163.7500	163.746875
	163.753125
163.7625	163.759375
	163.765625
163.7750	163.771875
	163.778125
163.7875	163.784375
	163.790625
163.8000	163.796875
	163.803125
163.8125	163.809375
	163.815625
163.8250	163.821875
	163.828125
163.8375	163.834375
	163.840625
163.8500	163.846875
	163.853125
163.8625	163.859375
	163.865625
163.8750	163.871875
	163.878125
163.8875	163.884375
	163.890625

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
163.9000	163.896875
	163.903125
163.9125	163.909375
	163.915625
163.9250	163.921875
	163.928125
163.9375	163.934375
	163.940625
163.9500	163.946875
	163.953125
163.9625	163.959375
	163.965625
163.9750	163.971875
	163.978125
163.9875	163.984375
	163.990625
164.0000	163.996875
	164.003125
164.0125	164.009375
	164.015625
164.0250	164.021875
	164.028125
164.0375	164.034375
	164.040625
164.0500	164.046875
	164.053125
164.0625	164.059375
	164.065625
164.0750	164.071875
	164.078125
164.0875	164.084375
	164.090625
164.1000	164.096875
	164.103125
164.1125	164.109375
	164.115625
164.1250	164.121875
	164.128125
164.1375	164.134375
	164.140625
164.1500	164.146875
	164.153125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
164.1625	164.159375
	164.165625
164.1750	164.171875
	164.178125
164.1875	164.184375
	164.190625
164.2000	164.196875
	164.203125
164.2125	164.209375
	164.215625
164.2250	164.221875
	164.228125
164.2375	164.234375
	164.240625
164.2500	164.246875
	164.253125
164.2625	164.259375
	164.265625
164.2750	164.271875
	164.278125
164.2875	164.284375
	164.290625
164.3000	164.296875
	164.303125
164.3125	164.309375
	164.315625
164.3250	164.321875
	164.328125
164.3375	164.334375
	164.340625
164.3500	164.346875
	164.353125
164.3625	164.359375
	164.365625
164.3750	164.371875
	164.378125
164.3875	164.384375
	164.390625
164.4000	164.396875
	164.403125
164.4125	164.409375
	164.415625

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
164.4250	164.421875
	164.428125
164.4375	164.434375
	164.440625
164.4500	164.446875
	164.453125
164.4625	164.459375
	164.465625
164.4750	164.471875
	164.478125
164.4875	164.484375
	164.490625
164.5000	164.496875
	164.503125
164.5125	164.509375
	164.515625
164.5250	164.521875
	164.528125
164.5375	164.534375
	164.540625
164.5500	164.546875
	164.553125
164.5625	164.559375
	164.565625
164.5750	164.571875
	164.578125
164.5875	164.584375
	164.590625
164.6000	164.596875
	164.603125
164.6125	164.609375
	164.615625
164.6250	164.621875
	164.628125
164.6375	164.634375
	164.640625
164.6500	164.646875
	164.653125
164.6625	164.659375
	164.665625
164.6750	164.671875
	164.678125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
164.6875	164.684375
	164.690625
164.7000	164.696875
	164.703125
164.7125	164.709375
	164.715625
164.7250	164.721875
	164.728125
164.7375	164.734375
	164.740625
164.7500	164.746875
	164.753125
164.7625	164.759375
	164.765625
164.7750	164.771875
	164.778125
164.7875	164.784375
	164.790625
164.8000	164.796875
	164.803125
164.8125	164.809375
	164.815625
164.8250	164.821875
	164.828125
164.8375	164.834375
	164.840625
164.8500	164.846875
	164.853125
164.8625	164.859375
	164.865625
164.8750	164.871875
	164.878125
164.8875	164.884375
	164.890625
164.9000	164.896875
	164.903125
164.9125	164.909375
	164.915625
164.9250	164.921875
	164.928125
164.9375	164.934375
	164.940625

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
164.9500	164.946875
	164.953125
164.9625	164.959375
	164.965625
164.9750	164.971875
	164.978125
164.9875	164.984375
	164.990625
165.0000	164.996875
	165.003125
165.0125	165.009375
	165.015625
165.0250	165.021875
	165.028125
165.0375	165.034375
	165.040625
165.0500	165.046875
	165.053125
165.0625	165.059375
	165.065625
165.0750	165.071875
	165.078125
165.0875	165.084375
	165.090625
165.1000	165.096875
	165.103125
165.1125	165.109375
	165.115625
165.1250	165.121875
	165.128125
165.1375	165.134375
	165.140625
165.1500	165.146875
	165.153125
165.1625	165.159375
	165.165625
165.1750	165.171875
	165.178125
165.1875	165.184375
	165.190625
165.2000	165.196875
	165.203125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
165.2125	165.209375
	165.215625
165.2250	165.221875
	165.228125
165.2375	165.234375
	165.240625
165.2500	165.246875
	165.253125
165.2625	165.259375
	165.265625
165.2750	165.271875
	165.278125
165.2875	165.284375
	165.290625
165.3000	165.296875
	165.303125
165.3125	165.309375
	165.315625
165.3250	165.321875
	165.328125
165.3375	165.334375
	165.340625
165.3500	165.346875
	165.353125
165.3625	165.359375
	165.365625
165.3750	165.371875
	165.378125
165.3875	165.384375
	165.390625
165.4000	165.396875
	165.403125
165.4125	165.409375
	165.415625
165.4250	165.421875
	165.428125
165.4375	165.434375
	165.440625
165.4500	165.446875
	165.453125
165.4625	165.459375
	165.465625

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
165.4750	165.471875
	165.478125
165.4875	165.484375
	165.490625
165.5000	165.496875
	165.503125
165.5125	165.509375
	165.515625
165.5250	165.521875
	165.528125
165.5375	165.534375
	165.540625
165.5500	165.546875
	165.553125
165.5625	165.559375
	165.565625
165.5750	165.571875
	165.578125
165.5875	165.584375
	165.590625
165.6000	165.596875
	165.603125
165.6125	165.609375
	165.615625
165.6250	165.621875
	165.628125
165.6375	165.634375
	165.640625
165.6500	165.646875
	165.653125
165.6625	165.659375
	165.665625
165.6750	165.671875
	165.678125
165.6875	165.684375
	165.690625
165.7000	165.696875
	165.703125
165.7125	165.709375
	165.715625
165.7250	165.721875
	165.728125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
165.7375	165.734375
	165.740625
165.7500	165.746875
	165.753125
165.7625	165.759375
	165.765625
165.7750	165.771875
	165.778125
165.7875	165.784375
	165.790625
165.8000	165.796875
	165.803125
165.8125	165.809375
	165.815625
165.8250	165.821875
	165.828125
165.8375	165.834375
	165.840625
165.8500	165.846875
	165.853125
165.8625	165.859375
	165.865625
165.8750	165.871875
	165.878125
165.8875	165.884375
	165.890625
165.9000	165.896875
	165.903125
165.9125	165.909375
	165.915625
165.9250	165.921875
	165.928125
165.9375	165.934375
	165.940625
165.9500	165.946875
	165.953125
165.9625	165.959375
	165.965625
165.9750	165.971875
	165.978125
165.9875	165.984375
	165.990625

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
166.0000	165.996875
	166.003125
166.0125	166.009375
	166.015625
166.0250	166.021875
	166.028125
166.0375	166.034375
	166.040625
166.0500	166.046875
	166.053125
166.0625	166.059375
	166.065625
166.0750	166.071875
	166.078125
166.0875	166.084375
	166.090625
166.1000	166.096875
	166.103125
166.1125	166.109375
	166.115625
166.1250	166.121875
	166.128125
166.1375	166.134375
	166.140625
166.1500	166.146875
	166.153125
166.1625	166.159375
	166.165625
166.1750	166.171875
	166.178125
166.1875	166.184375
	166.190625
166.2000	166.196875
	166.203125
166.2125	166.209375
	166.215625
166.2250	166.221875
	166.228125
166.2375	166.234375
	166.240625
166.2500	166.246875
	166.253125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
166.2625	166.259375
	166.265625
166.2750	166.271875
	166.278125
166.2875	166.284375
	166.290625
166.3000	166.296875
	166.303125
166.3125	166.309375
	166.315625
166.3250	166.321875
	166.328125
166.3375	166.334375
	166.340625
166.3500	166.346875
	166.353125
166.3625	166.359375
	166.365625
166.3750	166.371875
	166.378125

TABLE 1: Paired Operations Mobile Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
166.3875	166.384375
	166.390625
166.4000	166.396875
	166.403125
166.4125	166.409375
	166.415625
166.4250	166.421875
	166.428125
166.4375	166.434375
	166.440625
166.4500	166.446875
	166.453125
166.4625	166.459375
	166.465625
166.4750	166.471875
	166.478125
166.4875	166.484375
	166.490625

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
169.5125	169.509375
	169.515625
169.5250	169.521875
	169.528125
169.5375	169.534375
	169.540625
169.5500	169.546875
	169.553125
169.5625	169.559375
	169.565625
169.5750	169.571875
	169.578125
169.5875	169.584375
	169.590625
169.6000	169.596875
	169.603125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
169.6125	169.609375
	169.615625
169.6250	169.621875
	169.628125
169.6375	169.634375
	169.640625
169.6500	169.646875
	169.653125
169.6625	169.659375
	169.665625
169.6750	169.671875
	169.678125
169.6875	169.684375
	169.690625
169.7000	169.696875
	169.703125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
169.7125	169.709375
	169.715625
169.7250	169.721875
	169.728125
169.7375	169.734375
	169.740625
169.7500	169.746875
	169.753125
169.7625	169.759375
	169.765625
169.7750	169.771875
	169.778125
169.7875	169.784375
	169.790625
169.8000	169.796875
	169.803125
169.8125	169.809375
	169.815625
169.8250	169.821875
	169.828125
169.8375	169.834375
	169.840625
169.8500	169.846875
	169.853125
169.8625	169.859375
	169.865625
169.8750	169.871875
	169.878125
169.8875	169.884375
	169.890625
169.9000	169.896875
	169.903125
169.9125	169.909375
	169.915625
169.9250	169.921875
	169.928125
169.9375	169.934375
	169.940625
169.9500	169.946875
	169.953125
169.9625	169.959375
	169.965625
169.9750	169.971875
	169.978125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
169.9875	169.984375
	169.990625
170.0000	169.996875
	170.003125
170.0125	170.009375
	170.015625
170.0250	170.021875
	170.028125
170.0375	170.034375
	170.040625
170.0500	170.046875
	170.053125
170.0625	170.059375
	170.065625
170.0750	170.071875
	170.078125
170.0875	170.084375
	170.090625
170.1000	170.096875
	170.103125
170.1125	170.109375
	170.115625
170.1250	170.121875
	170.128125
170.1375	170.134375
	170.140625
170.1500	170.146875
	170.153125
170.1625	170.159375
	170.165625
170.1750	170.171875
	170.178125
170.1875	170.184375
	170.190625
170.2000	170.196875
	170.203125
170.2125	170.209375
	170.215625
170.2250	170.221875
	170.228125
170.2375	170.234375
	170.240625
170.2500	170.246875
	170.253125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
170.2625	170.259375
	170.265625
170.2750	170.271875
	170.278125
170.2875	170.284375
	170.290625
170.3000	170.296875
	170.303125
170.3125	170.309375
	170.315625
170.3250	170.321875
	170.328125
170.3375	170.334375
	170.340625
170.3500	170.346875
	170.353125
170.3625	170.359375
	170.365625
170.3750	170.371875
	170.378125
170.3875	170.384375
	170.390625
170.4000	170.396875
	170.403125
170.4125	170.409375
	170.415625
170.4250	170.421875
	170.428125
170.4375	170.434375
	170.440625
170.4500	170.446875
	170.453125
170.4625	170.459375
	170.465625
170.4750	170.471875
	170.478125
170.4875	170.484375
	170.490625
170.5000	170.496875
	170.503125
170.5125	170.509375
	170.515625
170.5250	170.521875
	170.528125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
170.5375	170.534375
	170.540625
170.5500	170.546875
	170.553125
170.5625	170.559375
	170.565625
170.5750	170.571875
	170.578125
170.5875	170.584375
	170.590625
170.6000	170.596875
	170.603125
170.6125	170.609375
	170.615625
170.6250	170.621875
	170.628125
170.6375	170.634375
	170.640625
170.6500	170.646875
	170.653125
170.6625	170.659375
	170.665625
170.6750	170.671875
	170.678125
170.6875	170.684375
	170.690625
170.7000	170.696875
	170.703125
170.7125	170.709375
	170.715625
170.7250	170.721875
	170.728125
170.7375	170.734375
	170.740625
170.7500	170.746875
	170.753125
170.7625	170.759375
	170.765625
170.7750	170.771875
	170.778125
170.7875	170.784375
	170.790625
170.8000	170.796875
	170.803125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
170.8125	170.809375
	170.815625
170.8250	170.821875
	170.828125
170.8375	170.834375
	170.840625
170.8500	170.846875
	170.853125
170.8625	170.859375
	170.865625
170.8750	170.871875
	170.878125
170.8875	170.884375
	170.890625
170.9000	170.896875
	170.903125
170.9125	170.909375
	170.915625
170.9250	170.921875
	170.928125
170.9375	170.934375
	170.940625
170.9500	170.946875
	170.953125
170.9625	170.959375
	170.965625
170.9750	170.971875
	170.978125
170.9875	170.984375
	170.990625
171.0000	170.996875
	171.003125
171.0125	171.009375
	171.015625
171.0250	171.021875
	171.028125
171.0375	171.034375
	171.040625
171.0500	171.046875
	171.053125
171.0625	171.059375
	171.065625
171.0750	171.071875
	171.078125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
171.0875	171.084375
	171.090625
171.1000	171.096875
	171.103125
171.1125	171.109375
	171.115625
171.1250	171.121875
	171.128125
171.1375	171.134375
	171.140625
171.1500	171.146875
	171.153125
171.1625	171.159375
	171.165625
171.1750	171.171875
	171.178125
171.1875	171.184375
	171.190625
171.2000	171.196875
	171.203125
171.2125	171.209375
	171.215625
171.2250	171.221875
	171.228125
171.2375	171.234375
	171.240625
171.2500	171.246875
	171.253125
171.2625	171.259375
	171.265625
171.2750	171.271875
	171.278125
171.2875	171.284375
	171.290625
171.3000	171.296875
	171.303125
171.3125	171.309375
	171.315625
171.3250	171.321875
	171.328125
171.3375	171.334375
	171.340625
171.3500	171.346875
	171.353125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
171.3625	171.359375
	171.365625
171.3750	171.371875
	171.378125
171.3875	171.384375
	171.390625
171.4000	171.396875
	171.403125
171.4125	171.409375
	171.415625
171.4250	171.421875
	171.428125
171.4375	171.434375
	171.440625
171.4500	171.446875
	171.453125
171.4625	171.459375
	171.465625
171.4750	171.471875
	171.478125
171.4875	171.484375
	171.490625
171.5000	171.496875
	171.503125
171.5125	171.509375
	171.515625
171.5250	171.521875
	171.528125
171.5375	171.534375
	171.540625
171.5500	171.546875
	171.553125
171.5625	171.559375
	171.565625
171.5750	171.571875
	171.578125
171.5875	171.584375
	171.590625
171.6000	171.596875
	171.603125
171.6125	171.609375
	171.615625
171.6250	171.621875
	171.628125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
171.6375	171.634375
	171.640625
171.6500	171.646875
	171.653125
171.6625	171.659375
	171.665625
171.6750	171.671875
	171.678125
171.6875	171.684375
	171.690625
171.7000	171.696875
	171.703125
171.7125	171.709375
	171.715625
171.7250	171.721875
	171.728125
171.7375	171.734375
	171.740625
171.7500	171.746875
	171.753125
171.7625	171.759375
	171.765625
171.7750	171.771875
	171.778125
171.7875	171.784375
	171.790625
171.8000	171.796875
	171.803125
171.8125	171.809375
	171.815625
171.8250	171.821875
	171.828125
171.8375	171.834375
	171.840625
171.8500	171.846875
	171.853125
171.8625	171.859375
	171.865625
171.8750	171.871875
	171.878125
171.8875	171.884375
	171.890625
171.9000	171.896875
	171.903125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
171.9125	171.909375
	171.915625
171.9250	171.921875
	171.928125
171.9375	171.934375
	171.940625
171.9500	171.946875
	171.953125
171.9625	171.959375
	171.965625
171.9750	171.971875
	171.978125
171.9875	171.984375
	171.990625
172.0000	171.996875
	172.003125
172.0125	172.009375
	172.015625
172.0250	172.021875
	172.028125
172.0375	172.034375
	172.040625
172.0500	172.046875
	172.053125
172.0625	172.059375
	172.065625
172.0750	172.071875
	172.078125
172.0875	172.084375
	172.090625
172.1000	172.096875
	172.103125
172.1125	172.109375
	172.115625
172.1250	172.121875
	172.128125
172.1375	172.134375
	172.140625
172.1500	172.146875
	172.153125
172.1625	172.159375
	172.165625
172.1750	172.171875
	172.178125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
172.1875	172.184375
	172.190625
172.2000	172.196875
	172.203125
172.2125	172.209375
	172.215625
172.2250	172.221875
	172.228125
172.2375	172.234375
	172.240625
172.2500	172.246875
	172.253125
172.2625	172.259375
	172.265625
172.2750	172.271875
	172.278125
172.2875	172.284375
	172.290625
172.3000	172.296875
	172.303125
172.3125	172.309375
	172.315625
172.3250	172.321875
	172.328125
172.3375	172.334375
	172.340625
172.3500	172.346875
	172.353125
172.3625	172.359375
	172.365625
172.3750	172.371875
	172.378125
172.3875	172.384375
	172.390625
172.4000	172.396875
	172.403125
172.4125	172.409375
	172.415625
172.4250	172.421875
	172.428125
172.4375	172.434375
	172.440625
172.4500	172.446875
	172.453125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
172.4625	172.459375
	172.465625
172.4750	172.471875
	172.478125
172.4875	172.484375
	172.490625
172.5000	172.496875
	172.503125
172.5125	172.509375
	172.515625
172.5250	172.521875
	172.528125
172.5375	172.534375
	172.540625
172.5500	172.546875
	172.553125
172.5625	172.559375
	172.565625
172.5750	172.571875
	172.578125
172.5875	172.584375
	172.590625
172.6000	172.596875
	172.603125
172.6125	172.609375
	172.615625
172.6250	172.621875
	172.628125
172.6375	172.634375
	172.640625
172.6500	172.646875
	172.653125
172.6625	172.659375
	172.665625
172.6750	172.671875
	172.678125
172.6875	172.684375
	172.690625
172.7000	172.696875
	172.703125
172.7125	172.709375
	172.715625
172.7250	172.721875
	172.728125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
172.7375	172.734375
	172.740625
172.7500	172.746875
	172.753125
172.7625	172.759375
	172.765625
172.7750	172.771875
	172.778125
172.7875	172.784375
	172.790625
172.8000	172.796875
	172.803125
172.8125	172.809375
	172.815625
172.8250	172.821875
	172.828125
172.8375	172.834375
	172.840625
172.8500	172.846875
	172.853125
172.8625	172.859375
	172.865625
172.8750	172.871875
	172.878125
172.8875	172.884375
	172.890625
172.9000	172.896875
	172.903125
172.9125	172.909375
	172.915625
172.9250	172.921875
	172.928125
172.9375	172.934375
	172.940625
172.9500	172.946875
	172.953125
172.9625	172.959375
	172.965625
172.9750	172.971875
	172.978125
172.9875	172.984375
	172.990625
173.0000	172.996875
	173.003125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
173.0125	173.009375
	173.015625
173.0250	173.021875
	173.028125
173.0375	173.034375
	173.040625
173.0500	173.046875
	173.053125
173.0625	173.059375
	173.065625
173.0750	173.071875
	173.078125
173.0875	173.084375
	173.090625
173.1000	173.096875
	173.103125
173.1125	173.109375
	173.115625
173.1250	173.121875
	173.128125
173.1375	173.134375
	173.140625
173.1500	173.146875
	173.153125
173.1625	173.159375
	173.165625
173.1750	173.171875
	173.178125
173.1875	173.184375
	173.190625
173.2000	173.196875
	173.203125
173.2125	173.209375
	173.215625
173.2250	173.221875
	173.228125
173.2375	173.234375
	173.240625
173.2500	173.246875
	173.253125
173.2625	173.259375
	173.265625
173.2750	173.271875
	173.278125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
173.2875	173.284375
	173.290625
173.3000	173.296875
	173.303125
173.3125	173.309375
	173.315625
173.3250	173.321875
	173.328125
173.3375	173.334375
	173.340625
173.3500	173.346875
	173.353125
173.3625	173.359375
	173.365625
173.3750	173.371875
	173.378125
173.3875	173.384375
	173.390625
173.4000	173.396875
	173.403125
173.4125	173.409375
	173.415625
173.4250	173.421875
	173.428125
173.4375	173.434375
	173.440625
173.4500	173.446875
	173.453125
173.4625	173.459375
	173.465625
173.4750	173.471875
	173.478125
173.4875	173.484375
	173.490625
173.5000	173.496875
	173.503125
173.5125	173.509375
	173.515625
173.5250	173.521875
	173.528125
173.5375	173.534375
	173.540625
173.5500	173.546875
	173.553125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
173.5625	173.559375
	173.565625
173.5750	173.571875
	173.578125
173.5875	173.584375
	173.590625
173.6000	173.596875
	173.603125
173.6125	173.609375
	173.615625
173.6250	173.621875
	173.628125
173.6375	173.634375
	173.640625
173.6500	173.646875
	173.653125
173.6625	173.659375
	173.665625
173.6750	173.671875
	173.678125
173.6875	173.684375
	173.690625
173.7000	173.696875
	173.703125
173.7125	173.709375
	173.715625
173.7250	173.721875
	173.728125
173.7375	173.734375
	173.740625
173.7500	173.746875
	173.753125
173.7625	173.759375
	173.765625
173.7750	173.771875
	173.778125

TABLE 1: Paired Operations Land Station Transmit	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
173.7875	173.784375
	173.790625
173.8000	173.796875
	173.803125
173.8125	173.809375
	173.815625
173.8250	173.821875
	173.828125
173.8375	173.834375
	173.840625
173.8500	173.846875
	173.853125
173.8625	173.859375
	173.865625
173.8750	173.871875
	173.878125
173.8875	173.884375
	173.890625
173.9000	173.896875
	173.903125
173.9125	173.909375
	173.915625
173.9250	173.921875
	173.928125
173.9375	173.934375
	173.940625
173.9500	173.946875
	173.953125
173.9625	173.959375
	173.965625
173.9750	173.971875
	173.978125
173.9875	173.984375
	173.990625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
166.5000	166.496875
	166.503125

