



**FEDERAL COMMUNICATIONS COMMISSION**  
**OFFICE OF ENGINEERING AND TECHNOLOGY**  
**POLICY AND BILLS DIVISION**

**FCC ONLINE TABLE OF FREQUENCY ALLOCATIONS**

**47 C.F.R. § 2.106**

**Revised on April 4, 2024**

**Disclaimer:** The Table of Frequency Allocations as published by the Federal Register and codified in the Code of Federal Regulations remains the legal source material. This Online Table of Frequency Allocations may display amendments that have been adopted by the FCC but that have not yet taken effect.

NOTE: If a Rule Part is listed in the last column of the Allocation Table, click here to find those [Rules](#).

Contact Jamie Coleman at 202-418-2705 if you have any questions or comments.<sup>1</sup>

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<sup>1</sup> The International Table (columns 1-3 of § 2.106) reflects Article 5, Section IV of the ITU Radio Regulations (Edition of 2016), except for the revisions listed below:

Band; Table	Action
2120-2170 MHz; Regions 1 & 3	The bands 2120-2160 and 2160-2170 MHz are combined.
9.3-9.5 GHz, all Regions	Reference to 5.475 placed to the right of RADIONAVIGATION.
24.25-24.45 GHz; Region 3	The radio services are listed in French alphabetical order.
International Footnote	Action (The notation "(FCC)" has been appended to these footnotes)
5.134, 5.197A, 5.329, 5.345, 5.351A, 5.353A, 5.389A, 5.389C, 5.396, 5.446C, 5.516B, 5.547	The cross-references to ITU Resolutions 33, 75, 143, 212, 222, 225, 413, 418, 517, 528, 555, 608, and 716 have been updated to reflect the version listed in the Radio Regulations.
5.208B	Note is not shown.

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)			Below 8.3 (Not Allocated)		
5.53 5.54			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			14-19.95 FIXED MARITIME MOBILE 5.57	14-19.95 Fixed	
5.55 5.56			US2	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			20.05-59 FIXED MARITIME MOBILE 5.57	20.05-59 FIXED	

			US2	US2	
			59-61		
			STANDARD FREQUENCY AND TIME SIGNAL (60 kHz)		
			US2		
			61-70	61-70	
			FIXED	FIXED	
			MARITIME MOBILE 5.57		
5.56 5.58			US2	US2	
70-72	70-90	70-72	70-90	70-90	Private Land Mobile (90)
RADIONAVIGATION 5.60	FIXED	RADIONAVIGATION 5.60	FIXED	FIXED	
	MARITIME MOBILE 5.57	Fixed	MARITIME MOBILE 5.57	Radiolocation	
	MARITIME RADIONAVIGATION 5.60	Maritime mobile 5.57	Radiolocation		
	Radiolocation	5.59			
72-84		72-84			
FIXED		FIXED			
MARITIME MOBILE 5.57		MARITIME MOBILE 5.57			
RADIONAVIGATION 5.60		RADIONAVIGATION 5.60			
5.56					
84-86		84-86			
RADIONAVIGATION 5.60		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					
115-117.6 RADIONAVIGATION 5.60 Fixed Maritime mobile  5.64 5.66					
117.6-126 FIXED MARITIME MOBILE					

RADIONAVIGATION 5.60		RADIONAVIGATION 5.60			
5.64		5.64			
126-129		126-129			
RADIONAVIGATION 5.60		RADIONAVIGATION 5.60			
		Fixed			
		Maritime mobile			
		5.64 5.65			
129-130		129-130			
FIXED		FIXED			
MARITIME MOBILE		MARITIME MOBILE			
RADIONAVIGATION 5.60		RADIONAVIGATION 5.60			
5.64	5.61 5.64	5.64	5.64 US2		
130-135.7	130-135.7	130-135.7	130-135.7		
FIXED	FIXED	FIXED	FIXED		Maritime (80)
MARITIME MOBILE	MARITIME MOBILE	MARITIME MOBILE	MARITIME MOBILE		
		RADIONAVIGATION			
5.64 5.67	5.64	5.64	5.64 US2		
135.7-137.8	135.7-137.8	135.7-137.8	135.7-137.8	135.7-137.8	
FIXED	FIXED	FIXED	FIXED	Amateur 5.67A	Amateur Radio (97)
MARITIME MOBILE	MARITIME MOBILE	MARITIME MOBILE	MARITIME MOBILE		
Amateur 5.67A	Amateur 5.67A	RADIONAVIGATION			
		Amateur 5.67A			
5.64 5.67 5.67B	5.64	5.64 5.67B	5.64 US2	US2	

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	137.8-160 FIXED MARITIME MOBILE RADIONAVIGATION	137.8-160 FIXED MARITIME MOBILE		Maritime (80)
148.5-255 BROADCASTING	5.64 160-190 FIXED	5.64 160-190 FIXED Aeronautical radionavigation	5.64 US2 160-190 FIXED MARITIME MOBILE US2	160-190 FIXED US2	
5.68 5.69 5.70 255-283.5 BROADCASTING AERONAUTICAL RADIONAVIGATION	190-200 AERONAUTICAL RADIONAVIGATION  200-275 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	200-285 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	190-200 AERONAUTICAL RADIONAVIGATION US18 US2 200-275 AERONAUTICAL RADIONAVIGATION US18 Aeronautical mobile US2		Aviation (87)
5.70 283.5-315 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73	275-285 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons)		275-285 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons) US2 US18		



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 US79A AERONAUTICAL RADIONAVIGATION	



435-472			435-472	435-472	
MARITIME MOBILE 5.79			MARITIME MOBILE US79A	MARITIME MOBILE US79A	
Aeronautical radionavigation 5.77			Aeronautical radionavigation		
5.82	5.78 5.82		5.82 US2 US231	5.82 US2 US231	
472-479			472-479	472-479	
MARITIME MOBILE 5.79				Amateur 5.80A	Amateur Radio (97)
Amateur 5.80A					
Aeronautical radionavigation 5.77 5.80					
5.80B 5.82			US2	5.82 US2 NG8	
479-495	479-495		479-495	479-495	
MARITIME MOBILE 5.79 5.79A	MARITIME MOBILE 5.79 5.79A		MARITIME MOBILE US79A	MARITIME MOBILE US79A	Maritime (80)
Aeronautical radionavigation 5.77	Aeronautical radionavigation 5.77 5.80		5.79A	5.79A	
			Aeronautical radionavigation		
5.82	5.82		5.82 US2 US231	5.82 US2 US231	
495-505			495-505		
MARITIME MOBILE 5.82C			MARITIME MOBILE		Maritime (80)
					Aviation (87)
505-526.5	505-510	505-526.5	505-510		
MARITIME MOBILE 5.79 5.79A 5.84	MARITIME MOBILE 5.79	MARITIME MOBILE 5.79 5.79A 5.84	MARITIME MOBILE US79A		Maritime (80)
AERONAUTICAL RADIONAVIGATION	510-525	AERONAUTICAL RADIONAVIGATION	510-525		
	MARITIME MOBILE 5.79A 5.84	Aeronautical mobile	MARITIME MOBILE (ships only) 5.79A 5.84		Maritime (80)
	AERONAUTICAL RADIONAVIGATION	Land mobile	AERONAUTICAL RADIONAVIGATION (radiobeacons) US18		Aviation (87)
			US14 US225		
	525-535		525-535		

526.5-1606.5 BROADCASTING	BROADCASTING 5.86 AERONAUTICAL RADIONAVIGATION	526.5-535 BROADCASTING Mobile 5.88	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		1605-1615 1605-1705	
1606.5-1625 FIXED MARITIME MOBILE 5.90 LAND MOBILE 5.92	BROADCASTING 5.89 5.90	1606.5-1800 FIXED MOBILE RADIOLOCATION RADIONAVIGATION	MOBILE US221 G127 1615-1705	Radio Broadcast (AM)(73) Alaska Fixed (80) Private Land Mobile (90)
1625-1635 RADIOLOCATION 5.93	1625-1705 FIXED MOBILE BROADCASTING 5.89		US299	
1635-1800 FIXED MARITIME MOBILE 5.90 LAND MOBILE	Radiolocation 5.90		US299 NG1 NG5	
	1705-1800 FIXED MOBILE RADIOLOCATION AERONAUTICAL RADIONAVIGATION		1705-1800 FIXED MOBILE RADIOLOCATION US240	Alaska Fixed (80) Private Land Mobile (90)
5.92 5.96		5.91		

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          1850-2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIOLOCATION RADIONAVIGATION 5.102	1800-2000  AMATEUR FIXED MOBILE except aeronautical mobile RADIONAVIGATION Radiolocation       5.97	1800-2000	1800-2000  AMATEUR          NG92	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					
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		US340	US340 NG7	
LAND MOBILE	2065-2107	2065-2107		
	MARITIME MOBILE 5.105	MARITIME MOBILE 5.105		Maritime (80)
	5.106	US296 US340		
5.92	2107-2170	2107-2170	2107-2170	
2160-2170	FIXED	FIXED	FIXED	Maritime (80)
RADIOLOCATION	MOBILE	MOBILE	MOBILE except aeronautical mobile	Private Land Mobile (90)
5.93 5.107		US340	US340 NG7	
2170-2173.5		2170-2173.5	2170-2173.5	
MARITIME MOBILE		MARITIME MOBILE (telephony)	MARITIME MOBILE	Maritime (80)
		US340	US340	
2173.5-2190.5		2173.5-2190.5		
MOBILE (distress and calling)		MOBILE (distress and calling)		Maritime (80)
5.108 5.109 5.110 5.111		5.108 5.109 5.110 5.111 US279 US340		Aviation (87)
2190.5-2194		2190.5-2194	2190.5-2194	
MARITIME MOBILE		MARITIME MOBILE (telephony)	MARITIME MOBILE	Maritime (80)
		US340	US340	

2194-2300	2194-2300	2194-2495	2194-2495	Maritime (80) Private Land Mobile (90)
FIXED MOBILE except aeronautical mobile (R)  5.92 5.103 5.112	FIXED MOBILE  5.112	FIXED MOBILE  US22 US340	FIXED MOBILE except aeronautical mobile  US22 US340 NG7	
2300-2498	2300-2495	2495-2505 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)	2495-2505 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)	
FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113	FIXED MOBILE BROADCASTING 5.113			
5.103	2495-2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)			
2498-2501	2501-2502 STANDARD FREQUENCY AND TIME SIGNAL  Space research	US1 US340		
STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)				
2502-2625	2502-2505 STANDARD FREQUENCY AND TIME SIGNAL	2505-2850 FIXED MOBILE US285	2505-2850 FIXED MOBILE except aeronautical mobile US285	Maritime (80) Aviation (87) Private Land Mobile (90)
FIXED MOBILE except aeronautical mobile (R)  5.92 5.103 5.114	2505-2850 FIXED MOBILE			
2625-2650	5.92			
MARITIME MOBILE MARITIME RADIONAVIGATION				

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		



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  3.75-4	3.5-3.9 AMATEUR FIXED MOBILE	3.5-4	3.5-4 AMATEUR	Amateur Radio (97)
3.8-3.9 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	AMATEUR FIXED MOBILE except aeronautical mobile (R)				
3.9-3.95 AERONAUTICAL MOBILE (OR)		3.9-3.95 AERONAUTICAL MOBILE BROADCASTING			
5.123					
3.95-4	5.122 5.125	3.95-4	US340	US340	

FIXED BROADCASTING		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)	5.003-5.005 STANDARD FREQUENCY AND TIME SIGNAL Space research		4.995-5.005 STANDARD FREQUENCY AND TIME SIGNAL (5 MHz)  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	5.25-5.275 FIXED	5.25-5.275 FIXED	5.25-5.275 FIXED		Maritime (80)

MOBILE except aeronautical mobile Radiolocation 5.132A 5.133A	MOBILE except aeronautical mobile RADIOLOCATION 5.132A	MOBILE except aeronautical mobile Radiolocation 5.132A	MOBILE except aeronautical mobile RADIOLOCATION 5.132A US340	Private Land Mobile (90)
5.275-5.3515 FIXED MOBILE except aeronautical mobile 5.3515-5.3665 FIXED MOBILE except aeronautical mobile Amateur 5.133B 5.3665-5.45 FIXED MOBILE except aeronautical mobile			5.275-5.45 FIXED US22 Mobile except aeronautical mobile US23 US340	Maritime (80) Aviation (87) Private Land Mobile (90) Amateur Radio (97)
5.45-5.48 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE 5.48-5.68 AERONAUTICAL MOBILE (R) 5.111 5.115	5.45-5.48 AERONAUTICAL MOBILE (R)	5.45-5.48 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5.45-5.68 AERONAUTICAL MOBILE (R) 5.111 5.115 US283 US340	Aviation (87)
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	5.73-5.9	5.73-5.9	5.73-5.9		Maritime (80) Aviation (87) Private Land Mobile (90)
FIXED	FIXED	FIXED	FIXED		
LAND MOBILE	MOBILE except aeronautical mobile (R)	Mobile except aeronautical mobile (R)	MOBILE except aeronautical mobile (R)	US340	
5.9-5.95			5.9-6.2		International Broadcast Stations (73F)
BROADCASTING 5.134			BROADCASTING 5.134		
5.136					
5.95-6.2				US136 US340	
BROADCASTING					
6.2-6.525			6.2-6.525		Maritime (80)
MARITIME MOBILE 5.109 5.110 5.130 5.132			MARITIME MOBILE 5.109 5.110 5.130 5.132 US82		
5.137			US296 US340		
6.525-6.685			6.525-6.685		Aviation (87)
AERONAUTICAL MOBILE (R)			AERONAUTICAL MOBILE (R)	US283 US340	
6.685-6.765			6.685-6.765		
AERONAUTICAL MOBILE (OR)			AERONAUTICAL MOBILE (OR)		
			US340		
6.765-7			6.765-7		ISM Equipment (18) Private Land Mobile (90)
FIXED			FIXED US22		
MOBILE except aeronautical mobile (R)			MOBILE except aeronautical mobile (R)		

5.138			5.138 US340		
7-7.1 AMATEUR AMATEUR-SATELLITE 5.140 5.141 5.141A			7-7.2		Amateur Radio (97)
7.1-7.2 AMATEUR 5.142 5.141A 5.141B			7-7.1 AMATEUR AMATEUR-SATELLITE 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	7.4-7.45 FIXED MOBILE except aeronautical mobile (R)	7.4-7.45 BROADCASTING	7.4-7.45 FIXED MOBILE except aeronautical mobile (R) US142 US340	7.4-7.45 FIXED MOBILE except aeronautical mobile (R)	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			8.1-8.195	Maritime (80)
FIXED MARITIME MOBILE			FIXED MARITIME MOBILE  US340	
8.195-8.815			8.195-8.815	Maritime (80) Aviation (87)
MARITIME MOBILE 5.109 5.110 5.132 5.145  5.111			MARITIME MOBILE 5.109 5.110 5.132 5.145 US82  5.111 US296 US340	
8.815-8.965			8.815-8.965	Aviation (87)
AERONAUTICAL MOBILE (R)			AERONAUTICAL MOBILE (R)  US340	
8.965-9.04			8.965-9.04	
AERONAUTICAL MOBILE (OR)			AERONAUTICAL MOBILE (OR)  US340	
9.04-9.305	9.04-9.4 FIXED	9.04-9.305	9.04-9.4 FIXED	Maritime (80) Private Land Mobile (90)
9.305-9.355		9.305-9.355		
FIXED Radiolocation 5.145A  5.145B		FIXED Radiolocation 5.145A		
9.355-9.4		9.355-9.4		
FIXED		FIXED	US340	
9.4-9.5			9.4-9.9	International Broadcast
BROADCASTING 5.134			BROADCASTING 5.134	

5.146			Stations (73F)
9.5-9.9			
BROADCASTING			
5.147	US136 US340		
9.9-9.995	9.9-9.995		Private Land Mobile (90)
FIXED	FIXED		
	US340		
9.995-10.003	9.995-10.005		
STANDARD FREQUENCY AND TIME SIGNAL (10 MHz)	STANDARD FREQUENCY AND TIME SIGNAL (10 MHz)		
5.111			
10.003-10.005			
STANDARD FREQUENCY AND TIME SIGNAL			
Space research			
5.111	5.111 US1 US340		
10.005-10.1	10.005-10.1		Aviation (87)
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE (R)		
5.111	5.111 US283 US340		
10.1-10.15	10.1-10.15	10.1-10.15	Amateur Radio (97)
FIXED		AMATEUR US247	
Amateur	US247 US340	US340	
10.15-11.175	10.15-11.175		Private Land Mobile (90)
FIXED	FIXED		

Mobile except aeronautical mobile (R)

Mobile except aeronautical mobile (R)

US340

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
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          US136 US340		International Broadcast Stations (73F)
11.65-12.05 BROADCASTING  5.147					
12.05-12.1 BROADCASTING 5.134					
5.146					

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		14.25-14.35 AMATEUR	
5.152	US340	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)	14.99-15.01 STANDARD FREQUENCY AND TIME SIGNAL (15 MHz)		
5.111 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		

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
15.1-15.6			15.1-15.8		International Broadcast Stations (73F)
BROADCASTING			BROADCASTING 5.134		
15.6-15.8					
BROADCASTING 5.134					
5.146			US136 US340		
15.8-16.1			15.8-16.1		Private Land Mobile (90)
FIXED			FIXED		
5.153			US340		
16.1-16.2	16.1-16.2	16.1-16.2	16.1-16.2		
FIXED	FIXED	FIXED	FIXED		
Radiolocation 5.145A	RADIOLOCATION 5.145A	Radiolocation 5.145A	RADIOLOCATION 5.145A		
5.145B			US340		
16.2-16.36			16.2-16.36		
FIXED			FIXED		
			US340		
16.36-17.41			16.36-17.41		Maritime (80)
MARITIME MOBILE 5.109 5.110 5.132 5.145			MARITIME MOBILE 5.109 5.110 5.132 5.145 US82		
			US296 US340		
17.41-17.48			17.41-17.48		Private Land Mobile (90)
FIXED			FIXED		
			US340		



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)
18.052-18.068 FIXED Space research	US340		Private Land Mobile (90)
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		Maritime (80) Private Land Mobile (90)

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US340

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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 US1 US340	

5.111			
20.01-21	20.01-21	20.01-21	
FIXED	FIXED	FIXED	Private Land Mobile (90)
Mobile	Mobile		
	US340	US340	
21-21.45	21-21.45	21-21.45	
AMATEUR		AMATEUR	Amateur Radio (97)
AMATEUR-SATELLITE		AMATEUR-SATELLITE	
	US340	US340	
21.45-21.85	21.45-21.85		
BROADCASTING	BROADCASTING		International Broadcast Stations (73F)
	US340		
21.85-21.87	21.85-21.924		
FIXED 5.155A	FIXED		Aviation (87) Private Land Mobile (90)
5.155			
21.87-21.924	US340		
21.924-22	21.924-22		
AERONAUTICAL MOBILE (R)	AERONAUTICAL MOBILE (R)		Aviation (87)
	US340		
22-22.855	22-22.855		
MARITIME MOBILE 5.132	MARITIME MOBILE 5.132 US82		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			22.855-23		Private Land Mobile (90)
FIXED			FIXED		
5.156			US340		
23-23.2			23-23.2	23-23.2	Private Land Mobile (90)
FIXED			FIXED	FIXED	
Mobile except aeronautical mobile (R)			Mobile except aeronautical mobile (R)		
5.156			US340	US340	
23.2-23.35			23.2-23.35		Private Land Mobile (90)
FIXED 5.156A			AERONAUTICAL MOBILE (OR)		
AERONAUTICAL MOBILE (OR)			US340		
23.35-24			23.35-24.45	23.35-24.45	Private Land Mobile (90)
FIXED			FIXED	FIXED	
MOBILE except aeronautical mobile 5.157			MOBILE except aeronautical mobile		
24-24.45			24-24.45		Private Land Mobile (90)
FIXED			FIXED		
LAND MOBILE			US340		
24.45-24.6	24.45-24.65	24.45-24.6	24.45-24.65	24.45-24.65	Private Land Mobile (90)
FIXED	FIXED	FIXED	FIXED	FIXED	
LAND MOBILE	LAND MOBILE	LAND MOBILE	MOBILE except aeronautical mobile	RADIOLOCATION 5.132A	
Radiolocation 5.132A	RADIOLOCATION 5.132A	Radiolocation 5.132A	RADIOLOCATION 5.132A		
5.158					

24.6-24.89		24.6-24.89		
FIXED		FIXED	US340	US340
LAND MOBILE		LAND MOBILE		
	24.65-24.89		24.65-24.89	24.65-24.89
	FIXED		FIXED	FIXED
	LAND MOBILE		MOBILE except aeronautical mobile	
			US340	US340
24.89-24.99			24.89-24.99	24.89-24.99
AMATEUR				AMATEUR
AMATEUR-SATELLITE				AMATEUR-SATELLITE
			US340	US340
24.99-25.005			24.99-25.01	
STANDARD FREQUENCY AND TIME SIGNAL (25 MHz)			STANDARD FREQUENCY AND TIME SIGNAL (25 MHz)	
25.005-25.01				
STANDARD FREQUENCY AND TIME SIGNAL			US1 US340	
Space research				
25.01-25.07			25.01-25.07	25.01-25.07
FIXED				LAND MOBILE
MOBILE except aeronautical mobile				
			US340	US340 NG112
25.07-25.21			25.07-25.21	25.07-25.21
MARITIME MOBILE			MARITIME MOBILE US82	MARITIME MOBILE US82
			US281 US296 US340	US281 US296 US340 NG112
				Maritime (80)
				Private Land Mobile (90)

25.21-25.55			25.21-25.33	25.21-25.33	Private Land Mobile (90)
FIXED MOBILE except aeronautical mobile			US340	LAND MOBILE US340	
25.55-25.67			25.33-25.55	25.33-25.55	
RADIO ASTRONOMY  5.149			FIXED MOBILE except aeronautical mobile US340	US340	
25.67-26.1			25.55-25.67		International Broadcast Stations (73F) Remote Pickup (74D)
BROADCASTING			RADIO ASTRONOMY US74 US342		
26.1-26.175			26.1-26.1		Remote Pickup (74D) Low Power Auxiliary (74H) Maritime (80)
MARITIME MOBILE 5.132			BROADCASTING US25 US340		
26.175-26.2			26.1-26.175		Remote Pickup (74D) Low Power Auxiliary (74H)
FIXED MOBILE except aeronautical mobile			MARITIME MOBILE 5.132 US25 US340	26.175-26.2 LAND MOBILE US340	
26.2-26.35	26.2-26.42	26.2-26.35	26.175-26.2	26.175-26.2	Remote Pickup (74D) Low Power Auxiliary (74H)
FIXED	FIXED	FIXED	US340	LAND MOBILE US340	
26.2-26.35	26.2-26.42	26.2-26.35	26.2-26.42	26.2-26.42	Remote Pickup (74D)
FIXED	FIXED	FIXED	RADIOLOCATION US132A	LAND MOBILE	



MOBILE except aeronautical mobile Radiolocation 5.132A 5.133A	MOBILE except aeronautical mobile RADIOLOCATION 5.132A	MOBILE except aeronautical mobile Radiolocation 5.132A		RADIOLOCATION US132A	Low Power Auxiliary (74H) Private Land Mobile (90)
26.35-27.5		26.35-27.5	US340	US340	
FIXED	26.42-27.5	FIXED	26.42-26.48	26.42-26.48	
MOBILE except aeronautical mobile 5.150	FIXED MOBILE except aeronautical mobile 5.150	MOBILE except aeronautical mobile 5.150	US340	LAND MOBILE US340	Remote Pickup (74D) Low Power Auxiliary (74H)
			26.48-26.95	26.48-26.95	
			FIXED MOBILE except aeronautical mobile 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 5.150 US340	ISM Equipment (18) Private Land Mobile (90) Personal Radio (95)
				5.150 US340	

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
(See previous page)			27.41-27.54	27.41-27.54	Private Land Mobile (90)
27.5-28				FIXED	
METEOROLOGICAL AIDS				LAND MOBILE	
FIXED			US340	US340	
MOBILE			27.54-28	27.54-28	
			FIXED		
			MOBILE		
			US298 US340	US298 US340	
28-29.7			28-29.7	28-29.7	Amateur Radio (97)
AMATEUR				AMATEUR	
AMATEUR-SATELLITE				AMATEUR-SATELLITE	
			US340	US340	
29.7-30.005			29.7-29.89	29.7-29.8	Private Land Mobile (90)
FIXED				LAND MOBILE	
MOBILE				US340	
				29.8-29.89	
				FIXED	
			US340	US340	
			29.89-29.91	29.89-29.91	
			FIXED		
			MOBILE		

	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 NG124	Private Land Mobile (90)
	32-33 FIXED MOBILE	32-33	
	33-34	33-34 FIXED LAND MOBILE NG124	Private Land Mobile (90)

			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			37.5-38 Radio astronomy US342	37.5-38 LAND MOBILE Radio astronomy US342 NG59 NG124	
5.149			38-38.25 FIXED MOBILE RADIO ASTRONOMY US81 US342	38-38.25 RADIO ASTRONOMY US81 US342	
38.25-39 FIXED	38.25-39.986 FIXED	38.25-39.5 FIXED	38.25-39 FIXED	38.25-39	

MOBILE	MOBILE	MOBILE	MOBILE		
39-39.5			39-40	39-40	Private Land Mobile (90)
FIXED				LAND MOBILE	
MOBILE Radiolocation 5.132A					
5.159					
39.5-39.986		39.5-39.986			
FIXED		FIXED			
MOBILE		MOBILE			
		RADIOLOCATION 5.132A			
39.986-40.02		39.986-40			
FIXED		FIXED			
MOBILE		MOBILE			
Space research		RADIOLOCATION 5.132A			
		Space research		NG124	
		40-40.02	40-41.015	40-41.015	ISM Equipment (18) Private Land Mobile (90)
		FIXED	FIXED		
		MOBILE	MOBILE		
		Space research			
40.02-40.98					
FIXED					
MOBILE					
5.150			5.150 US210 US220	5.150 US210 US220	