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
166.5125	166.509375
	166.515625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
166.5250	166.521875
	166.528125
166.5375	166.534375
	166.540625
166.5500	166.546875
	166.553125
166.5625	166.559375
	166.565625
166.5750	166.571875
	166.578125
166.5875	166.584375
	166.590625
166.6000	166.596875
	166.603125
166.6125	166.609375
	166.615625
166.6250	166.621875
	166.628125
166.6375	166.634375
	166.640625
166.6500	166.646875
	166.653125
166.6625	166.659375
	166.665625
166.6750	166.671875
	166.678125
166.6875	166.684375
	166.690625
166.7000	166.696875
	166.703125
166.7125	166.709375
	166.715625
166.7250	166.721875
	166.728125
166.7375	166.734375
	166.740625
166.7500	166.746875
	166.753125
166.7625	166.759375
	166.765625
166.7750	166.771875
	166.778125
166.7875	166.784375
	166.790625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
166.8000	166.796875
	166.803125
166.8125	166.809375
	166.815625
166.8250	166.821875
	166.828125
166.8375	166.834375
	166.840625
166.8500	166.846875
	166.853125
166.8625	166.859375
	166.865625
166.8750	166.871875
	166.878125
166.8875	166.884375
	166.890625
166.9000	166.896875
	166.903125
166.9125	166.909375
	166.915625
166.9250	166.921875
	166.928125
166.9375	166.934375
	166.940625
166.9500	166.946875
	166.953125
166.9625	166.959375
	166.965625
166.9750	166.971875
	166.978125
166.9875	166.984375
	166.990625
167.0000	166.996875
	167.003125
167.0125	167.009375
	167.015625
167.0250	167.021875
	167.028125
167.0375	167.034375
	167.040625
167.0500	167.046875
	167.053125
167.0625	167.059375
	167.065625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
167.0750	167.071875
	167.078125
167.0875	167.084375
	167.090625
167.1000	167.096875
	167.103125
167.1125	167.109375
	167.115625
167.1250	167.121875
	167.128125
167.1375	167.134375
	167.140625
167.1500	167.146875
	167.153125
167.1625	167.159375
	167.165625
167.1750	167.171875
	167.178125
167.1875	167.184375
	167.190625
167.2000	167.196875
	167.203125
167.2125	167.209375
	167.215625
167.2250	167.221875
	167.228125
167.2375	167.234375
	167.240625
167.2500	167.246875
	167.253125
167.2625	167.259375
	167.265625
167.2750	167.271875
	167.278125
167.2875	167.284375
	167.290625
167.3000	167.296875
	167.303125
167.3125	167.309375
	167.315625
167.3250	167.321875
	167.328125
167.3375	167.334375
	167.340625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
167.3500	167.346875
	167.353125
167.3625	167.359375
	167.365625
167.3750	167.371875
	167.378125
167.3875	167.384375
	167.390625
167.4000	167.396875
	167.403125
167.4125	167.409375
	167.415625
167.4250	167.421875
	167.428125
167.4375	167.434375
	167.440625
167.4500	167.446875
	167.453125
167.4625	167.459375
	167.465625
167.4750	167.471875
	167.478125
167.4875	167.484375
	167.490625
167.5000	167.496875
	167.503125
167.5125	167.509375
	167.515625
167.5250	167.521875
	167.528125
167.5375	167.534375
	167.540625
167.5500	167.546875
	167.553125
167.5625	167.559375
	167.565625
167.5750	167.571875
	167.578125
167.5875	167.584375
	167.590625
167.6000	167.596875
	167.603125
167.6125	167.609375
	167.615625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
167.6250	167.621875
	167.628125
167.6375	167.634375
	167.640625
167.6500	167.646875
	167.653125
167.6625	167.659375
	167.665625
167.6750	167.671875
	167.678125
167.6875	167.684375
	167.690625
167.7000	167.696875
	167.703125
167.7125	167.709375
	167.715625
167.7250	167.721875
	167.728125
167.7375	167.734375
	167.740625
167.7500	167.746875
	167.753125
167.7625	167.759375
	167.765625
167.7750	167.771875
	167.778125
167.7875	167.784375
	167.790625
167.8000	167.796875
	167.803125
167.8125	167.809375
	167.815625
167.8250	167.821875
	167.828125
167.8375	167.834375
	167.840625
167.8500	167.846875
	167.853125
167.8625	167.859375
	167.865625
167.8750	167.871875
	167.878125
167.8875	167.884375
	167.890625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
167.9000	167.896875
	167.903125
167.9125	167.909375
	167.915625
167.9250	167.921875
	167.928125
167.9375	167.934375
	167.940625
167.9500	167.946875
	167.953125
167.9625	167.959375
	167.965625
167.9750	167.971875
	167.978125
167.9875	167.984375
	167.990625
168.0000	167.996875
	168.003125
168.0125	168.009375
	168.015625
168.0250	168.021875
	168.028125
168.0375	168.034375
	168.040625
168.0500	168.046875
	168.053125
168.0625	168.059375
	168.065625
168.0750	168.071875
	168.078125
168.0875	168.084375
	168.090625
168.1000	168.096875
	168.103125
168.1125	168.109375
	168.115625
168.1250	168.121875
	168.128125
168.1375	168.134375
	168.140625
168.1500	168.146875
	168.153125
168.1625	168.159375
	168.165625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
168.1750	168.171875
	168.178125
168.1875	168.184375
	168.190625
168.2000	168.196875
	168.203125
168.2125	168.209375
	168.215625
168.2250	168.221875
	168.228125
168.2375	168.234375
	168.240625
168.2500	168.246875
	168.253125
168.2625	168.259375
	168.265625
168.2750	168.271875
	168.278125
168.2875	168.284375
	168.290625
168.3000	168.296875
	168.303125
168.3125	168.309375
	168.315625
168.3250	168.321875
	168.328125
168.3375	168.334375
	168.340625
168.3500	168.346875
	168.353125
168.3625	168.359375
	168.365625
168.3750	168.371875
	168.378125
168.3875	168.384375
	168.390625
168.4000	168.396875
	168.403125
168.4125	168.409375
	168.415625
168.4250	168.421875
	168.428125
168.4375	168.434375
	168.440625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
168.4500	168.446875
	168.453125
168.4625	168.459375
	168.465625
168.4750	168.471875
	168.478125
168.4875	168.484375
	168.490625
168.5000	168.496875
	168.503125
168.5125	168.509375
	168.515625
168.5250	168.521875
	168.528125
168.5375	168.534375
	168.540625
168.5500	168.546875
	168.553125
168.5625	168.559375
	168.565625
168.5750	168.571875
	168.578125
168.5875	168.584375
	168.590625
168.6000	168.596875
	168.603125
168.6125	168.609375
	168.615625
168.6250	168.621875
	168.628125
168.6375	168.634375
	168.640625
168.6500	168.646875
	168.653125
168.6625	168.659375
	168.665625
168.6750	168.671875
	168.678125
168.6875	168.684375
	168.690625
168.7000	168.696875
	168.703125
168.7125	168.709375
	168.715625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
168.7250	168.721875
	168.728125
168.7375	168.734375
	168.740625
168.7500	168.746875
	168.753125
168.7625	168.759375
	168.765625
168.7750	168.771875
	168.778125
168.7875	168.784375
	168.790625
168.8000	168.796875
	168.803125
168.8125	168.809375
	168.815625
168.8250	168.821875
	168.828125
168.8375	168.834375
	168.840625
168.8500	168.846875
	168.853125
168.8625	168.859375
	168.865625
168.8750	168.871875
	168.878125
168.8875	168.884375
	168.890625
168.9000	168.896875
	168.903125
168.9125	168.909375
	168.915625
168.9250	168.921875
	168.928125
168.9375	168.934375
	168.940625
168.9500	168.946875
	168.953125
168.9625	168.959375
	168.965625
168.9750	168.971875
	168.978125
168.9875	168.984375
	168.990625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
169.0000	168.996875
	169.003125
169.0125	169.009375
	169.015625
169.0250	169.021875
	169.028125
169.0375	169.034375
	169.040625
169.0500	169.046875
	169.053125
169.0625	169.059375
	169.065625
169.0750	169.071875
	169.078125
169.0875	169.084375
	169.090625
169.1000	169.096875
	169.103125
169.1125	169.109375
	169.115625
169.1250	169.121875
	169.128125
169.1375	169.134375
	169.140625
169.1500	169.146875
	169.153125
169.1625	169.159375
	169.165625
169.1750	169.171875
	169.178125
169.1875	169.184375
	169.190625
169.2000	169.196875
	169.203125
169.2125	169.209375
	169.215625
169.2250	169.221875
	169.228125
169.2375	169.234375
	169.240625
169.2500	169.246875
	169.253125
169.2625	169.259375
	169.265625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
169.2750	169.271875
	169.278125
169.2875	169.284375
	169.290625
169.3000	169.296875
	169.303125
169.3125	169.309375
	169.315625
169.3250	169.321875
	169.328125
169.3375	169.334375
	169.340625
169.3500	169.346875
	169.353125
169.3625	169.359375
	169.365625
169.3750	169.371875
	169.378125
169.3875	169.384375
	169.390625

TABLE 2: Single Frequency Operations	
Center Frequency 12.5 kHz	**Center Frequency 6.25 kHz**
169.4000	169.396875
	169.403125
169.4125	169.409375
	169.415625
169.4250	169.421875
	169.428125
169.4375	169.434375
	169.440625
169.4500	169.446875
	169.453125
169.4625	169.459375
	169.465625
169.4750	169.471875
	169.478125
169.4875	169.484375
	169.490625
169.5000	169.496875
	169.503125

4.3.8 Reserved

4.3.9 Channeling Plan for Assignments in the Band 406.1-420 MHz

This plan is a guide for identifying center frequencies for assignments normally with necessary bandwidths of 6.25 or 12.5 kHz. This plan contains two tables, Table 1 contains center frequencies for channel pairs and Table 2 contains center frequencies for single frequency operations. This plan also includes conditions and limitation for use of assignments in the band 406.1-420 MHz. The addition of the 6.25 kHz channel spacing supports agencies purchasing equipment capable of using this bandwidth. There is no requirement for agencies to transition to 6.25 kHz Channels.

CONDITIONS AND LIMITATIONS

1. Transition. To allow for an orderly transition from previous channel plans to this plan, the following apply:

a. Agencies having assignments on or overlapping frequencies allotted for primary use by other agencies shall make every attempt to move their operations to frequencies allotted primarily for their own use, or to frequencies allotted for their shared use. Agencies must complete all moves by the earliest possible date.

b. Any wideband assignment authorized prior to December 31, 2007, and continued in use after that date, which is on or overlaps a narrowband frequency allotted for primary use by another agency, the using agency or agencies must vacate the assignment within 180 days of a

formal notice of requirement from the agency allotted the frequency. The notifying agency must demonstrate a valid requirement for the frequency and the FAS recommends the using agency vacate the assignment.

2. Narrowband Operations. Agencies may request narrowband assignments on the center frequencies shown in Table 1 and Table 2 for for transmitters with necessary bandwidths less than 12.5 kHz. Agencies requesting new narrowband assignments adjacent to wideband assignments (bandwidths 12.5 kHz or greater), must consider that additional distance separation may be required due to the increased potential for adjacent channel interference, and then only after coordination/notification with affected agencies.

3. Wideband Operations. NTIA may authorize renewal of assignments to existing stations with necessary bandwidths of 12.5 kHz or greater. In addition, NTIA may authorize assignments for expansion of stations within existing networks operating with bandwidths of 12.5 kHz or greater, but all such assignments must bear Special Note S391 (see Annex A). By January 1, 2008, all assignments and equipment must conform to the provisions set forth in paragraph 1, above, and Section 5.3.5 of this Manual. The Automated Surface Observing System (ASOS) operations centered on frequencies 410.075 and 410.950 MHz may continue to operate with necessary bandwidths greater than 12.5 kHz, but less than 25 kHz. Exceptions to these rules may be authorized on a case-by-case basis, provided the assignment with bandwidth(s) of 12.5 kHz or greater is needed to satisfy requirements and , has been properly coordinated with all affected agencies, and has been recommended for approval by the FAS. However, the rule outlined in subparagraph 1.b, above, applies.

4. Use of Coded Squelch. Use coded squelch techniques whenever this technique will promote more efficient spectrum use (e.g., use of fewer frequencies, sharing frequencies, or reduction or elimination of interference).

5. Time Division Multiple Access (TDMA) Operations. TDMA systems with at least one voice channel per 12.5 kHz will be allowed and accommodated on adjacent 12.5 kHz center frequencies listed in this channeling plan. The center frequency of the TDMA emission must be offset midway between the center frequencies listed in this plan to limit adjacent channel interference problems with existing or planned narrowband operations. Refer to Section 5.3 of this Manual for technical details.

6. Paired Frequency Operations. Table 1 contains pairs of frequencies used primarily for two-frequency simplex operations using equipment operating with a necessary bandwidth less than 12.5 kHz.

a. For paired frequency operations, use the frequencies in the range 406.1125-410.9875 MHz for land station transmissions (or mobile receive), and use the frequencies in the range 415.1125-419.9875 MHz for land station receive (or mobile transmit).

b. Base stations can transmit with an operating power of 125 watts or less in the range 415.1125-419.9875 MHz to access a repeater.

c. Mobile stations are permitted to use repeater transmit frequencies for talk-around communications.

d. NTIA may authorize unpaired single frequency operations using either of the paired frequencies, except those allotted AGA, if the requesting agency believes it to be a more effective spectrum use. All such assignments must bear Special Note S396 (see Annex A). However, as long as an agency has assignments for unpaired single frequency operations on frequencies listed in Table 1, that agency shall not be authorized paired frequency assignments on those frequencies in Table 1 allotted AGA, unless justified.

e. Agencies will first propose frequency pairs allotted primarily for their own use from the Table 1 structure.

f. If there are no agency allotted structured pairs available, the requesting agency or agencies must propose frequency pairs allotted primarily for AGA use from the Table 1 structure.

g. If there are no AGA allotted structured pairs available, an agency may use any of their allotted frequencies in the range 406.1125-410.9875 MHz and any of their allotted frequencies in the range 415.1125-419.9875 MHz to make up a single channel pair. This is if the requesting agency believes this is more effective spectrum use and if it complies, in part with the provisions of paragraph 6.a.

h. If a channel pair cannot be found from the transmit and receive ranges, an agency may use any of their allotted frequencies in the range 406.1125-410.9875 MHz and any of their allotted frequencies in the ranges 411.000-415.1000 MHz or 415.1125-419.9875 MHz to make up a single channel pair. This is if the requesting agency believes this to be more effective spectrum use.

i. Existing narrowband assignments that do not conform to the provisions of this paragraph are grand fathered until January 1, 2022. Additionally, authorizations expanding existing narrowband systems will continue within this period.

7. Single Frequency Operations. Table 2 contains the center frequencies used for single frequency operations with necessary bandwidths less than 12.5 kHz.

8. Use of the Band by Military Agencies. Use of the band 406.1-420 MHz by the military agencies is limited to non-tactical or intra-base radio operations with the following provisions:

a. frequency assignments may be authorized on center frequencies allotted primarily for DOD;

b. frequency assignments for certified trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, subject to the conditions imposed on the NTIA certification of spectrum support and coordination between the affected agencies. The priority note P076 shall be applied to assignments on center frequencies allotted primarily for non-military agencies and those allotted for shared use, unless the agency(ies) to which the frequency is primarily allotted agrees to waive this requirement.; and,

c. frequency assignments for purposes other than trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, provided the proper selection and coordination procedures have been followed, and provided the priority note P076 is applied to each such assignment.