International Table			United States Table		FCC Rule Part(s)
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			40-41.015 MHz: 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			43.35-44 RADIOLOCATION US132A	43.35-43.69 FIXED	

MOBILE				LAND MOBILE RADIOLOCATION US132A NG124	
5.160 5.161 5.161A				43.69-44 LAND MOBILE RADIOLOCATION US132A NG124	Private Land Mobile (90)
44-47 FIXED MOBILE			44-46.6	44-46.6 LAND MOBILE NG124 NG141	
5.162 5.162A			46.6-47 FIXED MOBILE	46.6-47	
47-50 BROADCASTING	47-50 FIXED MOBILE	47-50 FIXED MOBILE BROADCASTING	47-49.6	47-49.6 LAND MOBILE NG124	Private Land Mobile (90)
5.162A 5.163 5.164 5.165			49.6-50 FIXED MOBILE	49.6-50	
50-52 BROADCASTING Amateur 5.166A 5.166B 5.166C 5.166D 5.166E 5.169 5.169A	50-54 AMATEUR		50-54	50-54 AMATEUR	Amateur Radio (97)

5.169B					
5.162A 5.164 5.165	5.162A 5.167 5.167A 5.168 5.170				
52-68 BROADCASTING	54-68 BROADCASTING Fixed Mobile	54-68 FIXED MOBILE BROADCASTING	54-73	54-72 BROADCASTING	Broadcast Radio (TV)(73) LPTV, TV Translator/ Booster (74G) Low Power Auxiliary (74H)
5.162A 5.163 5.164 5.165 5.169 5.169A 5.169B 5.171	5.172	5.162A			
68-74.8 FIXED MOBILE except aeronautical mobile	68-72 BROADCASTING Fixed Mobile 5.173	68-74.8 FIXED MOBILE		NG5 NG14 NG115 NG149	
	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		74.6-74.8		



5.149 5.175 5.177 5.179	FIXED MOBILE	5.149 5.176 5.179	FIXED MOBILE US273	Private Land Mobile (90)	
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)
5.175 5.179 5.187	76-88 BROADCASTING Fixed	5.182 5.183 5.188 87-100 FIXED		76-88 BROADCASTING	Broadcast Radio (TV)(73) LPTV, TV Translator/ Booster (74G) Low Power Auxiliary (74H)
87.5-100 BROADCASTING	Mobile 5.185	MOBILE BROADCASTING		NG5 NG14 NG115 NG149	
5.190	88-100 BROADCASTING		88-108	88-108 BROADCASTING NG2	Broadcast Radio (FM)(73)

100-108 BROADCASTING  5.192 5.194	  US93	  US93 NG5	FM Translator/Booster (74L)
108-117.975 AERONAUTICAL RADIONAVIGATION  5.197 5.197A	108-117.975 AERONAUTICAL RADIONAVIGATION  5.197A US93		Aviation (87)  Page 20

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
117.975-137			117.975-121.9375		Aviation (87)
AERONAUTICAL MOBILE (R)			AERONAUTICAL MOBILE (R)		
			5.111 5.200 US26 US28 US36		
			121.9375-123.0875	121.9375-123.0875	
			US30 US31 US33 US80	AERONAUTICAL MOBILE	
			US102 US213	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	136-137	
				AERONAUTICAL MOBILE (R)	
5.111 5.200 5.201 5.202			US244	US244	

<p>137-137.025</p> <p>SPACE OPERATION (space-to-Earth) 5.203C</p> <p>METEOROLOGICAL-SATELLITE (space-to-Earth)</p> <p>MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209</p> <p>SPACE RESEARCH (space-to-Earth)</p> <p>Fixed</p> <p>Mobile except aeronautical mobile (R)</p> <p>5.204 5.205 5.206 5.207 5.208</p>	<p>137-137.025</p> <p>SPACE OPERATION (space-to-Earth)</p> <p>METEOROLOGICAL-SATELLITE (space-to-Earth)</p> <p>MOBILE-SATELLITE (space-to-Earth) US319 US320</p> <p>SPACE RESEARCH (space-to-Earth)</p> <p>5.208</p>	<p>Satellite Communications (25)</p>	
<p>137.025-137.175</p> <p>SPACE OPERATION (space-to-Earth) 5.203C</p> <p>METEOROLOGICAL-SATELLITE (space-to-Earth)</p> <p>SPACE RESEARCH (space-to-Earth)</p> <p>Fixed</p> <p>Mobile except aeronautical mobile (R)</p> <p>Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209</p> <p>5.204 5.205 5.206 5.207 5.208</p>	<p>137.025-137.175</p> <p>SPACE OPERATION (space-to-Earth)</p> <p>METEOROLOGICAL-SATELLITE (space-to-Earth)</p> <p>SPACE RESEARCH (space-to-Earth)</p> <p>Mobile-satellite (space-to-Earth) US319 US320</p> <p>5.208</p>		
<p>137.175-137.825</p> <p>SPACE OPERATION (space-to-Earth) 5.203C 5.209A</p> <p>METEOROLOGICAL-SATELLITE (space-to-Earth)</p> <p>MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209</p> <p>SPACE RESEARCH (space-to-Earth)</p> <p>Fixed</p> <p>Mobile except aeronautical mobile (R)</p> <p>5.204 5.205 5.206 5.207 5.208</p>	<p>137.175-137.825</p> <p>SPACE OPERATION (space-to-Earth)</p> <p>METEOROLOGICAL-SATELLITE (space-to-Earth)</p> <p>MOBILE-SATELLITE (space-to-Earth) US319 US320</p> <p>SPACE RESEARCH (space-to-Earth)</p> <p>5.208</p>		

137.825-138			137.825-138	
SPACE OPERATION (space-to-Earth) 5.203C			SPACE OPERATION (space-to-Earth)	
METEOROLOGICAL-SATELLITE (space-to-Earth)			METEOROLOGICAL-SATELLITE (space-to-Earth)	
SPACE RESEARCH (space-to-Earth)			SPACE RESEARCH (space-to-Earth)	
Fixed			Mobile-satellite (space-to-Earth) US319 US320	
Mobile except aeronautical mobile (R)				
Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209				
5.204 5.205 5.206 5.207 5.208			5.208	
138-143.6	138-143.6	138-143.6	138-144	138-144
AERONAUTICAL MOBILE (OR)	FIXED	FIXED	FIXED	
	MOBILE	MOBILE	MOBILE	
	RADIOLOCATION	Space research (space-to-Earth)		
	Space research (space-to-Earth)			
5.210 5.211 5.212 5.214		5.207 5.213		
143.6-143.65	143.6-143.65	143.6-143.65		
AERONAUTICAL MOBILE (OR)	FIXED	FIXED		
SPACE RESEARCH (space-to-Earth)	MOBILE	MOBILE		
	RADIOLOCATION	SPACE RESEARCH (space-to-Earth)		
	SPACE RESEARCH (space-to-Earth)			
5.211 5.212 5.214		5.207 5.213		
143.65-144	143.65-144	143.65-144		
AERONAUTICAL MOBILE (OR)	FIXED	FIXED		
	MOBILE	MOBILE		
	RADIOLOCATION	Space research (space-to-Earth)		
	Space research (space-to-Earth)			
5.210 5.211 5.212 5.214		5.207 5.213	G30	

144-146 AMATEUR AMATEUR-SATELLITE  5.216			144-148	144-146 AMATEUR AMATEUR-SATELLITE	Amateur Radio (97)
146-148 FIXED MOBILE except aeronautical mobile (R)	146-148 AMATEUR  5.217	146-148 AMATEUR FIXED MOBILE  5.217		146-148 AMATEUR	
148-149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 5.209  5.218 5.218A 5.219 5.221	148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209  5.218 5.218A 5.219 5.221	148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) US319 US320 US323 US325  5.218 5.219 G30	148-149.9 FIXED MOBILE-SATELLITE (Earth-to-space) US320 US323 US325  5.218 5.219 US319	Satellite Communications (25)	
149.9-150.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220		149.9-150.05 MOBILE-SATELLITE (Earth-to-space) US319 US320 RADIONAVIGATION-SATELLITE			
150.05-153 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY	150.05-154 FIXED MOBILE	150.05-150.8 FIXED MOBILE	150.05-150.8		

5.149

5.225

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150.05-153 MHz: see previous page	150.05-154 MHz: see previous page		150.8-152.855	150.8-152.855 FIXED LAND MOBILE NG4 NG51 NG112 US73 NG124	Public Mobile (22) Private Land Mobile (90) Personal Radio (95)
153-154 FIXED MOBILE except aeronautical mobile (R) Meteorological aids			152.855-156.2475	152.855-154 LAND MOBILE NG4 NG124	Remote Pickup (74D) Private Land Mobile (90)
154-156.4875 FIXED MOBILE except aeronautical mobile (R)	154-156.4875 FIXED MOBILE	154-156.4875 FIXED MOBILE		154-156.2475 FIXED LAND MOBILE NG112 5.226 NG22 NG124 NG148	Maritime (80) Private Land Mobile (90) Personal Radio (95)
5.225A 5.226	5.226	5.225A 5.226			
156.4875-156.5625 MARITIME MOBILE (distress and calling via DSC)			156.2475-156.5125 5.226 US52 US227 US266	156.2475-156.5125 MARITIME MOBILE NG22 5.226 US52 US227 US266 NG124	Maritime (80) Aviation (87)
			156.5125-156.5375 MARITIME MOBILE (distress, urgency, safety and calling via DSC) 5.111 5.226 US266		
5.111 5.226 5.227			156.5375-156.7625	156.5375-156.7625	



156.5625-156.7625	156.5625-156.7625			MARITIME MOBILE	
FIXED	FIXED				
MOBILE except aeronautical mobile (R)	MOBILE				
5.226	5.226		5.226 US52 US227 US266	5.226 US52 US227 US266	
156.7625-156.7875	156.7625-156.7875	156.7625-156.7875	156.7625-156.7875		Satellite Communications (25) Maritime (80)
MARITIME MOBILE	MARITIME MOBILE	MARITIME MOBILE	MOBILE-SATELLITE (Earth-to-space) (AIS 3)		
Mobile-satellite (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	Mobile-satellite (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space) (AIS 3)		
5.111 5.226 5.228	5.111 5.226 5.228	5.111 5.226 5.228	5.226 US52 US266		
156.7875-156.8125			156.7875-156.8125		Maritime (80) Aviation (87)
MARITIME MOBILE (distress and calling)			MARITIME MOBILE (distress, urgency, safety and calling)		
5.111 5.226			5.111 5.226 US266		
156.8125-156.8375	156.8125-156.8375	156.8125-156.8375	156.8125-156.8375		Satellite Communications (25) Maritime (80)
MARITIME MOBILE	MARITIME MOBILE	MARITIME MOBILE	MOBILE-SATELLITE (Earth-to-space) (AIS 4)		
Mobile-satellite (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space)	Mobile-satellite (Earth-to-space)	MOBILE-SATELLITE (Earth-to-space) (AIS 4)		
5.111 5.226 5.228	5.111 5.226 5.228	5.111 5.226 5.228	5.226 US52 US266		
156.8375-157.1875	156.8375-157.1875		156.8375-157.0375	156.8375-157.0375	Maritime (80) Aviation (87)
FIXED	FIXED			MARITIME MOBILE	
MOBILE except aeronautical mobile	MOBILE		5.226 US52 US266	5.226 US52 US266	
5.226			157.0375-157.1875	157.0375-157.1875	Maritime (80)
5.226			MARITIME MOBILE US214		
5.226			5.226 US266 G109	5.226 US214 US266	

157.1875-157.3375 FIXED MOBILE except aeronautical mobile Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC 5.226	157.1875-157.3375 FIXED MOBILE Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC 5.226	157.1875-161.575	157.1875-157.45 MOBILE except aeronautical mobile US266	Maritime (80) Aviation (87) Private Land Mobile (90)
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157.3375-161.7875	157.3375-161.7875		5.226 NG111	
FIXED	FIXED		157.45-161.575	
MOBILE except aeronautical mobile	MOBILE		FIXED	Public Mobile (22)
			LAND MOBILE NG28 NG111 NG112	Remote Pickup (74D)
			5.226 NG6 NG70 NG124 NG148 NG155	Maritime (80)
				Private Land Mobile (90)
		161.575-161.625	161.575-161.625	
			MARITIME MOBILE	Public Mobile (22)
		5.226 US52	5.226 US52 NG6 NG17	Maritime (80)
		161.625-161.9625	161.625-161.775	Public Mobile (22)
			LAND MOBILE NG6	Remote Pickup (74D)
			5.226	Low Power Auxiliary (74H)
			161.775-161.9625	
5.226	5.226		MOBILE except aeronautical mobile	Maritime (80)
			US266 NG6	Private Land Mobile (90)
161.7875-161.9375	161.7875-161.9375			
FIXED	FIXED			
MOBILE except aeronautical mobile	MOBILE			
Maritime mobile-satellite 5.208A	Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC			
5.208B 5.228AB 5.228AC				
5.226	5.226			
161.9375-161.9625	161.9375-161.9625			
FIXED	FIXED			
MOBILE except aeronautical mobile	MOBILE			

Maritime mobile-satellite (Earth-to-space) 5.228AA  5.226	Maritime mobile-satellite (Earth-to-space) 5.228AA  5.226		US266	5.226	
161.9625-161.9875  FIXED MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.228F  5.226 5.228A 5.228B	161.9625-161.9875  AERONAUTICAL MOBILE (OR) MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space)  5.228C 5.228D	161.9625-161.9875  MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F  5.226	161.9625-161.9875  AERONAUTICAL MOBILE (OR) (AIS 1) MARITIME MOBILE (AIS 1) MOBILE-SATELLITE (Earth-to-space) (AIS 1)  5.228C US52		Satellite  Communications (25) Maritime (80)
161.9875-162.0125  FIXED MOBILE except aeronautical mobile Maritime mobile-satellite (Earth-to-space) 5.228AA  5.226 5.229	161.9875-162.0125  FIXED MOBILE Maritime mobile-satellite (Earth-to-space) 5.228AA  5.226		161.9875-162.0125	161.9875-162.0125  MOBILE except aeronautical mobile  5.226	Maritime (80)
162.0125-162.0375  FIXED MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.228F  5.226 5.228A 5.228B 5.229	162.0125-162.0375  AERONAUTICAL MOBILE (OR) MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space)  5.228C 5.228D	162.0125-162.0375  MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F  5.226	162.0125-162.0375  AERONAUTICAL MOBILE (OR) (AIS 2) MARITIME MOBILE (AIS 2) MOBILE-SATELLITE (Earth-to-space) (AIS 2)  5.228C US52		Satellite  Communications (25) Maritime (80)

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FIXED	FIXED		FIXED		
MOBILE except aeronautical mobile	MOBILE		MOBILE		
			US8 US11 US13 US55 US73 US300 US312 G5	US8 US11 US13 US55 US73 US300 US312	
			173.2-173.4	173.2-173.4	Private Land Mobile (90)
				FIXED Land mobile	
			173.4-174	173.4-174	
			FIXED MOBILE		
5.226 5.229	5.226 5.230 5.231		G5		
174-223	174-216	174-223	174-216	174-216	Broadcast Radio (TV)(73) LPTV, TV Translator/ Booster (74G) Low Power Auxiliary (74H)
BROADCASTING	BROADCASTING Fixed Mobile	FIXED MOBILE BROADCASTING		BROADCASTING  NG5 NG14 NG115 NG149	
	216-220		216-217	216-219	Maritime (80) Private Land Mobile (90) Personal Radio (95)
	FIXED MARITIME MOBILE Radiolocation 5.241		Fixed Land mobile  US210 US241 G2	FIXED MOBILE except aeronautical mobile	
			217-220	US210 US241 NG173	

			Fixed Mobile  US210 US241	219-220 FIXED MOBILE except aeronautical mobile Amateur NG152  US210 US241 NG173	Maritime (80) Private Land Mobile (90) Amateur Radio (97)
	5.242				
	220-225 AMATEUR FIXED MOBILE Radiolocation 5.241		220-222 FIXED LAND MOBILE  US241 US242		Private Land Mobile (90)
5.235 5.237 5.243		5.233 5.238 5.240 5.245	222-225	222-225	
223-230		223-230		AMATEUR	Amateur Radio (97)
BROADCASTING Fixed Mobile	225-235 FIXED MOBILE	FIXED MOBILE BROADCASTING AERONAUTICAL RADIONAVIGATION Radiolocation	225-235 FIXED MOBILE	225-235	
5.243 5.246 5.247		5.250			
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			G27		

5.247 5.251 5.252		5.250		
235-267 FIXED MOBILE			235-267 FIXED MOBILE	235-267
5.111 5.252 5.254 5.256 5.256A			5.111 5.256 G27 G100	5.111 5.256
267-272 FIXED MOBILE Space operation (space-to-Earth)			267-322 FIXED MOBILE	267-322
5.254 5.257 272-273 SPACE OPERATION (space-to-Earth) FIXED MOBILE				
5.254				
273-312 FIXED MOBILE				
5.254				
312-315 FIXED MOBILE Mobile-satellite (Earth-to-space) 5.254 5.255				

315-322			
FIXED			
MOBILE			
5.254	G27 G100		
322-328.6	322-328.6	322-328.6	
FIXED	FIXED		
MOBILE	MOBILE		
RADIO ASTRONOMY			
5.149	US342 G27	US342	
328.6-335.4	328.6-335.4		
AERONAUTICAL RADIONAVIGATION 5.258	AERONAUTICAL RADIONAVIGATION 5.258		Aviation (87)
5.259			
335.4-387	335.4-399.9	335.4-399.9	
FIXED	FIXED		
MOBILE	MOBILE		
5.254			
387-390			
FIXED			
MOBILE			
Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.254 5.255			
390-399.9			
FIXED			
MOBILE			



5.254	G27 G100		
399.9-400.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220 5.260A 5.260B	399.9-400.05 MOBILE-SATELLITE (Earth-to-space) US319 US320 RADIONAVIGATION-SATELLITE		Satellite Communications (25) Page 26

International Table			United States Table		FCC Rule Part(s)
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STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz)			STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz)		
5.261 5.262			5.261		
400.15-401			400.15-401	400.15-401	Satellite Communications (25)
METEOROLOGICAL AIDS			METEOROLOGICAL AIDS	METEOROLOGICAL AIDS	
METEOROLOGICAL-SATELLITE (space-to-Earth)			(radiosonde) US70	(radiosonde) US70	
MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209			METEOROLOGICAL-SATELLITE	MOBILE-SATELLITE (space-to-	
SPACE RESEARCH (space-to-Earth) 5.263			(space-to-Earth)	Earth) US319 US320 US324	
Space operation (space-to-Earth)			MOBILE-SATELLITE (space-to-	SPACE RESEARCH	
			Earth) US319 US320 US324	(space-to-Earth) 5.263	
			SPACE RESEARCH	Space operation (space-to-Earth)	
			(space-to-Earth) 5.263		
			Space operation (space-to-Earth)		
5.262 5.264			5.264	5.264	
401-402			401-402	401-402	MedRadio (95I)
METEOROLOGICAL AIDS			METEOROLOGICAL AIDS	METEOROLOGICAL AIDS	
SPACE OPERATION (space-to-Earth)			(radiosonde) US70	(radiosonde) US70	
EARTH EXPLORATION-SATELLITE (Earth-to-space)			SPACE OPERATION	SPACE OPERATION	
METEOROLOGICAL-SATELLITE (Earth-to-space)			(space-to-Earth)	(space-to-Earth)	
Fixed			EARTH EXPLORATION-	Earth exploration-satellite	
Mobile except aeronautical mobile			SATELLITE (Earth-to-space)	(Earth-to-space)	
			METEOROLOGICAL-SATELLITE	Meteorological-satellite	
			(Earth-to-space)	(Earth-to-space)	

5.264A 5.264B	US64 US384	US64 US384	
402-403 METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile	402-403 METEOROLOGICAL AIDS (radiosonde) US70 EARTH EXPLORATION- SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space)	402-403 METEOROLOGICAL AIDS (radiosonde) US70 Earth exploration-satellite (Earth-to-space) Meteorological-satellite (Earth-to-space)	
5.264A 5.264B	US64 US384	US64 US384	
403-406 METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile	403-406 METEOROLOGICAL AIDS (radiosonde) US70	403-406 METEOROLOGICAL AIDS (radiosonde) US70	
5.265	US64 G6	US64	
406-406.1 MOBILE-SATELLITE (Earth-to-space)	406-406.1 MOBILE-SATELLITE (Earth-to-space)		Maritime (EPIRBs) (80V) Aviation (ELTs) (87F) Personal Radio (95)
5.265 5.266 5.267	5.266 5.267		
406.1-410 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY	406.1-410 FIXED MOBILE RADIO ASTRONOMY US74	406.1-410 RADIO ASTRONOMY US74	Private Land Mobile (90)

5.149 5.265		US13 US55 US117 G5 G6	US13 US55 US117	
410-420 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 5.268		410-420 FIXED MOBILE SPACE RESEARCH (space-to-space) 5.268 US13 US55 US64 G5	410-420 US13 US55 US64	Private Land Mobile (90) MedRadio (95I)
420-430 FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271		420-450 RADIOLOCATION G2 G129	420-450 Amateur US270	Private Land Mobile (90) MedRadio (95I) Amateur Radio (97)
430-432 AMATEUR RADIOLOCATION	430-432 RADIOLOCATION Amateur			
5.271 5.274 5.275 5.276 5.277		5.271 5.276 5.277 5.278 5.279		
432-438 AMATEUR RADIOLOCATION Earth exploration-satellite (active) 5.279A	432-438 RADIOLOCATION Amateur Earth exploration-satellite (active) 5.279A			
5.138 5.271 5.276 5.277				

5.280 5.281 5.282	5.271 5.276 5.277 5.278 5.279 5.281 5.282			
438-440 AMATEUR RADIOLOCATION	438-440 RADIOLOCATION Amateur			
5.271 5.274 5.275 5.276 5.277 5.283	5.271 5.276 5.277 5.278 5.279			
440-450 FIXED MOBILE except aeronautical mobile Radiolocation		5.286 US64 US87 US230 US269 US270 US397 G8	5.282 5.286 US64 US87 US230 US269 US397	
5.269 5.270 5.271 5.284 5.285 5.286				
450-455 FIXED MOBILE 5.286AA	450-454	450-454	LAND MOBILE	Remote Pickup (74D) Low Power Auxiliary (74H) Private Land Mobile (90) MedRadio (95I)
	5.286 US64 US87	5.286 US64 US87 NG112 NG124		
	454-456	454-455	FIXED LAND MOBILE	Public Mobile (22) Maritime (80) MedRadio (95I)
5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E		US64 NG32 NG112 NG148		

455-456 FIXED MOBILE 5.286AA  5.209 5.271 5.286A 5.286B 5.286C 5.286E	455-456 FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	455-456 FIXED MOBILE 5.286AA  5.209 5.271 5.286A 5.286B 5.286C 5.286E	US64	455-456 LAND MOBILE  US64	Remote Pickup (74D) Low Power Auxiliary (74H) MedRadio (95I)
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459-460  FIXED MOBILE 5.286AA  5.209 5.271 5.286A 5.286B	459-460 FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C	459-460 FIXED MOBILE 5.286AA  5.209 5.271 5.286A 5.286B	459-460		

5.286C 5.286E	5.209	5.286C 5.286E			
460-470			460-470	460-462.5375	
FIXED			Meteorological-satellite	FIXED	Private Land Mobile (90)
MOBILE 5.286AA			(space-to-Earth)	LAND MOBILE	
Meteorological-satellite (space-to-Earth)				US209 US289 NG124	
				462.5375-462.7375	
				LAND MOBILE	Personal Radio (95)
				US289	
				462.7375-467.5375	
				FIXED	Maritime (80)
				LAND MOBILE	Private Land Mobile (90)
				US73 US209 US287 US288 US289	
				NG124	
				467.5375-467.7375	
				LAND MOBILE	Maritime (80)
				US287 US288 US289	Personal Radio (95)
				467.7375-470	
				FIXED	Maritime (80)
				LAND MOBILE	Private Land Mobile (90)
			US73 US209 US287 US288		
5.287 5.288 5.289 5.290			US289	US73 US288 US289 NG124	
470-694	470-512	470-585	470-608	470-512	
BROADCASTING	BROADCASTING	FIXED		FIXED	Public Mobile (22)
	Fixed	MOBILE 5.296A		LAND MOBILE	Broadcast Radio (TV)(73)
					LPTV, TV Translator/Booster (74G)

Mobile  5.292 5.293 5.295	BROADCASTING  5.291 5.298		BROADCASTING  NG5 NG14 NG66 NG115 NG149	Low Power Auxiliary (74H) Private Land Mobile (90)
512-608  BROADCASTING  5.295 5.297	585-610  FIXED  MOBILE 5.296A  BROADCASTING		512-608  BROADCASTING  NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)
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790-862	
FIXED	
	5.293 5.309

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	698-758	
	FIXED	Wireless Communications (27)
	MOBILE	LPTV and TV Translator (74G)
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	MOBILE	
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				FIXED	Private Land Mobile (90)
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		US116 US268 G2	931-932  FIXED LAND MOBILE  US116 US268	Public Mobile (22)
		932-935  FIXED  US268 G2	932-935  FIXED  US268 NG35	Public Mobile (22) Fixed Microwave (101)
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				936.5-939.5 FIXED MOBILE except aeronautical mobile  US116 US268	Wireless Communications (27) Private Land Mobile (90)
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5.365 5.366 5.367 5.368 5.369	5.367 5.368 5.370 5.372	5.365 5.366 5.367 5.368 5.369 5.372	5.341 5.364 5.365 5.366 5.367 5.368 5.372 US208
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MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B				
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Fixed			mobile	
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		MOBILE except aeronautical mobile		
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MOBILE					
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				MOBILE	
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2120-2170 FIXED MOBILE 5.388A 5.388B    5.388	2120-2160 FIXED MOBILE 5.388A 5.388B Mobile-satellite (space-to-Earth)  5.388  2160-2170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)  5.388 5.389C 5.389E	2120-2170 FIXED MOBILE 5.388A 5.388B    5.388	2120-2200	2120-2180 FIXED MOBILE   NG41 2180-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)	Satellite Communications (25) Wireless Communications (27)
2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A  5.388 5.389A 5.389F					

<p>2200-2290</p> <p>SPACE OPERATION (space-to-Earth) (space-to-space)</p> <p>EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)</p> <p>FIXED</p> <p>MOBILE 5.391</p> <p>SPACE RESEARCH (space-to-Earth) (space-to-space)</p> <p>5.392</p>	<p>2200-2290</p> <p>SPACE OPERATION (space-to-Earth) (space-to-space) US96</p> <p>EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)</p> <p>FIXED (line-of-sight only)</p> <p>MOBILE (line-of-sight only including aeronautical telemetry, but excluding flight testing of manned aircraft) 5.391</p> <p>SPACE RESEARCH (space-to-Earth) (space-to-space)</p> <p>5.392 US303</p>	<p>2200-2290</p> <p>US96 US303</p>	<p>Space Launch Services (26)</p>	
<p>2290-2300</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>SPACE RESEARCH (deep space) (space-to-Earth)</p>	<p>2290-2300</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>SPACE RESEARCH (deep space) (space-to-Earth)</p>	<p>2290-2300</p> <p>SPACE RESEARCH (deep space) (space-to-Earth)</p>		
<p>2300-2450</p> <p>FIXED</p> <p>MOBILE 5.384A</p> <p>Amateur</p> <p>Radiolocation</p>	<p>2300-2450</p> <p>FIXED</p> <p>MOBILE 5.384A</p> <p>RADIOLOCATION</p> <p>Amateur</p>	<p>2300-2305</p> <p>G122</p> <hr/> <p>2305-2310</p> <p>US97 G122</p>	<p>2300-2305</p> <p>Amateur</p> <hr/> <p>2305-2310</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>RADIOLOCATION</p> <p>Amateur</p> <p>US97</p>	<p>Amateur Radio (97)</p> <hr/> <p>Wireless Communications (27)</p> <p>Amateur Radio (97)</p>

5.150 5.282 5.395

5.150 5.282 5.393 5.394

2310-2320 Fixed Mobile US100 Radiolocation G2  US97 US327	2310-2320 FIXED MOBILE BROADCASTING-SATELLITE RADIOLOCATION  US97 US100 US327	Wireless  Communications (27)
2320-2345 Fixed Radiolocation G2  US327	2320-2345 BROADCASTING-SATELLITE  US327	Satellite  Communications (25)
2345-2360 Fixed Mobile US100 Radiolocation G2  US327	2345-2360 FIXED MOBILE US100 BROADCASTING-SATELLITE RADIOLOCATION  US327	Wireless  Communications (27)
2360-2390 MOBILE US276 RADIOLOCATION G2 G120 Fixed  US101	2360-2390 MOBILE US276   US101	Aviation (87) Personal Radio (95)
2390-2395 MOBILE US276	2390-2395 AMATEUR MOBILE US276	Aviation (87) Personal Radio (95)

		US101	US101	Amateur Radio (97)
		2395-2400	2395-2400	Personal Radio (95)
		US101 G122	US101	Amateur Radio (97)
		2400-2417	2400-2417	RF Devices (15)
		5.150 G122	5.150 5.282	ISM Equipment (18)
		2417-2450	2417-2450	Amateur Radio (97)
		Radiolocation G2	Amateur	
		5.150	5.150 5.282	
2450-2483.5	2450-2483.5	2450-2483.5	2450-2483.5	RF Devices (15)
FIXED	FIXED		FIXED	ISM Equipment (18)
MOBILE	MOBILE		MOBILE	TV Auxiliary
Radiolocation	RADIOLOCATION		Radiolocation	Broadcasting (74F)
				Private Land Mobile (90)
				Fixed Microwave (101)
5.150	5.150	5.150 US41	5.150 US41	

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
2483.5-2500	2483.5-2500	2483.5-2500	2483.5-2500	2483.5-2495	ISM Equipment (18) Satellite Communi- cations (25)
FIXED	FIXED	FIXED	MOBILE-SATELLITE (space-to- Earth) US319 US380 US391	MOBILE-SATELLITE (space-to- Earth) US380	
MOBILE	MOBILE	MOBILE	RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398	RADIODETERMINATION-SATEL- LITE (space-to-Earth) 5.398	
MOBILE-SATELLITE (space-to-Earth) 5.351A	MOBILE-SATELLITE (space-to-Earth) 5.351A	MOBILE-SATELLITE (space-to-Earth) 5.351A		5.150 5.402 US41 US319 NG147	ISM Equipment (18) Satellite Communi- cations (25) Wireless Communi- cations (27)
RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398	RADIOLOCATION RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398	RADIOLOCATION RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398		2495-2500	
Radiolocation 5.398A				FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to- Earth) US380 RADIODETERMINATION-SATEL- LITE (space-to-Earth) 5.398	
5.150 5.399 5.401 5.402	5.150 5.402	5.150 5.401 5.402	5.150 5.402 US41	5.150 5.402 US41 US319 US391 NG147	
2500-2520	2500-2520	2500-2520	2500-2655	2500-2655	Wireless Communi- cations (27)
FIXED 5.410	FIXED 5.410	FIXED 5.410		FIXED US205	
MOBILE except aeronautical mobile 5.384A	FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A	FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (space-to-Earth) 5.351A 5.407 5.414 5.414A		MOBILE except aeronautical mobile	
5.412	5.404	5.404 5.415A			

<p>2520-2655</p> <p>FIXED 5.410</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING-SATELLITE 5.413 5.416</p>	<p>2520-2655</p> <p>FIXED 5.410</p> <p>FIXED-SATELLITE (space-to-Earth) 5.415</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING-SATELLITE 5.413 5.416</p>	<p>2520-2535</p> <p>FIXED 5.410</p> <p>FIXED-SATELLITE (space-to-Earth) 5.415</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING-SATELLITE 5.413 5.416</p> <p>5.403 5.414A 5.415A</p> <hr/> <p>2535-2655</p> <p>FIXED 5.410</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING-SATELLITE 5.413 5.416</p>	<p>5.339 5.412 5.418B 5.418C</p> <p>5.339 5.418 5.418A 5.418B 5.418C</p> <p>5.339 US205</p>	<p>5.339</p>
<p>2655-2670</p> <p>FIXED 5.410</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING-SATELLITE 5.208B 5.413 5.416</p> <p>Earth exploration-satellite (passive)</p> <p>Radio astronomy</p> <p>Space research (passive)</p> <p>5.149 5.412</p>	<p>2655-2670</p> <p>FIXED 5.410</p> <p>FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.415</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING-SATELLITE 5.413 5.416</p> <p>Earth exploration-satellite (passive)</p> <p>Radio astronomy</p> <p>Space research (passive)</p> <p>5.149 5.208B</p>	<p>2655-2670</p> <p>FIXED 5.410</p> <p>FIXED-SATELLITE (Earth-to-space) 5.415</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING-SATELLITE 5.413 5.416</p> <p>Earth exploration-satellite (passive)</p> <p>Radio astronomy</p> <p>Space research (passive)</p> <p>5.149 5.208B 5.420</p>	<p>2655-2690</p> <p>Earth exploration-satellite (passive)</p> <p>Radio astronomy US385</p> <p>Space research (passive)</p>	<p>2655-2690</p> <p>FIXED US205</p> <p>MOBILE except aeronautical mobile</p> <p>Earth exploration-satellite (passive)</p> <p>Radio astronomy</p> <p>Space research (passive)</p>

2670-2690 FIXED 5.410 MOBILE except aeronautical mobile 5.384A Earth exploration-satellite (passive) Radio astronomy Space research (passive)  5.149 5.412	2670-2690 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.208B 5.415 MOBILE except aeronautical mobile 5.384A Earth exploration-satellite (passive) Radio astronomy Space research (passive)  5.149	2670-2690 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A 5.419 Earth exploration-satellite (passive) Radio astronomy Space research (passive)  5.149	US205	US385	
2690-2700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)  5.340 5.422			US246		
2700-2900 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation  5.423 5.424			2700-2900 METEOROLOGICAL AIDS AERONAUTICAL RADIONAVIGATION 5.337 US18 Radiolocation G2  5.423 G15	2700-2900        5.423 US18	Aviation (87)
2900-3100 RADIOLOCATION 5.424A			2900-3100 RADIOLOCATION 5.424A G56	2900-3100 MARITIME RADIONAVIGATION	Maritime (80)



RADIONAVIGATION 5.426			MARITIME RADIONAVIGATION	Radiolocation US44	Private Land Mobile (90)
5.425 5.427			5.427 US44 US316	5.427 US316	
3100-3300			3100-3300	3100-3300	
RADIOLOCATION			RADIOLOCATION G59	Earth exploration-satellite (active)	Private Land Mobile
Earth exploration-satellite (active)			Earth exploration-satellite (active)	Space research (active)	(90)
Space research (active)			Space research (active)	Radiolocation	
5.149 5.428			US342	US342	
3300-3400	3300-3400	3300-3400	3300-3500	3300-3450	
RADIOLOCATION	RADIOLOCATION	RADIOLOCATION	RADIOLOCATION US431B G2		
	Amateur	Amateur			
	Fixed				
	Mobile				
5.149 5.429 5.429A 5.429B					
5.430	5.149 5.429C 5.429D	5.149 5.429 5.429E 5.429F		US103 US342	
3400-3600	3400-3500	3400-3500		3450-3600	
FIXED	FIXED	FIXED		FIXED	Wireless Communi-
FIXED-SATELLITE	FIXED-SATELLITE (space-to-Earth)	FIXED-SATELLITE (space-to-Earth)		MOBILE except aeronautical mobile	cations (27)
(space-to-Earth)	MOBILE except aeronautical mobile	Amateur			Citizens Broadband
MOBILE except aeronautical	5.431A 5.431B	Mobile 5.432 5.432B			(96)
mobile 5.430A	Amateur	Radiolocation 5.433			
Radiolocation	Radiolocation 5.433				

5.431

5.282

5.282 5.432A

US103 US342

US103 US105 US431B US433

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
3400-3600 MHz: see previous page	3500-3600 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.431B Radiolocation 5.433	3500-3600 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.433A Radiolocation 5.433	3500-3550 RADIOLOCATION G59 AERONAUTICAL RADIONAVIGATION (ground-based) G110 US103 US431B	3500-3600 MHz: see previous page	
			3550-3650 RADIOLOCATION G59		
3600-4200 FIXED FIXED-SATELLITE (space-to-Earth) Mobile	3600-3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.434 Radiolocation 5.433	3600-3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation  5.435	AERONAUTICAL RADIONAVIGATION (ground-based) G110  US105 US107 US245 US433	3600-3700 FIXED FIXED-SATELLITE (space-to-Earth) US107 US245 NG169 MOBILE except aeronautical mobile	Satellite Communications (25) Citizens Broadband (96)
			3650-3700  US109 US349		
			3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	3700-4200	3700-4000 FIXED MOBILE except aeronautical mobile NG182 NG457A
		4000-4200			

			FIXED FIXED-SATELLITE (space-to-Earth) NG457A NG182	Satellite Communications (25)
4200-4400 AERONAUTICAL MOBILE (R) 5.436 AERONAUTICAL RADIONAVIGATION 5.438  5.437 5.439 5.440	4200-4400 AERONAUTICAL RADIONAVIGATION  5.440 US261			Aviation (87)
4400-4500 FIXED MOBILE 5.440A	4400-4940 FIXED MOBILE	4400-4500		
4500-4800 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE 5.440A		4500-4800 FIXED-SATELLITE (space-to-Earth) 5.441 US245		
4800-4990 FIXED MOBILE 5.440A 5.441A 5.441B 5.442  Radio astronomy  5.149 5.339 5.443	4800-4940 US113 US245 US342  4940-4990  5.339 US342 US385 G122	4800-4940 US113 US342  4940-4990 FIXED MOBILE except aeronautical mobile  5.339 US342 US385		Public Safety Land Mobile (90Y)
4990-5000 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space research (passive)	4990-5000 RADIO ASTRONOMY US74 Space research (passive)  US246			



<p>5000-5010</p> <p>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA</p> <p>AERONAUTICAL RADIONAVIGATION</p> <p>RADIONAVIGATION-SATELLITE (Earth-to-space)</p>	<p>5000-5010</p> <p>AERONAUTICAL MOBILE (R) US115</p> <p>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA</p> <p>AERONAUTICAL RADIONAVIGATION US260</p> <p>RADIONAVIGATION-SATELLITE (Earth-to-space)</p> <p>US211</p>	<p>Aviation (87)</p>
<p>5010-5030</p> <p>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA</p> <p>AERONAUTICAL RADIONAVIGATION</p> <p>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.443B</p>	<p>5010-5030</p> <p>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA</p> <p>AERONAUTICAL RADIONAVIGATION US260</p> <p>RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.443B</p> <p>US115 US211</p>	
<p>5030-5091</p> <p>AERONAUTICAL MOBILE (R) 5.443C</p> <p>AERONAUTICAL MOBILE-SATELLITE (R) 5.443D</p> <p>AERONAUTICAL RADIONAVIGATION</p> <p>5.444</p>	<p>5030-5091</p> <p>AERONAUTICAL MOBILE (R) 5.443C</p> <p>AERONAUTICAL MOBILE-SATELLITE (R) 5.443D</p> <p>AERONAUTICAL RADIONAVIGATION US260</p> <p>US211 US444</p>	
<p>5091-5150</p> <p>FIXED-SATELLITE (Earth-to-space) 5.444A</p> <p>AERONAUTICAL MOBILE 5.444B</p> <p>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA</p> <p>AERONAUTICAL RADIONAVIGATION</p> <p>5.444</p>	<p>5091-5150</p> <p>AERONAUTICAL MOBILE US111 US444B</p> <p>AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA</p> <p>AERONAUTICAL RADIONAVIGATION US260</p> <p>US211 US344 US444 US444A</p>	<p>Satellite</p> <p>Communications (25)</p> <p>Aviation (87)</p>

<p>5150-5250</p> <p>FIXED-SATELLITE (Earth-to-space) 5.447A</p> <p>MOBILE except aeronautical mobile 5.446A 5.446B</p> <p>AERONAUTICAL RADIONAVIGATION</p> <p>5.446 5.446C 5.446D 5.447 5.447B 5.447C</p>	<p>5150-5250</p> <p>AERONAUTICAL RADIONAVIGATION</p> <p>US260</p> <p>US211 US307 US344</p>	<p>5150-5250</p> <p>FIXED-SATELLITE (Earth-to-space) 5.447A</p> <p>US344</p> <p>AERONAUTICAL RADIONAVIGATION US260</p> <p>5.447C US211 US307</p>	<p>RF Devices (15)</p> <p>Satellite</p> <p>Communications (25)</p> <p>Aviation (87)</p>
<p>5250-5255</p> <p>EARTH EXPLORATION-SATELLITE (active)</p> <p>MOBILE except aeronautical mobile 5.446A 5.447F</p> <p>RADIOLOCATION</p> <p>SPACE RESEARCH 5.447D</p> <p>5.447E 5.448 5.448A</p>	<p>5250-5255</p> <p>EARTH EXPLORATION-SATELLITE</p> <p>(active)</p> <p>RADIOLOCATION G59</p> <p>SPACE RESEARCH (active) 5.447D</p> <p>5.448A</p>	<p>5250-5255</p> <p>Earth exploration-satellite (active)</p> <p>Radiolocation</p> <p>Space research</p>	<p>RF Devices (15)</p> <p>Private Land Mobile (90)</p>
<p>5255-5350</p> <p>EARTH EXPLORATION-SATELLITE (active)</p> <p>MOBILE except aeronautical mobile 5.446A 5.447F</p> <p>RADIOLOCATION</p> <p>SPACE RESEARCH (active)</p> <p>5.447E 5.448 5.448A</p>	<p>5255-5350</p> <p>EARTH EXPLORATION-SATELLITE</p> <p>(active)</p> <p>RADIOLOCATION G59</p> <p>SPACE RESEARCH (active)</p> <p>5.448A</p>	<p>5255-5350</p> <p>Earth exploration-satellite (active)</p> <p>Radiolocation</p> <p>Space research (active)</p> <p>5.448A</p>	
<p>5350-5460</p> <p>EARTH EXPLORATION-SATELLITE (active) 5.448B</p> <p>RADIOLOCATION 5.448D</p> <p>AERONAUTICAL RADIONAVIGATION 5.449</p> <p>SPACE RESEARCH (active) 5.448C</p>	<p>5350-5460</p> <p>EARTH EXPLORATION-SATELLITE</p> <p>(active) 5.448B</p> <p>RADIOLOCATION G56</p> <p>AERONAUTICAL RADIONAVIGATION</p> <p>5.449</p> <p>SPACE RESEARCH (active)</p>	<p>5350-5460</p> <p>AERONAUTICAL RADIONAVIGATION 5.449</p> <p>Earth exploration-satellite (active) 5.448B</p> <p>Radiolocation</p> <p>Space research (active)</p>	<p>Aviation (87)</p> <p>Private Land Mobile (90)</p>

	US390 G130	US390	
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International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
5460-5470			5460-5470	5460-5470	
EARTH EXPLORATION-SATELLITE (active)			EARTH EXPLORATION-SATELLITE	RADIONAVIGATION 5.449 US65	Maritime (80)
RADIOLOCATION 5.448D			(active)	Earth exploration-satellite (active)	Aviation (87)
RADIONAVIGATION 5.449			RADIOLOCATION G56	Radiolocation	Private Land Mobile (90)
SPACE RESEARCH (active)			RADIONAVIGATION 5.449 US65	Space research (active)	
			SPACE RESEARCH (active)		
5.448B			5.448B US49 G130	5.448B US49	
5470-5570			5470-5570	5470-5570	
EARTH EXPLORATION-SATELLITE (active)			EARTH EXPLORATION-SATELLITE	RADIOLOCATION	RF Devices (15)
MOBILE except aeronautical mobile 5.446A 5.450A			(active)	MARITIME RADIONAVIGATION US65	Maritime (80)
RADIOLOCATION 5.450B			RADIOLOCATION G56	Earth exploration-satellite (active)	Private Land Mobile (90)
MARITIME RADIONAVIGATION			MARITIME RADIONAVIGATION US65	Space research (active)	
SPACE RESEARCH (active)			SPACE RESEARCH (active)		
5.448B 5.450 5.451			5.448B US50 G131	US50	
5570-5650			5570-5600	5570-5600	
MOBILE except aeronautical mobile 5.446A 5.450A			RADIOLOCATION G56	RADIOLOCATION	
RADIOLOCATION 5.450B			MARITIME RADIONAVIGATION US65	MARITIME RADIONAVIGATION US65	
MARITIME RADIONAVIGATION					
			US50 G131	US50	
			5600-5650	5600-5650	
5.450 5.451 5.452			METEOROLOGICAL AIDS	METEOROLOGICAL AIDS	

		RADIOLOCATION G56 MARITIME RADIONAVIGATION US65 5.452 US50 G131	RADIOLOCATION MARITIME RADIONAVIGATION US65 5.452 US50	
5650-5725 MOBILE except aeronautical mobile 5.446A 5.450A RADIOLOCATION Amateur Space research (deep space)  5.282 5.451 5.453 5.454 5.455		5650-5925 RADIOLOCATION G2	5650-5830 Amateur	RF Devices (15) ISM Equipment (18) Amateur Radio (97)
5725-5830 FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur  5.150 5.451 5.453 5.455	5725-5830 RADIOLOCATION Amateur  5.150 5.453 5.455		5.150 5.282	
5830-5850 FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur Amateur-satellite (space-to-Earth)  5.150 5.451 5.453 5.455	5830-5850 RADIOLOCATION Amateur Amateur-satellite (space-to-Earth)  5.150 5.453 5.455		5830-5850 Amateur Amateur-satellite (space-to-Earth)  5.150	

5850-5925	5850-5925	5850-5925		5850-5925	
FIXED	FIXED	FIXED		FIXED-SATELLITE (Earth-to-space) US245	RF Devices (15)
FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE (Earth-to-space)		MOBILE NG160	ISM Equipment (18)
MOBILE	MOBILE	MOBILE		Amateur	Private Land Mobile (90)
	Amateur	Radiolocation			Personal Radio (95)
	Radiolocation				Amateur Radio (97)
5.150	5.150	5.150	5.150 US245	5.150	
5925-6700			5925-6425	5925-6425	
FIXED 5.457				FIXED	RF Devices (15)
FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B				FIXED-SATELLITE (Earth-to-space)	Satellite Communications (25)
MOBILE 5.457C				NG457A	Fixed Microwave (101)
			6425-6525	6425-6525	
				FIXED-SATELLITE (Earth-to-space)	RF Devices (15)
				MOBILE	Satellite Communications (25)
					TV Broadcast Auxiliary (74F)
					Cable TV Relay (78)
			5.440 5.458	5.440 5.458	Fixed Microwave (101)
			6525-6700	6525-6700	
				FIXED	RF Devices (15)
				FIXED-SATELLITE (Earth-to-space)	Satellite Communications (25)
					Fixed Microwave (101)
5.149 5.440 5.458			5.458 US342	5.458 US342	
6700-7075			6700-7125	6700-6875	
FIXED				FIXED	

<p>FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441</p> <p>MOBILE</p>		<p>FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441</p> <p>5.458 5.458A 5.458B</p>	
<p>5.458 5.458A 5.458B</p>		<p>6875-7025</p> <p>FIXED NG118</p> <p>FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441</p> <p>MOBILE NG171</p> <p>5.458 5.458A 5.458B</p>	<p>RF Devices (15)</p> <p>Satellite Communications (25)</p> <p>TV Broadcast Auxiliary (74F)</p> <p>Cable TV Relay (78)</p>
<p>7075-7145</p> <p>FIXED</p> <p>MOBILE</p>	<p>5.458</p>	<p>7025-7075</p> <p>FIXED NG118</p> <p>FIXED-SATELLITE (Earth-to-space) NG172</p> <p>MOBILE NG171</p> <p>5.458 5.458A 5.458B</p>	<p>RF Devices (15)</p> <p>TV Broadcast Auxiliary (74F)</p> <p>Cable TV Relay (78)</p>
	<p>7125-7145</p> <p>FIXED</p>	<p>7075-7125</p> <p>FIXED NG118</p> <p>MOBILE NG171</p> <p>5.458</p>	<p>RF Devices (15)</p>
<p>5.458 5.459</p>	<p>5.458 G116</p>	<p>7125-7145</p> <p>5.458</p>	<p>RF Devices (15)</p>

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
7145-7190			7145-7190	7145-7235	RF Devices (15)
FIXED MOBILE SPACE RESEARCH (deep space) (Earth-to-space)			FIXED SPACE RESEARCH (deep space)(Earth-to-space) US262		
5.458 5.459			5.458 G116		
7190-7235			7190-7235		
EARTH EXPLORATION-SATELLITE (Earth-to-space) 5.460A 5.460B			EARTH EXPLORATION-SATELLITE (Earth-to-space) 5.460A		
FIXED			5.460B		
MOBILE			FIXED		
SPACE RESEARCH (Earth-to-space) 5.460			SPACE RESEARCH (Earth-to-space) 5.460		
5.458 5.459			5.458 G134	5.458 US262	
7235-7250			7235-7250	7235-7250	
EARTH EXPLORATION-SATELLITE (Earth-to-space) 5.460A			EARTH EXPLORATION-SATELLITE (Earth-to-space) 5.460A		
FIXED			FIXED		
MOBILE					
5.458			5.458	5.458	
7250-7300			7250-7300	7250-8025	
FIXED			FIXED-SATELLITE (space-to-Earth)		
FIXED-SATELLITE (space-to-Earth)			MOBILE-SATELLITE (space-to-Earth)		
MOBILE			Fixed		

5.461	G117		
7300-7375 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	7300-7375 FIXED FIXED-SATELLITE (space-to-Earth) Mobile-satellite (space-to-Earth)		
5.461	G117		
7375-7450 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MARITIME MOBILE-SATELLITE (space-to-Earth) 5.461AA 5.461AB	7375-7450 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MARITIME MOBILE-SATELLITE (space-to-Earth) 5.461AA 5.461AB Mobile-satellite except maritime mobile-satellite (space-to-Earth)  G117		
7450-7550 FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile MARITIME MOBILE-SATELLITE (space-to-Earth) 5.461AA 5.461AB	7450-7550 FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MARITIME MOBILE-SATELLITE (space-to-Earth) 5.461AA 5.461AB Mobile-satellite except maritime mobile-satellite (space-to-Earth)		
5.461A	G104 G117		

<p>7550-7750</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE except aeronautical mobile</p> <p>MARITIME MOBILE-SATELLITE (space-to-Earth) 5.461AA 5.461AB</p>	<p>7550-7750</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MARITIME MOBILE-SATELLITE (space-to-Earth) 5.461AA 5.461AB</p> <p>Mobile-satellite except maritime mobile-satellite (space-to-Earth)</p> <p>G117</p>		
<p>7750-7900</p> <p>FIXED</p> <p>METEOROLOGICAL-SATELLITE (space-to-Earth) 5.461B</p> <p>MOBILE except aeronautical mobile</p>	<p>7750-7900</p> <p>FIXED</p> <p>METEOROLOGICAL-SATELLITE (space-to-Earth) 5.461B</p>		
<p>7900-8025</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space)</p> <p>MOBILE</p> <p>5.461</p>	<p>7900-8025</p> <p>FIXED-SATELLITE (Earth-to-space)</p> <p>MOBILE-SATELLITE (Earth-to-space)</p> <p>Fixed</p> <p>G117</p>		
<p>8025-8175</p> <p>EARTH EXPLORATION-SATELLITE (space-to-Earth)</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space)</p> <p>MOBILE 5.463</p> <p>5.462A</p>	<p>8025-8175</p> <p>EARTH EXPLORATION-SATELLITE (space-to-Earth)</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space)</p> <p>Mobile-satellite (Earth-to-space)(no airborne transmissions)</p> <p>US258 G117</p>	<p>8025-8400</p>	