Table 1: Paired Channels

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
406.1125	406.109375	415.1125	415.109375
	406.115625		415.115625
406.1250	406.121875	415.1250	415.121875
	406.128125		415.128125
406.1375	406.134375	415.1375	415.134375
	406.140625		415.140625
406.1500	406.146875	415.1500	415.146875
	406.153125		415.153125
406.1625	406.159375	415.1625	415.159375
	406.165625		415.165625
406.1750	406.171875	415.1750	415.171875
	406.178125		415.178125
406.1875	406.184375	415.1875	415.184375
	406.190625		415.190625
406.2000	406.196875	415.2000	415.196875
	406.203125		415.203125
406.2125	406.209375	415.2125	415.209375
	406.215625		415.215625
406.2250	406.221875	415.2250	415.221875
	406.228125		415.228125
406.2375	406.234375	415.2375	415.234375
	406.240625		415.240625
406.2500	406.246875	415.2500	415.246875
	406.253125		415.253125
406.2625	406.259375	415.2625	415.259375
	406.265625		415.265625
406.2750	406.271875	415.2750	415.271875
	406.278125		415.278125
406.2875	406.284375	415.2875	415.284375
	406.290625		415.290625
406.3000	406.296875	415.3000	415.296875
	406.303125		415.303125
406.3125	406.309375	415.3125	415.309375
	406.315625		415.315625
406.3250	406.321875	415.3250	415.321875
	406.328125		415.328125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
406.3375	406.334375	415.3375	415.334375
	406.340625		415.340625
406.3500	406.346875	415.3500	415.346875
	406.353125		415.353125
406.3625	406.359375	415.3625	415.359375
	406.365625		415.365625
406.3750	406.371875	415.3750	415.371875
	406.378125		415.378125
406.3875	406.384375	415.3875	415.384375
	406.390625		415.390625
406.4000	406.396875	415.4000	415.396875
	406.403125		415.403125
406.4125	406.409375	415.4125	415.409375
	406.415625		415.415625
406.4250	406.421875	415.4250	415.421875
	406.428125		415.428125
406.4375	406.434375	415.4375	415.434375
	406.440625		415.440625
406.4500	406.446875	415.4500	415.446875
	406.453125		415.453125
406.4625	406.459375	415.4625	415.459375
	406.465625		415.465625
406.4750	406.471875	415.4750	415.471875
	406.478125		415.478125
406.4875	406.484375	415.4875	415.484375
	406.490625		415.490625
406.5000	406.496875	415.5000	415.496875
	406.503125		415.503125
406.5125	406.509375	415.5125	415.509375
	406.515625		415.515625
406.5250	406.521875	415.5250	415.521875
	406.528125		415.528125
406.5375	406.534375	415.5375	415.534375
	406.540625		415.540625
406.5500	406.546875	415.5500	415.546875
	406.553125		415.553125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
406.5625	406.559375	415.5625	415.559375
	406.565625		415.565625
406.5750	406.571875	415.5750	415.571875
	406.578125		415.578125
406.5875	406.584375	415.5875	415.584375
	406.590625		415.590625
406.6000	406.596875	415.6000	415.596875
	406.603125		415.603125
406.6125	406.609375	415.6125	415.609375
	406.615625		415.615625
406.6250	406.621875	415.6250	415.621875
	406.628125		415.628125
406.6375	406.634375	415.6375	415.634375
	406.640625		415.640625
406.6500	406.646875	415.6500	415.646875
	406.653125		415.653125
406.6625	406.659375	415.6625	415.659375
	406.665625		415.665625
406.6750	406.671875	415.6750	415.671875
	406.678125		415.678125
406.6875	406.684375	415.6875	415.684375
	406.690625		415.690625
406.7000	406.696875	415.7000	415.696875
	406.703125		415.703125
406.7125	406.709375	415.7125	415.709375
	406.715625		415.715625
406.7250	406.721875	415.7250	415.721875
	406.728125		415.728125
406.7375	406.734375	415.7375	415.734375
	406.740625		415.740625
406.7500	406.746875	415.7500	415.746875
	406.753125		415.753125
406.7625	406.759375	415.7625	415.759375
	406.765625		415.765625
406.7750	406.771875	415.7750	415.771875
	406.778125		415.778125
406.7875	406.784375	415.7875	415.784375
	406.790625		415.790625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
406.8000	406.796875	415.8000	415.796875
	406.803125		415.803125
406.8125	406.809375	415.8125	415.809375
	406.815625		415.815625
406.8250	406.821875	415.8250	415.821875
	406.828125		415.828125
406.8375	406.834375	415.8375	415.834375
	406.840625		415.840625
406.8500	406.846875	415.8500	415.846875
	406.853125		415.853125
406.8625	406.859375	415.8625	415.859375
	406.865625		415.865625
406.8750	406.871875	415.8750	415.871875
	406.878125		415.878125
406.8875	406.884375	415.8875	415.884375
	406.890625		415.890625
406.9000	406.896875	415.9000	415.896875
	406.903125		415.903125
406.9125	406.909375	415.9125	415.909375
	406.915625		415.915625
406.9250	406.921875	415.9250	415.921875
	406.928125		415.928125
406.9375	406.934375	415.9375	415.934375
	406.940625		415.940625
406.9500	406.946875	415.9500	415.946875
	406.953125		415.953125
406.9625	406.959375	415.9625	415.959375
	406.965625		415.965625
406.9750	406.971875	415.9750	415.971875
	406.978125		415.978125
406.9875	406.984375	415.9875	415.984375
	406.990625		415.990625
407.0000	406.996875	416.0000	415.996875
	407.003125		416.003125
407.0125	407.009375	416.0125	416.009375
	407.015625		416.015625
407.0250	407.021875	416.0250	416.021875
	407.028125		416.028125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
407.0375	407.034375	416.0375	416.034375
	407.040625		416.040625
407.0500	407.046875	416.0500	416.046875
	407.053125		416.053125
407.0625	407.059375	416.0625	416.059375
	407.065625		416.065625
407.0750	407.071875	416.0750	416.071875
	407.078125		416.078125
407.0875	407.084375	416.0875	416.084375
	407.090625		416.090625
407.1000	407.096875	416.1000	416.096875
	407.103125		416.103125
407.1125	407.109375	416.1125	416.109375
	407.115625		416.115625
407.1250	407.121875	416.1250	416.121875
	407.128125		416.128125
407.1375	407.134375	416.1375	416.134375
	407.140625		416.140625
407.1500	407.146875	416.1500	416.146875
	407.153125		416.153125
407.1625	407.159375	416.1625	416.159375
	407.165625		416.165625
407.1750	407.171875	416.1750	416.171875
	407.178125		416.178125
407.1875	407.184375	416.1875	416.184375
	407.190625		416.190625
407.2000	407.196875	416.2000	416.196875
	407.203125		416.203125
407.2125	407.209375	416.2125	416.209375
	407.215625		416.215625
407.2250	407.221875	416.2250	416.221875
	407.228125		416.228125
407.2375	407.234375	416.2375	416.234375
	407.240625		416.240625
407.2500	407.246875	416.2500	416.246875
	407.253125		416.253125
407.2625	407.259375	416.2625	416.259375
	407.265625		416.265625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
407.2750	407.271875	416.2750	416.271875
	407.278125		416.278125
407.2875	407.284375	416.2875	416.284375
	407.290625		416.290625
407.3000	407.296875	416.3000	416.296875
	407.303125		416.303125
407.3125	407.309375	416.3125	416.309375
	407.315625		416.315625
407.3250	407.321875	416.3250	416.321875
	407.328125		416.328125
407.3375	407.334375	416.3375	416.334375
	407.340625		416.340625
407.3500	407.346875	416.3500	416.346875
	407.353125		416.353125
407.3625	407.359375	416.3625	416.359375
	407.365625		416.365625
407.3750	407.371875	416.3750	416.371875
	407.378125		416.378125
407.3875	407.384375	416.3875	416.384375
	407.390625		416.390625
407.4000	407.396875	416.4000	416.396875
	407.403125		416.403125
407.4125	407.409375	416.4125	416.409375
	407.415625		416.415625
407.4250	407.421875	416.4250	416.421875
	407.428125		416.428125
407.4375	407.434375	416.4375	416.434375
	407.440625		416.440625
407.4500	407.446875	416.4500	416.446875
	407.453125		416.453125
407.4625	407.459375	416.4625	416.459375
	407.465625		416.465625
407.4750	407.471875	416.4750	416.471875
	407.478125		416.478125
407.4875	407.484375	416.4875	416.484375
	407.490625		416.490625
407.5000	407.496875	416.5000	416.496875
	407.503125		416.503125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
407.5125	407.509375	416.5125	416.509375
	407.515625		416.515625
407.5250	407.521875	416.5250	416.521875
	407.528125		416.528125
407.5375	407.534375	416.5375	416.534375
	407.540625		416.540625
407.5500	407.546875	416.5500	416.546875
	407.553125		416.553125
407.5625	407.559375	416.5625	416.559375
	407.565625		416.565625
407.5750	407.571875	416.5750	416.571875
	407.578125		416.578125
407.5875	407.584375	416.5875	416.584375
	407.590625		416.590625
407.6000	407.596875	416.6000	416.596875
	407.603125		416.603125
407.6125	407.609375	416.6125	416.609375
	407.615625		416.615625
407.6250	407.621875	416.6250	416.621875
	407.628125		416.628125
407.6375	407.634375	416.6375	416.634375
	407.640625		416.640625
407.6500	407.646875	416.6500	416.646875
	407.653125		416.653125
407.6625	407.659375	416.6625	416.659375
	407.665625		416.665625
407.6750	407.671875	416.6750	416.671875
	407.678125		416.678125
407.6875	407.684375	416.6875	416.684375
	407.690625		416.690625
407.7000	407.696875	416.7000	416.696875
	407.703125		416.703125
407.7125	407.709375	416.7125	416.709375
	407.715625		416.715625
407.7250	407.721875	416.7250	416.721875
	407.728125		416.728125
407.7375	407.734375	416.7375	416.734375
	407.740625		416.740625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
407.7500	407.746875	416.7500	416.746875
	407.753125		416.753125
407.7625	407.759375	416.7625	416.759375
	407.765625		416.765625
407.7750	407.771875	416.7750	416.771875
	407.778125		416.778125
407.7875	407.784375	416.7875	416.784375
	407.790625		416.790625
407.8000	407.796875	416.8000	416.796875
	407.803125		416.803125
407.8125	407.809375	416.8125	416.809375
	407.815625		416.815625
407.8250	407.821875	416.8250	416.821875
	407.828125		416.828125
407.8375	407.834375	416.8375	416.834375
	407.840625		416.840625
407.8500	407.846875	416.8500	416.846875
	407.853125		416.853125
407.8625	407.859375	416.8625	416.859375
	407.865625		416.865625
407.8750	407.871875	416.8750	416.871875
	407.878125		416.878125
407.8875	407.884375	416.8875	416.884375
	407.890625		416.890625
407.9000	407.896875	416.9000	416.896875
	407.903125		416.903125
407.9125	407.909375	416.9125	416.909375
	407.915625		416.915625
407.9250	407.921875	416.9250	416.921875
	407.928125		416.928125
407.9375	407.934375	416.9375	416.934375
	407.940625		416.940625
407.9500	407.946875	416.9500	416.946875
	407.953125		416.953125
407.9625	407.959375	416.9625	416.959375
	407.965625		416.965625
407.9750	407.971875	416.9750	416.971875
	407.978125		416.978125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
407.9875	407.984375	416.9875	416.984375
	407.990625		416.990625
408.0000	407.996875	417.0000	416.996875
	408.003125		417.003125
408.0125	408.009375	417.0125	417.009375
	408.015625		417.015625
408.0250	408.021875	417.0250	417.021875
	408.028125		417.028125
408.0375	408.034375	417.0375	417.034375
	408.040625		417.040625
408.0500	408.046875	417.0500	417.046875
	408.053125		417.053125
408.0625	408.059375	417.0625	417.059375
	408.065625		417.065625
408.0750	408.071875	417.0750	417.071875
	408.078125		417.078125
408.0875	408.084375	417.0875	417.084375
	408.090625		417.090625
408.1000	408.096875	417.1000	417.096875
	408.103125		417.103125
408.1125	408.109375	417.1125	417.109375
	408.115625		417.115625
408.1250	408.121875	417.1250	417.121875
	408.128125		417.128125
408.1375	408.134375	417.1375	417.134375
	408.140625		417.140625
408.1500	408.146875	417.1500	417.146875
	408.153125		417.153125
408.1625	408.159375	417.1625	417.159375
	408.165625		417.165625
408.1750	408.171875	417.1750	417.171875
	408.178125		417.178125
408.1875	408.184375	417.1875	417.184375
	408.190625		417.190625
408.2000	408.196875	417.2000	417.196875
	408.203125		417.203125
408.2125	408.209375	417.2125	417.209375
	408.215625		417.215625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
408.2250	408.221875	417.2250	417.221875
	408.228125		417.228125
408.2375	408.234375	417.2375	417.234375
	408.240625		417.240625
408.2500	408.246875	417.2500	417.246875
	408.253125		417.253125
408.2625	408.259375	417.2625	417.259375
	408.265625		417.265625
408.2750	408.271875	417.2750	417.271875
	408.278125		417.278125
408.2875	408.284375	417.2875	417.284375
	408.290625		417.290625
408.3000	408.296875	417.3000	417.296875
	408.303125		417.303125
408.3125	408.309375	417.3125	417.309375
	408.315625		417.315625
408.3250	408.321875	417.3250	417.321875
	408.328125		417.328125
408.3375	408.334375	417.3375	417.334375
	408.340625		417.340625
408.3500	408.346875	417.3500	417.346875
	408.353125		417.353125
408.3625	408.359375	417.3625	417.359375
	408.365625		417.365625
408.3750	408.371875	417.3750	417.371875
	408.378125		417.378125
408.3875	408.384375	417.3875	417.384375
	408.390625		417.390625
408.4000	408.396875	417.4000	417.396875
	408.403125		417.403125
408.4125	408.409375	417.4125	417.409375
	408.415625		417.415625
408.4250	408.421875	417.4250	417.421875
	408.428125		417.428125
408.4375	408.434375	417.4375	417.434375
	408.440625		417.440625
408.4500	408.446875	417.4500	417.446875
	408.453125		417.453125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
408.4625	408.459375	417.4625	417.459375
	408.465625		417.465625
408.4750	408.471875	417.4750	417.471875
	408.478125		417.478125
408.4875	408.484375	417.4875	417.484375
	408.490625		417.490625
408.5000	408.496875	417.5000	417.496875
	408.503125		417.503125
408.5125	408.509375	417.5125	417.509375
	408.515625		417.515625
408.5250	408.521875	417.5250	417.521875
	408.528125		417.528125
408.5375	408.534375	417.5375	417.534375
	408.540625		417.540625
408.5500	408.546875	417.5500	417.546875
	408.553125		417.553125
408.5625	408.559375	417.5625	417.559375
	408.565625		417.565625
408.5750	408.571875	417.5750	417.571875
	408.578125		417.578125
408.5875	408.584375	417.5875	417.584375
	408.590625		417.590625
408.6000	408.596875	417.6000	417.596875
	408.603125		417.603125
408.6125	408.609375	417.6125	417.609375
	408.615625		417.615625
408.6250	408.621875	417.6250	417.621875
	408.628125		417.628125
408.6375	408.634375	417.6375	417.634375
	408.640625		417.640625
408.6500	408.646875	417.6500	417.646875
	408.653125		417.653125
408.6625	408.659375	417.6625	417.659375
	408.665625		417.665625
408.6750	408.671875	417.6750	417.671875
	408.678125		417.678125
408.6875	408.684375	417.6875	417.684375
	408.690625		417.690625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
408.7000	408.696875	417.7000	417.696875
	408.703125		417.703125
408.7125	408.709375	417.7125	417.709375
	408.715625		417.715625
408.7250	408.721875	417.7250	417.721875
	408.728125		417.728125
408.7375	408.734375	417.7375	417.734375
	408.740625		417.740625
408.7500	408.746875	417.7500	417.746875
	408.753125		417.753125
408.7625	408.759375	417.7625	417.759375
	408.765625		417.765625
408.7750	408.771875	417.7750	417.771875
	408.778125		417.778125
408.7875	408.784375	417.7875	417.784375
	408.790625		417.790625
408.8000	408.796875	417.8000	417.796875
	408.803125		417.803125
408.8125	408.809375	417.8125	417.809375
	408.815625		417.815625
408.8250	408.821875	417.8250	417.821875
	408.828125		417.828125
408.8375	408.834375	417.8375	417.834375
	408.840625		417.840625
408.8500	408.846875	417.8500	417.846875
	408.853125		417.853125
408.8625	408.859375	417.8625	417.859375
	408.865625		417.865625
408.8750	408.871875	417.8750	417.871875
	408.878125		417.878125
408.8875	408.884375	417.8875	417.884375
	408.890625		417.890625
408.9000	408.896875	417.9000	417.896875
	408.903125		417.903125
408.9125	408.909375	417.9125	417.909375
	408.915625		417.915625
408.9250	408.921875	417.9250	417.921875
	408.928125		417.928125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
408.9375	408.934375	417.9375	417.934375
	408.940625		417.940625
408.9500	408.946875	417.9500	417.946875
	408.953125		417.953125
408.9625	408.959375	417.9625	417.959375
	408.965625		417.965625
408.9750	408.971875	417.9750	417.971875
	408.978125		417.978125
408.9875	408.984375	417.9875	417.984375
	408.990625		417.990625
409.0000	408.996875	418.0000	417.996875
	409.003125		418.003125
409.0125	409.009375	418.0125	418.009375
	409.015625		418.015625
409.0250	409.021875	418.0250	418.021875
	409.028125		418.028125
409.0375	409.034375	418.0375	418.034375
	409.040625		418.040625
409.0500	409.046875	418.0500	418.046875
	409.053125		418.053125
409.0625	409.059375	418.0625	418.059375
	409.065625		418.065625
409.0750	409.071875	418.0750	418.071875
	409.078125		418.078125
409.0875	409.084375	418.0875	418.084375
	409.090625		418.090625
409.1000	409.096875	418.1000	418.096875
	409.103125		418.103125
409.1125	409.109375	418.1125	418.109375
	409.115625		418.115625
409.1250	409.121875	418.1250	418.121875
	409.128125		418.128125
409.1375	409.134375	418.1375	418.134375
	409.140625		418.140625
409.1500	409.146875	418.1500	418.146875
	409.153125		418.153125
409.1625	409.159375	418.1625	418.159375
	409.165625		418.165625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
409.1750	409.171875	418.1750	418.171875
	409.178125		418.178125
409.1875	409.184375	418.1875	418.184375
	409.190625		418.190625
409.2000	409.196875	418.2000	418.196875
	409.203125		418.203125
409.2125	409.209375	418.2125	418.209375
	409.215625		418.215625
409.2250	409.221875	418.2250	418.221875
	409.228125		418.228125
409.2375	409.234375	418.2375	418.234375
	409.240625		418.240625
409.2500	409.246875	418.2500	418.246875
	409.253125		418.253125
409.2625	409.259375	418.2625	418.259375
	409.265625		418.265625
409.2750	409.271875	418.2750	418.271875
	409.278125		418.278125
409.2875	409.284375	418.2875	418.284375
	409.290625		418.290625
409.3000	409.296875	418.3000	418.296875
	409.303125		418.303125
409.3125	409.309375	418.3125	418.309375
	409.315625		418.315625
409.3250	409.321875	418.3250	418.321875
	409.328125		418.328125
409.3375	409.334375	418.3375	418.334375
	409.340625		418.340625
409.3500	409.346875	418.3500	418.346875
	409.353125		418.353125
409.3625	409.359375	418.3625	418.359375
	409.365625		418.365625
409.3750	409.371875	418.3750	418.371875
	409.378125		418.378125
409.3875	409.384375	418.3875	418.384375
	409.390625		418.390625
409.4000	409.396875	418.4000	418.396875
	409.403125		418.403125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
409.4125	409.409375	418.4125	418.409375
	409.415625		418.415625
409.4250	409.421875	418.4250	418.421875
	409.428125		418.428125
409.4375	409.434375	418.4375	418.434375
	409.440625		418.440625
409.4500	409.446875	418.4500	418.446875
	409.453125		418.453125
409.4625	409.459375	418.4625	418.459375
	409.465625		418.465625
409.4750	409.471875	418.4750	418.471875
	409.478125		418.478125
409.4875	409.484375	418.4875	418.484375
	409.490625		418.490625
409.5000	409.496875	418.5000	418.496875
	409.503125		418.503125
409.5125	409.509375	418.5125	418.509375
	409.515625		418.515625
409.5250	409.521875	418.5250	418.521875
	409.528125		418.528125
409.5375	409.534375	418.5375	418.534375
	409.540625		418.540625
409.5500	409.546875	418.5500	418.546875
	409.553125		418.553125
409.5625	409.559375	418.5625	418.559375
	409.565625		418.565625
409.5750	409.571875	418.5750	418.571875
	409.578125		418.578125
409.5875	409.584375	418.5875	418.584375
	409.590625		418.590625
409.6000	409.596875	418.6000	418.596875
	409.603125		418.603125
409.6125	409.609375	418.6125	418.609375
	409.615625		418.615625
409.6250	409.621875	418.6250	418.621875
	409.628125		418.628125
409.6375	409.634375	418.6375	418.634375
	409.640625		418.640625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
409.6500	409.646875	418.6500	418.646875
	409.653125		418.653125
409.6625	409.659375	418.6625	418.659375
	409.665625		418.665625
409.6750	409.671875	418.6750	418.671875
	409.678125		418.678125
409.6875	409.684375	418.6875	418.684375
	409.690625		418.690625
409.7000	409.696875	418.7000	418.696875
	409.703125		418.703125
409.7125	409.709375	418.7125	418.709375
	409.715625		418.715625
409.7250	409.721875	418.7250	418.721875
	409.728125		418.728125
409.7375	409.734375	418.7375	418.734375
	409.740625		418.740625
409.7500	409.746875	418.7500	418.746875
	409.753125		418.753125
409.7625	409.759375	418.7625	418.759375
	409.765625		418.765625
409.7750	409.771875	418.7750	418.771875
	409.778125		418.778125
409.7875	409.784375	418.7875	418.784375
	409.790625		418.790625
409.8000	409.796875	418.8000	418.796875
	409.803125		418.803125
409.8125	409.809375	418.8125	418.809375
	409.815625		418.815625
409.8250	409.821875	418.8250	418.821875
	409.828125		418.828125
409.8375	409.834375	418.8375	418.834375
	409.840625		418.840625
409.8500	409.846875	418.8500	418.846875
	409.853125		418.853125
409.8625	409.859375	418.8625	418.859375
	409.865625		418.865625
409.8750	409.871875	418.8750	418.871875
	409.878125		418.878125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
409.8875	409.884375	418.8875	418.884375
	409.890625		418.890625
409.9000	409.896875	418.9000	418.896875
	409.903125		418.903125
409.9125	409.909375	418.9125	418.909375
	409.915625		418.915625
409.9250	409.921875	418.9250	418.921875
	409.928125		418.928125
409.9375	409.934375	418.9375	418.934375
	409.940625		418.940625
409.9500	409.946875	418.9500	418.946875
	409.953125		418.953125
409.9625	409.959375	418.9625	418.959375
	409.965625		418.965625
409.9750	409.971875	418.9750	418.971875
	409.978125		418.978125
409.9875	409.984375	418.9875	418.984375
	409.990625		418.990625
410.0000	409.996875	419.0000	418.996875
	410.003125		419.003125
410.0125	410.009375	419.0125	419.009375
	410.015625		419.015625
410.0250	410.021875	419.0250	419.021875
	410.028125		419.028125
410.0375	410.034375	419.0375	419.034375
	410.040625		419.040625
410.0500	410.046875	419.0500	419.046875
	410.053125		419.053125
410.0625	410.059375	419.0625	419.059375
	410.065625		419.065625
410.0750	410.071875	419.0750	419.071875
	410.078125		419.078125
410.0875	410.084375	419.0875	419.084375
	410.090625		419.090625
410.1000	410.096875	419.1000	419.096875
	410.103125		419.103125
410.1125	410.109375	419.1125	419.109375
	410.115625		419.115625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
410.1250	410.121875	419.1250	419.121875
	410.128125		419.128125
410.1375	410.134375	419.1375	419.134375
	410.140625		419.140625
410.1500	410.146875	419.1500	419.146875
	410.153125		419.153125
410.1625	410.159375	419.1625	419.159375
	410.165625		419.165625
410.1750	410.171875	419.1750	419.171875
	410.178125		419.178125
410.1875	410.184375	419.1875	419.184375
	410.190625		419.190625
410.2000	410.196875	419.2000	419.196875
	410.203125		419.203125
410.2125	410.209375	419.2125	419.209375
	410.215625		419.215625
410.2250	410.221875	419.2250	419.221875
	410.228125		419.228125
410.2375	410.234375	419.2375	419.234375
	410.240625		419.240625
410.2500	410.246875	419.2500	419.246875
	410.253125		419.253125
410.2625	410.259375	419.2625	419.259375
	410.265625		419.265625
410.2750	410.271875	419.2750	419.271875
	410.278125		419.278125
410.2875	410.284375	419.2875	419.284375
	410.290625		419.290625
410.3000	410.296875	419.3000	419.296875
	410.303125		419.303125
410.3125	410.309375	419.3125	419.309375
	410.315625		419.315625
410.3250	410.321875	419.3250	419.321875
	410.328125		419.328125
410.3375	410.334375	419.3375	419.334375
	410.340625		419.340625
410.3500	410.346875	419.3500	419.346875
	410.353125		419.353125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
410.3625	410.359375	419.3625	419.359375
	410.365625		419.365625
410.3750	410.371875	419.3750	419.371875
	410.378125		419.378125
410.3875	410.384375	419.3875	419.384375
	410.390625		419.390625
410.4000	410.396875	419.4000	419.396875
	410.403125		419.403125
410.4125	410.409375	419.4125	419.409375
	410.415625		419.415625
410.4250	410.421875	419.4250	419.421875
	410.428125		419.428125
410.4375	410.434375	419.4375	419.434375
	410.440625		419.440625
410.4500	410.446875	419.4500	419.446875
	410.453125		419.453125
410.4625	410.459375	419.4625	419.459375
	410.465625		419.465625
410.4750	410.471875	419.4750	419.471875
	410.478125		419.478125
410.4875	410.484375	419.4875	419.484375
	410.490625		419.490625
410.5000	410.496875	419.5000	419.496875
	410.503125		419.503125
410.5125	410.509375	419.5125	419.509375
	410.515625		419.515625
410.5250	410.521875	419.5250	419.521875
	410.528125		419.528125
410.5375	410.534375	419.5375	419.534375
	410.540625		419.540625
410.5500	410.546875	419.5500	419.546875
	410.553125		419.553125
410.5625	410.559375	419.5625	419.559375
	410.565625		419.565625
410.5750	410.571875	419.5750	419.571875
	410.578125		419.578125
410.5875	410.584375	419.5875	419.584375
	410.590625		419.590625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	**Center Frequency 6.25KHz**	**Center Frequency 12.5KHz**	**Center Frequency 6.25KHz**
410.6000	410.596875	419.6000	419.596875
	410.603125		419.603125
410.6125	410.609375	419.6125	419.609375
	410.615625		419.615625
410.6250	410.621875	419.6250	419.621875
	410.628125		419.628125
410.6375	410.634375	419.6375	419.634375
	410.640625		419.640625
410.6500	410.646875	419.6500	419.646875
	410.653125		419.653125
410.6625	410.659375	419.6625	419.659375
	410.665625		419.665625
410.6750	410.671875	419.6750	419.671875
	410.678125		419.678125
410.6875	410.684375	419.6875	419.684375
	410.690625		419.690625
410.7000	410.696875	419.7000	419.696875
	410.703125		419.703125
410.7125	410.709375	419.7125	419.709375
	410.715625		419.715625
410.7250	410.721875	419.7250	419.721875
	410.728125		419.728125
410.7375	410.734375	419.7375	419.734375
	410.740625		419.740625
410.7500	410.746875	419.7500	419.746875
	410.753125		419.753125
410.7625	410.759375	419.7625	419.759375
	410.765625		419.765625
410.7750	410.771875	419.7750	419.771875
	410.778125		419.778125
410.7875	410.784375	419.7875	419.784375
	410.790625		419.790625
410.8000	410.796875	419.8000	419.796875
	410.803125		419.803125
410.8125	410.809375	419.8125	419.809375
	410.815625		419.815625
410.8250	410.821875	419.8250	419.821875
	410.828125		419.828125

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	Center Frequency 6.25KHz	Center Frequency 12.5KHz	Center Frequency 6.25KHz
410.8375	410.834375	419.8375	419.834375
	410.840625		419.840625
410.8500	410.846875	419.8500	419.846875
	410.853125		419.853125
410.8625	410.859375	419.8625	419.859375
	410.865625		419.865625
410.8750	410.871875	419.8750	419.871875
	410.878125		419.878125
410.8875	410.884375	419.8875	419.884375
	410.890625		419.890625
410.9000	410.896875	419.9000	419.896875
	410.903125		419.903125
410.9125	410.909375	419.9125	419.909375
	410.915625		419.915625

TABLE 1: Paired Channels			
Center Frequency 12.5KHz	Center Frequency 6.25KHz	Center Frequency 12.5KHz	Center Frequency 6.25KHz
410.9250	410.921875	419.9250	419.921875
	410.928125		419.928125
410.9375	410.934375	419.9375	419.934375
	410.940625		419.940625
410.9500	410.946875	419.9500	419.946875
	410.953125		419.953125
410.9625	410.959375	419.9625	419.959375
	410.965625		419.965625
410.9750	410.971875	419.9750	419.971875
	410.978125		419.978125
410.9875	410.984375	419.9875	419.984375
	410.990625		419.990625

Table 2: Single Channels

TABLE 2: Single Channel	
Center Frequency 12.5kHz	Center Frequency 6.25 kHz
411.0000	410.996875
	411.003125
411.0125	411.009375
	411.015625
411.0250	411.021875
	411.028125
411.0375	411.034375
	411.040625
411.0500	411.046875
	411.053125
411.0625	411.059375
	411.065625
411.0750	411.071875
	411.078125
411.0875	411.084375
	411.090625
411.1000	411.096875
	411.103125