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		
8215-8400 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463  5.462A	8215-8400 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) Mobile-satellite (Earth-to-space)(no airborne transmissions)  US258 G117	US258	
8400-8500 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) 5.465 5.466	8400-8450 FIXED SPACE RESEARCH (deep space)(space-to-Earth) 8450-8500 FIXED SPACE RESEARCH (space-to-Earth)	8400-8450 Space research (deep space) (space-to-Earth) 8450-8500 SPACE RESEARCH (space-to-Earth)	
8500-8550 RADIOLOCATION  5.468 5.469	8500-8550 RADIOLOCATION G59	8500-8550 Radiolocation	Private Land Mobile (90)
8550-8650 EARTH EXPLORATION-SATELLITE (active)	8550-8650 EARTH EXPLORATION-SATELLITE (active)	8550-8650 Earth exploration-satellite (active)	



RADIOLOCATION SPACE RESEARCH (active)  5.468 5.469 5.469A	RADIOLOCATION G59 SPACE RESEARCH (active)	Radiolocation Space research (active)
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International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
8.65-8.75 RADIOLOCATION			8.65-9 RADIOLOCATION G59	8.65-9 Radiolocation	Aviation (87) Private Land Mobile (90)
5.468 5.469 8.75-8.85 RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.470					
5.471 8.85-9 RADIOLOCATION MARITIME RADIONAVIGATION 5.472			US53	US53	
5.473 9-9.2 AERONAUTICAL RADIONAVIGATION 5.337 RADIOLOCATION			9-9.2 AERONAUTICAL RADIONAVIGATION 5.337 RADIOLOCATION G2	9-9.2 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation	
5.471 5.473A			5.473A G19		
9.2-9.3 EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C RADIOLOCATION MARITIME RADIONAVIGATION 5.472			9.2-9.3 MARITIME RADIONAVIGATION 5.472 Radiolocation US110 G59	9.2-9.3 MARITIME RADIONAVIGATION 5.472 Radiolocation US110	Maritime (80) Private Land Mobile (90)

5.473 5.474 5.474D	5.474	5.474	
9.3-9.5 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION 5.475 SPACE RESEARCH (active)	9.3-9.5 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G56 RADIONAVIGATION US475 SPACE RESEARCH (active) Meteorological aids  5.427 5.474 5.475A 5.475B US67 US71 US476A	9.3-9.5 RADIONAVIGATION US475 Meteorological aids Earth exploration-satellite (active) Radiolocation Space research (active)  5.427 5.474 US67 US71 US476A	Maritime (80) Aviation (87) Private Land Mobile (90)
5.427 5.474 5.475A 5.475B 5.476A			
9.5-9.8 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active)	9.5-9.8 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active)	9.5-9.9 Earth exploration-satellite (active) Radiolocation Space research (active)	Private Land Mobile (90)
5.476A			
9.8-9.9 RADIOLOCATION Earth exploration-satellite (active) Fixed Space research (active)	9.8-9.9 RADIOLOCATION Earth exploration-satellite (active) Space research (active)		
5.477 5.478 5.478A 5.478B			
9.9-10 EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C	9.9-10 RADIOLOCATION	9.9-10 Radiolocation	

RADIOLOCATION

Fixed

5.474D 5.477 5.478 5.479

5.479

5.479

10-10.4 EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C FIXED MOBILE RADIOLOCATION Amateur 5.474D 5.479	10-10.4 EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C RADIOLOCATION Amateur 5.474D 5.479 5.480	10-10.4 EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C FIXED MOBILE RADIOLOCATION Amateur 5.474D 5.479	10-10.5 RADIOLOCATION US108 G32	10-10.45 Amateur Radiolocation US108	Private Land Mobile (90) Amateur Radio (97)
10.4-10.45 FIXED MOBILE RADIOLOCATION Amateur	10.4-10.45 RADIOLOCATION Amateur 5.480	10.4-10.45 FIXED MOBILE RADIOLOCATION Amateur		5.479 US128 NG50	
10.45-10.5 RADIOLOCATION Amateur Amateur-satellite 5.481			5.479 US128	10.45-10.5 Amateur Amateur-satellite Radiolocation US108 US128 NG50	
10.5-10.55 FIXED MOBILE Radiolocation	10.5-10.55 FIXED MOBILE RADIOLOCATION		10.5-10.55 RADIOLOCATION US59		Private Land Mobile (90)
10.55-10.6 FIXED			10.55-10.6	10.55-10.6 FIXED	Fixed Microwave (101)

MOBILE except aeronautical mobile				
Radiolocation				
10.6-10.68		10.6-10.68	10.6-10.68	
EARTH EXPLORATION-SATELLITE (passive)		EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	
FIXED		SPACE RESEARCH (passive)	FIXED US482 SPACE RESEARCH (passive)	
MOBILE except aeronautical mobile			US130 US131	
RADIO ASTRONOMY				
SPACE RESEARCH (passive)				
Radiolocation				
5.149 5.482 5.482A		US130 US131 US482		
10.68-10.7		10.68-10.7		
EARTH EXPLORATION-SATELLITE (passive)		EARTH EXPLORATION-SATELLITE (passive)		
RADIO ASTRONOMY		RADIO ASTRONOMY US74		
SPACE RESEARCH (passive)		SPACE RESEARCH (passive)		
5.340 5.483		US131 US246		
10.7-10.95	10.7-10.95	10.7-11.7	10.7-11.7	
FIXED	FIXED		FIXED	Satellite
FIXED-SATELLITE (space-to-Earth)	FIXED-SATELLITE (space-to-Earth) 5.441		FIXED-SATELLITE (space-to-Earth)	Communications (25)
5.441 (Earth-to-space) 5.484	MOBILE except aeronautical mobile		5.441 US131 US211 NG52	Fixed Microwave (101)
MOBILE except aeronautical mobile				
10.95-11.2	10.95-11.2			
FIXED	FIXED			
FIXED-SATELLITE (space-to-Earth)	FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B			
5.484A 5.484B (Earth-to-space)	MOBILE except aeronautical mobile			
5.484				

MOBILE except aeronautical mobile

US131 US211

NG527A

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11.2-11.45 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 (Earth-to-space) 5.484 MOBILE except aeronautical mobile	11.2-11.45 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE except aeronautical mobile		(See previous page)		
11.45-11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.484 MOBILE except aeronautical mobile	11.45-11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B MOBILE except aeronautical mobile				
11.7-12.5 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492	11.7-12.1 FIXED 5.486 FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.488 Mobile except aeronautical mobile 5.485 12.1-12.2 FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.488 5.485 5.489	11.7-12.2 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492 5.487 5.487A	11.7-12.2	11.7-12.2 FIXED-SATELLITE (space-to-Earth) 5.485 5.488 NG143 NG527A	Satellite Communications (25)
5.487 5.487A	12.2-12.7 FIXED MOBILE except aeronautical mobile	12.2-12.5 FIXED FIXED-SATELLITE (space-to-Earth)	12.2-12.75	12.2-12.7 FIXED BROADCASTING-SATELLITE	Satellite Communications (25)



	BROADCASTING BROADCASTING-SATELLITE 5.492	5.484B MOBILE except aeronautical mobile BROADCASTING 5.484A 5.487			Fixed Microwave (101)
12.5-12.75	5.487A 5.488 5.490	12.5-12.75		5.487A 5.488 5.490	
FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space)	12.7-12.75 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B MOBILE except aeronautical mobile BROADCASTING-SATELLITE 5.493		12.7-12.75 FIXED NG118 FIXED-SATELLITE (Earth-to-space) MOBILE	TV Broadcast Auxiliary (74F) Cable TV Relay (78) Fixed Microwave (101)
5.494 5.495 5.496					
12.75-13.25			12.75-13.25	12.75-13.25 FIXED NG118 FIXED-SATELLITE (Earth-to-space) 5.441 NG52 NG57 MOBILE US251	Satellite Communications (25) TV Broadcast Auxiliary (74F) Cable TV Relay (78) Fixed Microwave (101)
FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space research (deep space) (space-to-Earth)					
13.25-13.4			13.25-13.4	13.25-13.4 AERONAUTICAL RADIONAVIGATION 5.497 Earth exploration-satellite (active) Space research (active)	Aviation (87)
EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active)					
5.498A 5.499			5.498A		

<p>13.4-13.65</p> <p>EARTH EXPLORATION-SATELLITE (active)</p> <p>FIXED-SATELLITE (space-to-Earth) 5.499A 5.499B</p> <p>RADIOLOCATION</p> <p>SPACE RESEARCH 5.499C 5.499D</p> <p>Standard frequency and time signal-satellite (Earth-to-space)</p> <p>5.499E 5.500 5.501 5.501B</p>	<p>13.4-13.65</p> <p>EARTH EXPLORATION-SATELLITE (active)</p> <p>RADIOLOCATION</p> <p>SPACE RESEARCH 5.499C 5.499D</p> <p>Standard frequency and time signal-satellite (Earth-to-space)</p> <p>5.499 5.500 5.501 5.501B</p>	<p>13.4-13.75</p> <p>EARTH EXPLORATION-SATELLITE (active)</p> <p>RADIOLOCATION G59</p> <p>SPACE RESEARCH 5.499C 5.499D 5.501A</p> <p>Standard frequency and time signal-satellite (Earth-to-space)</p> <p>5.501B</p>	<p>13.4-13.75</p> <p>Earth exploration-satellite (active)</p> <p>Radiolocation</p> <p>Space research</p> <p>Standard frequency and time signal-satellite (Earth-to-space)</p>	<p>Private Land Mobile (90)</p>
<p>13.65-13.75</p> <p>EARTH EXPLORATION-SATELLITE (active)</p> <p>RADIOLOCATION</p> <p>SPACE RESEARCH 5.501A</p> <p>Standard frequency and time signal-satellite (Earth-to-space)</p> <p>5.499 5.500 5.501 5.501B</p>				
<p>13.75-14</p> <p>FIXED-SATELLITE (Earth-to-space) 5.484A</p> <p>RADIOLOCATION</p> <p>Earth exploration-satellite</p> <p>Standard frequency and time signal-satellite (Earth-to-space)</p> <p>Space research</p> <p>5.499 5.500 5.501 5.502 5.503</p>		<p>13.75-14</p> <p>RADIOLOCATION G59</p> <p>Standard frequency and time signal-satellite (Earth-to-space)</p> <p>Space research US337</p> <p>US356 US357</p>	<p>13.75-14</p> <p>FIXED-SATELLITE (Earth-to-space) US337</p> <p>Standard frequency and time signal-satellite (Earth-to-space)</p> <p>Space research</p> <p>Radiolocation</p> <p>US356 US357</p>	<p>Satellite</p> <p>Communications (25)</p> <p>Private Land Mobile (90)</p>
<p>14-14.25</p> <p>FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B</p>		<p>14-14.2</p> <p>Space research US133</p>	<p>14-14.2</p> <p>FIXED-SATELLITE (Earth-to-space) NG527A</p>	<p>Satellite</p>

RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) 5.504B 5.504C 5.506A Space research 5.504A 5.505				Mobile-satellite (Earth-to-space) Space research US133	Communications (25)
14.25-14.3 FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.508A Space research 5.504A 5.505 5.508			14.2-14.4	14.2-14.47 FIXED-SATELLITE (Earth-to-space) NG527A Mobile-satellite (Earth-to-space)	
14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A Radionavigation-satellite 5.504A	14.3-14.4 FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.484B 5.506 5.506B Mobile-satellite (Earth-to-space) 5.506A Radionavigation-satellite 5.504A	14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.484B 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A Radionavigation-satellite 5.504A			
14.4-14.47 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.484B 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A Space research (space-to-Earth)			14.4-14.47	Fixed Mobile	

5.504A

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International Table			United States Table		FCC Rule Part(s)
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14.47-14.5			14.47-14.5	14.47-14.5	Satellite Communications (25)
FIXED			Fixed	FIXED-SATELLITE (Earth-to-space)	
FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B			Mobile	NG527A	
MOBILE except aeronautical mobile				Mobile-satellite (Earth-to-space)	
Mobile-satellite (Earth-to-space) 5.504B 5.506A 5.509A					
Radio astronomy					
5.149 5.504A			US113 US133 US342	US113 US133 US342	
14.5-14.75			14.5-14.7145	14.5-14.8	
FIXED			FIXED		
FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510			Mobile		
MOBILE			Space research 5.509G		
Space research 5.509G			14.7145-14.8		
14.75-14.8			MOBILE		
FIXED			Fixed		
FIXED-SATELLITE (Earth-to-space) 5.510			Space research 5.509G		
MOBILE					
Space research 5.509G					
14.75-14.8			14.75-14.8		
FIXED			FIXED		
FIXED-SATELLITE (Earth-to-space) 5.510			FIXED-SATELLITE (Earth-to-space)		
MOBILE			5.509B 5.509C 5.509D 5.509E		
Space research 5.509G			5.509F 5.510		
			MOBILE		
			Space research 5.509G		
14.8-15.35			14.8-15.1365	14.8-15.1365	
FIXED			MOBILE		
MOBILE			SPACE RESEARCH		
Space research			Fixed		
			US310	US310	

<p>5.339</p>	<p>15.1365-15.35 FIXED SPACE RESEARCH Mobile 5.339 US211</p>	<p>15.1365-15.35 5.339 US211</p>	
<p>15.35-15.4 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.511</p>	<p>15.35-15.4 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) US246</p>		
<p>15.4-15.43 RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION</p>	<p>15.4-15.43 RADIOLOCATION 5.511E 5.511F US511E AERONAUTICAL RADIONAVIGATION US260 US211</p>	<p>15.4-15.43 AERONAUTICAL RADIONAVIGATION US260 US211 US511E</p>	<p>Aviation (87)</p>
<p>15.43-15.63 FIXED-SATELLITE (Earth-to-space) 5.511A RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511C</p>	<p>15.43-15.63 RADIOLOCATION 5.511E 5.511F US511E AERONAUTICAL RADIONAVIGATION US260 5.511C US211 US359</p>	<p>15.43-15.63 FIXED-SATELLITE (Earth-to-space) AERONAUTICAL RADIONAVIGATION US260 5.511C US211 US359 US511E</p>	<p>Satellite Communications (25) Aviation (87)</p>

15.63-15.7 RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION			15.63-15.7 RADIOLOCATION 5.511E 5.511F US511E AERONAUTICAL RADIONAVIGATION US260 US211	15.63-15.7 AERONAUTICAL RADIONAVIGATION US260 US211 US511E	Aviation (87)
15.7-16.6 RADIOLOCATION  5.512 5.513			15.7-16.6 RADIOLOCATION G59	15.7-17.2 Radiolocation	Private Land Mobile (90)
16.6-17.1 RADIOLOCATION Space research (deep space) (Earth-to-space)  5.512 5.513			16.6-17.1 RADIOLOCATION G59 Space research (deep space) (Earth-to-space)		
17.1-17.2 RADIOLOCATION  5.512 5.513			17.1-17.2 RADIOLOCATION G59		
17.2-17.3 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active)  5.512 5.513 5.513A			17.2-17.3 EARTH EXPLORATION- SATELLITE (active) RADIOLOCATION G59 SPACE RESEARCH (active)	17.2-17.3 Earth exploration-satellite (active) Radiolocation Space research (active)	
17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) 5.516A	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516	17.3-17.7 Radiolocation US259 G59	17.3-17.7 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) NG527A	Satellite Communications (25)

5.516B Radiolocation	BROADCASTING-SATELLITE Radiolocation	Radiolocation		BROADCASTING-SATELLITE	
5.514	5.514 5.515	5.514	US402 G117	US259 US402 NG58	
17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE	17.7-17.8 FIXED FIXED-SATELLITE (space-to-Earth) 5.517 5.517A (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.515	17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE	17.7-17.8       US334 G117	17.7-17.8 FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) NG527A   US334 NG58	Satellite Communications (25) TV Broadcast Auxiliary (74F) Cable TV Relay (78) Fixed Microwave (101)
	17.8-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE 5.519		17.8-18.6 FIXED-SATELLITE (space-to-Earth) US334 G117	17.8-18.3 FIXED Fixed-satellite (space-to-Earth) NG527A	
18.1-18.4 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B 5.517A (Earth-to-space) 5.520 MOBILE 5.519 5.521				US334 US519 18.3-18.6 FIXED-SATELLITE (space-to-Earth) NG527A	Satellite Communications (25)



18.4-18.6

FIXED

FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B 5.517A

MOBILE

US139 US519

US139 US334

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
18.6-18.8	18.6-18.8	18.6-18.8	18.6-18.8	18.6-18.8	Satellite Communications (25)
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	
FIXED	FIXED	FIXED	FIXED-SATELLITE (space-to-Earth) US255 US334 G117	FIXED-SATELLITE (space-to-Earth) US255 NG164 NG527A	
FIXED-SATELLITE (space-to-Earth) 5.517A 5.522B	FIXED-SATELLITE (space-to-Earth) 5.516B 5.517A 5.522B	FIXED-SATELLITE (space-to-Earth) 5.517A 5.522B	SPACE RESEARCH (passive)	SPACE RESEARCH (passive)	
MOBILE except aeronautical mobile	MOBILE except aeronautical mobile	MOBILE except aeronautical mobile			
Space research (passive)	SPACE RESEARCH (passive)	Space research (passive)			
5.522A 5.522C	5.522A	5.522A	US139 US254	US139 US254 US334	
18.8-19.3			18.8-20.2	18.8-19.3	
FIXED			FIXED-SATELLITE (space-to-Earth) US334 G117	FIXED-SATELLITE (space-to-Earth) NG165 NG527A	
FIXED-SATELLITE (space-to-Earth) 5.516B 5.517A 5.523A				US139 US334	
MOBILE					
19.3-19.7				19.3-19.7	Satellite Communications (25) TV Broadcast Auxiliary (74F) Cable TV Relay (78) Fixed Microwave (101)
FIXED				FIXED	
FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.517A 5.523B 5.523C 5.523D 5.523E				FIXED-SATELLITE (space-to-Earth) NG166	
MOBILE				US334 NG527A	
19.7-20.1	19.7-20.1	19.7-20.1		19.7-20.2	Satellite Communications (25)
FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A	FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A	FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A		FIXED-SATELLITE (space-to-Earth) NG527A	
Mobile-satellite (space-to-Earth)	MOBILE-SATELLITE (space-to-Earth)	Mobile-satellite (space-to-Earth)		MOBILE-SATELLITE (space-to-Earth)	
	5.524 5.525 5.526 5.527 5.528				

5.524	5.529	5.524			
20.1-20.2					
FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A					
MOBILE-SATELLITE (space-to-Earth)					
5.524 5.525 5.526 5.527 5.528			US139	5.525 5.526 5.527 5.528 5.529	US334
20.2-21.2			20.2-21.2	20.2-21.2	
FIXED-SATELLITE (space-to-Earth)			FIXED-SATELLITE	Standard frequency and time	
MOBILE-SATELLITE (space-to-Earth)			(space-to-Earth)	signal-satellite (space-to-Earth)	
Standard frequency and time signal-satellite (space-to-Earth)			MOBILE-SATELLITE		
			(space-to-Earth)		
			Standard frequency and time		
			signal-satellite (space-to-Earth)		
5.524			G117		
21.2-21.4			21.2-21.4		
EARTH EXPLORATION-SATELLITE (passive)			EARTH EXPLORATION-SATELLITE (passive)		Fixed Microwave (101)
FIXED			FIXED		
MOBILE			MOBILE		
SPACE RESEARCH (passive)			SPACE RESEARCH (passive)		
			US532		
21.4-22			21.4-22	21.4-22	
FIXED	FIXED 5.530E	FIXED	FIXED		
MOBILE	MOBILE	MOBILE	MOBILE		
BROADCASTING-SATELLITE 5.208B		BROADCASTING-SATELLITE 5.208B			
5.530A 5.530B	5.530A	5.530A 5.530B 5.531			

<p>22-22.21</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>5.149</p>	<p>22-22.21</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>US342</p>	
<p>22.21-22.5</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>RADIO ASTRONOMY</p> <p>SPACE RESEARCH (passive)</p> <p>5.149 5.532</p>	<p>22.21-22.5</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>RADIO ASTRONOMY</p> <p>SPACE RESEARCH (passive)</p> <p>US342 US532</p>	
<p>22.5-22.55</p> <p>FIXED</p> <p>MOBILE</p>	<p>22.5-22.55</p> <p>FIXED</p> <p>MOBILE</p> <p>US211</p>	
<p>22.55-23.15</p> <p>FIXED</p> <p>INTER-SATELLITE 5.338A</p> <p>MOBILE</p> <p>SPACE RESEARCH (Earth-to-space) 5.532A</p> <p>5.149</p>	<p>22.55-23.15</p> <p>FIXED</p> <p>INTER-SATELLITE US145 US278</p> <p>MOBILE</p> <p>SPACE RESEARCH (Earth-to-space) 5.532A</p> <p>US342</p>	<p>Satellite</p> <p>Communications (25)</p> <p>Fixed Microwave (101)</p>
<p>23.15-23.55</p> <p>FIXED</p> <p>INTER-SATELLITE 5.338A</p>	<p>23.15-23.55</p> <p>FIXED</p> <p>INTER-SATELLITE US145 US278</p>	

MOBILE			MOBILE		
23.55-23.6			23.55-23.6		Fixed Microwave (101)
FIXED			FIXED		
MOBILE			MOBILE		
23.6-24			23.6-24		
EARTH EXPLORATION-SATELLITE (passive)			EARTH EXPLORATION-SATELLITE (passive)		
RADIO ASTRONOMY			RADIO ASTRONOMY US74		
SPACE RESEARCH (passive)			SPACE RESEARCH (passive)		
5.340			US246		
24-24.05			24-24.05	24-24.05	
AMATEUR				AMATEUR	ISM Equipment (18)
AMATEUR-SATELLITE				AMATEUR-SATELLITE	Amateur Radio (97)
5.150			5.150 US211	5.150 US211	
24.05-24.25			24.05-24.25	24.05-24.25	
RADIOLOCATION			RADIOLOCATION G59	Amateur	RF Devices (15)
Amateur			Earth exploration-satellite (active)	Earth exploration-satellite (active)	ISM Equipment (18)
Earth exploration-satellite (active)				Radiolocation	Private Land Mobile (90)
5.150			5.150	5.150	Amateur Radio (97)
24.25-24.45	24.25-24.45	24.25-24.45	24.25-24.45	24.25-24.45	RF Devices (15)
FIXED	FIXED 5.532AA	FIXED		FIXED	Upper Microwave
MOBILE except aeronautical mobile 5.338A 5.532AB	MOBILE except aeronautical mobile 5.338A 5.532AB	MOBILE 5.338A 5.532AB		MOBILE	Flexible Use (30)
	RADIONAVIGATION	RADIONAVIGATION			

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
24.45-24.65	24.45-24.65	24.45-24.65	24.45-24.65		
FIXED	FIXED 5.532AA	FIXED	INTER-SATELLITE		RF Devices (15)
INTER-SATELLITE	INTER-SATELLITE	INTER-SATELLITE	RADIONAVIGATION		Satellite
MOBILE except aeronautical mobile 5.338A 5.532AB	MOBILE except aeronautical mobile 5.338A 5.532AB RADIONAVIGATION	MOBILE 5.338A 5.532AB RADIONAVIGATION			Communications (25)
	5.533	5.533	5.533		
24.65-24.75	24.65-24.75	24.65-24.75	24.65-24.75		
FIXED	FIXED 5.532AA	FIXED	INTER-SATELLITE		
FIXED-SATELLITE (Earth-to-space) 5.532B	INTER-SATELLITE	FIXED-SATELLITE (Earth-to-space) 5.532B	RADIOLOCATION-SATELLITE (Earth-to-space)		
INTER-SATELLITE	MOBILE except aeronautical mobile 5.338A 5.532AB	INTER-SATELLITE			
MOBILE except aeronautical mobile 5.338A 5.532AB	RADIOLOCATION-SATELLITE (Earth-to-space)	MOBILE 5.338A 5.532AB			
24.75-25.25	24.75-25.25	24.75-25.25	24.75-25.25	24.75-25.25	
FIXED	FIXED 5.532AA	FIXED		FIXED	RF Devices (15)
FIXED-SATELLITE (Earth-to-space) 5.532B	FIXED-SATELLITE (Earth-to-space) 5.535	FIXED-SATELLITE (Earth-to-space) 5.535		FIXED-SATELLITE (Earth-to-space)	Satellite
MOBILE except aeronautical mobile 5.338A 5.532AB	MOBILE except aeronautical mobile 5.338A 5.532AB	MOBILE 5.338A 5.532AB		MOBILE	Communications (25)
				NG65	Upper Microwave Flexible Use (30)
25.25-25.5			25.25-25.5	25.25-25.5	
FIXED 5.534A			FIXED	Inter-satellite 5.536	RF Devices (15)
INTER-SATELLITE 5.536			INTER-SATELLITE 5.536	Standard frequency and time	
MOBILE 5.338A 5.532AB			MOBILE	signal-satellite (Earth-to-space)	

Standard frequency and time signal-satellite (Earth-to-space)		Standard frequency and time signal-satellite (Earth-to-space)		
25.5-27		25.5-27	25.5-27	
EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.536B		EARTH EXPLORATION-SATELLITE (space-to-Earth)	SPACE RESEARCH (space-to-Earth)	
FIXED 5.534A		FIXED	Inter-satellite 5.536	
INTER-SATELLITE 5.536		INTER-SATELLITE 5.536	Standard frequency and time signal-satellite (Earth-to-space)	
MOBILE 5.338A 5.532AB		MOBILE		
SPACE RESEARCH (space-to-Earth) 5.536C		SPACE RESEARCH (space-to-Earth)		
Standard frequency and time signal-satellite (Earth-to-space)		Standard frequency and time signal-satellite (Earth-to-space)		
5.536A		5.536A US258	5.536A US258	
27-27.5	27-27.5	27-27.5	27-27.5	
FIXED	FIXED 5.534A	FIXED	Inter-satellite 5.536	
INTER-SATELLITE 5.536	FIXED-SATELLITE (Earth-to-space)	INTER-SATELLITE 5.536		
MOBILE 5.338A 5.532AB	INTER-SATELLITE 5.536 5.537	MOBILE		
	MOBILE 5.338A 5.532AB			
27.5-28.5		27.5-30	27.5-28.35	
FIXED 5.537A			FIXED	RF Devices (15)
FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539			FIXED-SATELLITE (Earth-to-space)	Satellite Communications (25)
MOBILE			MOBILE	Upper Microwave Flexible Use (30)
				Fixed Microwave (101)
5.538 5.540			28.35-29.1	
			FIXED-SATELLITE (Earth-to-space)	RF Devices (15)
			NG165 NG527A	Satellite Communications (25)

28.5-29.1

FIXED

FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.523A 5.539

MOBILE

Earth exploration-satellite (Earth-to-space) 5.541

5.540

29.1-29.5

FIXED

FIXED-SATELLITE (Earth-to-space) 5.516B 5.517A 5.523C 5.523E 5.535A 5.539 5.541A

MOBILE

Earth exploration-satellite (Earth-to-space) 5.541

5.540

29.5-29.9	29.5-29.9	29.5-29.9
FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE (Earth-to-space)
5.484A 5.484B 5.516B 5.527A	5.484A 5.484B 5.516B 5.527A	5.484A 5.484B 5.516B 5.527A
5.539	5.539	5.539
Earth exploration-satellite (Earth-to-space) 5.541	MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541	Earth exploration-satellite (Earth-to-space) 5.541
Mobile-satellite (Earth-to-space)		Mobile-satellite (Earth-to-space)
5.540 5.542	5.525 5.526 5.527 5.529 5.540	5.540 5.542

29.9-30

FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539

MOBILE-SATELLITE (Earth-to-space)

NG62

29.1-29.25

FIXED

FIXED-SATELLITE (Earth-to-space)

NG166

MOBILE

Satellite  
Communications  
(25)  
Fixed Microwave (101)

29.25-29.5

FIXED-SATELLITE (Earth-to-space)

NG527A NG535A

NG62

Satellite  
Communications (25)

29.5-30

FIXED-SATELLITE (Earth-to-space)

NG527A

MOBILE-SATELLITE  
(Earth-to-space)

5.525 5.526 5.527 5.529 5.543



Earth exploration-satellite (Earth-to-space) 5.541 5.543				
5.525 5.526 5.527 5.538 5.540 5.542				
30-31			30-31	30-31
FIXED-SATELLITE (Earth-to-space) 5.338A			FIXED-SATELLITE (Earth-to-space)	Standard frequency and time
MOBILE-SATELLITE (Earth-to-space)			MOBILE-SATELLITE (Earth-to-space)	signal-satellite (space-to-Earth)
Standard frequency and time signal-satellite (space-to-Earth)			Standard frequency and time	
5.542			signal-satellite (space-to-Earth)	
G117				
31-31.3			31-31.3	31-31.3
FIXED 5.338A 5.543B			Standard frequency and time	FIXED NG60
MOBILE			signal-satellite (space-to-Earth)	MOBILE
Standard frequency and time signal-satellite (space-to-Earth)				Standard frequency and time
Space research 5.544 5.545				signal-satellite (space-to-Earth)
5.149			US211 US342	US211 US342
31.3-31.5			31.3-31.8	
EARTH EXPLORATION-SATELLITE (passive)			EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY			RADIO ASTRONOMY US74	
SPACE RESEARCH (passive)			SPACE RESEARCH (passive)	
5.340				
31.5-31.8	31.5-31.8	31.5-31.8		
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)		
RADIO ASTRONOMY	RADIO ASTRONOMY	RADIO ASTRONOMY		
SPACE RESEARCH (passive)	SPACE RESEARCH (passive)	SPACE RESEARCH (passive)		
Fixed		Fixed		
Mobile except aeronautical mobile		Mobile except aeronautical mobile	US246	

Fixed Microwave (101)

5.149 5.546	5.340	5.149	
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International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
31.8-32 FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth)  5.547 5.547B 5.548			31.8-32.3 RADIONAVIGATION US69 SPACE RESEARCH (deep space) (space-to-Earth) US262  5.548 US211		31.8-32.3 SPACE RESEARCH (deep space) (space-to-Earth) US262
32-32.3 FIXED 5.547A RADIONAVIGATION SPACE RESEARCH (deep space) (space-to-Earth)  5.547 5.547C 5.548			5.548 US211		
32.3-33 FIXED 5.547A INTER-SATELLITE RADIONAVIGATION  5.547 5.547D 5.548			32.3-33 INTER-SATELLITE US278 RADIONAVIGATION US69  5.548		Aviation (87)
33-33.4 FIXED 5.547A RADIONAVIGATION  5.547 5.547E			33-33.4 RADIONAVIGATION US69  US360 G117		
33.4-34.2			33.4-34.2	33.4-34.2	

RADIOLOCATION  5.549	RADIOLOCATION  US360 G117	Radiolocation  US360	Private Land Mobile  (90)
34.2-34.7  RADIOLOCATION  SPACE RESEARCH (deep space) (Earth-to-space)  5.549	34.2-34.7  RADIOLOCATION  SPACE RESEARCH (deep space) (Earth-to-space) US262  US360 G34 G117	34.2-34.7  Radiolocation  Space research (deep space) (Earth-to-space) US262  US360	
34.7-35.2  RADIOLOCATION  Space research 5.550  5.549	34.7-35.5  RADIOLOCATION        US360 G117	34.7-35.5  Radiolocation        US360	
35.2-35.5  METEOROLOGICAL AIDS  RADIOLOCATION  5.549			
35.5-36  METEOROLOGICAL AIDS  EARTH EXPLORATION-SATELLITE (active)  RADIOLOCATION  SPACE RESEARCH (active)  5.549 5.549A	35.5-36  EARTH EXPLORATION-SATELLITE (active)  RADIOLOCATION  SPACE RESEARCH (active)  US360 G117	35.5-36  Earth exploration-satellite (active)  Radiolocation  Space research (active)  US360	
36-37  EARTH EXPLORATION-SATELLITE (passive)  FIXED	36-37  EARTH EXPLORATION-SATELLITE (passive)  FIXED		

MOBILE

SPACE RESEARCH (passive)

5.149 5.550A

MOBILE

SPACE RESEARCH (passive)

US342 US550A

<p>37-37.5</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile 5.550B</p> <p>SPACE RESEARCH (space-to-Earth)</p> <p>5.547</p>	<p>37-38</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>SPACE RESEARCH (space-to-Earth)</p>	<p>37-37.5</p> <p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>US151</p>	<p>Upper Microwave</p> <p>Flexible Use (30)</p>
<p>37.5-38</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth) 5.550C</p> <p>MOBILE except aeronautical mobile 5.550B</p> <p>SPACE RESEARCH (space-to-Earth)</p> <p>Earth exploration-satellite (space-to-Earth)</p> <p>5.547</p>	<p>US151</p>	<p>37.5-38</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>NG63</p> <p>MOBILE except aeronautical mobile</p> <p>US151</p>	<p>Satellite</p> <p>Communications (25)</p> <p>Upper Microwave</p> <p>Flexible Use (30)</p>
<p>38-39.5</p> <p>FIXED 5.550D</p> <p>FIXED-SATELLITE (space-to-Earth) 5.550C</p> <p>MOBILE 5.550B</p> <p>Earth exploration-satellite (space-to-Earth)</p> <p>5.547</p>	<p>38-38.6</p> <p>FIXED</p> <p>MOBILE</p> <p>38.6-39.5</p>	<p>38-39.5</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>NG63</p> <p>MOBILE NG175</p>	
<p>39.5-40</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C</p> <p>MOBILE 5.550B</p> <p>MOBILE-SATELLITE (space-to-Earth)</p> <p>Earth exploration-satellite (space-to-Earth)</p> <p>5.547 5.550E</p>	<p>39.5-40</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE-SATELLITE (space-to-Earth)</p> <p>US382</p> <p>G117</p>	<p>39.5-40</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>NG63</p> <p>MOBILE NG175</p> <p>US382</p>	
<p>40-40.5</p>	<p>40-40.5</p>	<p>40-40.5</p>	

EARTH EXPLORATION-SATELLITE (Earth-to-space)			EARTH EXPLORATION-SATELLITE (Earth-to-space)	FIXED-SATELLITE (space-to-Earth)	Satellite Communications (25)
FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C MOBILE 5.550B MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)			FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)	MOBILE-SATELLITE (space-to-Earth)	
5.550E			G117		
40.5-41	40.5-41	40.5-41	40.5-41	40.5-41	
FIXED FIXED-SATELLITE (space-to-Earth) 5.550C LAND MOBILE 5.550B BROADCASTING BROADCASTING-SATELLITE Aeronautical mobile Maritime mobile	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C LAND MOBILE 5.550B BROADCASTING BROADCASTING-SATELLITE Aeronautical mobile Maritime mobile Mobile-satellite (space-to-Earth)	FIXED FIXED-SATELLITE (space-to-Earth) 5.550C LAND MOBILE 5.550B BROADCASTING BROADCASTING-SATELLITE Aeronautical mobile Maritime mobile	FIXED-SATELLITE (space-to-Earth) Mobile-satellite (space-to-Earth)	FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Fixed Mobile Mobile-satellite (space-to-Earth)	
5.547	5.547	5.547	US211 G117	US211	
41-42.5			41-42.5	41-42	
FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.550C LAND MOBILE 5.550B BROADCASTING BROADCASTING-SATELLITE Aeronautical mobile Maritime mobile				FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE	

Table of Frequency Allocations

42-56.9 GHz (EHF)

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
41-42.5 GHz: see previous page			41-42.5 GHz: see previous page	42-42.5 FIXED MOBILE US211	
42.5-43.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile 5.550B RADIO ASTRONOMY			42.5-43.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile RADIO ASTRONOMY US342	42.5-43.5 RADIO ASTRONOMY US342	
5.149 5.547			US342		
43.5-47 MOBILE 5.553 5.553A MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE			43.5-45.5 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) G117	43.5-45.5	
			45.5-46.9 MOBILE MOBILE-SATELLITE (Earth-to-space) RADIONAVIGATION-SATELLITE 5.554		



<p>5.554</p>	<p>46.9-47</p> <p>MOBILE</p> <p>MOBILE-SATELLITE (Earth-to-space)</p> <p>RADIONAVIGATION-SATELLITE</p> <p>5.554</p>	<p>46.9-47</p> <p>FIXED</p> <p>MOBILE</p> <p>MOBILE-SATELLITE (Earth-to-space)</p> <p>RADIONAVIGATION-SATELLITE</p> <p>5.554</p>	
<p>47-47.2</p> <p>AMATEUR</p> <p>AMATEUR-SATELLITE</p>	<p>47-48.2</p>	<p>47-47.2</p> <p>AMATEUR</p> <p>AMATEUR-SATELLITE</p>	<p>Amateur Radio (97)</p>
<p>47.2-47.5</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552</p> <p>MOBILE 5.553B</p> <p>5.552A</p>		<p>47.2-48.2</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space)</p> <p>US297</p> <p>MOBILE</p>	<p>Satellite</p> <p>Communications (25)</p> <p>Upper Microwave</p> <p>Flexible Use (30)</p>
<p>47.5-47.9</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space)</p> <p>5.550C 5.552 (space-to-Earth)</p> <p>5.516B 5.554A</p> <p>MOBILE 5.553B</p>	<p>47.5-47.9</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552</p> <p>MOBILE 5.553B</p>		
<p>47.9-48.2</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space) 5.550C 5.552</p> <p>MOBILE 5.553B</p>		<p>NG65</p>	

5.552A

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<p>48.2-48.54</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space)</p> <p>5.550C 5.552 (space-to-Earth)</p> <p>5.516B 5.554A 5.555B</p> <p>MOBILE</p>	<p>48.2-50.2</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space) 5.338A 5.516B 5.550C</p> <p>5.552</p> <p>MOBILE</p>	<p>48.2-50.2</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space) US156 US297</p> <p>MOBILE US264</p>		<p>Satellite</p> <p>Communications (25)</p>
<p>48.54-49.44</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space)</p> <p>5.550C 5.552</p> <p>MOBILE</p> <p>5.149 5.340 5.555</p>	<p>5.149 5.340 5.555</p>	<p>5.555 US342</p>		
<p>49.44-50.2</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space)</p> <p>5.338A 5.550C 5.552 (space-to-Earth) 5.516B 5.554A 5.555B</p> <p>MOBILE</p>	<p>5.149 5.340 5.555</p>	<p>5.555 US342</p>		
<p>50.2-50.4</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>SPACE RESEARCH (passive)</p> <p>5.340</p>		<p>50.2-50.4</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>SPACE RESEARCH (passive)</p> <p>US246</p>		
<p>50.4-51.4</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space) 5.338A 5.550C</p> <p>MOBILE</p>	<p>50.4-51.4</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space) US156</p> <p>MOBILE</p> <p>MOBILE-SATELLITE (Earth-to-space)</p>	<p>50.4-51.4</p> <p>FIXED</p> <p>FIXED-SATELLITE (Earth-to-space) US156</p> <p>MOBILE</p> <p>MOBILE-SATELLITE (Earth-to-space)</p>	<p>Satellite</p> <p>Communications (25)</p>	

Mobile-satellite (Earth-to-space)	G117	NG65	
51.4-52.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.555C MOBILE  5.338A 5.547 5.556	51.4-52.6 FIXED US157 MOBILE		
52.4-52.6 FIXED 5.338A MOBILE  5.547 5.556			
52.6-54.25 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive)  5.340 5.556	52.6-54.25 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive)  US246		
54.25-55.78 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive)  5.556B	54.25-55.78 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive)		Satellite Communications (25)
55.78-56.9 EARTH EXPLORATION-SATELLITE (passive) FIXED 5.557A INTER-SATELLITE 5.556A MOBILE 5.558	55.78-56.9 EARTH EXPLORATION-SATELLITE (passive) FIXED US379 INTER-SATELLITE 5.556A MOBILE 5.558		

SPACE RESEARCH (passive)	SPACE RESEARCH (passive)	
5.547 5.557	US353 US532	Page 60

Table of Frequency Allocations 56.9-81 GHz (EHF) Page 61

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
56.9-57			56.9-57	56.9-57	
EARTH EXPLORATION-SATELLITE (passive)			EARTH EXPLORATION-SATELLITE	EARTH EXPLORATION-SATELLITE	
FIXED			(passive)	(passive)	
INTER-SATELLITE 5.558A			FIXED	FIXED	
MOBILE 5.558			INTER-SATELLITE G128	MOBILE 5.558	
SPACE RESEARCH (passive)			MOBILE 5.558	SPACE RESEARCH (passive)	
5.547 5.557			SPACE RESEARCH (passive)		
5.547 5.557			US532	US532	
57-58.2			57-58.2		
EARTH EXPLORATION-SATELLITE (passive)			EARTH EXPLORATION-SATELLITE (passive)		RF Devices (15)
FIXED			FIXED		Satellite Communications (25)
INTER-SATELLITE 5.556A			INTER-SATELLITE 5.556A		
MOBILE 5.558			MOBILE 5.558		
SPACE RESEARCH (passive)			SPACE RESEARCH (passive)		
5.547 5.557			US532		
58.2-59			58.2-59		
EARTH EXPLORATION-SATELLITE (passive)			EARTH EXPLORATION-SATELLITE (passive)		RF Devices (15)
FIXED			FIXED		
MOBILE			MOBILE		
SPACE RESEARCH (passive)			SPACE RESEARCH (passive)		

5.547 5.556	US353 US354		
59-59.3 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 RADIOLOCATION 5.559 SPACE RESEARCH (passive)	59-59.3 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 RADIOLOCATION 5.559 SPACE RESEARCH (passive)  US353	59-59.3 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE 5.558 RADIOLOCATION 5.559 SPACE RESEARCH (passive)  US353	
59.3-64 FIXED INTER-SATELLITE MOBILE 5.558 RADIOLOCATION 5.559  5.138	59.3-64 FIXED INTER-SATELLITE MOBILE 5.558 RADIOLOCATION 5.559  5.138 US353	59.3-64 FIXED MOBILE 5.558 RADIOLOCATION 5.559  5.138 US353	RF Devices (15) ISM Equipment (18)
64-65 FIXED INTER-SATELLITE MOBILE except aeronautical mobile  5.547 5.556	64-65 FIXED INTER-SATELLITE MOBILE except aeronautical mobile	64-65 FIXED MOBILE except aeronautical mobile	RF Devices (15)
65-66 EARTH EXPLORATION-SATELLITE FIXED	65-66 EARTH EXPLORATION-SATELLITE	65-66 EARTH EXPLORATION-SATELLITE	RF Devices (15)

<p>INTER-SATELLITE</p> <p>MOBILE except aeronautical mobile</p> <p>SPACE RESEARCH</p> <p>5.547</p>	<p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>SPACE RESEARCH</p>	<p>FIXED</p> <p>INTER-SATELLITE</p> <p>MOBILE except aeronautical mobile</p> <p>SPACE RESEARCH</p>	<p>Satellite Communications (25)</p>
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<p>66-71</p> <p>INTER-SATELLITE</p> <p>MOBILE 5.553 5.558 5.559AA</p> <p>MOBILE-SATELLITE</p> <p>RADIONAVIGATION</p> <p>RADIONAVIGATION-SATELLITE</p> <p>5.554</p>	<p>66-71</p> <p>MOBILE 5.553 5.558</p> <p>MOBILE-SATELLITE</p> <p>RADIONAVIGATION</p> <p>RADIONAVIGATION-SATELLITE</p> <p>5.554</p>	<p>66-71</p> <p>INTER-SATELLITE</p> <p>MOBILE 5.553 5.558</p> <p>MOBILE-SATELLITE</p> <p>RADIONAVIGATION</p> <p>RADIONAVIGATION-SATELLITE</p> <p>5.554</p>	
<p>71-74</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE</p> <p>MOBILE-SATELLITE (space-to-Earth)</p>	<p>71-74</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE</p> <p>MOBILE-SATELLITE (space-to-Earth)</p> <p>US389</p>	<p>Fixed Microwave (101)</p>	
<p>74-76</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE</p> <p>BROADCASTING</p> <p>BROADCASTING-SATELLITE</p> <p>Space research (space-to-Earth)</p> <p>5.561</p>	<p>74-76</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE</p> <p>Space research (space-to-Earth)</p> <p>US389</p>	<p>74-76</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE</p> <p>BROADCASTING</p> <p>BROADCASTING-SATELLITE</p> <p>Space research (space-to-Earth)</p> <p>US389</p>	<p>RF Devices (15)</p> <p>Fixed Microwave (101)</p>
<p>76-77.5</p> <p>RADIO ASTRONOMY</p> <p>RADIOLOCATION</p> <p>Amateur</p> <p>Amateur-satellite</p>	<p>76-81</p> <p>RADIO ASTRONOMY</p> <p>RADIOLOCATION</p> <p>Space research (space-to-Earth)</p>	<p>76-77</p> <p>RADIO ASTRONOMY</p> <p>RADIOLOCATION</p> <p>Amateur</p> <p>Space research (space-to-Earth)</p>	<p>RF Devices (15)</p> <p>Personal Radio (95)</p> <p>Amateur Radio (97)</p>



Space research (space-to-Earth)		US342	
5.149 77.5-78 AMATEUR AMATEUR-SATELLITE RADIOLOCATION 5.559B Radio astronomy Space research (space-to-Earth)		77-81 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth)	
5.149 78-79 RADIOLOCATION Amateur Amateur-satellite Radio astronomy Space research (space-to-Earth)			
5.149 5.560 79-81 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth)	5.560 US342	5.560 US342	Page 62

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
81-84			81-84		RF Devices (15) Fixed Microwave (101)
FIXED 5.338A			FIXED		
FIXED-SATELLITE (Earth-to-space)			FIXED-SATELLITE (Earth-to-space) US297		
MOBILE			MOBILE		
MOBILE-SATELLITE (Earth-to-space)			MOBILE-SATELLITE (Earth-to-space)		
RADIO ASTRONOMY			RADIO ASTRONOMY		
Space research (space-to-Earth)			Space research (space-to-Earth)		
5.149 5.561A			US161 US342 US389		
84-86			84-86		
FIXED 5.338A			FIXED		
FIXED-SATELLITE (Earth-to-space) 5.561B			FIXED-SATELLITE (Earth-to-space)		
MOBILE			MOBILE		
RADIO ASTRONOMY			RADIO ASTRONOMY		
5.149			US161 US342 US389		
86-92			86-92		
EARTH EXPLORATION-SATELLITE (passive)			EARTH EXPLORATION-SATELLITE (passive)		
RADIO ASTRONOMY			RADIO ASTRONOMY US74		
SPACE RESEARCH (passive)			SPACE RESEARCH (passive)		
5.340			US246		
92-94			92-94		
FIXED 5.338A			FIXED		
MOBILE			MOBILE		

RADIO ASTRONOMY	RADIO ASTRONOMY		
RADIOLOCATION	RADIOLOCATION		
5.149	US161 US342		
94-94.1	94-94.1	94-94.1	
EARTH EXPLORATION-SATELLITE (active)	EARTH EXPLORATION-SATELLITE (active)	RADIOLOCATION	RF Devices (15)
RADIOLOCATION	RADIOLOCATION	Radio astronomy	
SPACE RESEARCH (active)	SPACE RESEARCH (active)		
Radio astronomy	Radio astronomy		
5.562 5.562A	5.562 5.562A	5.562A	
94.1-95	94.1-95		
FIXED	FIXED		RF Devices (15)
MOBILE	MOBILE		Fixed Microwave (101)
RADIO ASTRONOMY	RADIO ASTRONOMY		
RADIOLOCATION	RADIOLOCATION		
5.149	US161 US342		
95-100	95-100		
FIXED	FIXED		
MOBILE	MOBILE		
RADIO ASTRONOMY	RADIO ASTRONOMY		
RADIOLOCATION	RADIOLOCATION		
RADIONAVIGATION	RADIONAVIGATION		
RADIONAVIGATION-SATELLITE	RADIONAVIGATION-SATELLITE		
5.149 5.554	5.554 US342		

<p>100-102</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>RADIO ASTRONOMY</p> <p>SPACE RESEARCH (passive)</p> <p>5.340 5.341</p>	<p>100-102</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>RADIO ASTRONOMY US74</p> <p>SPACE RESEARCH (passive)</p> <p>5.341 US246</p>	
<p>102-105</p> <p>FIXED</p> <p>MOBILE</p> <p>RADIO ASTRONOMY</p> <p>5.149 5.341</p>	<p>102-105</p> <p>FIXED</p> <p>MOBILE</p> <p>RADIO ASTRONOMY</p> <p>5.341 US342</p>	
<p>105-109.5</p> <p>FIXED</p> <p>MOBILE</p> <p>RADIO ASTRONOMY</p> <p>SPACE RESEARCH (passive) 5.562B</p> <p>5.149 5.341</p>	<p>105-109.5</p> <p>FIXED</p> <p>MOBILE</p> <p>RADIO ASTRONOMY</p> <p>SPACE RESEARCH (passive) 5.562B</p> <p>5.341 US342</p>	
<p>109.5-111.8</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>RADIO ASTRONOMY</p> <p>SPACE RESEARCH (passive)</p> <p>5.340 5.341</p>	<p>109.5-111.8</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>RADIO ASTRONOMY US74</p> <p>SPACE RESEARCH (passive)</p> <p>5.341 US246</p>	
<p>111.8-114.25</p> <p>FIXED</p> <p>MOBILE</p>	<p>111.8-114.25</p> <p>FIXED</p> <p>MOBILE</p>	

RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B  5.149 5.341 114.25-116	RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B  5.341 US342		
EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)  5.340 5.341 116-119.98	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive)  5.341 US246		
EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive)  5.341 119.98-122.25	EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive)  5.138 5.341 US211		ISM Equipment (18)
EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.562C SPACE RESEARCH (passive)  5.138 5.341 122.25-123	122.25-123 FIXED INTER-SATELLITE MOBILE 5.558	122.25-123 FIXED INTER-SATELLITE MOBILE 5.558 Amateur	ISM Equipment (18) Amateur Radio (97)
FIXED INTER-SATELLITE MOBILE 5.558 Amateur			



International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
123-130			123-130		
FIXED-SATELLITE (space-to-Earth)			FIXED-SATELLITE (space-to-Earth)		
MOBILE-SATELLITE (space-to-Earth)			MOBILE-SATELLITE (space-to-Earth)		
RADIONAVIGATION			RADIONAVIGATION		
RADIONAVIGATION-SATELLITE			RADIONAVIGATION-SATELLITE		
Radio astronomy 5.562D			Radio astronomy		
5.149 5.554			5.554 US211 US342		
130-134			130-134		
EARTH EXPLORATION-SATELLITE (active) 5.562E			EARTH EXPLORATION-SATELLITE (active) 5.562E		
FIXED			FIXED		
INTER-SATELLITE			INTER-SATELLITE		
MOBILE 5.558			MOBILE 5.558		
RADIO ASTRONOMY			RADIO ASTRONOMY		
5.149 5.562A			5.562A US342		
134-136			134-136	134-136	Amateur Radio (97)
AMATEUR			Radio astronomy	AMATEUR	
AMATEUR-SATELLITE				AMATEUR-SATELLITE	
Radio astronomy				Radio astronomy	
136-141			136-141	136-141	
RADIO ASTRONOMY			RADIO ASTRONOMY	RADIO ASTRONOMY	
RADIOLOCATION			RADIOLOCATION	RADIOLOCATION	
Amateur				Amateur	