TABLE 2: Single Channel	
Center Frequency 12.5kHz	Center Frequency 6.25 kHz
411.1125	411.109375
	411.115625
411.1250	411.121875
	411.128125
411.1375	411.134375
	411.140625
411.1500	411.146875
	411.153125
411.1625	411.159375
	411.165625
411.1750	411.171875
	411.178125
411.1875	411.184375
	411.190625
411.2000	411.196875
	411.203125
411.2125	411.209375
	411.215625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
411.2250	411.221875
	411.228125
411.2375	411.234375
	411.240625
411.2500	411.246875
	411.253125
411.2625	411.259375
	411.265625
411.2750	411.271875
	411.278125
411.2875	411.284375
	411.290625
411.3000	411.296875
	411.303125
411.3125	411.309375
	411.315625
411.3250	411.321875
	411.328125
411.3375	411.334375
	411.340625
411.3500	411.346875
	411.353125
411.3625	411.359375
	411.365625
411.3750	411.371875
	411.378125
411.3875	411.384375
	411.390625
411.4000	411.396875
	411.403125
411.4125	411.409375
	411.415625
411.4250	411.421875
	411.428125
411.4375	411.434375
	411.440625
411.4500	411.446875
	411.453125

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
411.4625	411.459375
	411.465625
411.4750	411.471875
	411.478125
411.4875	411.484375
	411.490625
411.5000	411.496875
	411.503125
411.5125	411.509375
	411.515625
411.5250	411.521875
	411.528125
411.5375	411.534375
	411.540625
411.5500	411.546875
	411.553125
411.5625	411.559375
	411.565625
411.5750	411.571875
	411.578125
411.5875	411.584375
	411.590625
411.6000	411.596875
	411.603125
411.6125	411.609375
	411.615625
411.6250	411.621875
	411.628125
411.6375	411.634375
	411.640625
411.6500	411.646875
	411.653125
411.6625	411.659375
	411.665625
411.6750	411.671875
	411.678125
411.6875	411.684375
	411.690625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
411.7000	411.696875
	411.703125
411.7125	411.709375
	411.715625
411.7250	411.721875
	411.728125
411.7375	411.734375
	411.740625
411.7500	411.746875
	411.753125
411.7625	411.759375
	411.765625
411.7750	411.771875
	411.778125
411.7875	411.784375
	411.790625
411.8000	411.796875
	411.803125
411.8125	411.809375
	411.815625
411.8250	411.821875
	411.828125
411.8375	411.834375
	411.840625
411.8500	411.846875
	411.853125
411.8625	411.859375
	411.865625
411.8750	411.871875
	411.878125
411.8875	411.884375
	411.890625
411.9000	411.896875
	411.903125
411.9125	411.909375
	411.915625
411.9250	411.921875
	411.928125

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
411.9375	411.934375
	411.940625
411.9500	411.946875
	411.953125
411.9625	411.959375
	411.965625
411.9750	411.971875
	411.978125
411.9875	411.984375
	411.990625
412.0000	411.996875
	412.003125
412.0125	412.009375
	412.015625
412.0250	412.021875
	412.028125
412.0375	412.034375
	412.040625
412.0500	412.046875
	412.053125
412.0625	412.059375
	412.065625
412.0750	412.071875
	412.078125
412.0875	412.084375
	412.090625
412.1000	412.096875
	412.103125
412.1125	412.109375
	412.115625
412.1250	412.121875
	412.128125
412.1375	412.134375
	412.140625
412.1500	412.146875
	412.153125
412.1625	412.159375
	412.165625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
412.1750	412.171875
	412.178125
412.1875	412.184375
	412.190625
412.2000	412.196875
	412.203125
412.2125	412.209375
	412.215625
412.2250	412.221875
	412.228125
412.2375	412.234375
	412.240625
412.2500	412.246875
	412.253125
412.2625	412.259375
	412.265625
412.2750	412.271875
	412.278125
412.2875	412.284375
	412.290625
412.3000	412.296875
	412.303125
412.3125	412.309375
	412.315625
412.3250	412.321875
	412.328125
412.3375	412.334375
	412.340625
412.3500	412.346875
	412.353125
412.3625	412.359375
	412.365625
412.3750	412.371875
	412.378125
412.3875	412.384375
	412.390625
412.4000	412.396875
	412.403125

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
412.4125	412.409375
	412.415625
412.4250	412.421875
	412.428125
412.4375	412.434375
	412.440625
412.4500	412.446875
	412.453125
412.4625	412.459375
	412.465625
412.4750	412.471875
	412.478125
412.4875	412.484375
	412.490625
412.5000	412.496875
	412.503125
412.5125	412.509375
	412.515625
412.5250	412.521875
	412.528125
412.5375	412.534375
	412.540625
412.5500	412.546875
	412.553125
412.5625	412.559375
	412.565625
412.5750	412.571875
	412.578125
412.5875	412.584375
	412.590625
412.6000	412.596875
	412.603125
412.6125	412.609375
	412.615625
412.6250	412.621875
	412.628125
412.6375	412.634375
	412.640625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
412.6500	412.646875
	412.653125
412.6625	412.659375
	412.665625
412.6750	412.671875
	412.678125
412.6875	412.684375
	412.690625
412.7000	412.696875
	412.703125
412.7125	412.709375
	412.715625
412.7250	412.721875
	412.728125
412.7375	412.734375
	412.740625
412.7500	412.746875
	412.753125
412.7625	412.759375
	412.765625
412.7750	412.771875
	412.778125
412.7875	412.784375
	412.790625
412.8000	412.796875
	412.803125
412.8125	412.809375
	412.815625
412.8250	412.821875
	412.828125
412.8375	412.834375
	412.840625
412.8500	412.846875
	412.853125
412.8625	412.859375
	412.865625
412.8750	412.871875
	412.878125

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
412.8875	412.884375
	412.890625
412.9000	412.896875
	412.903125
412.9125	412.909375
	412.915625
412.9250	412.921875
	412.928125
412.9375	412.934375
	412.940625
412.9500	412.946875
	412.953125
412.9625	412.959375
	412.965625
412.9750	412.971875
	412.978125
412.9875	412.984375
	412.990625
413.0000	412.996875
	413.003125
413.0125	413.009375
	413.015625
413.0250	413.021875
	413.028125
413.0375	413.034375
	413.040625
413.0500	413.046875
	413.053125
413.0625	413.059375
	413.065625
413.0750	413.071875
	413.078125
413.0875	413.084375
	413.090625
413.1000	413.096875
	413.103125
413.1125	413.109375
	413.115625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
413.1250	413.121875
	413.128125
413.1375	413.134375
	413.140625
413.1500	413.146875
	413.153125
413.1625	413.159375
	413.165625
413.1750	413.171875
	413.178125
413.1875	413.184375
	413.190625
413.2000	413.196875
	413.203125
413.2125	413.209375
	413.215625
413.2250	413.221875
	413.228125
413.2375	413.234375
	413.240625
413.2500	413.246875
	413.253125
413.2625	413.259375
	413.265625
413.2750	413.271875
	413.278125
413.2875	413.284375
	413.290625
413.3000	413.296875
	413.303125
413.3125	413.309375
	413.315625
413.3250	413.321875
	413.328125
413.3375	413.334375
	413.340625
413.3500	413.346875
	413.353125

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
413.3625	413.359375
	413.365625
413.3750	413.371875
	413.378125
413.3875	413.384375
	413.390625
413.4000	413.396875
	413.403125
413.4125	413.409375
	413.415625
413.4250	413.421875
	413.428125
413.4375	413.434375
	413.440625
413.4500	413.446875
	413.453125
413.4625	413.459375
	413.465625
413.4750	413.471875
	413.478125
413.4875	413.484375
	413.490625
413.5000	413.496875
	413.503125
413.5125	413.509375
	413.515625
413.5250	413.521875
	413.528125
413.5375	413.534375
	413.540625
413.5500	413.546875
	413.553125
413.5625	413.559375
	413.565625
413.5750	413.571875
	413.578125
413.5875	413.584375
	413.590625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
413.6000	413.596875
	413.603125
413.6125	413.609375
	413.615625
413.6250	413.621875
	413.628125
413.6375	413.634375
	413.640625
413.6500	413.646875
	413.653125
413.6625	413.659375
	413.665625
413.6750	413.671875
	413.678125
413.6875	413.684375
	413.690625
413.7000	413.696875
	413.703125
413.7125	413.709375
	413.715625
413.7250	413.721875
	413.728125
413.7375	413.734375
	413.740625
413.7500	413.746875
	413.753125
413.7625	413.759375
	413.765625
413.7750	413.771875
	413.778125
413.7875	413.784375
	413.790625
413.8000	413.796875
	413.803125
413.8125	413.809375
	413.815625
413.8250	413.821875
	413.828125

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
413.8375	413.834375
	413.840625
413.8500	413.846875
	413.853125
413.8625	413.859375
	413.865625
413.8750	413.871875
	413.878125
413.8875	413.884375
	413.890625
413.9000	413.896875
	413.903125
413.9125	413.909375
	413.915625
413.9250	413.921875
	413.928125
413.9375	413.934375
	413.940625
413.9500	413.946875
	413.953125
413.9625	413.959375
	413.965625
413.9750	413.971875
	413.978125
413.9875	413.984375
	413.990625
414.0000	413.996875
	414.003125
414.0125	414.009375
	414.015625
414.0250	414.021875
	414.028125
414.0375	414.034375
	414.040625
414.0500	414.046875
	414.053125
414.0625	414.059375
	414.065625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
414.0750	414.071875
	414.078125
414.0875	414.084375
	414.090625
414.1000	414.096875
	414.103125
414.1125	414.109375
	414.115625
414.1250	414.121875
	414.128125
414.1375	414.134375
	414.140625
414.1500	414.146875
	414.153125
414.1625	414.159375
	414.165625
414.1750	414.171875
	414.178125
414.1875	414.184375
	414.190625
414.2000	414.196875
	414.203125
414.2125	414.209375
	414.215625
414.2250	414.221875
	414.228125
414.2375	414.234375
	414.240625
414.2500	414.246875
	414.253125
414.2625	414.259375
	414.265625
414.2750	414.271875
	414.278125
414.2875	414.284375
	414.290625
414.3000	414.296875
	414.303125

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
414.3125	414.309375
	414.315625
414.3250	414.321875
	414.328125
414.3375	414.334375
	414.340625
414.3500	414.346875
	414.353125
414.3625	414.359375
	414.365625
414.3750	414.371875
	414.378125
414.3875	414.384375
	414.390625
414.4000	414.396875
	414.403125
414.4125	414.409375
	414.415625
414.4250	414.421875
	414.428125
414.4375	414.434375
	414.440625
414.4500	414.446875
	414.453125
414.4625	414.459375
	414.465625
414.4750	414.471875
	414.478125
414.4875	414.484375
	414.490625
414.5000	414.496875
	414.503125
414.5125	414.509375
	414.515625
414.5250	414.521875
	414.528125
414.5375	414.534375
	414.540625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
414.5500	414.546875
	414.553125
414.5625	414.559375
	414.565625
414.5750	414.571875
	414.578125
414.5875	414.584375
	414.590625
414.6000	414.596875
	414.603125
414.6125	414.609375
	414.615625
414.6250	414.621875
	414.628125
414.6375	414.634375
	414.640625
414.6500	414.646875
	414.653125
414.6625	414.659375
	414.665625
414.6750	414.671875
	414.678125
414.6875	414.684375
	414.690625
414.7000	414.696875
	414.703125
414.7125	414.709375
	414.715625
414.7250	414.721875
	414.728125
414.7375	414.734375
	414.740625
414.7500	414.746875
	414.753125
414.7625	414.759375
	414.765625
414.7750	414.771875
	414.778125

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
414.7875	414.784375
	414.790625
414.8000	414.796875
	414.803125
414.8125	414.809375
	414.815625
414.8250	414.821875
	414.828125
414.8375	414.834375
	414.840625
414.8500	414.846875
	414.853125
414.8625	414.859375
	414.865625
414.8750	414.871875
	414.878125
414.8875	414.884375
	414.890625
414.9000	414.896875
	414.903125
414.9125	414.909375
	414.915625
414.9250	414.921875
	414.928125
414.9375	414.934375
	414.940625
414.9500	414.946875
	414.953125
414.9625	414.959375
	414.965625
414.9750	414.971875
	414.978125
414.9875	414.984375
	414.990625
415.0000	414.996875
	415.003125
415.0125	415.009375
	415.015625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
415.0250	415.021875
	415.028125
415.0375	415.034375
	415.040625
415.0500	415.046875
	415.053125
415.0625	415.059375
	415.065625

TABLE 2: Single Channel	
Center Frequency 12.5kHz	**Center Frequency 6.25 kHz**
415.0750	415.071875
	415.078125
415.0875	415.084375
	415.090625
415.1000	415.096875
	415.103125

4.3.10 Reserved

4.3.11 Plan for Bio-Medical Telemetry and Medical Radiocommunication

BIO-MEDICAL TELEMETRY ONLY

38-41 MHz (see Annex K)
174-216 MHz (see Annex K)
460.650-460.875 MHz (see US209 in Section 4.1.3)
465.650-465.875 MHz (see US209 in Section 4.1.3)

MEDICAL RADIOCOMMUNICATION

The following frequencies may be authorized for the purpose of conducting radio operations for the delivery or rendition of medical services to individuals, subject to the indicated limitations.

Frequency (MHz)	Class of Station(s)	Limitation
150.775	Base and Mobile	1
150.790	Base and Mobile	1
152.0075	Base	2
163.250	Base	2
462.950	Base and Mobile	3,5
462.975	Base and Mobile	3,5
463.000	Base and Mobile	3,4,6,7
463.025	Base and Mobile	3,4,6,7
463.050	Base and Mobile	3,4,6,7
463.075	Base and Mobile	3,4,7,8
463.100	Base and Mobile	3,4,7,8
463.125	Base and Mobile	3,4,7,8
463.150	Base and Mobile	3,4,7,8
463.175	Base and Mobile	3,4,7,8
467.950	Mobile Only	3,5,9
467.975	Mobile Only	3,5,9

Frequency (MHz)	Class of Station(s)	Limitation
468.000	Mobile Only	3,4,6,7,9
468.025	Mobile Only	3,4,6,7,9
468.050	Mobile Only	3,4,6,7,9
468.075	Mobile Only	3,4,6,7,9
468.100	Mobile Only	3,4,6,7,9
468.125	Mobile Only	3,4,6,7,9
468.150	Mobile Only	3,4,6,7,9
468.175	Mobile Only	3,4,6,7,9

1. This frequency may be authorized for base (FB or FC), mobile (ML or MS), mobile repeater (MLR), and for fixed (FX) operations to access a repeater which retransmits on a different frequency. This frequency shall be authorized for both federal and non-federal use with a maximum Effective Radiated Power (ERP) of 100 watts. Airborne operations on this frequency are prohibited. The fixed station classes included in this limitation are in addition to those mentioned in US73 (A).

2. This frequency may be authorized only for one-way paging communications to mobile receivers. Transmissions for the purpose of activating or controlling remote objects on this frequency will not be authorized.

3. For two-frequency systems, separation between base and mobile transmit frequencies is 5 MHz.

4. For applications for new radio systems received after August 15, 1974, the eight frequency pairs listed below will be assigned in a block for shared operations subject to the following:

a. For uniformity in usage, these frequency pairs may be referred to by channel name, as follows:

Base and Mobile MHz	Mobile Only MHz	Channel Name
463.000	468.000	MED-ONE
463.025	468.025	MED-TWO
463.050	468.050	MED-THREE
463.075	468.075	MED-FOUR
463.100	468.100	MED-FIVE
463.125	468.125	MED-SIX
463.150	468.150	MED-SEVEN
463.175	468.175	MED-EIGHT

b. Except as provided in subparagraphs e. and f. of this paragraph, mobile or portable stations must employ equipment which is both wired and equipped to transmit/receive, respectively, on each of these eight frequency pairs.

c. Except as provided in subparagraph f. of this paragraph, base and fixed stations[2] must employ equipment which is both wired and equipped to transmit/receive, respectively, on at least four (three, if bio-medical telemetry operation is not employed in the system) of these eight frequency pairs.

d. Multi-channel equipment requirements for use of these frequency pairs are intended to afford capability for alternating use of the individual frequencies, and ability to conduct simultaneous operations is not required. These requirements may be met in a single equipment unit or in any combination of equipment units suitable to the applicant's operations.

e. Portable (hand-held) units operated with a maximum output power of 2.5 watts are exempted from the multi-channel equipment requirements specified in subparagraph c. of this paragraph.

f. Stations located in the Canadian coordination zone (see Section 3.4), will be required to meet multi-channel equipment requirements only for those frequencies up to the number specified in subparagraphs b.

[2] As indicated in Limitation 9, Section 4.3.11, transmissions by fixed stations are limited to the control of base station repeaters.

and c. of this paragraph which have been assigned to the licensee after coordination with Canada in accordance with the applicable US-Canada agreement.

5. This frequency may be authorized for the dispatch of medical-care vehicles and personnel for the rendition or delivery of medical services. Central-dispatch operations serving multisystem requirements in an area-wide medical radio communications plan may be authorized and may include the designation of this frequency for intra-system and inter-system mutual assistance purposes.

6. This frequency may be authorized on a primary basis for operations in bio-medical telemetry systems. F1D, F2D, and F3E emissions may be authorized. On a secondary basis, subject to noninterference to bio-medical telemetry systems, this frequency may be authorized for the transmission of messages related to the efficient administration of organizations and facilities engaged in medical services operations.

7. The continuous carrier mode of operation may be authorized for use of telemetry emission on this frequency.

8. This frequency may be authorized on a primary basis for communications, between medical facilities, vehicles, and personnel, related to medical supervision and instruction for treatment and transport of patients in the rendition or delivery of medical services. F2D and F3E emissions may be authorized. On a secondary basis, subject to noninterference to the foregoing types of operations, this frequency may be authorized for the transmission of messages related to the efficient administration of organizations and facilities engaged in medical services operations and for bio-medical telemetry transmissions, including the use of F1D emission.

9. This frequency may be assigned to a fixed station for the control of a base station repeater (FBR) if it is also assigned to the associated mobile station. Fixed stations operating on this frequency shall comply with the following requirements if they are located within 120 kilometers of the center of urbanized areas of 200,000 or more population.

a. If the station is used to control one or more base station repeaters located within 45 degrees of azimuth, a directional antenna having a front-to-back ratio of at least 15 dB shall be used at the fixed station. For other situations, where a directional antenna cannot be used, a cardioid, bi-directional or omni-directional antenna may be employed. In each case, the antenna used must, consistent with reasonable design, produce a radiation pattern that provides only the coverage necessary to permit satisfactory control of each base station repeater and limit radiation in other directions to the extent feasible.

b. The strength of the signal of a fixed station, controlling a single base station repeater, may not exceed by more than 6 dB, at the antenna terminal of the base station repeater receiver, the signal strength produced there by a unit of the associated mobile station. When the station controls more than one base station repeater, the 6 dB control-to-mobile signal difference need be verified at only one of the base station repeater sites. The measurement of the signal strength of the mobile unit must be made when such unit is transmitting from the fixed station location or, if that is not practical, from a location within 400 meters of the fixed station site.

c. Each application for a fixed station to be authorized under the provisions of this paragraph shall be accompanied by a statement certifying that the output power of the proposed station transmitter will be adjusted to comply with the foregoing signal level limitation. Records of the measurements used to determine the signal ratio shall be kept with the station records and shall be made available for inspection upon request.

d. Urbanized areas of 200,000 or more population are defined in the U.S. Census Population, 1960, Vol. 1, Table 23, Page 50. The centers of urbanized areas are determined from the Appendix, page 226, of the U.S. Commerce publication “Air Line Distance Between Cities in the United States.”

4.3.12 Channeling Plan for Assignments in the Fixed Service in the 14500.0 to 14714.5 and 15136.5 to 15350.0 MHz

1. The following channeling plan became effective on January 1, 1982, for all assignments in the Fixed Service.

2. Existing assignments as of January 1, 1982 in the Fixed Service which are in the bands 14500.0 to

14714.5 MHz and 15136.5 to 15350.0 MHz that are not in compliance with the channeling plan may be retained until January 1, 1997. However, if existing equipment is replaced prior to January 1, 1997, assignments for the replaced equipment must be in accordance with the channeling plan.

3. This channeling plan is only applicable to assignments in the Fixed Service in the bands 14500.0 to 14714.5 and 15136.5 to 15350.0 MHz. The assigned frequency shall be chosen such that the frequency "2 of its necessary bandwidth shall not extend beyond the upper or lower limits of bands indicated herein. A general breakdown of these bands is:

a. For emission bandwidths equal to or greater than 3.5 MHz:
14500.0 to 14710.0 MHz
15140.0 to 15350.0 MHz

b. For emission bandwidths less than 3.5 MHz:
14710.0 to 14714.5 MHz
15136.5 to 15140.0 MHz

4. Criteria for assignments in the Fixed Service with emission bandwidths equal to or greater than 3.5 MHz:

a. The assigned frequency must center on one of the frequencies given in Table 1.

b. Multiple contiguous channels are to be used for emission bandwidths of 3.5 MHz or greater.

c. In order to promote uniformity and to establish a natural guard band, it is strongly urged that frequencies be selected in pairs from the bands 14500.0 to 14710.0 and 15140.0 to 15350.0 on an equal basis.

5. Criteria for assignments in the Fixed Service with emission bandwidth of less than 3.5 MHz:

a. Assignments in the Fixed Service with emission bandwidths of less than 3.5 MHz are restricted to the bands:
14710.0 to 14714.5 MHz
and
15136.5 to 15140.0 MHz

b. Narrowband assignments, those with less than 3.5 MHz of necessary bandwidth, shall not be made in the bands 14500.0 to 14710.0 and 15140.0 to 15350.0 MHz.