Amateur-satellite		Amateur-satellite	
5.149	US342	US342	
141-148.5	141-148.5		
FIXED	FIXED		
MOBILE	MOBILE		
RADIO ASTRONOMY	RADIO ASTRONOMY		
RADIOLOCATION	RADIOLOCATION		
5.149	US342		
148.5-151.5	148.5-151.5		
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)		
RADIO ASTRONOMY	RADIO ASTRONOMY US74		
SPACE RESEARCH (passive)	SPACE RESEARCH (passive)		
5.340	US246		
151.5-155.5	151.5-155.5		
FIXED	FIXED		
MOBILE	MOBILE		
RADIO ASTRONOMY	RADIO ASTRONOMY		
RADIOLOCATION	RADIOLOCATION		
5.149	US342		



<p>155.5-158.5</p> <p>FIXED</p> <p>MOBILE</p> <p>RADIO ASTRONOMY</p> <p>5.149</p>	<p>155.5-158.5</p> <p>FIXED</p> <p>MOBILE</p> <p>RADIO ASTRONOMY</p> <p>US342</p>	
<p>158.5-164</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE</p> <p>MOBILE-SATELLITE (space-to-Earth)</p>	<p>158.5-164</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>MOBILE</p> <p>MOBILE-SATELLITE (space-to-Earth)</p> <p>US211</p>	
<p>164-167</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>RADIO ASTRONOMY</p> <p>SPACE RESEARCH (passive)</p> <p>5.340</p>	<p>164-167</p> <p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>RADIO ASTRONOMY US74</p> <p>SPACE RESEARCH (passive)</p> <p>US246</p>	
<p>167-174.5</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>INTER-SATELLITE</p> <p>MOBILE 5.558</p> <p>5.149 5.562D</p>	<p>167-174.5</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth)</p> <p>INTER-SATELLITE</p> <p>MOBILE 5.558</p> <p>US211 US342</p>	

174.5-174.8	174.5-174.8	
FIXED	FIXED	
INTER-SATELLITE	INTER-SATELLITE	
MOBILE 5.558	MOBILE 5.558	
174.8-182	174.8-182	
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	
INTER-SATELLITE 5.562H	INTER-SATELLITE 5.562H	
SPACE RESEARCH (passive)	SPACE RESEARCH (passive)	
182-185	182-185	
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	
RADIO ASTRONOMY	RADIO ASTRONOMY	
SPACE RESEARCH (passive)	SPACE RESEARCH (passive)	
5.340	US246	
185-190	185-190	
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	
INTER-SATELLITE 5.562H	INTER-SATELLITE 5.562H	
SPACE RESEARCH (passive)	SPACE RESEARCH (passive)	
190-191.8	190-191.8	
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)	
SPACE RESEARCH (passive)	SPACE RESEARCH (passive)	
5.340	US246	

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International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
191.8-200			191.8-200		
FIXED			FIXED		
INTER-SATELLITE			INTER-SATELLITE		
MOBILE 5.558			MOBILE 5.558		
MOBILE-SATELLITE			MOBILE-SATELLITE		
RADIONAVIGATION			RADIONAVIGATION		
RADIONAVIGATION-SATELLITE			RADIONAVIGATION-SATELLITE		
5.149 5.341 5.554			5.341 5.554 US211 US342		
200-209			200-209		
EARTH EXPLORATION-SATELLITE (passive)			EARTH EXPLORATION-SATELLITE (passive)		
RADIO ASTRONOMY			RADIO ASTRONOMY US74		
SPACE RESEARCH (passive)			SPACE RESEARCH (passive)		
5.340 5.341 5.563A			5.341 5.563A US246		
209-217			209-217		
FIXED			FIXED		
FIXED-SATELLITE (Earth-to-space)			FIXED-SATELLITE (Earth-to-space)		
MOBILE			MOBILE		
RADIO ASTRONOMY			RADIO ASTRONOMY		
5.149 5.341			5.341 US342		
217-226			217-226		
FIXED			FIXED		
FIXED-SATELLITE (Earth-to-space)			FIXED-SATELLITE (Earth-to-space)		

MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B  5.149 5.341	MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B  5.341 US342	
226-231.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)  5.340	226-231.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)  US246	
231.5-232 FIXED MOBILE Radiolocation	231.5-232 FIXED MOBILE Radiolocation	
232-235 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation	232-235 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation	
235-238 EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) SPACE RESEARCH (passive)  5.563A 5.563B	235-238 EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) SPACE RESEARCH (passive)  5.563A 5.563B	

238-240	238-240		
FIXED	FIXED		
FIXED-SATELLITE (space-to-Earth)	FIXED-SATELLITE (space-to-Earth)		
MOBILE	MOBILE		
RADIOLOCATION	RADIOLOCATION		
RADIONAVIGATION	RADIONAVIGATION		
RADIONAVIGATION-SATELLITE	RADIONAVIGATION-SATELLITE		
240-241	240-241		
FIXED	FIXED		
MOBILE	MOBILE		
RADIOLOCATION	RADIOLOCATION		
241-248	241-248	241-248	
RADIO ASTRONOMY	RADIO ASTRONOMY	RADIO ASTRONOMY	ISM Equipment (18)
RADIOLOCATION	RADIOLOCATION	RADIOLOCATION	Amateur Radio (97)
Amateur		Amateur	
Amateur-satellite		Amateur-satellite	
5.138 5.149	5.138 US342	5.138 US342	
248-250	248-250	248-250	
AMATEUR	Radio astronomy	AMATEUR	Amateur Radio (97)
AMATEUR-SATELLITE		AMATEUR-SATELLITE	
Radio astronomy		Radio astronomy	
5.149	US342	US342	
250-252	250-252		
EARTH EXPLORATION-SATELLITE (passive)	EARTH EXPLORATION-SATELLITE (passive)		

RADIO ASTRONOMY SPACE RESEARCH (passive)  5.340 5.563A	RADIO ASTRONOMY US74 SPACE RESEARCH (passive)  5.563A US246	
252-265 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY RADIONAVIGATION RADIONAVIGATION-SATELLITE  5.149 5.554	252-265 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY RADIONAVIGATION RADIONAVIGATION-SATELLITE  5.554 US211 US342	
265-275 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY  5.149 5.563A	265-275 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY  5.563A US342	
275-3000 (Not allocated)  5.564A 5.565	275-3000 (Not allocated)  US565	Amateur Radio (97)  Page 68

(a) *Allocation Table*. The Table of Frequency Allocations (Allocation Table) consists of the International Table of Frequency Allocations (International Table), the United States Table of Frequency Allocations (United States Table), and the FCC rule part(s) cross references as described in §§ 2.104 and 2.105, respectively. The International Telecommunication Union (ITU) Radio Regulations are described in § 2.100. The definitions of terms and acronyms used in the Allocation Table are specified in § 2.1. The footnotes to the Allocation Table are listed in ascending numerical order in paragraphs (b) through (e) of this section; however, in some cases, a letter(s) has/have been appended to the digit(s) of a footnote number in order to preserve the sequential order.

### INTERNATIONAL FOOTNOTES

(b) *International footnotes*. International footnotes, each in the format "5." followed by one or more digits, denote stipulations applicable in the relationship between the United States and other nations and thus appear at a minimum in the International Table. Where an international footnote is applicable, without modification, to both Federal and non-Federal operations, the footnote is placed in both the Federal Table and the non-Federal Table (columns 4 and 5) and the international footnote is binding on both Federal users and non-Federal licensees. If, however, an international footnote pertains to a service allocated only for Federal or non-Federal use, the international footnote will be placed only in the relevant Table. Annex, Appendix, Article, No., and Resolution are cross references to provisions in the International Telecommunication Union (ITU) Radio Regulations (see § 2.100 for descriptions of the structure of the ITU Radio Regulations and the terms and abbreviations used in the international footnotes). The ITU-R Recommendations referenced in certain of the international footnotes are available at <https://www.itu.int/pub/R-REC>. The list of international footnotes follows:

(1) - (52) [Reserved]

(53) 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.

(54) 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.

(i) 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.

(ii) 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.

(iii) 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.

(55) 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.

(56) 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.

(57) 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.

(58) 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.

(59) 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).

(60) 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.

(61) 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.

(62) 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.

(63) [Reserved]

(64) 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.

(65) 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).

(66) 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).

(67) 5.67 *Additional allocation:* in Kyrgyzstan and Turkmenistan, the frequency 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.

(i) 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 paragraph (b)(67) of this section.

(ii) 5.67B The use of the frequency band 135.7-137.8 kHz in Algeria, Egypt, 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 previously-mentioned countries in the frequency band 135.7-137.8 kHz, and this should be taken into account by the countries authorizing such use.

(68) 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.

(69) 5.69 *Additional allocation:* in Somalia, the band 200-255 kHz is also allocated to the aeronautical radionavigation service on a primary basis.

(70) 5.70 *Alternative allocation:* in Angola, Botswana, Burundi, the Central African Rep., Congo (Rep. of the), Eswatini, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, the Dem. Rep. of the Congo, South Africa, Tanzania, Chad, Zambia and Zimbabwe, the frequency band 200-283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis.

(72) [Reserved]

(73) 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.

(74) 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.

(75) 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.

(76) 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.

(77) 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, the Dem. People's Rep. of Korea 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.

(78) 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.

(79) 5.79 In the maritime mobile service, the frequency bands 415-495 kHz and 505-526.5 kHz are limited to radiotelegraphy and may also be used for the NAVDAT system in accordance with the most recent version of Recommendation ITU-R M.2010, subject to agreement between interested and affected administrations. NAVDAT transmitting stations are limited to coast stations.

(i) 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)).

(ii) [Reserved]

(80) 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.

(i) 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.

(ii) 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.

(81) [Reserved]

(82) 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.

(i) 5.82C The frequency band 495-505 kHz is used for the international NAVDAT system as described in the most recent version of Recommendation ITU-R M.2010. NAVDAT transmitting stations are limited to coast stations.

(ii) [Reserved]

(83) [Reserved]

(84) 5.84 The conditions for the use of the frequency 518 kHz by the maritime mobile service are prescribed in Articles 31 and 52.

(85) [Reserved]

(86) 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.

(87) 5.87 *Additional allocation:* in Angola, Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia and Niger, the frequency band 526.5-535 kHz is also allocated to the mobile service on a secondary basis.

(i) 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.

(ii) [Reserved]

(88) 5.88 *Additional allocation:* in China, the band 526.5-535 kHz is also allocated to the aeronautical radionavigation service on a secondary basis.

(89) 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).

(90) 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.

(91) 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.

(92) 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.

(93) 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.

(94) - (95) [Reserved]

(96) 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.

(97) 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.

(98) 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.

(99) 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.

(100) 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 paragraphs (b)(98) and (99) of this section to define the necessary steps to be taken to prevent harmful interference between amateur stations and stations of other services operating in accordance with paragraphs (b)(98) and (99) of this section.

(101) [Reserved]

(102) 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.

(103) 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.

(104) 5.104 In Region 1, the use of the band 2025-2045 kHz by the meteorological aids service is limited to oceanographic buoy stations.

(105) 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.

(106) 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.

(107) 5.107 *Additional allocation:* in Saudi Arabia, Eritrea, Eswatini, Ethiopia, Iraq, Libya and Somalia, the frequency 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.

(108) 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.

(109) 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.

(110) 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.

(111) 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  $\pm 3$  kHz about the frequency.

(112) 5.112 *Alternative allocation:* in Sri Lanka, the frequency band 2194-2300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

(113) 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.

(114) 5.114 *Alternative allocation:* in Iraq, the frequency band 2502-2625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

(115) 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.

(116) 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.

(117) 5.117 *Alternative allocation:* in Côte d'Ivoire, Egypt, Liberia, Sri Lanka and Togo, the frequency band 3155-3200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

(118) 5.118 *Additional allocation:* in the United States, Mexico and Peru, the frequency band 3230-3400 kHz is also allocated to the radiolocation service on a secondary basis.

(119) 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.

(120) - (121) [Reserved]

(122) 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.

(123) 5.123 *Additional allocation:* in Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe, the frequency band 3900-3950 kHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. 9.21.

(124) [Reserved]

(125) 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.

(126) 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.

(127) 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).

(128) 5.128 Frequencies in the frequency 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, 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 frequency 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.



(129) [Reserved]

(130) 5.130 The conditions for the use of the carrier frequencies 4125 kHz and 6215 kHz are prescribed in Articles 31 and 52.

(131) 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.

(132) 5.132 The frequencies 4210 kHz, 6314 kHz, 8416.5 kHz, 12579 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).

(i) 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).

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

(133) 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).

(i) 5.133A *Alternative allocation:* in Armenia, Belarus, Moldova 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.

(ii) 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 countries and territories within the Kingdom 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.).

(134) 5.134 The use of the frequency 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 frequency bands to facilitate the introduction of digitally modulated emissions in accordance with the provisions of Resolution 517 (Rev.WRC-19).

(135) [Reserved]

(136) 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.

(137) 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.

(138) 5.138 The 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.

(139) [Reserved]

(140) 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.

(141) 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.

(i) 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.

(ii) 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, the Dem. People's Rep. of Korea, 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.

(142) 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.

(143) 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.

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

(144) 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.

(145) 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.

(i) 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).

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

(146) 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.

(147) 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

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country in which they are located, each station using a total radiated power not exceeding 24 dBW.

(148) [Reserved]

(149) 5.149 In making assignments to stations of other services to which the bands listed in table 1 to paragraph (b)(149) of this section 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).

**Table 1 to Paragraph (b)(149) Introductory Text**

13 360-13 410 kHz,	23.07-23.12 GHz,
25 550-25 670 kHz,	31.2-31.3 GHz,
37.5-38.25 MHz,	31.5-31.8 GHz in Regions 1 and 3,
73-74.6 MHz in Regions 1 and 3,	36.43-36.5 GHz,
150.05-153 MHz in Region 1,	42.5-43.5 GHz,
322-328.6 MHz,	48.94-49.04 GHz,
406.1-410 MHz,	76-86 GHz,
608-614 MHz in Regions 1 and 3,	92-94 GHz,
1330-1400 MHz,	94.1-100 GHz,
1610.6-1613.8 MHz,	102-109.5 GHz,
1660-1670 MHz,	111.8-114.25 GHz,
1718.8-1722.2 MHz,	128.33-128.59 GHz,
2655-2690 MHz,	129.23-129.49 GHz,
3260-3267 MHz,	130-134 GHz,
3332-3339 MHz,	136-148.5 GHz,
3345.8-3352.5 MHz,	151.5-158.5 GHz,
4825-4835 MHz,	168.59-168.93 GHz,
4950-4990 MHz,	171.11-171.45 GHz,

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4990-5000 MHz,	172.31-172.65 GHz,
6650-6675.2 MHz,	173.52-173.85 GHz,
10.6-10.68 GHz,	195.75-196.15 GHz,
14.47-14.5 GHz,	209-226 GHz,
22.01-22.21 GHz,	241-250 GHz,
22.21-22.5 GHz,	252-275 GHz
22.81-22.86 GHz,	

(i) 5.149A *Alternative allocation:* in Armenia, Belarus, Moldova 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.

(ii) [Reserved]

(150) 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.

(151) 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.

(152) 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.

(153) 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.

(154) 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.

(155) 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.

(i) 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.

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

(156) 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.

(i) 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.

(ii) [Reserved]

(157) 5.157 The use of the band 23 350-24 000 kHz by the maritime mobile service is limited to inter-ship radiotelegraphy.

(158) 5.158 *Alternative allocation:* in Armenia, Belarus, Moldova and Kyrgyzstan, the frequency band 24 450-24 600 kHz is allocated to the fixed and land mobile services on a primary basis.

(159) 5.159 *Alternative allocation:* in Armenia, Belarus, Moldova and Kyrgyzstan, the frequency band 39-39.5 MHz is allocated to the fixed and mobile services on a primary basis.

(160) 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.

(161) 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.

(i) 5.161A *Additional allocation:* in Korea (Rep. of), the United States and Mexico, 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).

(ii) 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, Liechtenstein, Lithuania, Luxembourg, North Macedonia, 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.

(162) 5.162 *Additional allocation:* in Australia, the band 44-47 MHz is also allocated to the broadcasting service on a primary basis.

(i) 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, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Monaco, Montenegro, Norway, the Netherlands, Poland, Portugal, the Czech Rep., the United Kingdom, Serbia, Slovenia, Sweden and Switzerland the frequency 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).

(ii) [Reserved]



(163) 5.163 *Additional allocation:* in Armenia, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the frequency bands 47-48.5 MHz and 56.5-58 MHz are also allocated to the fixed and land mobile services on a secondary basis.

(164) 5.164 *Additional allocation:* in Albania, 'lgeria, Germany, Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Côte d'Ivoire, Croatia, Denmark, Spain, Estonia, Eswatini, Finland, France, Gabon, Greece, Hungary, 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, 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 bands 48.5-56.5 MHz and 58-68 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.

(165) 5.165 *Additional allocation:* in Angola, Cameroon, Congo (Rep. of the), Egypt, Madagascar, Mozambique, Niger, Somalia, Sudan, South Sudan, Tanzania and Chad, the frequency band 47-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

(166) [Reserved]

(166)(i) 5.166A *Different category of service:* in Austria, Cyprus, the Vatican, Croatia, Denmark, Spain, Finland, Hungary, Latvia, the Netherlands, the Czech Republic, the United Kingdom, Slovakia and Slovenia, the frequency band 50.0-50.5 MHz is allocated to the amateur service on a primary basis. Stations in the amateur service in these countries shall not cause harmful interference to, or claim protection from, stations of the broadcasting, fixed and mobile services operating in accordance with the Radio Regulations in the frequency band 50.0-50.5 MHz in the countries not listed in this provision. For a station of these services, the protection criteria in paragraph (b)(169)(ii) of this section shall also apply. In Region 1, with the exception of those countries listed in paragraph (b)(169) of this section, wind profiler radars operating in the radiolocation service under paragraph (b)(162)(i) of this section are authorized to operate on the basis of equality with stations in the amateur service in the frequency band 50.0-50.5 MHz.

(ii) 5.166B In Region 1, stations in the amateur service operating on a secondary basis shall not cause harmful interference to, or claim protection from, stations of the broadcasting service. The field strength generated by an amateur station in Region 1 in the frequency band

50-52 MHz shall not exceed a calculated value of +6 dB( $\mu$ V/m) at a height of 10 m above ground for more than 10% of time along the border of a country with operational analogue broadcasting stations in Region 1 and of neighbouring countries with broadcasting stations in Region 3 listed in paragraphs (b)(167) and (b)(168) of this section.

(iii) 5.166C In Region 1, stations in the amateur service in the frequency band 50-52 MHz, with the exception of those countries listed in paragraph (b)(169) of this section, shall not cause harmful interference to, or claim protection from, wind profiler radars operating in the radiolocation service under paragraph (b)(162)(i) of this section.

(iv) 5.166D *Different category of service:* in Lebanon, the frequency band 50-52 MHz is allocated to the amateur service on a primary basis. Stations in the amateur service in Lebanon shall not cause harmful interference to, or claim protection from, stations of the broadcasting, fixed and mobile services operating in accordance with the Radio Regulations in the frequency band 50-52 MHz in the countries not listed in this provision.

(v) 5.166E In the Russian Federation, only the frequency band 50.080-50.280 MHz is allocated to the amateur service on a secondary basis. The protection criteria for the other services in the countries not listed in this provision are specified in paragraphs (b)(166)(ii) and (b)(169)(ii) of this section.

(167) 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.

(i) 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.

(ii) [Reserved]

(168) 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.

(169) 5.169 *Alternative allocation:* in Botswana, Eswatini, Lesotho, Malawi, Namibia, Rwanda, South Africa, Zambia and Zimbabwe, the frequency band 50-54 MHz is allocated to the amateur service on a primary basis. In Senegal, the frequency band 50-51 MHz is allocated to the amateur service on a primary basis.

(i) 5.169A *Alternative allocation:* in the following countries in Region 1: Angola, Saudi Arabia, Bahrain, Burkina Faso, Burundi, the United Arab Emirates, Gambia, Jordan, Kenya, Kuwait, Mauritius, Mozambique, Oman, Uganda, Qatar, South Sudan and Tanzania, the frequency band 50-54 MHz is allocated to the amateur service on a primary basis. In Guinea-Bissau, the frequency band 50.0-50.5 MHz is allocated to the amateur service on a primary

basis. In Djibouti, the frequency band 50-52 MHz is allocated to the amateur service on a primary basis. With the exception of those countries listed in this paragraph (b)(169), stations in the amateur service operating in Region 1 under this footnote, in all or part of the frequency band 50-54 MHz, shall not cause harmful interference to, or claim protection from, stations of other services operating in accordance with the Radio Regulations in Algeria, Egypt, Iran (Islamic Republic of), Iraq, Israel, Libya, Palestine, the Syrian Arab Republic, the Dem. People's Republic of Korea, Sudan and Tunisia. The field strength generated by an amateur station in the frequency band 50-54 MHz shall not exceed a value of +6 dB( $\mu$ V/m) at a height of 10 m above ground for more than 10% of time along the borders of listed countries requiring protection.

Note 1 to § 2.106(b)(169)(i): Pursuant to Resolution 99 (Rev. Dubai, 2018) and taking into account the Israeli-Palestinian Interim Agreement of 28 September 1995.

(ii) 5.169B Except countries listed under this paragraph (b)(169), stations in the amateur service used in Region 1, in all or part of the 50-54 MHz frequency band, shall not cause harmful interference to, or claim protection from, stations of other services used in accordance with the Radio Regulations in Algeria, Armenia, Azerbaijan, Belarus, Egypt, Russian Federation, Iran (Islamic Republic of), Iraq, Kazakhstan, Kyrgyzstan, Libya, Uzbekistan, Palestine, the Syrian Arab Republic, Sudan, Tunisia and Ukraine. The field strength generated by an amateur station in the frequency band 50-54 MHz shall not exceed a value of +6 dB( $\mu$ V/m) at a height of 10 m above ground for more than 10% of time along the borders of the countries listed in this provision.

Note 2 to § 2.106(b)(169)(ii): Pursuant to Resolution 99 (Rev. Dubai, 2018) and taking into account the Israeli-Palestinian Interim Agreement of 28 September 1995.

(170) 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.

(171) 5.171 *Additional allocation:* in Botswana, Eswatini, Lesotho, Malawi, Mali, Namibia, Dem. Rep. of the Congo, Rwanda, South Africa, Zambia and Zimbabwe, the frequency band 54-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

(172) 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).

(173) 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 IRU RR No. 5.33).

(174) [Reserved]

(175) 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.

(176) 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.

(177) 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.

(178) 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.

(179) 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.

(180) 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.

(181) 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

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service by any administration which may be identified in the application of the procedure invoked under No. 9.21.

(182) 5.182 *Additional allocation:* in Western Samoa, the band 75.4-87 MHz is also allocated to the broadcasting service on a primary basis.

(183) 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.

(184) [Reserved]

(185) 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).

(186) [Reserved]

(187) 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).

(188) 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.

(189) [Reserved]

(190) 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.

(191) [Reserved]

(192) 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.

(193) [Reserved]

(194) 5.194 *Additional allocation:* in Kyrgyzstan, Somalia and Turkmenistan, the frequency band 104-108 MHz is also allocated to the mobile, except aeronautical mobile (R), service on a secondary basis.

(195) - (196) [Reserved]

(197) 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.

(i) 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.

(ii) [Reserved]

(198) - (199) [Reserved]

(200) 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.

(201) 5.201 *Additional allocation*: in Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq (Republic of), Japan, Kazakhstan, Mali, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Romania, Senegal, 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.

(202) 5.202 *Additional allocation*: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bulgaria, the United Arab Emirates, the Russian Federation, Georgia, Iran (Islamic Republic of), Jordan, Mali, Oman, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Romania, Senegal, 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.

(203) [Reserved]

(203) 5.203C The use of the space operation service (space-to-Earth) with non-geostationary satellite short-duration mission systems in the frequency band 137-138 MHz is subject to Resolution 660 (WRC-19). Resolution 32 (WRC-19) applies. These systems shall not cause harmful interference to, or claim protection from, the existing services to which the frequency band is allocated on a primary basis.

(204) 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, Singapore, Thailand and Yemen, the frequency band 137-138 MHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (see No. 5.33).

(205) 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 ITU No. 5.33).

(206) 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).

(207) 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.

(208) 5.208 The use of the band 137-138 MHz by the mobile-satellite service is subject to coordination under No. 9.11A.

(i) 5.208A In making assignments to space stations in the mobile-satellite service in the frequency bands 137-138 MHz, 387-390 MHz and 400.15-401 MHz and in the maritime mobile-satellite service (space-to-Earth) in the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the frequency bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions as shown in the most recent version of Recommendation ITU-R RA.769.

(ii) 5.208B In the frequency bands 137-138 MHz, 157.1875-157.3375 MHz, 161.7875-161.9375 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-19) applies.

(209) 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.

(i) 5.209A The use of the frequency band 137.175-137.825 MHz by non-geostationary-satellite systems in the space operation service identified as short-duration mission in accordance with Appendix 4 is not subject to No. 9.11A.

(ii) [Reserved]

(210) 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.

(211) 5.211 *Additional allocation:* in Germany, Saudi Arabia, Austria, Bahrain, Belgium, Denmark, the United Arab Emirates, Spain, Finland, Greece, Guinea, Ireland, Israel, Kenya, Kuwait, Lebanon, Liechtenstein, Luxembourg, North Macedonia, 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.

(212) 5.212 *Alternative allocation:* in Angola, Botswana, Cameroon, the Central African Rep., Congo (Rep. of the), Eswatini, 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, Chad, Togo, Zambia and Zimbabwe, the frequency band 138-144 MHz is allocated to the fixed and mobile services on a primary basis.

(213) 5.213 *Additional allocation:* in China, the band 138-144 MHz is also allocated to the radiolocation service on a primary basis.

(214) 5.214 *Additional allocation:* in Eritrea, Ethiopia, Kenya, North Macedonia, Montenegro, Serbia, Somalia, Sudan, South Sudan and Tanzania, the frequency band 138-144 MHz is also allocated to the fixed service on a primary basis.

(215) [Reserved]

(216) 5.216 *Additional allocation:* in China, the band 144-146 MHz is also allocated to the aeronautical mobile (OR) service on a secondary basis.

(217) 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.



(218) 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  $\pm 25$  kHz.