Table 1: Center Frequencies (MHz) of 2.5 MHz Channels in the Bands 14500.0-14714.5 MHz and 15136.5-15350.0 MHz

Table 1: Center Frequencies (MHz) of 2.5 MHz Channels in the Bands 14500.0-14714.5 MHz and 15136.5-15350.0 MHz	
14500.0-14714.5 MHz	**15136.5-15350.0 MHz**
*14501.25	*15141.25
14503.75	15143.75
14506.25	15146.25
14508.75	15148.75
14511.25	15151.25
14513.75	15153.75
14516.25	15156.25
14518.75	15158.75
14521.25	15161.25
14523.75	15163.75
14526.25	15166.25
14528.75	15168.75
14531.25	15171.25
14533.75	15173.75
14536.25	15176.25

Table 1: Center Frequencies (MHz) of 2.5 MHz Channels in the Bands 14500.0-14714.5 MHz and 15136.5-15350.0 MHz	
14500.0-14714.5 MHz	**15136.5-15350.0 MHz**
14538.75	15178.75
14541.25	15181.25
14543.75	15183.75
14546.25	15186.25
14548.75	15188.75
14551.25	15191.25
14553.75	15193.75
14556.25	15196.25
14558.75	15198.75
14561.25	15201.25
14563.75	15203.75
14566.25	15206.25
14568.75	15208.75
14571.25	15211.25
14573.75	15213.75

Table 1: Center Frequencies (MHz) of 2.5 MHz Channels in the Bands 14500.0-14714.5 MHz and 15136.5-15350.0 MHz	
14500.0-14714.5 MHz	**15136.5-15350.0 MHz**
14576.25	15216.25
14578.75	15218.75
14581.25	15221.25
14583.75	15223.75
14586.25	15226.25
14588.75	15228.75
14591.25	15231.25
14593.75	15233.75
14596.25	15236.25
14598.75	15238.75
14601.25	15241.25
14603.75	15243.75
14606.25	15246.25
14608.75	15248.75
14611.25	15251.25
14613.75	15253.75
14616.25	15256.25
14618.75	15258.75
14621.25	15261.25
14623.75	15263.75
14626.25	15266.25
14628.75	15268.75
14631.25	15271.25
14633.75	15273.75
14636.25	15276.25
14638.75	15278.75
14641.25	15281.25
14643.75	15283.75
14646.25	15286.25

Table 1: Center Frequencies (MHz) of 2.5 MHz Channels in the Bands 14500.0-14714.5 MHz and 15136.5-15350.0 MHz	
14500.0-14714.5 MHz	**15136.5-15350.0 MHz**
14648.75	15288.75
14651.25	15291.25
14653.75	15293.75
14656.25	15296.25
14658.75	15298.75
14661.25	15301.25
14663.75	15303.75
14666.25	15306.25
14668.75	15308.75
14671.25	15311.25
14673.75	15313.75
14676.25	15316.25
14678.75	15318.75
14681.25	15321.25
14683.75	15323.75
14686.25	15326.25
14688.75	15328.75
14691.25	15331.25
14693.75	15333.75
14696.25	15336.25
14698.75	15338.75
14701.25	15341.25
14703.75	15343.75
14706.25	15346.25
*14708.75	*15348.75
* These channels cannot be used for bandwidths greater than 2.5 MHz. Total number of channels available--168.	

4.3.13 Channeling Plan for Assignments in the Maritime Mobile Service

For digital maritime mobile systems operating before 1 January 2017, Appendix 17, Annex 2 of the ITU Radio Regulations may be used in accordance with footnote w. After this date, all frequency assignments must conform to Appendix 17, with priority for maritime mobile data transmission systems.Channeling Plan for Assignments in the Fixed Service in the Bands 932.4-935 MHz and 941.4-944 MHz

4.3.14 Channeling Plan for Assignments in the Fixed Service in the Bands 932.4-935 MHz and 941.4-944 MHz

This plan is a guide for identifying the center frequencies of those paired frequencies that normally are used for assignments with a necessary bandwidth that can be accommodated within 12.5, 25, 50, 100 and 200 kHz. Transportable Operations are not permitted in the point-to-point bands 932.5-935.0 and 941.5-944.0 MHz. To permit flexibility, applicants for either point-to-point or point-to-multipoint channels will be permitted to combine channels upon a showing that there is a need and sufficient frequencies are available to permit this. Applicants may split channels if they choose to do so. The frequencies listed in this

plan are shared with non-federal users, and applications for assignment from federal users are subject to coordination with non-federal users prior to NTIA approval.

CONDITIONS AND LIMITATIONS

1. Point-to-Multipoint Assignments: Table 1 contains a list of five pairs of frequencies that are designated for use only in fixed point-to-multipoint assignments operating with a necessary bandwidth of 12.5 kHz or less.

a. For paired frequency operations the 941.4-941.5 MHz frequencies will be used to transmit to the multipoint receiving stations, and the 932.4-932.5 MHz frequencies will be used for reverse link communications.

b. Unpaired, single frequency, one-way point-to-multipoint operations are permitted, using either of the paired frequencies. However, when the multipoint receiving stations are located less than 48 kilometers (30 miles) from the transmitting station, frequencies from the 932-932.5 MHz band must be used.

c. Point-to-point use of the 932.4-932.5 MHz frequencies will be permitted but only when the transmission is relayed by a station transmitting in the 941.4-941.5 MHz band.

d. Frequencies will be used so as to facilitate communications on an interference-free basis in each operational/service area. In order to facilitate maximum reuse of frequencies, stations separated by 113 kilometers (70 miles) or more, and operating on the same frequency (co-channel), will be considered as interference free (see also Section 8.2.16). However, at distances of less than 113 km, reuse of a frequency (co-channel) will be permitted only upon providing evidence that the operation will not cause harmful interference to existing users.

e. Equivalent power and antenna-height restrictions:

Antenna Height in Meters	Maximum Effective Radiated Power	
	In Watts	In dBm
152.5 and below	1,000	60
Above 152.5 up to 182	630	58
Above 182 up to 213	500	57
Above 213 up to 244	400	56
Above 244 up to 274	315	55
Above 274 up to 305	250	54
Above 305	200	53

2. Point-to-Point Assignments: Table 2 contains a list of thirty pairs of frequencies that are designated for two-way use in fixed point-to-point operations with a necessary bandwidth of 200 kHz or less. Frequencies shall be selected in pairs. However, unpaired frequency use, or single frequency one-way use, will be permitted, but only upon showing that spectrum is not available in other bands and that paired use will not be adversely affected.

EXCEPTIONS

Exceptions to the above conditions and limitations will be considered by the FAS on a case-by-case basis.

Table 1: Paired Frequencies for Point-to-Multipoint Assignments (12.5 kHz Bandwidth)

Table 1: Paired Frequencies for Point-to-Multipoint Assignments (12.5 kHz Bandwidth)	
MHz	**MHz**
932.44375	941.44375
932.45625	941.45625
932.46875	941.46875
932.48125	941.48125
932.49375	941.49375

Table 2: Paired Frequencies for Point-to-Point Assignments

Table 2: Paired Frequencies for Point-to-Point Assignments							
25 kHz Bandwidth Pairs		**50 kHz Bandwidth Pairs**		**100 kHz Bandwidth Pairs**		**200 kHz Bandwidth Pairs**	
MHz	**MHz**	**MHz**	**MHz**	**MHz**	**MHz**	**MHz**	**MHz**
932.5125	941.5125	932.7000	941.7000	932.8250	941.8250	933.1750	942.1750
932.5375	941.5375	932.7500	941.7500	932.9250	941.9250	933.3750	942.3750
932.5625	941.5625	934.8000	943.8000	933.0250	942.0250	933.5750	942.5750
932.5875	941.5875			934.5250	943.5250	933.7750	942.7750
932.6125	941.6125			934.6250	943.6250	933.9750	942.9750
932.6375	941.6375			934.7250	943.7250	934.1750	943.1750
932.6625	941.6625					934.3750	943.3750
934.8375	943.8375						
934.8625	943.8625						
934.8875	943.8875						
934.9125	943.9125						
934.9375	943.9375						
934.9625	943.9625						
934.9875	943.9875						

4.3.15 Channeling Plan for Land Mobile Assignments in the Band 220-222 MHz

1. The following channeling plan is composed of 200 frequency pairs for shared federal/non-federal land-mobile operations with necessary bandwidths less than or equal to 4 kHz. Of these 200 channel pairs, 60 pairs are for nationwide use and 140 pairs are for shared local use. Of the 60 nationwide channel pairs, 10 are for exclusive federal use and 50 are for exclusive non-federal use. Of the 140 shared local-use channel pairs, 100 are available for trunked operations or other operations of equivalent or greater efficiency, 20 are set aside for data only operations until March 31, 2000, 10 are available for public safety/mutual aid, and the remaining 10 channel pairs have no restrictions on use.

2. The following table indicates the channel designations of frequencies (channel number, base station frequency and function) available for assignment under the following conditions:

a. Frequencies shall be assigned in pairs, with base station frequencies taken from the 220-221 MHz

band, corresponding mobile frequencies being 1 MHz higher, taken from the 221-222 MHz band.

b. Only the lower half of the frequency pairs is listed in the table.

Table of 220-222 MHz Channel Designations

(Channel Number, Base Frequency in MHz and Function)

Trunked Systems (See next paragraph for Trunked Channel Groups)			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
1	220.0025	11	.0525
2	.0075	12	.0575
3	.0125	13	.0625
4	.0175	14	.0675
5	.0225	15	.0725
6	.0275	16	.0775
7	.0325	17	.0825
8	.0375	18	.0875
9	.0425	19	.0925
10	.0475	20	.0975

Non-Federal Nationwide System			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
21	220.1025	26	220.1275
22	.1075	27	.1325
23	.1125	28	.1375
24	.1175	29	.1425
25	.1225	30	.1475

Trunked Systems (See next paragraph for Trunked Channel Groups)			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
31	220.1525	41	220.2025
32	.1575	42	.2075
33	.1625	43	.2125
34	.1675	44	.2175
35	.1725	45	.2225
36	.1775	46	.2275
37	.1825	47	.2325
38	.1875	48	.2375
39	.1925	49	.2425
40	.1975	50	.2475

Non-Federal Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
51	220.2525	56	.2775
52	.2575	57	.2825
53	.2625	58	.2875
54	.2675	59	.2925
55	.2725	60	.2975

Trunked Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
61	220.3025	71	.3525
62	.3075	72	.3575
63	.3125	75	.3625
64	.3175	74	.3675
65	.3225	75	.3725
66	.3275	76	.3775
67	.3325	77	.3825
68	.3375	78	.3875
69	.3425	79	.3925
70	.3475	80	.3975

Non-Federal Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
81	220.4025	86	.4275
82	.4075	87	.4325
83	.4125	88	.4375
84	.4175	89	.4425
85	.4225	90	.4475

Trunked Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
91	220.4525	101	.5025
92	.4575	102	.5075
93	.4625	103	.5125
94	.4675	104	.5175
95	.4725	105	.5225
96	.4775	106	.5275
97	.4825	107	.5325
98	.4875	108	.5375
99	.4925	109	.5425
100	.4975	110	.5475

Federal Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
111	220.5525	116	220.5775
112	.5575	117	.5825
113	.5625	118	.5875
114	.5675	119	.5925
115	.5725	120	.5975
Trunked Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
121	220.6025	131	220.6525
122	.6075	132	.6575
123	.6125	133	.6625
124	.6175	134	.6675
125	.6225	135	.6725

126	.6275	136	.6775
127	.6325	137	.6825
128	.6375	138	.6875
129	.6425	139	.6925
130	.6475	140	.6975
Non-Federal Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
141	220.7025	151	.7525
142	.7075	152	.7575
143	.7125	153	.7625
144	.7175	154	.7675
145	.7225	155	.7725
146	.7275	156	.7775
147	.7325	157	.7825
148	.7375	158	.7875
149	.7425	159	.7925
150	.7475	160	.7975

Public Safety/Mutual Air Operations			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
161	220.8025	166	220.8275
162	.8075	167	.8325
163	.8125	168	.8375
164	.8175	169	.8425
165	.8225	170	.8475

Available for any use			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
171	220.8525	176	220.8775
172	.8575	177	.8825
173	.8625	178	.8875
174	.8675	179	.8925
175	.8725	180	.8975

Data Operations (See Note *)			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
181	220.9025	191	220.9525
182	.9075	192	.9575
183	.9125	193	.9625
184	.9175	194	.9675
185	.9225	195	.9725
186	.9275	196	.9775
187	.9325	197	.9825
188	.9375	198	.9875
189	.9425	199	.9925
190	.9475	200	.9975

Note: Channels 181-185 and 196-200 are indefinitely reserved until further FCC action and are not currently available for assignment or use.

Trunked Channel Groups

The channel groups listed in the following table are available to both federal and non-federal applicants for trunked operations.

Table - Trunked Channel Groups

Group #	Channel #	Group #	Channel #
1	1-31-61-91-121	11	11-41-71-101-131
2	2-32-62-92-122	12	12-42-72-102-132
3	3-33-63-93-123	14	14-44-74-104-134
4	4-34-64-94-124	15	15-45-75-105-135
5	5-35-65-95-125	16	16-46-76-106-136
6	6-36-66-96-126	11	11-41-71-101-131
7	7-37-67-97-127	17	17-47-77-107-137
8	8-38-68-98-128	18	18-48-78-108-138
9	9-39-69-99-129	19	19-49-79-109-139
10	10-40-70-100-130	20	20-50-80-110-140

4.3.16 Plans for Federal Interoperability Channels for Interagency Law Enforcement and Incident Response Operations in the Bands 162-174 MHz and 406.1-420 MHz

CONDITIONS FOR USE

1. The plans shown in Tables 1 and 2 show frequencies available for assignment to all federal agencies to satisfy law enforcement, public safety, emergency response, and disaster response interoperability requirements. These frequencies will be referred to hereinafter as "Federal Interoperability Channels".

2. The Federal Interoperability Channels are available for use among federal agencies and between federal agencies and non-federal entities with which federal agencies have a requirement to operate.

3. The channels are available to federal agencies on a shared basis and will not be authorized for the exclusive use of any one federal agency.

4. The channels are available to non-federal entities to enable joint federal/non-federal operations for law enforcement, public safety, emergency response and disaster response, subject to the condition that harmful interference will not be caused to federal stations.

5. Non-federal use will be coordinated with the FCC through the Statewide Interoperability Coordinator (SWIC) or a state appointed official. The FCC will grant authority to program and use the Federal Interoperability Channels through a signed agreement between the SWIC or state appointed official and a federal user with a valid GMF assignment.

6. These channels are restricted to mobile (including portable) interoperability communications and are not authorized for routine or administrative uses.

7. These channels are authorized to operate mobile (including portable) to perform testing, training and exercises of interoperable communications, subject to the existing geographic restrictions maintained by NTIA.

8. Extended operations and congestion may lead to frequency conflicts. Coordination with NTIA is required so that interference can be avoided.

9. Only narrowband emissions are authorized on the Federal Interoperability Channels.

10. Federal agencies having a law enforcement, public safety, emergency response or disaster response requirement will ensure that their agency is added to the (*JNT) circuit remarks field in

the Government Master File (GMF).

11. All federal law enforcement, public safety, emergency response, and disaster response agencies are required to have the Federal Interoperability Channels programmed into one or more zones/banks/channel groups of their mobile (including portable) radios.

12. Exceptions to the above conditions of use will be considered by the Interdepartment Radio Advisory Committee (IRAC)/Frequency Assignment Subcommittee (FAS) on a case-by-case basis.

LAW ENFORCEMENT PLANS

1. Frequencies 167.0875 MHz and 414.0375 MHz are designated as National Calling Channels for initial contact and will be identified in the radio as indicated in Table 1.

2. Initial contact communications will be established using analog FM emission (11KF3E).

3. The interoperability channels will be identified in mobile and portable radios as follows with Continuous Tone Controlled Squelch Systems (CTCSS) frequency 167.9 Hz and/or Network Access Code (NAC) $68F:

Table 1 Law Enforcement Channeling Plans

LE VHF PLAN			LE UHF PLAN		
Identifier	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**	**Identifier**	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**
LEA	167.0875 (Simplex)	167.0875	LEB	414.0375 (Simplex)	414.0375
LE1	162.0875	167.0875	LE10	418.9875	409.9875
LE2	162.2625	167.2500	LE11	419.1875	410.1875
LE3	162.8375	167.7500	LE12	419.6125	410.6125
LE4	163.2875	168.1125	LE13	414.0625 (Simplex)	414.0625
LE5	163.4250	168.4625	LE14	414.3125 (Simplex)	414.3125
LE6	167.2500 (Simplex)	167.2500	LE15	414.3375 (Simplex)	414.3375
LE7	167.7500 (Simplex)	167.7500	LE16	409.9875 (Simplex)	409.9875
LE8	168. 1125 (Simplex)	168.1125	LE17	410. 1875 (Simplex)	410.1875
LE9	168.4625 (Simplex)	168.4625	LE18	410.6125 (Simplex)	410.6125

INCIDENT RESPONSE PLANS

1. Frequencies 169.5375 MHz, paired with 164.7125 MHz, and 410.2375 MHz, paired with 419.2375 MHz, are designated as the calling channels for initial contact and will be identified in the radio as indicated in Table 2.

2. Initial contact will be established using analog FM emission (11KF3E).

3. To ensure access by stations from outside the normal area of operation, CTCSS will not be used on the calling channels.

4. The interoperability channels will be identified in mobile and portable radios as follows:

Table 2 Incident Response Channeling Plans

IR VHF PLAN					IR UHF PLAN			
Identifier	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**	**CTCSS**		**Identifier**	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**	**CTCSS**
NC 1 Calling	164.7125	169.5375	None		NC 2 Calling	419.2375	410.2375	None
IR1	165.2500	170.0125	As required		IR10	419.4375	410.4375	As required
IR2	165.9625	170.4125	As required		IR11	419.6375	410.6375	As required
IR3	166.5750	170.6875	As required		IR12	419.8375	410.8375	As required
IR4	167.3250	173.0375	As required		IR13	413.1875 (Simplex)	413.1875	As required
IR5	169.5375 (Simplex)	169.5375	As required		IR14	413.2125 (Simplex)	413.2125	As required
IR6	170.0125 (Simplex)	170.0125	As required		IR15	410.2375 (Simplex)	410.2375	As required
IR7	170.4125 (Simplex)	170.4125	As required		IR16	410.4375 (Simplex)	410.4375	As required
IR8	170.6875 (Simplex)	170.6875	As required		IR17	410.6375 (Simplex)	410.6375	As required
IR9	173.0375 (Simplex)	173.0375	As required		IR18	410.8375 (Simplex)	410.8375	As required

4.3.17 Plan for JTIDS TDMA Waveform Systems

1. The Joint Tactical Information Distribution System/Multifunctional Information Distribution System (JTIDS/MIDS) Time Division Multiple Access (TDMA) Waveform is the designation for the tactical data link system used by the military services, which is critical to the "Command and Control" infrastructure of the Department of Defense (DOD). This waveform designation applies to the JTIDS family of terminals (Class 1, Class 2, Class 2M and Class 2H); MIDS Low Volume Terminal (LVT) variants (LVT-1, LVT-2, LVT-3/Fighter Data Link); and future approved systems incorporating the JTIDS/MIDS TDMA Waveform implementation. These TDMA systems provide the DOD with totally Integrated Communications, Navigation and Identification (ICNI) capabilities. The DOD refers to these terminals collectively as "Link 16".

2. JTIDS/MIDS TDMA Waveform operation is authorized in the 960-1215 MHz band and in addition, the DOD and the Department of Transportation (DOT) have made agreements to assure spectrum access and to maintain mutual compatibility between Air Traffic Control (ATC) systems and JTIDS/MIDS TDMA Waveform systems within the United States and its possessions (US&P). The following paragraphs are consistent with DOD - DOT agreements:

a. Uncoordinated JTIDS/MIDS TDMA Waveform operations are authorized in the 960-1215 MHz band in accordance with the coordinations outlined in the authorizing NTIA spectrum certification documents.

b. The DOD shall incorporate engineering features in the JTIDS/MIDS TDMA Waveform equipment in accordance with the NTIA guidance and requirements for JTIDS/MIDS EMC features. The engineering features when implemented shall minimize the possibility for harmful interference between ATC and JTIDS/MIDS TDMA Waveform systems operating in the US&P.

c. The DOT will support US&P frequency assignments for JTIDS/MIDS TDMA Waveform operations, with the conditions identified in the authorizing NTIA spectrum certification documents and as set forth herein.

d. The DOD will ensure that by January 1, 2025, all fielded JTIDS/MIDS TDMA Waveform terminals are capable of remapping frequencies. MIDS LVT terminals will be retrofitted with the remapping

capability and recertified between January 1, 2012 and December 31, 2022. These retrofits will occur during any scheduled system updates/modifications, when the terminals are brought in for maintenance. If necessary, special procedures will be established to ensure that all retrofits are completed no later than January 1, 2025. Any JTIDS/MIDS TDMA Waveform terminal produced after July 1, 2007 other than the MIDS LVT terminals will be capable of remapping. The remapping implementation will be flexible, but there will not be a requirement to remap more that 14 carrier frequencies. The remapping capability will be utilized as necessary to prevent harmful interference with ATC systems that have been approved by a NTIA Stage 4 spectrum certification. Between January 1, 2020 and January 1, 2025, only JTIDS/MIDS TDMA Waveform terminals that are either (i) capable of remapping, or (ii) on the "remap non-compliant terminal list" (see 4.a) will be considered for frequency assignments.

e. The DOT will ensure that planned and future systems/equipment subject to its jurisdiction that are to be implemented using spectrum not subject to remapping will be designed to satisfy their minimum performance standards in their intended electromagnetic environments. This environment includes JTIDS/MIDS TDMA Waveform systems operating in conformance with the remapping requirement. This will ensure that such new or modified systems shall incorporate features so as to not constrain JTIDS/MIDS TDMA Waveform Terminals operations in accordance with the approved NTIA Spectrum Certification.

f. Coordination procedures for JTIDS/MIDS TDMA Waveform operations involving all 51 frequencies, operations exceeding approved NTIA spectrum certification conditions and operations involving non-US and new terminals shall be cooperatively developed by DOD and DOT.

3. The DOD is granted this one-time extension to January 1, 2025 due to budgeting issues and delayed technology development. Any Link 16 terminal not certified with frequency remapping capabilities, by the January 1, 2025 due date, will not transmit within the US&P on training sorties or training events.

Per agreements with coalition partner nations, this mandate will include terminals manufactured outside the United States that may be used within the US&P.

4. The DOD will utilize the Joint Capabilities Integration and Development System (JCIDS) as a means to govern and oversee the integration of frequency remapping terminals across the Services. In the event of further budgeting and technology issues, the DOD will make necessary budgetary adjustments to meet the 2025 mandate.

The DOD will compile and submit to IRAC a list of "remap non-compliant terminals" by January 1, 2020. Those terminals will be tracked and the DOD will report to the IRAC and FAA every 6 months or as needed with the current progress towards compliance with the 2025 mandate.

5. Some JTIDS/MIDS TDMA Waveform terminals are not capable of utilizing contention access while operating in Full EMC Protect mode. Since Full EMC Protect mode operation is a key feature to minimize the possibility for harmful interference between ATC NAVAIDS and JTIDS/MIDS TDMA Waveform systems operating in the US&P, those contention non-compliant terminals are only authorized on a limited, case-by-case basis. Except as noted in 5.a, after January 1, 2025, frequency assignments will only be considered for JTIDS/MIDS TDMA Waveform terminals operating in Full EMC Protect Mode.

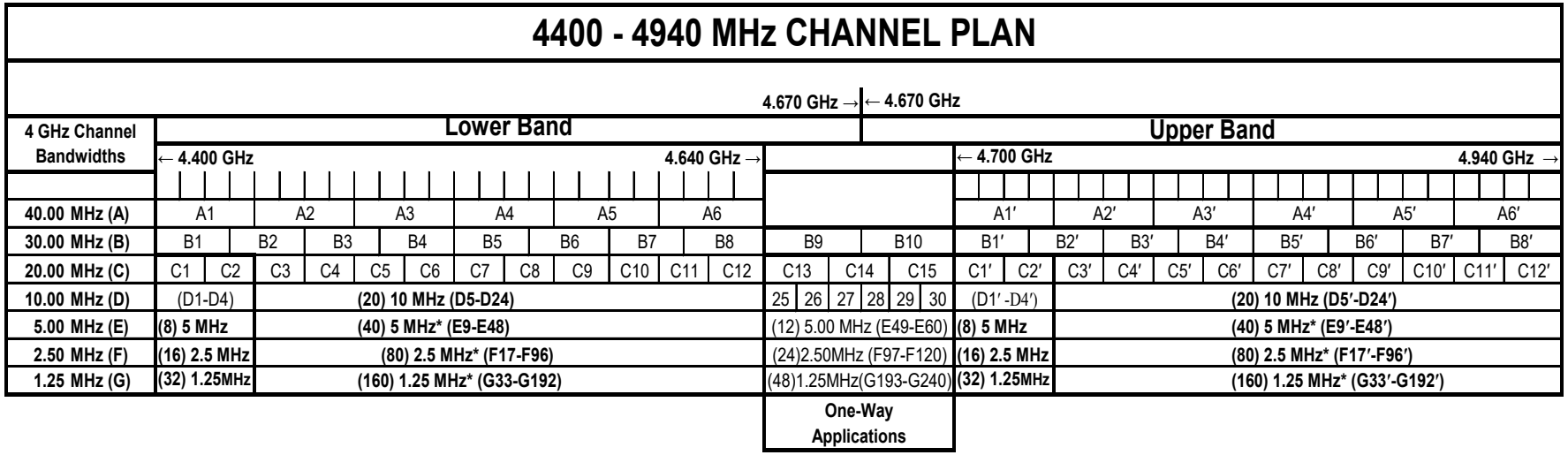
On a limited, case-by-case basis, DOD will need to use Combat and Exercise mode for special events, such as network enable weapons testing and delivery and/or specific DOD training requirements. DOD and FAA will continue to address such requirements through the use of temporary frequency authorizations, which will include the dates and time periods of the events.

4.3.18 4400-4940 MHz Channel Plan

1. This section describes the 4400-4940 MHz Channel Plan for stations operating in the fixed service and provides guidance on its implementation. This channel plan will become effective on August 1, 2009 and all incumbent frequency assignments in the 4400-4940 MHz band and will be grandfathered until the equipment or frequency is changed.

2. Figure 1 provides an overview of the 4400-4940 MHz Channel Plan.

Figure 1: The 4400-4940 MHz Channel Plan



NOTE: Paired channels will be implemented for fixed service assignments using A1 with A1', A2 with A2', etc.

3. Applicable Guidance. In implementing the 4400-4940 MHz Channel Plan, the following guidance applies.

a. This channel plan only applies to fixed and/or transportable fixed assignments. For mobile or airborne assignments, this channel plan should be used to the extent possible.

b. Incumbent fixed and/or transportable fixed assignments will be grandfathered until the end of the life-cycle of the equipment[3] and all replacement equipment will utilize frequencies in accordance with this channel. Other assignments should use this channel plan to the extent possible.

c. Any request for changes or modifications to "grandfathered" fixed service and/or transportable fixed assignments, except for the frequency, will be governed by existing NTIA procedures. However, if the operating frequency is to be modified, the replacement frequency will be selected in accordance with this channel plan.

d. The First Priority Channels will be considered first before the other designated channels.

e. The Second Priority Channels will be considered if the First Priority Channels are not available.

f. The wide-band Third Priority Channels (i.e., A1/A1'; B1/B1'; B9 and B10; C13, C14, and C15) will be considered only if their respective First and Second Priority Channels are not available.

g. The narrow-band Third Priority Channels (i.e., E-, F-, and G-Channels) will be considered only if their respective First Priority Channels are not available. The following narrow-band channels: E9/E9' and E10/E10'; F17/E17' through F20/F20'; G33/G33' through G40/G40' will be considered first before the other respective narrow-band channels.

h. Fixed and/or transportable fixed assignments, may use either channel of a paired-channel if the one-way link First Priority Channels are not available.[4] or if multiple one-way links assignments are required.

i. Fixed and/or transportable fixed assignments for which the emission bandwidth exceeds the bandwidth of a channel will use the next available wider channel in the channel plan. For example, an assignment with an emission bandwidth of 24 MHz will use a 30 MHz channel *(e.g., Channel B6 centered at 4565 MHz and see also Channel D17 in Table 4).*

j. Fixed and/or transportable fixed assignments for which the emission bandwidth exceeds 40 MHz may use concatenated channels[5] commensurate with the emission bandwidth However, the center frequency of the concatenated channels should be one of the center frequencies listed in the channel plan. For example, an assignments with a emission bandwidth of 60 MHz would require two concatenated 30 MHz channels, such as channels B7 and B8 with the center frequency being 4610 MHz *(see Channel C11 in Table 3).*

4. The following tables list the center frequencies for narrowband, wideband and single or unpaired channels.

a. Tables 1 through 4 show the center frequencies of the wide-band paired channels (*i.e.*, *Channels A-40 MHz, B-30 MHz, C-20 MHz, and D-10 MHz*) in the 4400-4940 MHz Channel Plan and their respective channel status.

CENTER FREQUENCIES FOR THE WIDE-BAND PAIRED CHANNELS

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[3] Transportable fixed assignments, include assignments employing one-way link applications; such as video target scoring, air-to-ground video downlink, ground-to-ground video and/or voice transmissions, etc.

[4]. Currently, land mobile radio assignments are not deployed in the 4400-4940 MHz band. In such time that land mobile radio assignments will be deployed in the band, the base stations will transmit at channels from the upper portion of the channel plan (*i.e.*, 4670-4940 MHz band segment) and mobile units will transmit from the lower portion of the channel plan (*i.e.*, 4400-4670 MHz band segment).

[5]. The term "concatenated channels" means any two or more adjacent channels in the 4400-4940 MHz band joined together for the purpose of accommodating a assignment having an emission bandwidth that exceeds the widest channel bandwidth in the channel plan.

Table 1: The Center Frequencies for the 40 MHz Wide-Band Paired Channels (A-Channels)

Table 1		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
A2/A2′ (4460/4760)	A3/A3′ (4500/4800)	A4/A4′ (4540/4840)
Second Priority Channels		
A5/A5′ (4580/4880)	A6/A6′ (4620/4920)	
Third Priority Channels		
A1/A1′ (4420/4720)		

Table 2: The Center Frequencies for the 30 MHz Wide-Band Paired Channels (B-Channels)

Table 2		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
B6/ B6′ (4565/4865)	B7/B7′ (4595/4895)	B8/B8′ (4625/4925)
Second Priority Channels		
B2/B2′ (4445/4745)	B4/B4′ (4505/4805)	B5/B5′ (4535/4835)
B3/B3′ (4475/4775)		
Third Priority Channels		
B1/B1′ (4415/4715)		

Table 3: The Center Frequencies for the 20 MHz Wide-Band Paired Channels (C-Channels)

Table 3		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
C1/C1′ (4410/4710)	C2/C2′ (4430/4730)	
Second Priority Channels		
C3/C3′ (4450/4750)	C7/C7′ (4530/4830)	C10/C10′ (4590/4890)
C4/C4′ (4470/4770)	C8/C8′ (4550/4850)	C11/C11′ (4610/4910)
C5/C5′ (4490/4790)	C9/C9′ (4570/4870)	C12/C12′ (4630/4930)
C6/C6′ (4510/4810)		

Table 4: The Center Frequencies for the 10 MHz Wide-Band Paired Channels (D-Channels)

Table 4		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
D1/D1′ (4405/4705)	D3/D3′ (4425/4725)	D4/D4′ (4435/4735)
D2/D2′ (4415/4715)		
Second Priority Channels		

Table 4		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
D5/D5′ (4445/4745)	D12/D12′ (4515/4815)	D19/D19′ (4585/4885)
D6/D6′ (4455/4755)	D13/D13′ (4525/4825)	D20/D20′ (4595/4895)
D7/D7′ (4465/4765)	D14/D14′ (4535/4835)	D21D21′ (4605/4905)
D8/D8′ (4475/4775)	D15/D15′ (4545/4845)	D22/D22′ (4615/4915)
D9/D9′ (4485/4785)	D16/D16′ (4555/4855)	D23/D23′ (4625/4925)
D10/D10′ (4495/4795)	D17/D17′ (4565/4865)	D24/D24′ (4635/4935)
D11/D11′ (4505/4805)	D18/D18′ (4575/4875)	

b. Tables 5 through 7 show the center frequencies of the narrow-band paired channels (i.e., Channels E-5 MHz, F-2.5 MHz, and G-1.5 MHz) in the 4400-4940 MHz Channel Plan and their respective channel status.

CENTER FREQUENCIES FOR THE NARROW-BAND PAIRED CHANNELS

Table 5: The Center Frequencies for the 5 MHz Narrow-Band Paired Channels (E-Channels)[6]

Table 5		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
E1/E1′ (4402.5/4702.5)	E4/E4′ (4417.5/4717.5)	E7/E7′ (4432.5/4732.5)
E2/E2′ (4407.5/4707.5)	E5/E5′ (4422.5/4722.5	E8/E8′ (4437.5/4737.5
E3/E3′ (4412.5/4712.5	E6/E6′ (4427.5/4727.5	
Third Priority Channels		
E9/E9′ (4442.5/4742.5)	E23/E23′ (4512.5/4812.5)	E37/E37′ (4582.5/4882.5)
E10/E10′ (4447.5/4747.5)	E24/E24′ (4517.5/4817.5)	E38/E38′ (4587.5/4887.5)
E11/E11′ (4452.5/4752.5)	E25/E25′ (4522.5/4822.5)	E39/E39′ (4592.5/4892.5)
E12/E12′ (4457.5/4757.5)	E26/E26′ (4527.5/4827.5)	E40/E40′ (4597.5/4897.5)
E13/E13′ (4462.5/4762.5)	E27/E27′ (4532.5/4832.5)	E41/E41′ (4602.5/4902.5)
E14/E14′ (4467.5/4767.5)	E28/E28′ (4537.5/4837.5)	E42/E42′ (4607.5/4907.5)
E15/E15′ (4472.5/4772.5)	E29/E29′ (4542.5/4842.5)	E43/E43′ (4612.5/4912.5)
E16/E16′ (4477.5/4777.5)	E30/E30′ (4547.5/4847.5)	E44/E44′ (4617.5/4917.5)
E17/E17′ (4482.5/4782.5)	E31/E31′ (4552.5/4852.5)	E45/E45′ (4622.5/4922.5)
E18/E18′ (4487.5/4787.5)	E32/E32′ (4557.5/4857.5)	E46/E46′ (4627.5/4927.5)
E19/E19′ (4492.5/4792.5)	E33/E33′ (4562.5/4862.5)	E47/E47′ (4632.5/4932.5)
E20/E20′ (4497.5/4797.5)	E34/E34′ (4567.5/4867.5)	E48/E48′ (4637.5/4937.5)
E21/E21′ (4502.5/4802.5)	E35/E35′ (4572.5/4872.5)	
E22/E22′ (4507.5/4807.5)	E36/E36′ (4577.5/4877.5)	

Table 6: The Center Frequencies for the 2.5 MHz Narrow-Band Paired Channels (F-Channels)[7]

[6]. There are no secondary channels for the E-Channels (5 MHz channels).

[7]. There are no secondary channels for the F-Channels (2.5 MHz channels).

Table 6		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
F1/F1′ (4401.25/4701.25)	F7/F7′ (4416.25/4716.25)	F12/F12′ (4428.75/4728.75)
F2/F2′ (4403.75/4703.75)	F8/F8′ (4418.75/4718.25)	F13/F13′ (4413.25/4731.25)
F3/F3′ (4406.25/4706.25	F9/F9′ (4421.25/4721.25)	F14/F14′ (4433.75/4733.75)
F4/F4′ (4408.75/4708.25)	F10/F10′ (4423.75/4723.25)	F15/F15′ (4436.25/4736.25)
F5/E5′ (4411.25/4711.25)	F11/F11′ (4426.25/4726.25)	F16/F16′ (4438.75/4738.75)
F6/F6′ (4413.75/4713.25)		
Third Priority Channels		
F17/F17′ (4441.25/4741.25)	F44/F44′(4508.75/4808.75)	F71/F71′ (4576.25/4876.25)
F18/F18′ (4443.75/4743.75)	F45/F45′ (4511.25/4811.25)	F72/F72′ (4578.75/4878.75)
F19/F19′ (4446.25/4746.25)	F46/F46′ (4513.75/4813.75)	F73/F73′ (4581.25/4881.25)
F20/F20′ (4448.75/4748.75)	F47/F47′ (4516.25/4816.25)	F74/F74′ (4583.75/4883.75)
F21/F21′ (4451.25/4751.25)	F48/F48′ (4518.75/4818.75)	F75/F75′ (4586.25/4886.25)
F22/F22′ (4453.75/4753.75)	F49/F49′ (4521.25/4821.25)	F76/F76′ (4588.75/4888.75)
F23/F23′ (4456.25/4756.25)	F50/F50′ (4523.75/4823.75)	F77/F77′ (4591.25/4891.25)
F24/F24′ (4458.75/4758.75)	F51/F51′ (4526.25/4826.25)	F78/F78′ (4593.75/4893.75)
F25/F25′ (4461.25/4761.25)	F52/F52′ (4528.75/4828.75)	F79/F79′ (4596.25/4896.25)
F26/F26′ (4463.75/4763.75)	F53/F53′ (4531.25/4831.25)	F80/F80′ (4598.75/4898.75)
F27/F27′ (4466.25/4766.25)	F54/F54′ (4533.75/4833.75)	F81/F81′ (4601.25/4901.25)
F28/F28′ (4468.75/4768.75)	F55/F55′ (4536.25/4836.25)	F82/F82′ (4603.75/4903.75)
F29/F29′ (4571.25/4771.25)	F56/F56′ (4538.75/4838.75)	F83/F83′ (4606.25/4906.25)
F30/F30′ (4473.75/4773.75)	F57/F57′ (4541.25/4841.25)	F84/F84′ (4608.75/4908.75)
F31/F31′ (4476.25/4776.25)	F58/F58′ (4543.75/4843.75)	F85/F85′ (4611.75/4911.75)
F32/F32′ (4478.75/4778.75)	F59/F59′ (4546.25/4846.25)	F86/F86′ (4613.25/4913.25)
F33/F33′ (4481.25/4781.25)	F60/F60′ (4548.75/4848.75)	E87/F87′ (4616.25/4916.25)
F34/F34′ (4483.75/4783.75)	F61/F61′ (4551.25/4851.25)	F88/F88′ (4618.75/4918.75)
F35/F35′ (4486.25/4786.25)	F62/F62′ (4553.75/4853.75)	F89/F89′ (4621.25/4921.25)
F36/F36′ (4488.75/4788.75)	F63/F63′ (4556.25/4856.25)	F90/F90′ (4623.75/4923.75)
F37/F37′ (4491.25/4791.25)	F64/F64′ (4558.75/4858.75)	F91/F91′ (4626.25/4926.25)
F38/F38′ (4493.75/4793.75)	F65/F65′ (4561.25/4861.25)	F92/F92′ (4628.75/4928.75)
F39/F39′ (4496.25/4796.25)	F66/F66′ (4563.75/4863.75)	F93/F93′ (4631.25/4931.25)
F40/F40′ (4498.75/4798.75)	F67/F67′ (4566.25/4866.25)	F94/F94′ (4633.75/4933.75)
F41/F41′ (4501.25/4801.25)	F68/F68′ (4568.75/4868.75)	F95/F95′ (4636.25/4936.25)
F42/F42′ (4503.75/4803.75)	F69/F69′ (4571.25/4871.25)	F96/F96′ (4638.75/4938.75)
F43/F43′ (4506.25/4806.25)	F70/F70′ (4573.75/4873.75)	

Table 7: The Center Frequencies for the 1.25 MHz Narrow-Band Paired Channels (G-Channels)[8]

Table 7		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
G1/G1′ (4400.625/4700.625)	G12/G12′ (4414.375/4714.375)	G23/G23′ (4428.125/4728.125)
G2/G2′ (4401.875/4701.875)	G13/G13′ (4415.625/4715.625)	G24/G24′ (4429.375/4729.375)
G3/G3′ (4403.125/4703.125)	G14/G14′ (4416.875/4716.875)	G25/G25′ (4430.625/4730.625)

[8]. There are no secondary channels for the G-Channels (1.25 MHz channels).

Table 7		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
G4/G4′ (4404.375/4704.325)	G15/G15′ (4418.125/4718.125)	G26/G26′ (4431.875/4731.875)
G5/G5′ (4405.625/4705.625)	G16/G16′ (4419.375/4719.375)	G27/G27′ (4433.125/4733.125)
G6/G6′ (4406.875/4706.825)	G17/G17′ (4420.625/4720.625)	G28/G28′ (4434.375/4734.375)
G7/G7′ (4408.125/4708.125)	G18/G18′ (4421.875/4721.875)	G29/G29′ (4435.625/4735.625)
G8/G8′ (4409.375/4708.375)	G19/G19′ (4423.125/4721.125)	G30/G30′ (4436.875/4736.875)
G9/G9′ (4410.625/4710.625)	G20/G20′ (4424.375/4724.375)	G31/G31′ (4438.125/4738.125)
G10/G10′ (4411.875/4711.875)	G21/G21′ (4425.625/4725.625)	G32/G32′ (4439.375/4789.375)
G11/G11′ (4413.125/4713.125)	G22/G22′ (4426.875/4726.875)	
Third Priority Channels		
G33/G33′ (4440.625/4740.625)	G87/G87′ (4508.125/4808.125)	G141/G141′ (4575.625/4875.625)
G34/G34′ (4441.875/4741.875)	G88/G88′ (4509.375/4809.375)	G142/G142′ (4576.875/4876.875)
G35/G35′ (4443.125/4743.125)	G89/G89′ (4510.675/4810.675)	G143/G143′ (4578.125/4878.125)
G36/G36′ (4444.375/4744.375)	G90/G90′ (4511.875/4811.875)	G144/G144′ (4579.375/4879.375)
G37/G37′ (4445.625/4745.625)	G91/G91′ (4513.125/4813.125)	G145/G145′ (4580.625/4880.625)
G38/G38′ (4446.875/4746.875)	G92/G92′ (4514.625/4814.625)	G146/G146′ (4581.875/4881.875)
G39/G39′ (4448.125/4748.125)	G93/G93′ (4515.625/4815.625)	G147/G147′ (4583.125/4883.125)
G40/G40′ (4449.375/4748.375)	G94/G94′ (4516.875/4816.875)	G148/G148′ (4584.375/4884.375)
G41/G41′ (4450.625/4750.625)	G95/G95′ (4518.125/4818.125)	G149/G149′ (4585.625/4885.625)
G42/G42′ (4451.875/4751.875)	G96/G96′ (4519.375/4819.375)	G150/G150′ (4586.875/4886.875)
G43/G43′ (4453.125/4753.125)	G97/G97′ (4520.625/4820.625)	G151/G151′ (4588.125/4888.125)
G44/G44′ (4454.375/4754.375)	G98/G98′ (4521.875/4821.875)	G152/G152′ (4589.375/4889.375)
G45/G45′ (4455.625/4755.625)	G99/G99′ (4523.125/4823.125)	G153/G153′ (4590.625/4890.625)
G46/G46′ (4456.875/4756.875)	G100/G100′ (4524.375/4824.375)	G154/G154′ (4591.875/4891.875)
G47/G47′ (4458.125/4758.125)	G101/G101′ (4525.625/4825.625)	G155/G155′ (4593.125/4893.125)
G48/G48′ (4459.375/4759.375)	G102/G102′ (4526.875/4826.875)	G156/G156′ (4594.375/4594.375)
G49/G49′ (4460.625/4760.625)	G103/G103′ (4528.125/4828.125)	G157/G157′ (4595.625/4895.625)
G50/G50′ (4461.875/4761.875)	G104/G104′ (4529.375/4829.375)	G158/G158′ (4596.875/4896.875)
G51/G51′ (4463.125/4763.125)	G105/G105′ (4530.625/4830.625)	G159/G159′ (4598.125/4898.125)
G52/G52′ (4464.375/4764.375)	G106/G106′ (4531.875/4831.875)	G160/G160′ (4599.375/4899.375)
G53/G53′ (4465.625/4765.625)	G107/G107′ (4533.125/4833.125)	G161/G161′ (4600.625/4900.625)
G54/G54′ (4466.875/4766.875)	G108/G108′ (4534.375/4834.375)	G162/G162′ (4601.875/4901.875)
G55/G55′ (4468.125/4768.125)	G109/G109′ (4535.625/4835.625)	G163/G163′ (4603.125/4903.125)
G57/G57′ (4470.625/4770.625)	G110/G110′ (4536.875/4836.875)	G164/G164′ (4604.375/4904.375)
G58/G58′ (4471.875/4771.875)	G111/G111′ (4538.125/4838.125)	G165/G165′ (4605.625/4905.625)
G59/G59′ (4473.125/4773.125)	G112/G112′ (4539.375/4889.375)	G166/G166′ (4606.875/4906.875)
G60/G60′ (4474.375/4774.375)	G113/G113′ (4540.625/4840.625)	G167/G167′ (4608.125/4908.125)
G61/G61′ (4475.625/4775.625)	G114/G114′ (4541.875/4841.875)	G168/G168′ (4609.375/4909.375)
G62/G62′ (4476.875/4776.875)	G115/G115′ (4543.125/4843.125)	G169/G169′ (4610.625/4910.625)
G63/G63′ (4478.125/4778.125)	G116/G116′ (4544.375/4844.375)	G170/G170′ (4611.875/4911.875)
G64/G64′ (4479.375/4779.375)	G117/G117′ (4545.625/4845.625)	G171/G171′ (4613.125/4913.125)
G65/G65′ (4480.625/4780.625)	G118/G118′ (4546.875/4846.875)	G172/G172′ (4614.375/4914.375)
G66/G66′ (4481.875/4781.875)	G119/G119′ (4548.125/4848.125)	G173/G173′ (4615.625/4915.625)
G67/G67′ (4483.125/4783.125)	G120/G120′ (4549.375/4849.375)	G174/G174′ (4616.875/4916.875)
G56/G56′ (4469.375/4768.375)	G121/G121′ (4550.625/4850.625)	G175/G175′ (4618.125/4918.125)
G68/G68′ (4484.375/4784.375)	G122/G122′ (4551.875/4851.875)	G176/G176′ (4619.375/4919.375)
G69/G69′ (4485.625/4785.625)	G123/G123′ (4553.125/4853.125)	G177/G177′ (4620.625/4920.625)
G70/G70′ (4486.875/4786.875)	G124/G124′ (4554.375/4854.375)	G178/G178′ (4621.875/4921.875)
G71/G71′ (4488.125/4788.125)	G125/G125′ (4555.625/4855.625)	G179/G179′ (4623.125/4923.125)
G72/G72′ (4489.375/4789.375)	G126/G126′ (4556.875/4856.875)	G180/G180′ (4624.375/4924.375)
G73/G73′ (4490.625/4790.625)	G127/G127′ (4858.125/4858.125)	G181/G181′ (4625.625/4925.625)

Table 7		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
G74/G74′ (4491.875/4791.875)	G128/G128′ (4559.375/4559.375)	G182/G182′ (4626.875/4926.875)
G75/G75′ (4493.125/4793.125)	G129/G129′ (4560.625/4860.625)	G183/G183′ (4628.125/4928.125)
G76/G76′ (4494.375/4794.375)	G130/G130′ (4561.875/4861.875)	G184/G184′ (4629.375/4929.375)
G77/G77′ (4495.625/4795.625)	G131/G131′ (4563.125/4863.125)	G185/G185′ (4630.625/4930.625)
G78/G78′ (4496.875/4796.875)	G132/G132′ (4564.375/4864.375)	G186/G186′ (4631.875/4931.875)
G79/G79′ (4498.125/4798.125)	G133/G133′ (4565.625/4865.625)	G187/G187′ (4633.125/4933.125)
G80/G80′ (4499.375/4799.375)	G134/G134′ (4566.875/4866.875)	G188/G188′ (4634.375/4934.375)
G81/G81′ (4500.625/4800.625)	G135/G135′ (4568.125/4868.125)	G189/G189′ (4635.625/4935.625)
G82/G82′ (4501.875/4801.875)	G136/G136′ (4569.375/4869.375)	G190/G190′ (4636.875/4936.875)
G83/G83′ (4503.125/4803.125)	G137/G137′ (4570.625/4870.625)	G191/G191′ (4638.125/4938.125)
G84/G84′ (4504.375/4804.375)	G138/G138′ (4571.875/4871.825)	G192/G192′ (4639.375/4939.375)
G85/G85′ (4505.625/4805.625)	G139/G139′ (4573.125/4873.125)	
G86/G86′ (4506.875/4806.875)	G140/G140′ (4574.375/4874.375)	

c. Table 8 shows the center frequencies of the unpaired or single channels in the 4400-4940 MHz Channel Plan and their respective channel status.