(i) 5.218A The frequency band 148-149.9 MHz in the space operation service (Earth-to-space) may be used by non-geostationary-satellite systems with short-duration missions. Non-geostationary-satellite systems in the space operation service used for a short-duration mission in accordance with Resolution 32 (WRC-19) of the Radio Regulations are not subject to agreement under No. 9.21. At the stage of coordination, the provisions of Nos. 9.17 and 9.18 also apply. In the frequency band 148-149.9 MHz, non-geostationary-satellite systems with short-duration missions shall not cause unacceptable interference to, or claim protection from, existing primary services within this frequency band, or impose additional constraints on the space operation and mobile-satellite services. In addition, earth stations in non-geostationary-satellite systems in the space operation service with short-duration missions in the frequency band 148-149.9 MHz shall ensure that the power flux-density does not exceed  $-149$  dB(W/(m<sup>2</sup> · 4 kHz)) for more than 1% of time at the border of the territory of the following countries: Armenia, Azerbaijan, Belarus, China, Korea (Rep. of), Cuba, Russian Federation, India, Iran (Islamic Republic of), Japan, Kazakhstan, Malaysia, Uzbekistan, Kyrgyzstan, Thailand and Viet Nam. In case this power flux-density limit is exceeded, agreement under No. 9.21 is required to be obtained from countries mentioned in this footnote.

(ii) [Reserved]

(219) 5.219 The use of the frequency 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 frequency band 148-149.9 MHz. The use of the frequency band 148-149.9 MHz by non-geostationary-satellite systems in the space operation service identified as short-duration mission is not subject to No. 9.11A.

(220) 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.

(221) 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, Eswatini, 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, Lesotho, Latvia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, North Macedonia, 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, Tanzania, Chad, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia and Zimbabwe.

(222) - (224) [Reserved]

(225) 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.

(i) 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( $\mu$ V/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.

(ii) [Reserved]

(226) 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.

(227) 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.

(228) 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.

(i) 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.

(ii) 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.

(iii) 5.228AB The use of the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz by the maritime mobile-satellite service (Earth-to-space) is limited to non-geostationary-satellite systems operating in accordance with Appendix 18.

(iv) 5.228AC The use of the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz by the maritime mobile-satellite service (space-to-Earth) is limited to non-geostationary-satellite systems operating in accordance with Appendix 18. Such use is subject to agreement obtained under No. 9.21 with respect to the terrestrial services in Azerbaijan,

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Belarus, China, Korea (Rep. of), Cuba, the Russian Federation, the Syrian Arab Republic, the Dem. People's Rep. of Korea, South Africa and Viet Nam.

(v) 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.

(vi) 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.

(vii) 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.

(viii) 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.

(ix) 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.

(229) 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.

(230) 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.

(231) 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.

(232) [Reserved]

(233) 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.

(234) [Reserved]

(235) 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.

(236) [Reserved]

(237) 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.

(238) 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.

(239) [Reserved]

(240) 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.

(241) 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.

(242) 5.242 *Additional allocation:* in Canada and Mexico, the frequency band 216-220 MHz is also allocated to the land mobile service on a primary basis.

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(243) 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.

(244) [Reserved]

(245) 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.

(246) 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.

(247) 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.

(248) - (249) [Reserved]

(250) 5.250 *Additional allocation:* in China, the band 225-235 MHz is also allocated to the radio astronomy service on a secondary basis.

(251) 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.

(252) 5.252 *Alternative allocation:* in Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe, the frequency 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.

(253) [Reserved]

(254) 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 paragraph (b)(256)(i) of this section.

(255) 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.

(256) 5.256 The frequency 243 MHz is the frequency in this band for use by survival craft stations and equipment used for survival purposes.

(i) 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.

(ii) [Reserved]

(257) 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.

(258) 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).

(259) 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.

(260) [Reserved]

(260)(i) 5.260A In the frequency band 399.9-400.05 MHz, the maximum e.i.r.p. of any emission of earth stations in the mobile-satellite service shall not exceed 5 dBW in any 4 kHz band and the maximum e.i.r.p. of each earth station in the mobile-satellite service shall not exceed 5 dBW in the whole 399.9-400.05 MHz frequency band. Until 22 November 2022, this limit shall not apply to satellite systems for which complete notification information has been received by the Radiocommunication Bureau by 22 November 2019 and that have been brought into use by that date. After 22 November 2022, these limits shall apply to all systems within the mobile-satellite service operating in this frequency band. In the frequency band 399.99-400.02 MHz, the e.i.r.p. limits as specified in this paragraph (b)(260)(i) shall apply after

22 November 2022 to all systems within the mobile-satellite service. Administrations are requested that their mobile-satellite service satellite links in the 399.99-400.02 MHz frequency band comply with the e.i.r.p. limits as specified in this paragraph (b)(260)(i), after 22 November 2019.

(ii) 5.260B In the frequency band 400.02-400.05 MHz, the provisions of paragraph (b)(169)(i) of this section are not applicable for telecommand uplinks within the mobile-satellite service.

(261) 5.261 Emissions shall be confined in a band of  $\pm 25$  kHz about the standard frequency 400.1 MHz.

(262) 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.

(263) 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.

(264) 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.

(i) 5.264A In the frequency band 401-403 MHz, the maximum e.i.r.p. of any emission of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 22 dBW in any 4 kHz band for geostationary-satellite systems and non-geostationary-satellite systems with an orbit of apogee equal or greater than 35 786 km. The maximum e.i.r.p. of any emission of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 7 dBW in any 4 kHz band for non-geostationary-satellite systems with an orbit of apogee lower than 35 786 km. The maximum e.i.r.p. of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 22 dBW for geostationary-satellite systems and non-geostationary-satellite systems with an orbit of apogee equal or greater than 35 786 km in the whole 401-403 MHz frequency band. The maximum e.i.r.p. of each earth station in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 7 dBW for non-geostationary-satellite systems with an orbit of apogee lower than 35 786 km in



the whole 401-403 MHz frequency band. Until 22 November 2029, these limits shall not apply to satellite systems for which complete notification information has been received by the Radiocommunication Bureau by 22 November 2019 and that have been brought into use by that date. After 22 November 2029, these limits shall apply to all systems within the meteorological-satellite service and the Earth exploration-satellite service operating in this frequency band.

(ii) 5.264B Non-geostationary-satellite systems in the meteorological-satellite service and the Earth exploration-satellite service for which complete notification information has been received by the Radiocommunication Bureau before 28 April 2007 are exempt from provisions of paragraph (b)(264)(i) of this section and may continue to operate in the frequency band 401.898-402.522 MHz on a primary basis without exceeding a maximum e.i.r.p. level of 12 dBW.

(265) 5.265 In the frequency band 403-410 MHz, Resolution 205 (Rev.WRC-19) applies.

(266) 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).

(267) 5.267 Any emission capable of causing harmful interference to the authorized uses of the band 406-406.1 MHz is prohibited.

(268) 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  $-153 \text{ dB(W/m}^2\text{)}$  for  $0^\circ \leq \delta \leq 5^\circ$ ,  $-153 + 0.077 (\delta - 5) \text{ dB(W/m}^2\text{)}$  for  $5^\circ \leq \delta \leq 70^\circ$  and  $-148 \text{ dB(W/m}^2\text{)}$  for  $70^\circ \leq \delta \leq 90^\circ$ , where  $\delta$  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.

(269) 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).

(270) 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.

(271) 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.

(272) and (273) [Reserved]

(274) 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.

(275) 5.275 *Additional allocation*: in Croatia, Estonia, Finland, Libya, North 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.

(276) 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.

(277) 5.277 *Additional allocation*: in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo (Rep. of the), Djibouti, the Russian Federation, Georgia, Hungary, Israel, Kazakhstan, Mali, Uzbekistan, Poland, the Dem. Rep. of the Congo, Kyrgyzstan, Slovakia, Romania, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the frequency band 430-440 MHz is also allocated to the fixed service on a primary basis.

(278) 5.278 *Different category of service*: in Argentina, Brazil, Colombia, Costa Rica, Cuba, Guyana, Honduras, Panama, Paraguay, Uruguay and Venezuela, the allocation of the frequency band 430-440 MHz to the amateur service is on a primary basis (see No. 5.33).

(279) 5.279 *Additional allocation*: in Mexico, the frequency bands 430-435 MHz and 438-440 MHz are also allocated on a primary basis to the mobile, except aeronautical mobile, service, and on a secondary basis to the fixed service, subject to agreement obtained under No. 9.21.

(i) 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.1260-2. 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.

(ii) [Reserved]

(280) 5.280 In Germany, Austria, Bosnia and Herzegovina, Croatia, Liechtenstein, North Macedonia, Montenegro, Portugal, Serbia, Slovenia and Switzerland, the frequency 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 frequency band must accept harmful interference which may be caused by these applications. ISM equipment operating in this frequency band is subject to the provisions of No. 15.13.

(281) 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.

(282) 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.

(283) 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.

(284) 5.284 *Additional allocation:* in Canada, the band 440-450 MHz is also allocated to the amateur service on a secondary basis.

(285) 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).

(286) 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.

(i) 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.

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(ii) 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-19). 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.

(iii) 5.286B The use of the band 454-455 MHz in the countries listed in paragraph (b)(286)(v) of this section, 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.

(iv) 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.

(v) 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.

(vi) 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.

(287) 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.1174-4. The use of these frequency bands in territorial waters is subject to the national regulations of the administration concerned.

(288) 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.1174-4.

(289) 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.

(290) 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.

(291) 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.

(i) 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).

(ii) [Reserved]

(292) 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.

(293) 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.

(294) 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.

(295) 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-19). 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.

(296) 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, Eswatini, Finland, France, Gabon, Georgia, Ghana, Hungary, Iraq, Ireland, Iceland, Israel, Italy, Jordan, Kenya, Kuwait, Lesotho, Latvia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, North Macedonia, 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, Romania, the United Kingdom, Rwanda, San Marino, Serbia, Sudan, South Africa, Sweden, Switzerland, 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.

(i) 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-19). 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.

(ii) [Reserved]

(297) 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. In

Mexico, the frequency band 512-608 MHz is also allocated on a secondary basis to the fixed service (see No. 5.32).

(298) 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.

(299) [Reserved]

(300) 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.

(301) - (303) [Reserved]

(304) 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.

(305) 5.305 *Additional allocation:* in China, the band 606-614 MHz is also allocated to the radio astronomy service on a primary basis.

(306) 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.

(307) 5.307 *Additional allocation:* in India, the band 608-614 MHz is also allocated to the radio astronomy service on a primary basis.

(308) 5.308 *Additional allocation:* in Belize, Colombia and Guatemala, 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.

(i) 5.308A In the Bahamas, Barbados, Belize, Canada, Colombia, the United States, Guatemala and Mexico, the frequency band 614-698 MHz, or portions thereof, is identified for International Mobile Telecommunications (IMT) – see Resolution 224 (Rev.WRC-19). 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.

(ii) [Reserved]

(309) 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.

(310) [Reserved]

(ii) [Reserved]

(312) 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, and in Bulgaria the frequency bands 646-686 MHz, 726-753 MHz, 778-811 MHz and 822-852 MHz, are also allocated to the aeronautical radionavigation service on a primary basis.

(i) 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 (Rev.WRC-19). See also Resolution 224 (Rev.WRC-19).

(313) 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, the Dem. People's Rep. of Korea, 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.

(314) - (315) [Reserved]

(316) 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-19) and 749 (Rev.WRC-19) shall apply, as appropriate.

(317) 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.



(i) 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-19), 760 (Rev.WRC-19) and 749 (Rev.WRC-19), 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.

(ii) [Reserved]

(318) 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.

(319) 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.

(320) 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.

(321) [Reserved]

(322) 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.

(323) 5.323 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the frequency band 862-960 MHz, in Bulgaria the frequency bands 862-880 MHz and 915-925 MHz, and in Romania the frequency 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.

(324) [Reserved]

(325) 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.

(i) 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, Paraguay, Uruguay and Venezuela, the frequency band 902-928 MHz is allocated to the land mobile service on a primary basis. In Mexico, the frequency band 902-928 MHz is allocated to the mobile, except aeronautical 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.

(ii) [Reserved]

(326) 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.

(327) 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).

(i) 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).

(ii) [Reserved]

(328) 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.

(i) 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.

(ii) 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 (Rev.WRC-19) shall apply.

(iii) 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 (Rev.WRC-19) shall also apply; however, in the case of radionavigation-satellite service (space-to-space) networks and systems, Resolution 610 (Rev.WRC-19) 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).

(329) 5.329 Use of the radionavigation-satellite service in the frequency 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 paragraph (b)(331) of this section. Furthermore, the use of the radionavigation-satellite service in the frequency 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-19) shall apply.

(i) 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.

(ii) [Reserved]

(330) 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.

(331) 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, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Madagascar, Mali, Mauritania, Montenegro, Nigeria, Norway, Oman, Pakistan, the Kingdom of 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 frequency band 1215-1300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the frequency 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.

(332) 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.

(333) [Reserved]

(334) 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.

(335) 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.

(i) 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.

(ii) [Reserved]

(336) [Reserved]

(337) 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.

(i) 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.

(ii) [Reserved]

(338) 5.338 In Kyrgyzstan, Slovakia and Turkmenistan, existing installations of the radionavigation service may continue to operate in the band 1350-1400 MHz.

(i) 5.338A In the frequency bands 1350-1400 MHz, 1427-1452 MHz, 22.55-23.55 GHz, 24.25-27.5 GHz, 30-31.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz, 51.4-52.4 GHz, 52.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution 750 (Rev.WRC-19) applies.

(ii) [Reserved]

(339) 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.

(340) 5.340 All emissions are prohibited in the bands 1400-1427 MHz, 2690-2700 MHz (except those provided for by paragraph (b)(422) of this section), 10.68-10.7 GHz (except those provided for by paragraph (b)(483) of this section), 15.35-15.4 GHz (except those provided for by paragraph (b)(511) of this section), 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, 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, and 250-252 GHz. 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.

(341) 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.

(i) 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-19). 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 paragraph (b)(342) of this section.

(ii) 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-19). 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.

(iii) 5.341C The frequency bands 1427-1452 MHz and 1492-1518 MHz are identified for use by administrations in Region 3 wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-19). The use of these frequency bands by the referenced 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.

(342) 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.

(343) 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.

(344) 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 paragraph (b)(343) of this section).

(345) 5.345 Use of the frequency 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-19).

(346) 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, Eswatini, 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, Tanzania, Chad, Togo, Tunisia, Zambia, and Zimbabwe, the frequency band 1452-1492 MHz is identified for use by administrations listed in this paragraph (b)(346) wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev.WRC-19). 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 paragraph (b)(342) of this section. See also Resolution 761 (Rev.WRC-19).

Note 3 to § 2.16(b)(346) introductory text: 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. Dubai, 2018) and taking into account the Israeli-Palestinian Interim Agreement of 28 September 1995.

(i) 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-19) and Resolution 761 (Rev.WRC-19). 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.

(ii) [Reserved]

(347) [Reserved]

(348) 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.

(i) 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/m<sup>2</sup>) 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.

(ii) 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 paragraphs (b)(343) and (344) of this section) and in the countries listed in paragraph (b)(342) of this section. No. 5.43A does not apply.

(349) 5.349 *Different category of service:* in Saudi Arabia, Azerbaijan, Bahrain, Cameroon, Egypt, Iran (Islamic Republic of), Iraq, Israel, Kazakhstan, Kuwait, Lebanon, North Macedonia, Morocco, Qatar, Syrian Arab Republic, Kyrgyzstan, Turkmenistan and Yemen, the allocation of the frequency band 1525-1530 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. 5.33).

(350) 5.350 *Additional allocation:* in Kyrgyzstan and Turkmenistan, the frequency band 1525-1530 MHz is also allocated to the aeronautical mobile service on a primary basis.

(351) 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.

(i) 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-19) and 225 (Rev.WRC-12).

(ii) [Reserved]

(352) 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, 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.

(353) 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.)

(354) 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.

(355) 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.

(356) 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).

(357) 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.

(i) 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.)

(ii) [Reserved]

(358) [Reserved]

(359) 5.359 *Additional allocation:* in Germany, Saudi Arabia, Armenia, Azerbaijan, Belarus, Cameroon, the Russian Federation, 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.

(360) - (361) [Reserved]

(362) 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.

(363) [Reserved]

(364) 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 paragraph (b)(366) of this section (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 paragraph (b)(366) of this section and stations in the fixed service operating in accordance with the provisions of paragraph (b)(359) of this section. 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 paragraph (b)(366) of this section.

(365) 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.

(366) 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.

(367) 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.

(368) 5.368 The provisions of No. 4.10 do not apply with respect to the radiodetermination-satellite and mobile-satellite services in the frequency band 1610-1626.5 MHz. However, No. 4.10 applies in the frequency band 1610-1626.5 MHz with respect to the aeronautical radionavigation-satellite service when operating in accordance with paragraph (b)(366) of this section, the aeronautical mobile satellite (R) service when operating in accordance with paragraph (b)(367) of this section, and in the frequency band 1621.35-1626.5 MHz with respect to the maritime mobile-satellite service when used for GMDSS.

(369) 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.

(370) 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.

(371) 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.

(373) 5.373 Maritime mobile earth stations receiving in the frequency band 1621.35-1626.5 MHz shall not impose additional constraints on earth stations operating in the maritime mobile-satellite service or maritime earth stations of the radiodetermination-satellite service operating in accordance with the Radio Regulations in the frequency band 1610-1621.35 MHz or on earth stations operating in the maritime mobile-satellite service operating in accordance with the Radio Regulations in the frequency band 1626.5-1660.5 MHz, unless otherwise agreed between the notifying administrations.

(i) 5.373A Maritime mobile earth stations receiving in the frequency band 1621.35-1626.5 MHz shall not impose constraints on the assignments of earth stations of the mobile-satellite service (Earth-to-space) and the radiodetermination-satellite service (Earth-to-space) in the frequency band 1621.35-1626.5 MHz in networks for which complete coordination information has been received by the Radiocommunication Bureau before 28 October 2019.

(ii) [Reserved]

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(374) 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 paragraph (b)(359) of this section.

(375) 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).

(376) 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.

(i) 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.

(ii) [Reserved]

(377) - (378) [Reserved]

(379) 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.

(i) 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.

(ii) 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.

(iii) 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/m<sup>2</sup>) in 10 MHz and  $-194$  dB(W/m<sup>2</sup>) 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.

(iv) 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.

(v) 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.

(380) 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.

(381) 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.

(382) 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, Lebanon, North Macedonia, 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.

(383) [Reserved]

(384) 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.

(i) 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-19). 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.

(ii) [Reserved]

(385) 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.

(386) 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.

(387) 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.

(388) 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-19) (see also Resolution 223 (Rev.WRC-19)).

(i) 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.

(ii) 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, Lebanon, 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 frequency bands referred to in paragraph (b)(388)(i) of this section, shall not exceed a co-channel power flux-density of  $-127 \text{ dB(W)/(m}^2 \cdot \text{MHz)}$  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.

(389) 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).

(i) 5.389B The use of the frequency 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, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay and Venezuela.

(ii) 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).

(iii) 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.

(iv) 5.389F In Algeria, Cape Verde, Egypt, Iran (Islamic Republic of), Mali, Syrian Arab Republic and Tunisia, the use of the frequency 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.

(390) [Reserved]

(391) 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.

(392) 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.

(393) 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-19), with the exception of *resolves* 3 in regard to the limitation on broadcasting-satellite systems in the upper 25 MHz. Complementary terrestrial sound broadcasting stations shall be subject to bilateral coordination with neighbouring countries prior to their bringing into use.

(394) 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.

(395) 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.

(397) [Reserved]

(398) 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.

(i) 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.

(ii) [Reserved]

(399) 5.399 Except for cases referred to in paragraph (b)(401) of this section, 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 paragraph (b)(398)(i) of this section.

(400) [Reserved]

(401) 5.401 In Angola, Australia, Bangladesh, China, Eritrea, Eswatini, Ethiopia, India, Lebanon, Liberia, Libya, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, Dem. Rep. of the Congo, Sudan, 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.

(402) 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.

(403) 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.

(404) 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.

(405) - (406) [Reserved]

(407) 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  $-152 \text{ dB (W/(m}^2 \cdot 4 \text{ kHz))}$  in Argentina, unless otherwise agreed by the administrations concerned.

(408) - (409) [Reserved]

(410) 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.

(411) [Reserved]

(412) 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.

(413) 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.

(414) 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.

(i) 5.414A In Japan and India, the use of the bands 2500-2520 MHz and 2520-2535 MHz, under paragraph (b)(403) of this section, 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:  $-136 \text{ dB(W/(m}^2 \cdot \text{MHz))}$  for  $0^\circ \leq \theta \leq 5^\circ$ ,  $-136 + 0.55 (\theta - 5) \text{ dB(W/(m}^2 \cdot \text{MHz))}$  for  $5^\circ < \theta \leq 25^\circ$ , and  $-125 \text{ dB(W/(m}^2 \cdot \text{MHz))}$  for  $25^\circ < \theta \leq 90^\circ$ , where  $\theta$  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 Radiocommunication Bureau by 14 November 2007 and that have been brought into use by that date. 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.

(ii) [Reserved]

(415) 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.

(416) 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.

(417) [Reserved]

(418) 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-19). The provisions of paragraph (b)(416) of this section 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-19). 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:  $-130 \text{ dB(W/(m}^2 \cdot \text{MHz))}$  for

$0^\circ \leq \theta \leq 5^\circ$ ,  $-130 + 0.4 (\theta - 5)$  dB(W/(m<sup>2</sup> · MHz)) for  $5^\circ < \theta \leq 25^\circ$ ,  $-122$  dB(W/(m<sup>2</sup> · MHz)) for  $25^\circ < \theta \leq 90^\circ$ , where  $\theta$  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 provided in this paragraph (b)(418), the pfd value of  $-122$  dB(W/(m<sup>2</sup> · 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 paragraph (b)(416) of this section for systems for which complete Appendix 4 coordination information has been received after 1 June 2005.

(i) 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.

(ii) 5.418B Use of the band 2630-2655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to this paragraph (b)(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.

(iii) 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 this paragraph (b)(418) and No. 22.2 does not apply.

(419) 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.

(420) 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.

(421) [Reserved]

(422) 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.

(423) 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.

(424) 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.

(i) 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.

(ii) [Reserved]

(425) 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.

(426) 5.426 The use of the band 2900-3100 MHz by the aeronautical radionavigation service is limited to ground-based radars.

(427) 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.

(428) 5.428 *Additional allocation:* in Kyrgyzstan and Turkmenistan, the frequency band 3100-3300 MHz is also allocated to the radionavigation service on a primary basis.

(429) 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, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, New Zealand, 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. New Zealand and the countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service.

(i) 5.429A *Additional allocation:* in Angola, Benin, Botswana, Burkina Faso, Burundi, Djibouti, Eswatini, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Malawi, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sudan, South Sudan, South Africa, 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.

(ii) 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, Eswatini, 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, 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-19). 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.

(iii) 5.429C *Different category of service:* in Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, 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, the Dominican Republic, Guatemala, Mexico, Paraguay and Uruguay, 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.

(iv) 5.429D In the following countries in Region 2: Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Ecuador, Guatemala, Mexico, Paraguay 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-19). This use in Argentina, Paraguay 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.

(v) 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.

(vi) 5.429F In the following countries in Region 3: Cambodia, India, Indonesia, 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-19). 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.

(430) 5.430 *Additional allocation:* in Kyrgyzstan and Turkmenistan, the frequency band 3300-3400 MHz is also allocated to the radionavigation service on a primary basis.

(i) 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  $-154.5 \text{ dB(W/(m}^2 \square 4 \text{ kHz))}$  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).

(ii) [Reserved]

(431) 5.431 *Additional allocation:* in Germany, the frequency band 3400-3475 MHz is also allocated to the amateur service on a secondary basis.

(i) 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.

(ii) 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  $-154.5 \text{ dB(W/(m}^2 \cdot 4 \text{ kHz))}$  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 in this paragraph (b)(431)(ii). 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).

(432) 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).

(i) 5.432A In Korea (Rep. of), Japan, Pakistan and the Dem. People's Rep. of Korea, the frequency band 3400-3500 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  $-154.5 \text{ dB(W/(m}^2 \square 4 \text{ kHz))}$  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 in this paragraph (i). 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).

(ii) 5.432B *Different category of service:* in Australia, Bangladesh, Brunei Darussalam, China, French overseas communities of Region 3, India, Indonesia, Iran (Islamic Republic of), Malaysia, New Zealand, the Philippines, Singapore and Thailand, 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  $-154.5 \text{ dB(W/(m}^2 \square 4 \text{ kHz))}$  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 in this paragraph (ii). 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).

(433) 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.

(i) 5.433A In Australia, Bangladesh, Brunei Darussalam, China, French overseas communities of Region 3, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, New Zealand, Pakistan, the Philippines and the Dem. People's Rep. of Korea, 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  $-154.5 \text{ dB (W/(m}^2 \cdot 4 \text{ kHz))}$  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 in this paragraph (i). 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).

(ii) [Reserved]

(434) 5.434 In Canada, Chile, Colombia, Costa Rica, El Salvador, the United States and Paraguay, 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  $-154.5 \text{ dB(W/(m}^2 \square 4 \text{ kHz))}$  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 in this paragraph (434). 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).

(435) 5.435 In Japan, in the band 3620-3700 MHz, the radiolocation service is excluded.

(436) 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).

(437) 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.

(438) 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.

(439) 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.

(440) 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  $\pm 2$  MHz of these frequencies, subject to agreement obtained under No. 9.21.

(i) 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.

(ii) [Reserved]

(441) 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.

(i) 5.441A In Brazil, Paraguay and 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-19).