CENTER FREQUENCIES OF THE UNPAIRED OR SINGLE CHANNELS

Table 8: The Center Frequencies for the Unpaired or Single Channels in the 4400-4940 MHz Channel Plan

Table 8		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
30 MHz Channels (Third Priority B-Channels)		
B9 (4655)	B10 (4685)	
20 MHz Channels (Third Priority C-Channels)		
C13 (4650)	C14 (4670)	C15 (4690)
10 MHz Channels (First Priority D-Channels)		
D25 (4645)	D27 (4665)	D29 (4685)
D26 (4655)	D28 (4675)	D30 (4695)
5 MHz Channels (First Priority E-Channels)		
E49 (4642.5)	E53 (4662.5)	E57 (4682.5)
E50 (4647.5)	E54(4667.5)	E58 (4687.5)
E51 (4652.5)	E55 (4672.5)	E59 (4692.5)
E52 (4657.5)	E56 (4677.5)	E60 (4697.5)
2.5 MHz Channels (First Priority F-Channels)		
F97 (4641.25)	F105 (4661.25)	F113 (4681.25)
F98 (4643.75)	F106 (4663.75)	F114 (4683.75)
F99 (4646.25)	F107 (4666.25)	F115 (4686.25)
F100 (4648.75)	F108 (4668.75)	F116 (4688.75)
F101 (4651.25)	F109(4671.25)	F117 (4691.25)
F102 (4653.75)	F110 (4673.75)	F118 (4693.75)
F103 (4656.25)	F111 (4676.25)	F119 (4696.25)
F104 (4658.75)	F112 (4678.75)	F120 (4698.75)
1.25 MHz Channels (First Priority G-Channels)		
G193 (4640.625)	G209 (4660.625)	G225 (4680.625)
G194 (4641.875)	G210 (4661.875)	G226 (4681.875)

Table 8		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
G195 (4643.125)	G211 (4663.125)	G227 (4683.125)
G196 (4644.375)	G212 (4664.375)	G228 (4684.375)
G197 (4645.625)	G213 (4665.625)	G229 (4685.625)
G198 (4646.875)	G214 (4666.875)	G230 (4686.875)
G199 (4648.125)	G215 (4668.125)	G231 (4688.125)
G200 (4649.375)	G216 (4669.375)	G232 (4689.375)
G201 (4650.625)	G217 (4670.625)	G233 (4690.625)
G202 (4651.875)	G218 (4671.875)	G234 (4691.875)
G203 (4653.125)	G219 (4673.125)	G235 (4693.125)
G204 (4654.375)	G220 (4674.375)	G236 (4694.375)
G205 (4655.625)	G221 (4675.625)	G237 (4695.625)
G206 (4656.875)	G222 (4676.875)	G238 (4696.875)
G207 (4658.125)	G223 (4678.125)	G239 (4698.125)
G208 (4659.375)	G224 (4679.375)	G240 (4699.375)

4.3.19 7125-8500 MHz Channel Plan and Frequency Assignment Process

This section describes the 7125-8500 MHz Channel Plan for stations operating in the fixed service and provides guidance on its implementation. This Channel Plan became effective on December 1, 2009, and all incumbent frequency assignments in the band 7125-8500 MHz are grandfathered until the equipment or frequency is changed.[9]

The Channel Plan was revised in June 2019 to include 40, 50 and 60 MHz bandwidth channels and certain unpaired-channel uses. The procedures of frequency selections and guidelines were updated to incorporate the changes at same time. The revision also included requirement for adopting technologies like Adaptive Code Modulation (ACM) and Automatic Transmit Power Control (ATPC) in the fixed radio systems

2. Figure 1 and 2 provide an overview of the 7125-8500 MHz Channel Plan. The plan consists of the 7125-7750 MHz (7GHz) Channel Plan (Figure 1) and the 7750-8500 MHz (8GHz) Channel Plan (Figure 2). Detail frequencies for each channel are shown in the tables in the following sections.

[9] Any system in the Government Master File (GMF) or on the Frequency Assignment Subcommittee (FAS) agenda before December 1, 2009, are grandfathered.

Figure 1: 7 GHz Channel Plan

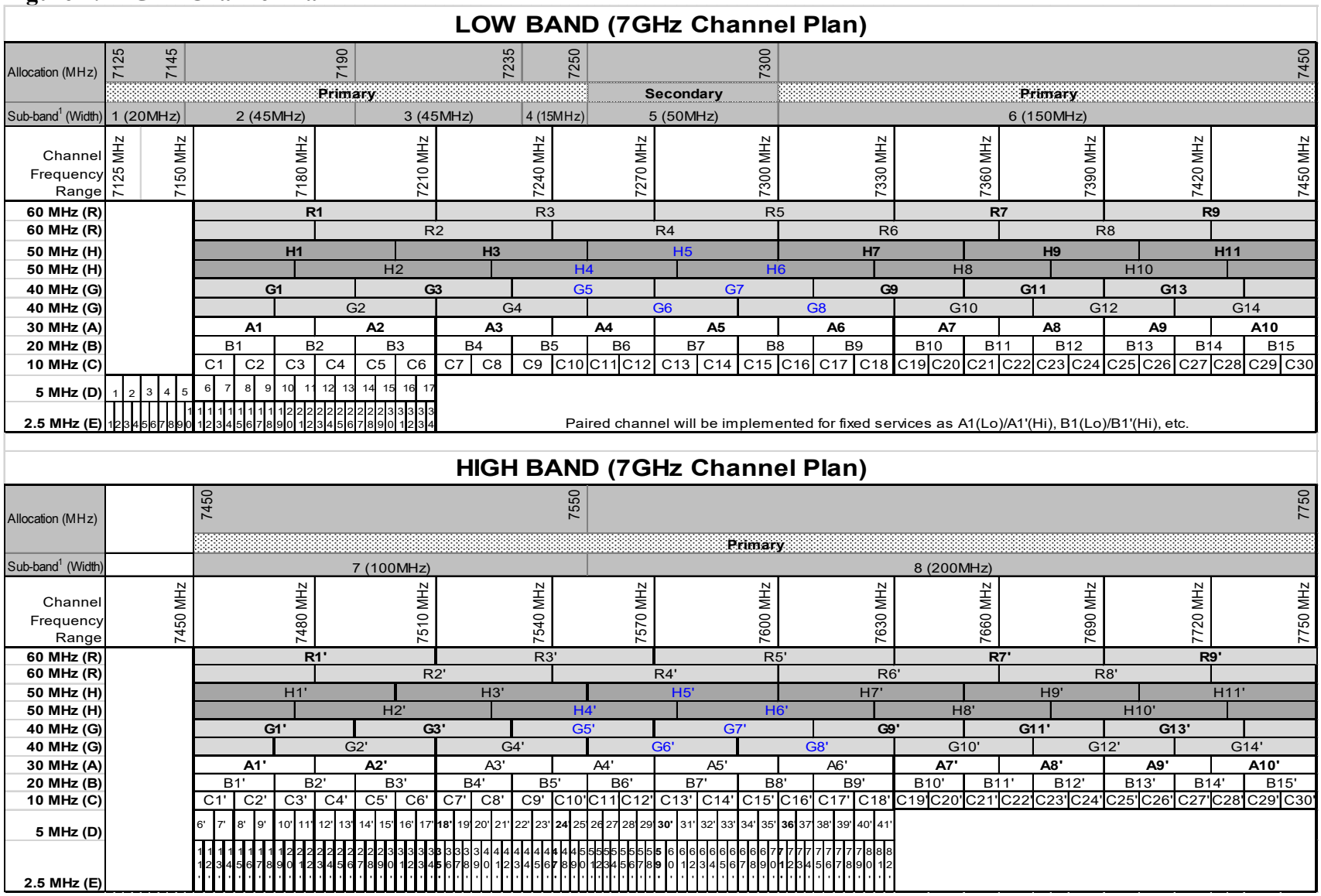
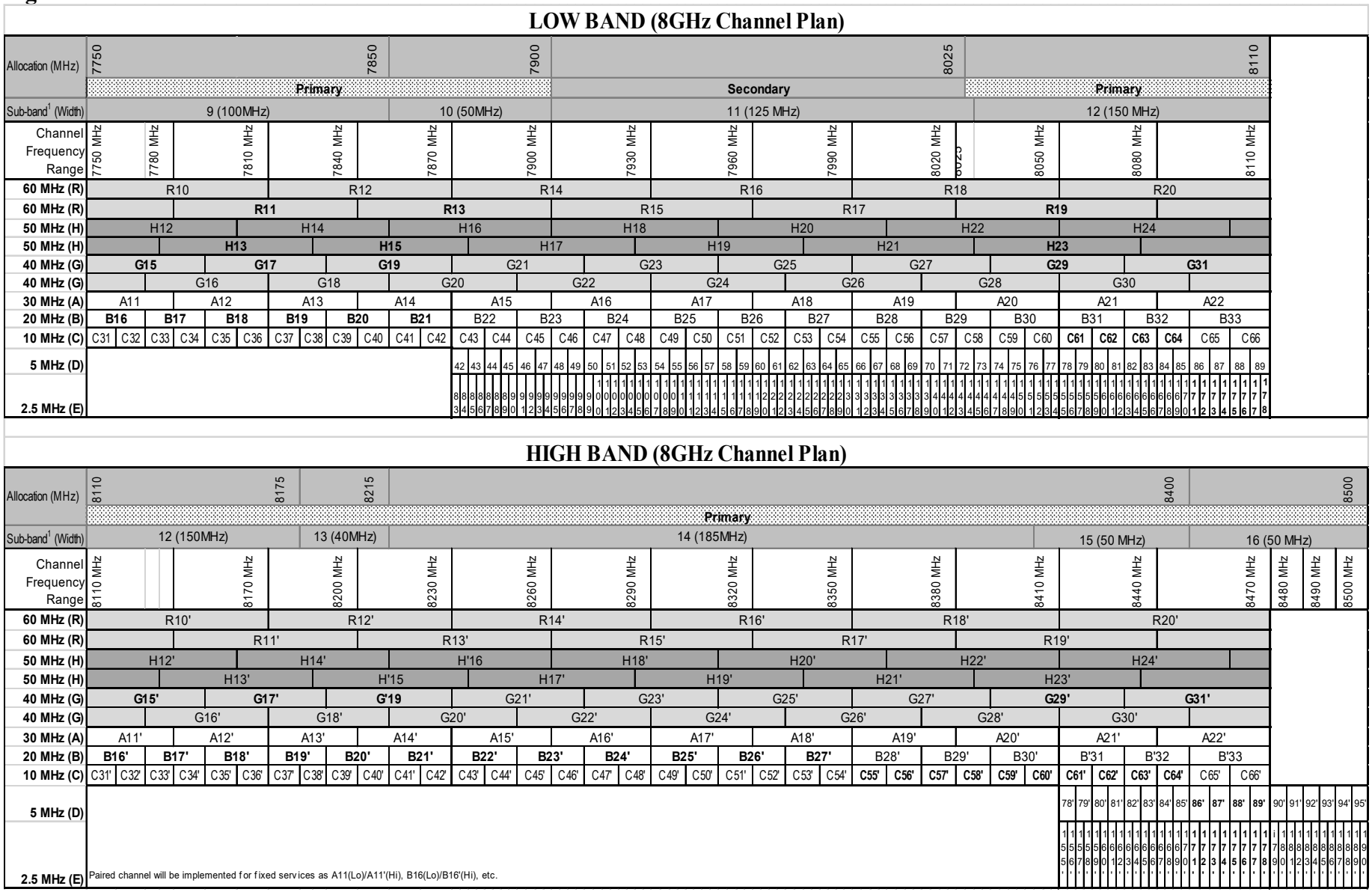


Figure 2: 8 GHz Channel Plan



4.3.19.1 Procedure for Frequency Selection

The selection of frequencies for fixed service systems (does not include transportable systems) will be performed by NTIA Spectrum Engineering and Analysis Division (SEAD) in conjunction with the NTIA Frequency Assignment Branch (FAB) within 9 workdays of receipt of complete data. The process and coordination procedures are following:

1. The selection of frequency assignments for new fixed services in this band will be performed by SEAD. Any coordinate changes or technical modifications (e.g. update radio parameters, move antenna height, etc.) to the existing fixed service assignments in this band must also be submitted to SEAD for review and possible re-engineering.

2. SEAD will provide the selected freqencies to the requesting agency for review. Upon agreeing to the frequencies identified, the agency will submit the selected frequencies to the FAS using the existing NTIA frequency assignment process. If the submitting agency disagrees with the selected frequencies, the agency will work with SEAD staff members to identify a mutually agreeable frequencies.

3. Agencies must submit the Link ID numbers assigned by SEAD from the selection process when submitting frequency applications to FAS for approval. Agencies must record the link ID number and date on the bottom of SEAD engineering report to its associated serial numbers in the GMF database remark lines.[10]

4. Agencies must record detailed radio model and antenna model information in the GMF database equipment data fields for all assignments.

The federal agency submitting a frequency selection request must provide the following information in card format and/or other preferred formats to SEADFASSupport@ntia.gov:

a. Serial numbers for each requested transmit frequency and paired receiver frequency

b. Transmitter and Receiver site names and coordinates of the proposed location(s) of deployment (antenna locations)

c. Transmitter and Receiver radio nomenclature, radio manufacturer name and radio manfacturer model number (e.g. Alcatel MDR-87084S-155, Cambrium PTP820, Aviat Eclipse IRU600, Nokia 9500MPR, etc.)

d. Transmitter and Receiver bandwidth and emission designator (e.g. 10M0G7W, 27M2D1D, 30M0D7W)

e. Transmitter and Receiver radio modulation type and capacity

1) Specify the use of Adaptive Code Modualtion (ACM) in the system (Yes/No)

2) For fixed modulation systems, specify the type of modulation (i.e. QPSK, 64QAM, 256QAM, 2048QAM) and radio capacity (i.e. 45 Mbps, 155 Mbps, 177.4 Mbps, etc.)

3) For ACM systems, indicate the type of modulation used under normal operation or the highest modulation used (i.e. ACM@256QAM, ACM@1024QAM), and its radio capacity (e.g. 155Mbps, 177.4 Mbps, etc.)

f. Transmitter power (in watts)[11]

1) Specify the use of Automatic Transmit Power Control (ATPC) function (Yes/No)

2) For ACM systems, must provide ACM Coordinated power

3) For non-ATPC systems, must provide Norminal transmit power (at which the sysem will operate in normal unfaded coditions)

4) For ATPC systems, must provide Norminal transmit power, Coordinated transmit power, Maximum transmit power, ATPC trigger levels (upper and lower, in dBm) and Coordinated Receive Signal

[10] The Link ID is a seven-digit number for new assignments (e.g. 1008020). But for legacy systems before 2009, the Link ID was formatted with agency name followed by sequence numbers (e.g. AF23, DOE100, etc),

[11] For ATPC requirements and related definitions of terms used here, see details in ANSI/TIA-10 standard (Interference Criteria for Microwave Systems) and NSMA Recommendations WG18.91.032 for ATPC.

Level (RSL, in dBm)

g. Transmitter Equivalent Isotropically Radiated Power (EIRP in watts): the EIRP must meet the maximum EIRP limit requirement in Section 5.3.3

h. Transmitter and Receiver antenna model (e.g. Andrew HP6-71W44)

i. Transmitter and Receiver antenna type

j. Transmitter and Receiver mainbeam antenna gain (in dBi)

k. Transmitter and Receiver antenna azimuth in degrees

l. Transmitter and Receiver antenna heights above ground level (AGL in meters) including the structure heights such as building heights

m. Transmitter and Receiver antenna ground elevation above mean sea level (AMSL in meters)

n. Transmitter and Receiver antenna polarization (H – Horizontal, V – Vertical, S – Horizontal and Vertical)

o. Transmitter and Receiver space diversity (SP) antenna models, gains and heights if the link is in SP configuration.

p. Repeater information if applicable: station name, station coordinators, ground elevation, reflector model and demension or antenna model for antenna back-to-back type, repeater mounting heights (AGL, in meters)

q. Losses in dB (common loss, TX loss, RX loss, e.g. waveguide or cable line losses, branch losses, etc.)

r. Attenuation loss in dB if applicable.

4.3.19.2 Applicable Guidance for Use of Channel Plan

In implementing the 7125-8500 MHz Channel Plan, the following guidance applies.

1. This channel plan only applies to fixed and/or transportable assignments. This plan does not apply to mobile, airborne, air to ground (i.e. Space to Earth) or ground to air (i.e. Earth to space) operations, however, NTIA encourages that agencies use this channel plan whenever possible.

2. Incumbent fixed and/or transportable assignments will be grandfathered until the end of the life-cycle of the equipment and all replacement equipment will utilize frequencies in accordance with the channel plan. Other assignments should use this channel plan to the extent possible.

3. Any request for changes or modifications to "grandfathered" fixed and/or transportable assignments, except for the frequency, will be governed by existing NTIA procedures. However, if the operating frequency is to be modified, the replacement frequency will be selected in accordance with the channel plan.

4. The First Priority Channels should be considered prior to the other designated channels.

5. The Second Priority Channels should be considered if the First Priority Channels are not available.

6. Fixed and/or transportable fixed assignments for which the emission bandwidth of a channel will use the next available wider channel in the channel plan. For example, an assignment with an emission bandwidth of 24 MHz will use a 30 MHz channel.

7. The channel spacing for symmetric paired-channels (same radio capacity requirements in both directions for duplex links) are 300 MHz in 7GHz band and 360 MHz in 8GHz band. E.g. spacing for pair A1/A1' is 300MHz, spacing for pair A11/A11' is 360MHz. This rule applies to all symmetric paired-channels at all bandwidths.

8. For 40, 50 and 60 MHz wide bandwidths, the channels are formed by concatenating two narrower channels such as 40MHz channels are formed by two adjacent 20 MHz channels. See Figure 4.3.19.1 and Figure 4.3.19.2 plan charts for details. Therefore, there is overlapping between two adjacent channels, e.g. channel G1 overlaps channel G2 by 20 MHz bandwidth, G2 overlaps G3 by 20 MHz bandwidth, etc. Further, for each wideband, the Channel Plan is divided into two sets of channels: the odd number channels are the First Priority Channels, and the even number channels are the Second Priority Channels.

9. For single channel applications or asymmetric channel applications that radio capacity requirement in one direction is greater than the other direction for a duplex link, if applicable, the unpaired channels

must be considered first (e.g. A3, D18', A3/D18', or A3/E35') prior to consider using the channels in the symmetric paired-channel pool. The frequency selections will be determined on case-by-case bases.

10. Fixed and/or transportable fixed assignments may either use single unpaired-channels for paired assignments if paired-channels are not available or use paired-channels for one-way or asymmetric channel applications if the unpaired-channels are not available.

11. Experimental stations may use any frequency in the 7125-8500 MHz under the condition that if the equipment/system becomes operational it must comply with the channel plan.

12. Frequency assignments for the fixed services in some sub-bands of 7125-8500 MHz may be subject to coordination with earth stations. See Manual Section 8.3.13 for details.

4.3.19.3 Channel Plan Tables

The following tables list the center frequencies of the paired-channels and single unpaired channels for different bandwidths in the 7125-8500 MHz Channel Plan and their priority status.

a. Tables 1 through 5 shows the center frequencies of the paired-channels of bandwidth from 2.5 MHz to 30 MHz.

Table 1: The Center Frequencies of the 30 MHz Paired Channels[12]

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
A1/A1' (7165 / 7465)	A7/A7' (7345 / 7645)	A9/A9' (7405 / 7705)
A2/A2' (7195 / 7495)	A8/A8' (7375 / 7675)	A10/A10' (7435 / 7735)
SECOND PRIORITY CHANNELS		
A11/A11' (7765 / 8125)	A13/A13' (7825 / 8185)	A21/A21' (8065 / 8425)
A12/A12' (7795 / 8155)	A14/A14' (7855 / 8215)	A22/A22' (8095 / 8455)

Table 2: The Center Frequencies of the 20 MHz Paired Channels[13]

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
B16/B16' (7760 / 8120)	B18/B18' (7800 / 8160)	B20/B20' (7840 / 8200)
B17/B17' (7780 / 8140)	B19/B19' (7820 / 8180)	B21/B21' (7860 / 8220)
SECOND PRIORITY CHANNELS		
B1/B1' (7160 / 7460)	B11/B11' (7360 / 7660)	B15/B15' (7440 / 7740)
B2/B2' (7180 / 7480)	B12/B12' (7380 / 7680)	B31/B31' (8060 / 8420)
B3/B3' (7200 / 7500)	B13/B13' (7400 / 7700)	B32/B32' (8080 / 8440)

[12] In the situation wherein one site is transmitting and receiving multiple 30 MHz bandwidth (BW) channels, unless a site engineering study is performed, precautions should be taken to allow a minimum transmit-receive (T/R) separation of 60 MHz between the transmit and receive frequencies to ensure sufficient isolation between the transmitter and the receiver. In this case, avoid assigning channels A1/A1' and A10/A10' (T/R = 30 MHz between A1' and A10) or A11/A11' and A22/A22' (T/R = 30 MHz between A11' and A22) at a single site.

[13] In the situation wherein one site is transmitting and receiving multiple 20 MHz BW channels, unless a site engineering study is performed, precautions should be taken to allow a minimum T/R separation of 40 MHz between the transmit and receive frequencies to ensure sufficient isolation between the transmitter and the receiver. In this case, avoid assigning channels B1/B1' and B15/B15' (T/R = 20 MHz between B1' and B15) or B16/B16' and B33/B33' (T/R = 20 MHz between B16' and B33) at a single site.

B10/B10' (7340 / 7640)	B14/B14' (7420 / 7720)	B33/B33' (8100 / 8460)

Table 3: The Center Frequencies of the 10 MHz Paired Channels[14]

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
C61/C61' (8055 / 8415)	C63/C63' (8075 / 8435)	
C62/C62' (8065 / 8425)	C64/C64' (8085 / 8445)	
SECOND PRIORITY CHANNELS		
C1 /C1 ' (7155 / 7455)	C24/C24' (7385 / 7685)	C35/C35' (7795 / 8155)
C2 /C2 ' (7165 / 7465)	C25/C25' (7395 / 7695)	C36/C36' (7805 / 8165)
C3 /C3 ' (7175 / 7475)	C26/C26' (7405 / 7705)	C37/C37' (7815 / 8175)
C4 /C4 ' (7185 / 7485)	C27/C27' (7415 / 7715)	C38/C38' (7825 / 8185)
C5 /C5 ' (7195 / 7495)	C28/C28' (7425 / 7725)	C39/C39' (7835 / 8195)
C6 /C6 ' (7205 / 7505)	C29/C29' (7435 / 7735)	C40/C40' (7845 / 8205)
C19/C19' (7335 / 7635)	C30/C30' (7445 / 7745)	C41/C41' (7855 / 8215)
C20/C20' (7345 / 7645)	C31/C31' (7755 / 8115)	C42/C42' (7865 / 8225)
C21/C21' (7355 / 7655)	C32/C32' (7765 / 8125)	C65/C65' (8095 / 8455)
C22/C22' (7365 / 7665)	C33/C33' (7775 / 8135)	C66/C66' (8105 / 8465)
C23/C23' (7375 / 7675)	C34/C34' (7785 / 8145)	

Table 4: The Center Frequencies of the 5 MHz Paired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
D86/D86' (8092.5 / 8452.5)	D88/D88' (8102.5 / 8462.5)	
D87/D87' (8097.5 / 8457.5)	D89/D89' (8107.5 / 8467.5)	
SECOND PRIORITY CHANNELS		
D6 /D6 ' (7152.5 / 7452.5)	D13/D13' (7187.5 / 7487.5)	D80/D80' (8062.5 / 8422.5)
D7 /D7 ' (7157.5 / 7457.5)	D14/D14' (7192.5 / 7492.5)	D81/D81' (8067.5 / 8427.5)
D8 /D8 ' (7162.5 / 7462.5)	D15/D15' (7197.5 / 7497.5)	D82/D82' (8072.5 / 8432.5)
D9 /D9 ' (7167.5 / 7467.5)	D16/D16' (7202.5 / 7502.5)	D83/D83' (8077.5 / 8437.5)
D10/D10' (7172.5 / 7472.5)	D17/D17' (7207.5 / 7507.5)	D84/D84' (8082.5 / 8442.5)
D11/D11' (7177.5 / 7477.5)	D78/D78' (8052.5 / 8412.5)	D85/D85' (8087.5 / 8447.5)
D12/D12' (7182.5 / 7482.5)	D79/D79' (8057.5 / 8417.5)	

Table 5: The Center Frequencies of the 2.5 MHz Paired Channels

[14] In the situation wherein one site is transmitting and receiving multiple 10 MHz BW channels, unless a site engineering study is performed, precautions should be taken to allow a minimum T/R separation of 20 MHz between the transmit and receive frequencies to ensure sufficient isolation between the transmitter and the receiver. In this case, avoid assigning channels C1/C1' and C30/C30' (T/R = 10 MHz between C1' and C30) or C31/C31' and C66/C66' (T/R = 10 MHz between C31' and C66) at a single site.

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
E171/E171' (8091.25/8451.25)	E174/E174' (8098.75 / 8458.75)	E177/E177' (8106.25 / 8466.25)
E172/E172' (8093.75/8453.75)	E175/E175' (8101.25 / 8461.25)	E178/E178' (8108.75 / 8468.75)
E173/E173' (8096.25/8456.25)	E176/E176' (8103.75 / 8463.75)	
SECOND PRIORITY CHANNELS		
E11 /E11 ' (7151.25 / 7451.25)	E25 /E25 ' (7186.25 / 7486.25)	E159/E159' (8061.25 / 8421.25)
E12 /E12 ' (7153.75 / 7453.75)	E26 /E26 ' (7188.75 / 7488.75)	E160/E160' (8063.75 / 8423.75)
E13 /E13 ' (7156.25 / 7456.25)	E27 /E27 ' (7191.25 / 7491.25)	E161/E161' (8066.25 / 8426.25)
E14 /E14 ' (7158.75 / 7458.75)	E28 /E28 ' (7193.75 / 7493.75)	E162/E162' (8068.75 / 8428.75)
E15 /E15 ' (7161.25 / 7461.25)	E29 /E29 ' (7196.25 / 7496.25)	E163/E163' (8071.25 / 8431.25)
E16 /E16 ' (7163.75 / 7463.75)	E30 /E30 ' (7198.75 / 7498.75)	E164/E164' (8073.75 / 8433.75)
E17 /E17 ' (7166.25 / 7466.25)	E31 /E31 ' (7201.25 / 7501.25)	E165/E165' (8076.25 / 8436.25)
E18 /E18 ' (7168.75 / 7468.75)	E32 /E32 ' (7203.75 / 7503.75)	E166/E167' (8078.75 / 8438.75)
E19 /E19 ' (7171.25 / 7471.25)	E33 /E33 ' (7206.25 / 7506.25)	E167/E167' (8081.25 / 8441.25)
E20 /E20 ' (7173.75 / 7473.75)	E34 /E34 ' (7208.75 / 7508.75)	E168/E168' (8083.75 / 8443.75)
E21 /E21 ' (7176.25 / 7476.25)	E155/E155' (8051.25 / 8411.25)	E169/E169' (8086.25 / 8446.25)
E22 /E22 ' (7178.75 / 7478.75)	E156/E156' (8053.75 / 8413.75)	E170/E170' (8088.75 / 8448.75)
E23 /E23 ' (7181.25 / 7481.25)	E157/E157' (8056.25 / 8416.25)	
E24 /E24 ' (7183.75 / 7483.75)	E158/E158' (8058.75 / 8418.75)	

b. Tables 6 through 10 shows the center frequencies of the single unpaired-channels of bandwidth from 2.5 MHz to 30 MHz.

Table 6: The Center Frequencies of the 30 MHz Unpaired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
A3 (7225)	A6 (7315)	A5' (7585)
A4 (7255)	A3' (7525)	A6' (7615)
A5 (7285)	A4' (7555)	
SECOND PRIORITY CHANNELS		
A15 (7885)	A19 (8005)	A17' (8305)
A16 (7915)	A20 (8035)	A18' (8335)
A17 (7945)	A15' (8245)	A19' (8365)
A18 (7975)	A16' (8275)	A20' (8395)

Table 7: The Center Frequencies of the 20 MHz Unpaired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
B22 (7880)	B26 (7960)	B24' (8280)
B23 (7900)	B27 (7980)	B25' (8300)
B24 (7920)	B22' (8240)	B26' (8320)
B25 (7940)	B23' (8260)	B27' (8340)
SECOND PRIORITY CHANNELS		

B4 (7220)	B4' (7520)	B28 (8000)
B5 (7240)	B5' (7540)	B29 (8020)
B6 (7260)	B6' (7560)	B30 (8040)
B7 (7280)	B7' (7580)	B28' (8360)
B8 (7300)	B8' (7600)	B29' (8380)
B9 (7320)	B9' (7620)	B30' (8400)

Table 8: The Center Frequencies of the 10 MHz Unpaired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
C55 (7995)	C59 (8035)	C57' (8375)
C56 (8005)	C60 (8045)	C58' (8385)
C57 (8015)	C55' (8355)	C59' (8395)
C58 (8025)	C56' (8365)	C60' (8405)
SECOND PRIORITY CHANNELS		
C7 (7215)	C11' (7555)	C51 (7955)
C8 (7225)	C12' (7565)	C52 (7965)
C9 (7235)	C13' (7575)	C53 (7975)
C10 (7245)	C14' (7585)	C54 (7985)
C11 (7255)	C15' (7595)	C43' (8235)
C12 (7265)	C16' (7605)	C44' (8245)
C13 (7275)	C17' (7615)	C45' (8255)
C14 (7285)	C18' (7625)	C46' (8265)
C15 (7295)	C43 (7875)	C47' (8275)
C16 (7305)	C44 (7885)	C48' (8285)
C17 (7315)	C45 (7895)	C49' (8295)
C18 (7325)	C46 (7905)	C50' (8305)
C7' (7515)	C47 (7915)	C51' (8315)
C8' (7525)	C48 (7925)	C52' (8325)
C9' (7535)	C49 (7935)	C53' (8335)
C10' (7545)	C50 (7945)	C54' (8345)

Table 9: The Center Frequencies of the 5 MHz Unpaired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
D1 (7127.5)	D5 (7147.5)	D93' (8487.5)
D2 (7132.5)	D90' (8472.5)	D94' (8492.5)
D3 (7137.5)	D91' (8477.5)	D95' (8497.5)
D4 (7142.5)	D92' (8482.5)	
SECOND PRIORITY CHANNELS		
D42 (7872.5)	D62 (7972.5)	D22' (7532.5)
D43 (7877.5)	D63 (7977.5)	D23' (7537.5)
D44 (7882.5)	D64 (7982.5)	D24' (7542.5)

D45 (7887.5)	D65 (7987.5)	D25' (7547.5)
D46 (7892.5)	D66 (7992.5)	D26' (7552.5)
D47 (7897.5)	D67 (7997.5)	D27' (7557.5)
D48 (7902.5)	D68 (8002.5)	D28' (7562.5)
D49 (7907.5)	D69 (8007.5)	D29' (7567.5)
D50 (7912.5)	D70 (8012.5)	D30' (7572.5)
D51 (7917.5)	D71 (8017.5)	D31' (7577.5)
D52 (7922.5)	D72 (8022.5)	D32' (7582.5)
D53 (7927.5)	D73 (8027.5)	D33' (7587.5)
D54 (7932.5)	D74 (8032.5)	D34' (7592.5)
D55 (7937.5)	D75 (8037.5)	D35' (7597.5)
D56 (7942.5)	D76 (8042.5)	D36' (7602.5)
D57 (7947.5)	D77 (8047.5)	D37' (7607.5)
D58 (7952.5)	D18' (7512.5)	D38' (7612.5)
D59 (7957.5)	D19' (7517.5)	D39' (7617.5)
D60 (7962.5)	D20' (7522.5)	D40' (7622.5)
D61 (7967.5)	D21' (7527.5)	D41' (7627.5)

Table 10: The Center Frequencies of the 2.5 MHz Unpaired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
E1 (7126.25)	E9 (7146.25)	E137' (8486.25)
E2 (7128.75)	E10 (7148.75)	E138' (8488.75)
E3 (7131.25)	E131' (8471.25)	E139' (8491.25)
E4 (7133.75)	E132' (8473.75)	E140' (8493.75)
E5 (7136.25)	E133' (8476.25)	E141' (8496.25)
E6 (7138.75)	E134' (8478.75)	E142' (8498.75)
E7 (7141.25)	E135' (8481.25)	
E8 (7143.75)	E136' (8483.75)	
SECOND PRIORITY CHANNELS		
E83 (7871.25)	E123 (7971.25)	E43' (7531.25)
E84 (7873.75)	E124 (7973.75)	E44' (7533.75)
E85 (7876.25)	E125 (7976.25)	E45' (7536.25)
E86 (7878.75)	E126 (7978.75)	E46' (7538.75)
E87 (7881.25)	E127 (7981.25)	E47' (7541.25)
E88 (7883.75)	E128 (7983.75)	E48' (7543.75)
E89 (7886.25)	E129 (7986.25)	E49' (7546.25)
E90 (7888.75)	E130 (7988.75)	E50' (7548.75)
E91 (7891.25)	E131 (7991.25)	E51' (7551.25)
E92 (7893.75)	E132 (7993.75)	E52' (7553.75)
E93 (7896.25)	E133 (7996.25)	E53' (7556.25)
E94 (7898.75)	E134 (7998.75)	E54' (7558.75)
E95 (7901.25)	E135 (8001.25)	E55' (7561.25)
E96 (7903.75)	E136 (8003.75)	E56' (7563.75)
E97 (7906.25)	E137 (8006.25)	E57' (7566.25)
E98 (7908.75)	E138 (8008.75)	E58' (7568.75)

E99 (7911.25)	E139 (8011.25)	E59' (7571.25)
E100 (7913.75)	E140 (8013.75)	E60' (7573.75)
E101 (7916.25)	E141 (8016.25)	E61' (7576.25)
E102 (7918.75)	E142 (8018.75)	E62' (7578.75)
E103 (7921.25)	E143 (8021.25)	E63' (7581.25)
E104 (7923.75)	E144 (8023.75)	E64' (7583.75)
E105 (7926.25)	E145 (8026.25)	E65' (7586.25)
E106 (7928.75)	E146 (8028.75)	E66' (7588.75)
E107 (7931.25)	E147 (8031.25)	E67' (7591.25)
E108 (7933.75)	E148 (8033.75)	E68' (7593.75)
E109 (7936.25)	E149 (8036.25)	E69' (7596.25)
E110 (7938.75)	E150 (8038.75)	E70' (7598.75)
E111 (7941.25)	E151 (8041.25)	E71' (7601.25)
E112 (7943.75)	E152 (8043.75)	E72' (7603.75)
E113 (7946.25)	E153 (8046.25)	E73' (7606.25)
E114 (7948.75)	E154 (8048.75)	E74' (7608.75)
E115 (7951.25)	E35' (7511.25)	E75' (7611.25)
E116 (7953.75)	E36' (7513.75)	E76' (7613.75)
E117 (7956.25)	E37' (7516.25)	E77' (7616.25)
E118 (7958.75)	E38' (7518.75)	E78' (7618.75)
E119 (7961.25)	E39' (7521.25)	E79' (7621.25)
E120 (7963.75)	E40' (7523.75)	E80' (7623.75)
E121 (7966.25)	E41' (7526.25)	E81' (7626.25)
E122 (7968.75)	E42' (7528.75)	E82' (7628.75)

c. Tables 11 through 14 shows the center frequencies of the 40, 50 and 60 MHz bandwidth Channel Plans. The non-overlapping adjacent channels in the plan refer to pair G1/G1' to pair G3/G3', pair G2/G2' to pair G4/G4', pair H1/H1' to pair H3/H3', and so on. Details are in the tables below.

Table 11 The Center Frequencies of the 40 MHz Paired Channels

Channel (Frequency) in MHz	Channel (Frequency) in MHz	Channel (Frequency) in MHz
FIRST PRIORITY CHANNELS		
G1/G1' (7170 / 7470)	G13/G13' (7410 / 7710)	G29/G29' (8050 / 8410)
G3/G3' (7210 / 7510)	G15/G15' (7770 / 8130)	G31/G31' (8090 / 8450)
G9/G9' (7330 / 7630)	G17/G17' (7810 / 8170)	
G11/G11' (7370 / 7670)	G19/G19' (7850 / 8210)	
SECOND PRIORITY CHANNELS		
G2/G2' (7190 / 7490)	G12/G12' (7390 / 7690)	G18/G18' (7830 / 8190)
G4/G4' (7230 / 7530)	G14/G14' (7430 / 7730)	G20/G20' (7870 / 8230)
G10/G10' (7350 / 7650)	G16/G16' (7790 / 8150)	G30/G30' (8070 / 8430)

Table 12 The Center Frequencies of the 50 MHz Paired Channels

Channel (Frequency) in MHz	Channel (Frequency) in MHz	Channel (Frequency) in MHz
FIRST PRIORITY CHANNELS		
H1/H1' (7175 / 7475)	H9/H9' (7375 / 7675)	H15/H15' (7850 / 8210)

H3/H3' (7225 / 7525)	H11/H11' (7425 / 7725)	H23/H23' (8050 / 8410)
H7/H7' (7325 / 7625)	H13/H13' (7800 / 8160)	
SECOND PRIORITY CHANNELS		
H2/H2' (7200 / 7500)	H12/H12' (7775 / 8135)	H24/H24' (8075 / 8435)
H8/H8' (7350 / 7650)	H14/H14' (7825 / 8185)	
H10/H10' (7400 / 7700)	H16/H16' (7875 / 8235)	

Table 13 The Center Frequencies of the 60MHz Paired Channels

Channel (Frequency) in MHz	Channel (Frequency) in MHz	Channel (Frequency) in MHz
FIRST PRIORITY CHANNELS		
R1/R1' (7180 / 7480)	R9/R9' (7420 / 7720)	R13/R13' (7870 / 8230)
R7/R7' (7360 / 7660)	R11/R11' (7810 / 8170)	R19/R19' (8050 / 8410)
SECOND PRIORITY CHANNELS		
R2/R2' (7210 / 7510)	R8/R8' (7390 / 7690)	R12/R12' (7840 / 8200)
R6/R6' (7330 / 7630)	R10/R10' (7780 / 8140)	R20/R20' (8080 / 8440)

Table 14 The Center Frequencies of the 40, 50 and 60 MHz Bandwidth Unpaired Channels

UnPaired Channels (Frequencies) in 40,50 and 60 MHz Bandwidth Channel Plan			
Channel (Frequency) in MHz	**Channel (Frequency) in MHz**	**Channel (Frequency) in MHz**	**Channel (Frequency) in MHz**
40 MHz			
G5 (7270)	G6 (7290)	G7 (7310)	G8 (7330)
G5' (7570)	G6' (7590)	G7' (7610)	G8' (7630)
G21 (7890)	G22 (G22')	G23 (7930)	G24 (7950)
G25 (7970)	G26 (7990)	G27 (8010)	G28 (8030)
G21' (8250)	G22' (8270)	G23' (8290)	G24' (8310)
G25' (8330)	G26' (8350)	G27' (8370)	G28' (8390)
50 MHz			
H4 (7250)	H5 (7275)	H6 (7300)	H4' (7550)
H5' (7575)	H6' (7600)	H17 (7900)	H18 (7925)
H19 (7950)	H20 (7975)	H21 (8000)	H22 (8025)
H17' (8260)	H18' (8285)	H19' (8310)	H20' (8335)
H21' (8360)	H22' (8385)		
60 MHz			
R3 (7240)	R4 (7270)	R5 (7300)	R3' (7540)
R4' (7570)	R5' (7600)	R14 (7900)	R15 (7930)
R16 (7960)	R17 (7990)	R18 (8020)	R14' (8260)
R15' (8290)	R16' (8320)	R17' (8350)	R18' (8380)

d. Unpaired-channels in Table 6 through 8 and Table 14 can be paired to use as symmetric paired-channels when symmetric paired-channels are not available, i.e. in congested areas or for frequency diversity configuration. Table 15 and Table 16 are showing center frequencies for unpaired-channels used as paired-channels.

Table 15 The Center Frequencies of the Unpaired Channel in the 10, 20 and 30 MHz Bandwidth Used as Symmetric Paired Channels

30MHz Bandwidth Channel (Frequency) in MHz	20MHz Bandwidth Channel (Frequency) in MHz	10MHz Bandwidth Channel (Frequency) in MHz	10MHz Bandwidth (cont') Channel (Frequency) in MHz
A3/A3' (7225 / 7525)	B4/B4' (7220 / 7520)	C7/C7' (7215 / 7515)	C46/C46' (7905 / 8265)
A4/A4' (7255 / 7555)	B5/B5' (7240 / 7540)	C8/C8' (7225 / 7525)	C47/C47' (7915 / 8275)
A5/A5' (7285 / 7585)	B6/B6' (7260 / 7560)	C9/C9' (7235 / 7535)	C48/C48' (7925 / 8285)
A6/A6' (7315 / 7615)	B7/B7' (7280 / 7580)	C10/C10' (7245 / 7545)	C49/C49' (7935 / 8295)
A15/A15' (7885 / 8245)	B8/B8' (7300 / 7600)	C11/C11' (7255 / 7555)	C50/C50' (7945 / 8305)
A16/A16' (7915 / 8275)	B9/B9' (7320 / 7620)	C12/C12' (7265 / 7565)	C51/C51' (7955 / 8315)
A17/A17' (7945 / 8305)	B22/B22' (7880 / 8240)	C13/C13' (7275 / 7575)	C52/C52' (7965 / 8325)
A18/A18' (7975 / 8335)	B23/B23' (7900 / 8260)	C14/C14' (7285 / 7585)	C53/C53' (7975 / 8335)
A19/A19' (8005 / 8365)	B24/B24' (7920 / 8280)	C15/C15' (7295 / 7595)	C54/C54' (7985 / 8345)
A20/A20' (8035 / 8395)	B25/B25' (7940 / 8300)	C16/C16' (7305 / 7605)	C55/C55' (7995 / 8355)
	B26/B26' (7960 / 8320)	C17/C17' (7315 / 7615)	C56/C56' (8005 / 8365)
	B27/B27' (7980 / 8340)	C18/C18' (7325 / 7625)	C57/C57' (8015 / 8375)
	B28/B28' (8000 / 8360)	C43/C43' (7875 / 8235)	C58/C58' (8025 / 8385)
	B29/B29' (8020 / 8380)	C44/C44' (7885 / 8245)	C59/C59' (8035 / 8395)
	B30/B30' (8040 / 8400)	C45/C45' (7895 / 8255)	C60/C60' (8045 / 8405)

Table 16 The Center Frequencies of the Unpaired Channel in the 40, 50 and 60 MHz Bandwidth Used as Symmetric Paired Channels

40MHz Bandwidth Channel (Frequency) in MHz	50MHz Bandwidth Channel (Frequency) in MHz	60MHz Bandwidth Channel (Frequency) in MHz
G5/G5' (7250 / 7550)	H4/H4' (7250 / 7550)	R3/R3' (7240 / 7540)
G6/G6' (7270 / 7570)	H5/H5' (7275 / 7575)	R4/R4' (7270 / 7570)
G7/G7' (7290 / 7590)	H6/H6' (7300 / 7600)	R5/R5' (7300 / 7600)
G8/G8' (7310 / 7610)	H17/H17' (7900 / 8260)	R14/R14' (7900 / 8260)
G21/G21' (7890 / 8250)	H18/H18' (7925 / 8285)	R15/R15' (7930 / 8290)
G22/G22' (7910 / 8270)	H19/H19' (7950 / 8310)	R16/R16' (7960 / 8320)
G23/G23' (7930 / 8290)	H20/H20' (7975 / 8335)	R17/R17' (7990 / 8350)
G24/G24' (7950 / 8310)	H21/H21' (8000 / 8360)	R18/R18' (8020 / 8380)
G25/G25' (7970 / 8330)	H22/H22' (8025 / 8385)	
G26/G26' (7990 / 8350)		
G27/G27' (8010 / 8370)		
G28/G28' (8030 / 8390)		

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