(ii) 5.441B In Angola, Armenia, Azerbaijan, Benin, Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, China, Côte d'Ivoire, Djibouti, Eswatini, Russian Federation, Gambia, Guinea, Iran (Islamic Republic of), Kazakhstan, Kenya, Lao P.D.R., Lesotho, Liberia, Malawi, Mauritius, Mongolia, Mozambique, Nigeria, Uganda, Uzbekistan, the Dem. Rep. of the Congo, Kyrgyzstan, the Dem. People's Rep. of Korea, Sudan, South Africa, Tanzania, Togo, Viet

Nam, Zambia and Zimbabwe, 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 IMT stations 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 (pfd) produced by this station does not exceed  $-155 \text{ dB(W/(m}^2 \cdot 1 \text{ MHz))}$  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 pfd criterion is subject to review at WRC-23. Resolution 223 (Rev.WRC-19) applies. This identification shall be effective after WRC-19.

(442) 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.

(443) 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).

(i) 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.

(ii) 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  $-124.5 \text{ dB(W/m}^2)$  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).

(iii) 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.

(iv) 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.

(444) 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, paragraph (b)(444)(i) of this section and Resolution 114 (Rev.WRC-15) apply.

(i) 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.

(ii) 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-19); aeronautical telemetry transmissions from aircraft stations (see No. 1.83) in accordance with Resolution 418 (Rev.WRC-19).

(445) [Reserved]

(446) 5.446 *Additional allocation:* in the countries listed in paragraph (b)(369) of this section, 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 paragraph (b)(369) of this section 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/m<sup>2</sup>) in any 4 kHz band for all angles of arrival.

(i) 5.446A The use of the frequency 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-19).

(ii) 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.

(iii) 5.446C *Additional allocation:* in Region 1 (except in Algeria, Saudi Arabia, Bahrain, Egypt, United Arab Emirates, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Syrian Arab Republic, Sudan, South Sudan and Tunisia), the frequency 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-19). These stations shall not claim protection from other stations operating in accordance with Article 5. No. 5.43A does not apply.

(iv) 5.446D *Additional allocation:* 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-19).

(447) 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.

(i) 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.

(ii) 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/m<sup>2</sup>) in any 4 kHz band for all angles of arrival.

(iii) 5.447C Administrations responsible for fixed-satellite service networks in the band 5150-5250 MHz operated under paragraphs (b)(447)(i) and (ii) of this section shall coordinate on an equal basis in accordance with No. 9.11A with administrations responsible for non-geostationary-satellite networks operated under paragraph (b)(446) of this section and brought into use prior to 17 November 1995. Satellite networks operated under paragraph (b)(446) of this section 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 paragraphs (b)(447)(i) and (ii) of this section.

(iv) 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.

(v) 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.

(vi) 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). The radiolocation service, the Earth exploration-satellite service (active) and the space research service (active) shall not impose more stringent conditions upon the mobile service than those stipulated in Resolution 229 (Rev.WRC-19).

(448) 5.448 *Additional allocation:* in Kyrgyzstan, Romania and Turkmenistan, the frequency band 5250-5350 MHz is also allocated to the radionavigation service on a primary basis.

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

(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.

(450) 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.

(i) 5.450A In the frequency band 5470-5725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. The radiodetermination services shall not impose more stringent conditions upon the mobile service than those stipulated in Resolution 229 (Rev.WRC-19).

(ii) 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.

(451) 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.



(452) 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.

(453) 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, Eswatini, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, 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, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the frequency 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-19) do not apply. In addition, in Afghanistan, Angola, Benin, Bhutan, Botswana, Burkina Faso, Burundi, Dem. Rep. of the Congo, Fiji, Ghana, Kiribati, Lesotho, Malawi, Maldives, Mauritius, Micronesia, Mongolia, Mozambique, Myanmar, Namibia, Nauru, New Zealand, Papua New Guinea, Rwanda, Solomon Islands, South Sudan, South Africa, Tonga, Vanuatu, Zambia and Zimbabwe, the frequency band 5725-5850 MHz is allocated to the fixed service on a primary basis, and stations operating in the fixed service shall not cause harmful interference to and shall not claim protection from other primary services in the frequency band.

(454) 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).

(455) 5.455 *Additional allocation:* in Armenia, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Kazakhstan, Moldova, Uzbekistan, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the frequency band 5670-5850 MHz is also allocated to the fixed service on a primary basis.

(456) [Reserved]

(457) 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.

(i) 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.

(ii) 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).

(iii) 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.

(458) 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.

(i) 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.

(ii) 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.

(459) 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.

(460) 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.

(i) 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.

(ii) 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.

(461) 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.

(i) 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.

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

(iii) 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.

(iv) 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.

(462) 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 ( $\theta$ ), without the consent of the affected administration:  $-135 \text{ dB(W/m}^2\text{)}$  in a 1 MHz band for  $0 \leq \theta < 5^\circ$ ,  $-135 + 0.5(\theta - 5) \text{ dB(W/m}^2\text{)}$  in a 1 MHz band for  $5 \leq \theta < 25^\circ$ , and  $-125 \text{ dB(W/m}^2\text{)}$  in a 1 MHz band for  $25 \leq \theta \leq 90^\circ$ .

(463) 5.463 Aircraft stations are not permitted to transmit in the band 8025-8400 MHz.

(464) [Reserved]

(465) 5.465 In the space research service, the use of the band 8400-8450 MHz is limited to deep space.

(466) 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).

(467) [Reserved]

(468) 5.468 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, Congo (Rep. of the), Djibouti, Egypt, the United Arab Emirates, Eswatini, 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, Chad, Togo, Tunisia and Yemen, the frequency band 8500-8750 MHz is also allocated to the fixed and mobile services on a primary basis.

(469) 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.

(i) 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.

(ii) [Reserved]

(470) 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.

(471) 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.

(472) 5.472 In the bands 8850-9000 MHz and 9200-9225 MHz, the maritime radionavigation service is limited to shore-based radars.

(473) 5.473 *Additional allocation:* in Armenia, Austria, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Uzbekistan, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the frequency bands 8850-9000 MHz and 9200-9300 MHz are also allocated to the radionavigation service on a primary basis.

(i) 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.

(ii) [Reserved]

(474) 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).

(i) 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.

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

(iii) 5.474C Stations operating in the Earth exploration-satellite (active) service shall comply with Recommendation ITU-R RS.2065-0.

(iv) 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.

(475) 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.

(i) 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.

(ii) 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.

(476) 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.

(477) 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).

(478) 5.478 *Additional allocation:* in Azerbaijan, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the frequency band 9800-10 000 MHz is also allocated to the radionavigation service on a primary basis.

(i) 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.

(ii) 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.

(479) 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.

(480) 5.480 *Additional allocation:* in Argentina, Brazil, Chile, Cuba, El Salvador, Ecuador, Guatemala, Honduras, Paraguay, the overseas countries and territories within the Kingdom of the Netherlands in Region 2, 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.

(481) 5.481 *Additional allocation:* in Algeria, Germany, Angola, Brazil, China, Côte d'Ivoire, Egypt, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Pakistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Romania, Tunisia 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.

(482) 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.

(i) 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.

(ii) [Reserved]

(483) 5.483 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, China, Colombia, Korea (Rep. of), 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 frequency 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.

(484) 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.

(i) 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.

(ii) 5.484B Resolution 155 (Rev.WRC-19) shall apply.

(485) 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.

(486) 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).

(487) 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.

(i) 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.

(ii) [Reserved]

(488) 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.

(489) 5.489 *Additional allocation:* in Peru, the band 12.1-12.2 GHz is also allocated to the fixed service on a primary basis.

(490) 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.

(491) [Reserved]

(492) 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.

(493) 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  $-111 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$  for all conditions and for all methods of modulation at the edge of the service area.

(494) 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.

(495) 5.495 *Additional allocation:* in Greece, Monaco, Montenegro, Uganda 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.

(496) 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.

(497) 5.497 The use of the band 13.25-13.4 GHz by the aeronautical radionavigation service is limited to Doppler navigation aids.

(498) 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.

(499) 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.

(i) 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.

(ii) 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).

(iii) 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; and 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.

(iv) 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.

(v) 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.

(500) 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.

(501) 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.

(i) 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.

(ii) 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.

(502) 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:  $-115 \text{ dB(W/(m}^2 \cdot 10 \text{ MHz))}$  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; and  $-115 \text{ dB(W/(m}^2 \cdot 10 \text{ MHz))}$  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.

(503) 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:

(i) 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:

(A)  $4.7D + 28$  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;

(B)  $49.2 + 20 \log (D/4.5)$  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;

(C) 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;

(D) 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;

(ii) 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.

(iii) 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.

(504) 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.

(i) 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.

(ii) 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.

(iii) 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.

(505) 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, Eswatini, 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, Chad, Viet Nam and Yemen, the frequency band 14-14.3 GHz is also allocated to the fixed service on a primary basis.

(506) 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.

(i) 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.

(ii) 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.

(507) [Reserved]

(508) 5.508 *Additional allocation:* in Germany, France, Italy, Libya, North Macedonia and the United Kingdom, the frequency band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis.

(i) 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.

(ii) [Reserved]

(509) 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.

(i) 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.

(ii) 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.

(iii) 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<sup>2</sup> · 4 kHz)) produced at all altitudes from 0 m to 19 000 m above sea level at 22 km seaward from all coasts, defined as the low-water mark, as officially recognized by each coastal State.

(iv) 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.

(v) 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.

(vi) 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.

(510) 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.

(511) 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.

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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<sup>2</sup>) 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.

(512) 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.

(513) 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.

(i) 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.

(ii) [Reserved]

(514) 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.

(515) 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 section 1 of Annex 4 of Appendix 30A.

(516) 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.

(i) 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.

(ii) 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 Regions 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 frequency bands by other fixed-satellite service applications or by other services to which these frequency bands are allocated on a co-primary basis and does not establish priority in these Radio Regulations among users of the frequency bands. Administrations should take this into account when considering regulatory provisions in relation to these frequency bands. See Resolution 143 (Rev.WRC-19).

(517) 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.

(i) 5.517A The operation of earth stations in motion communicating with geostationary fixed-satellite service space stations within the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) shall be subject to the application of Resolution 169 (WRC-19).

(ii) [Reserved]

(518) [Reserved]

(519) 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.

(520) 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.

(521) 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.

(522) 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.

(i) 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.

(ii) 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.

(523) 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.

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

(524) 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.

(525) 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.

(526) 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.

(527) 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.

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

(ii) [Reserved]

(528) 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.

(529) 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.

(530) 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  $-120.4 \text{ dB(W/(m}^2 \cdot \text{MHz))}$  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).

(i) 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.

(ii) 5.530E The allocation to the fixed service in the frequency band 21.4-22 GHz is identified for use in Region 2 by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by other fixed-service applications or by other services to which it is allocated on a co-primary basis, and does not establish priority in the Radio Regulations. Such use of the fixed-service allocation by HAPS is limited to the HAPS-to-ground direction, and shall be in accordance with the provisions of Resolution 165 (WRC-19).

(531) 5.531 *Additional allocation:* in Japan, the band 21.4-22 GHz is also allocated to the broadcasting service on a primary basis.

(532) 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.

(i) 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.

(ii) 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.

(iii) 5.532AA The allocation to the fixed service in the frequency band 24.25-25.25 GHz is identified for use in Region 2 by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by other fixed-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. Such use of the fixed-service allocation by HAPS is limited to the HAPS-to-ground direction and shall be in accordance with the provisions of Resolution 166 (WRC-19).

(iv) 5.532AB The frequency band 24.25-27.5 GHz is identified for use by administrations wishing to implement the terrestrial component 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. Resolution 242 (WRC-19) applies.

(533) 5.533 The inter-satellite service shall not claim protection from harmful interference from airport surface detection equipment stations of the radionavigation service.

(534) 5.534A The allocation to the fixed service in the frequency band 25.25-27.5 GHz is identified in Region 2 for use by high-altitude platform stations (HAPS) in accordance with the provisions of Resolution 166 (WRC-19). Such use of the fixed-service allocation by HAPS shall be limited to the ground-to-HAPS direction in the frequency band 25.25-27.0 GHz and to the HAPS-to-ground direction in the frequency band 27.0-27.5 GHz. Furthermore, the use of the frequency band 25.5-27.0 GHz by HAPS shall be limited to gateway links. This identification does not preclude the use of this frequency band by other fixed-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.

(535) 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.

(i) 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.

(ii) [Reserved]

(536) 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.

(i) 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. Resolution 242 (WRC-19) applies.

(ii) 5.536B In Algeria, Saudi Arabia, Austria, Bahrain, Belgium, Brazil, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Estonia, Finland, Hungary, India, Iran (Islamic Republic of), Iraq, Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Slovenia, Sudan, 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. Resolution 242 (WRC-19) applies.

(iii) 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.

(537) 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.

(i) 5.537A In Bhutan, Cameroon, China, 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 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-19).

(ii) [Reserved]

(538) 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.

(539) 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.

(540) 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.

(541) 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.

(i) 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.

(ii) [Reserved]

(542) 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.

(543) 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.

(i) 5.543B The allocation to the fixed service in the frequency band 31-31.3 GHz is identified for worldwide use by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by other fixed-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. Such use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 167 (WRC-19).

(544) 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.

(545) 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).

(546) 5.546 *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, 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 frequency band 31.5-31.8 GHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. 5.33).

(547) 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 (Rev.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 para. (b)(516)(ii) of this section), administrations should further take into account potential constraints to high-density applications in the fixed service, as appropriate.

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

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

(548) 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).

(549) 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.

(i) 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/m<sup>2</sup>) in this band.

(ii) [Reserved]

(550) 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).

(i) 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.

(ii) 5.550B The frequency band 37-43.5 GHz, or portions thereof, is identified for use by administrations wishing to implement the terrestrial component 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. Because of the potential deployment of FSS earth stations within the frequency range 37.5-42.5 GHz and high-density applications in the fixed-satellite service in the frequency bands 39.5-40 GHz in Region 1, 40-40.5 GHz in all Regions and 40.5-42 GHz in Region 2 (see paragraph (b)(516)(ii) of this section), administrations should further take into account potential constraints to IMT in these frequency bands, as appropriate. Resolution 243 (WRC-19) applies.

(iii) 5.550C The use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to the application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service but not with non-geostationary-satellite systems in other services. Resolution 770 (WRC-19) shall also apply, and No. 22.2 shall continue to apply.

(iv) 5.550D The allocation to the fixed service in the frequency band 38-39.5 GHz is identified for worldwide use by administrations wishing to implement high-altitude platform stations (HAPS). In the HAPS-to-ground direction, the HAPS ground station shall not claim protection from stations in the fixed, mobile and fixed-satellite services; and No. 5.43A does not apply. This identification does not preclude the use of this frequency band by other fixed-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. Furthermore, the development of the fixed-satellite, fixed and mobile services shall not be unduly constrained by HAPS. Such use of the fixed-service allocation by HAPS shall be in accordance with the provisions of Resolution 168 (WRC-19).

(v) 5.550E The use of the frequency bands 39.5-40 GHz and 40-40.5 GHz by non-geostationary-satellite systems in the mobile-satellite service (space-to-Earth) and by non-geostationary-satellite systems in the fixed-satellite service (space-to-Earth) is subject to the application of the provisions of No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite and mobile-satellite services but not with non-geostationary-satellite systems in other services. No. 22.2 shall continue to apply for non-geostationary-satellite systems.

(551) 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).

(i) 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:  $-230 \text{ dB(W/m}^2\text{)}$  in 1 GHz and  $-246 \text{ dB(W/m}^2\text{)}$  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  $-209 \text{ dB(W/m}^2\text{)}$  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  $\theta_{min}$  of the radiotelescope (for which a default value of  $5^\circ$  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.

(ii) 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:  $-137 \text{ dB(W/m}^2\text{)}$  in 1 GHz and  $-153 \text{ dB(W/m}^2\text{)}$  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  $-116 \text{ dB(W/m}^2\text{)}$  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.

(552) 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.

(i) 5.552A The allocation to the fixed service in the frequency bands 47.2-47.5 GHz and 47.9-48.2 GHz is identified for use by high-altitude platform stations (HAPS). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated on a co-primary basis, and does not establish priority in the Radio Regulations. Such use of the fixed-service allocation in the frequency bands 47.2-47.5 GHz and 47.9-48.2 GHz by HAPS shall be in accordance with the provisions of Resolution 122 (Rev.WRC-19).

(ii) [Reserved]

(553) 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).

(i) 5.553A In Algeria, Angola, Bahrain, Belarus, Benin, Botswana, Brazil, Burkina Faso, Cabo Verde, Korea (Rep. of), Côte d'Ivoire, Croatia, United Arab Emirates, Estonia, Eswatini, Gabon, Gambia, Ghana, Greece, Guinea, Guinea-Bissau, Hungary, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lesotho, Latvia, Liberia, Lithuania, Madagascar, Malawi, Mali, Morocco, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Qatar, Senegal, Seychelles, Sierra Leone, Slovenia, Sudan, South Africa, Sweden, Tanzania, Togo, Tunisia, Zambia and Zimbabwe, the frequency band 45.5-47 GHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT), taking into account paragraph (b)(553) of this section. With respect to the aeronautical mobile service and radionavigation service, the use of this frequency band for the implementation of IMT is subject to agreement obtained under No. 9.21 with concerned administrations and shall not cause harmful interference to, or claim protection from these services. 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. Resolution 244 (WRC-19) applies.

(ii) 5.553B In Region 2 and Algeria, Angola, Saudi Arabia, Australia, Bahrain, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Rep., Comoros, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Djibouti, Egypt, United Arab Emirates, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, India, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kenya, Kuwait, Lesotho, Liberia, Libya, Lithuania, Madagascar, Malaysia, Malawi, Mali, Morocco, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Uganda, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Singapore, Slovenia, Somalia, Sudan, South Sudan, South Africa, Sweden, Tanzania, Chad, Togo, Tunisia, Zambia and Zimbabwe, the frequency band 47.2-48.2 GHz 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 any priority in the Radio Regulations. Resolution 243 (WRC-19) applies.

(554) 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.

(i) 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.

(ii) [Reserved]

(555) 5.555 *Additional allocation:* the band 48.94-49.04 GHz is also allocated to the radio astronomy service on a primary basis.

(i) 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/m<sup>2</sup>) in any 500 kHz band at the site of any radio astronomy station.

(ii) 5.555C The use of the frequency band 51.4-52.4 GHz by the fixed-satellite service (Earth-to-space) is limited to geostationary-satellite networks. The earth stations shall be limited to gateway earth stations with a minimum antenna diameter of 2.4 metres.

(556) 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.

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(i) 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  $-147 \text{ dB(W/(m}^2 \cdot 100 \text{ MHz))}$  for all angles of arrival.

(ii) 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.

(557) 5.557 *Additional allocation*: in Japan, the band 55.78-58.2 GHz is also allocated to the radiolocation service on a primary basis.

(i) 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  $-26 \text{ dB(W/MHz)}$ .

(ii) [Reserved]

(558) 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).

(i) 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  $-147 \text{ dB(W/(m}^2 \cdot 100 \text{ MHz))}$  for all angles of arrival.

(ii) [Reserved]

(559) 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).

(i) 5.559AA The frequency band 66-71 GHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which this frequency band is allocated and does not establish priority in the Radio Regulations. Resolution 241 (WRC-19) applies.

(ii) 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.

(560) 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.

(561) 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.

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

(ii) 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.

(562) 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.

(i) 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.

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

(iii) 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  $-148 \text{ dB(W/(m}^2 \cdot \text{MHz))}$  for all angles of arrival.

(iv) 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.



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

(vi) 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/(m<sup>2</sup> · MHz)) for all angles of arrival.

(563) 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.

(i) 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.

(ii) [Reserved}

(564) 5.564A For the operation of fixed and land mobile service applications in frequency bands in the range 275-450 GHz: The frequency bands 275-296 GHz, 306-313 GHz, 318-333 GHz and 356-450 GHz are identified for use by administrations for the implementation of land mobile and fixed service applications, where no specific conditions are necessary to protect Earth exploration-satellite service (passive) applications. The frequency bands 296-306 GHz, 313-318 GHz and 333-356 GHz may only be used by fixed and land mobile service applications when specific conditions to ensure the protection of Earth exploration-satellite service (passive) applications are determined in accordance with Resolution 731 (Rev.WRC-19). In those portions of the frequency range 275-450 GHz where radio astronomy applications are used, specific conditions (e.g. minimum separation distances and/or avoidance angles) may be necessary to ensure protection of radio astronomy sites from land mobile and/or fixed service applications, on a case-by-case basis in accordance with Resolution 731 (Rev.WRC-19). The use of the above-mentioned frequency bands by land mobile and fixed service applications does not preclude use by, and does not establish priority over, any other applications of radio services in the range of 275-450 GHz.

(565) 5.565 The following frequency bands in the range 275-1000 GHz are identified for use by administrations for passive service applications:

(i) 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; and

(ii) 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

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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.

(iii) 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.

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

### UNITED STATES (US) FOOTNOTES

(c) *United States Footnotes.* United States footnotes, each in the format “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. The list of United States footnotes follows:

(1) US1 The bands 2501-2502 kHz, 5003-5005 kHz, 10.003-10.005 MHz, 15.005-15.01 MHz, 19.99-19.995 MHz, 20.005-20.01 MHz, and 25.005-25.01 MHz 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.

(2) 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 part 15 of this chapter, 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.

(3) - (7) [Reserved]

(8) 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

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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.

(9) - (10) [Reserved]

(11) 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:

(i) 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

(ii) 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.

(12) [Reserved]

(13) US13 The center frequencies in table 2 to paragraph (c)(13)(i) of this section, 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:

(i) 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.

**Table 2 to Paragraph (c)(13)(i)**

171.1000	406.1250
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Hydro Channels (MHz)	171.1125	406.1750
	171.1250	412.6625
	171.8250	412.6750
	171.8375	412.6875
	171.8500	412.7125
	171.8625	412.7250
	171.8750	412.7375
	171.8875	412.7625
	171.9000	412.7750
	171.9125	415.1250
	(ii) [Reserved]	171.9250

(14) US14 When 500 kHz is being used for distress purposes, ship and coast stations using morse telegraph may use 512 kHz for calling.

(15) - (17) [Reserved]

(18) 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.

(19) - (21) [Reserved]

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(22) US22 The following provisions denoted in table 3 to this paragraph (c)(22) shall apply to non-Federal use of 68 carrier frequencies in the range 2-8 MHz, which are not coordinated with NTIA:

(i) The frequencies authorized pursuant to §§ 90.264 (Disaster Communications) and 90.266 (Long Distance Communications) of this chapter 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).

(ii) Letter(s) to the right of a frequency indicate that the frequency is available only for the following purpose(s):

(A) A or I: Alternate channel or Interstate coordination.

(B) C, E, M, or W: For stations located in the Conterminous U.S., East of 108° West Longitude (WL), West of the Mississippi River, or West of 90° WL.

Note 2 to paragraph (c)(22)(ii)(B): 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 §§ 90.264 and 90.266 of this chapter.

(C) D or N: From two hours after local sunrise until two hours before local sunset (*i.e.*, Day only operations) or from two hours prior to local sunset until two hours after local sunrise (*i.e.*, Night only operations).

**Table 3 to Paragraph (c)(22)**

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

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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, D	4613.5	6800.1 ... N	7697.1
2487		4634.5	6803.1	
2511		4637.5	6806.1 ... W	
2535		4647	6855.1 ... N, M	
2569			6858.1 ... N	
2587			6861.1 ... W	
2801			6885.1 ... N	
2804 ... A			6888.1 ... N	
2812				

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(23) 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.

(24) [Reserved]

(25) 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.

(26) 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.

(27) [Reserved]

(28) US28 The band 121.5875-121.9375 MHz is for use by aeronautical utility land and mobile stations, and for air traffic control communications.

(29) [Reserved]

(30) 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.

(31) 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.

(i) 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, paragraph (c)(213) of this section applies.

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(ii) 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.

(iii) 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.

(32) 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.

(33) 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.

(34) - (35) [Reserved]

(36) 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 § 87.187 of this chapter.

(37) - (40) [Reserved]

(41) 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.

(42) - (43) [Reserved]

(44) 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.

(45) - (48) [Reserved]

(49) 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.

(50) 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.

(51) [Reserved]



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(52) US52 In the VHF maritime mobile band (156-162 MHz), the following provisions apply:

(i) 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.

(ii) 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).

(iii) 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.

(iv) Federal stations in the maritime mobile service may also be authorized as follows:

(A) 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;

(B) Inter-ship use of the frequency 156.3 MHz on a simplex basis;

(C) 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;

(D) Port operations use on a simplex basis by coast and ship stations on the frequencies 156.6 and 156.7 MHz;

(E) Environmental communications on the frequency 156.75 MHz in accordance with the national plan; and

(F) Duplex port operations use of the frequencies 157 MHz for ship stations and 161.6 MHz for coast stations.

(53) 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.

(54) [Reserved]

(55) 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 § 90.25 of this chapter.

(56) - (58) [Reserved]

(59) 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.

(60) - (63) [Reserved]

(64) US64

(i) 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.

(ii) 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 part 95 of this chapter.

(65) US65 The use of the band 5460-5650 MHz by the maritime radionavigation service is limited to shipborne radars.

(66) [Reserved]

(67) 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.

(68) [Reserved]

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(69) 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.

(70) US70 The meteorological aids service allocation in the band 400.15-406.0 MHz does not preclude the operation therein of associated ground transmitters.

(71) 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.

(72) [Reserved]

(73) 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.

(i) 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.

(ii) 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.

(iii) 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.

(74) 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 paragraph (c)(385) of this section.

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(75) - (78) [Reserved]

(79) US79 In the bands 1390-1400 MHz and 1427-1432 MHz, the following provisions shall apply:

(i) Airborne and space-to-Earth operations are prohibited.

(ii) 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.

(iii) US79A The use of the bands 415-472 kHz, 479-495 kHz, and 505-510 kHz by the maritime mobile service is limited to radiotelegraphy.

(80) US80 Federal stations may use the frequency 122.9 MHz subject to the following conditions:

(i) 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 part 87 (Aviation Services) of this chapter;

(ii) Use of the frequency is required for coordination of activities with Commission licensees operating on this frequency; and

(iii) Federal stations will not be authorized for operation at fixed locations.

(81) 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.

(82) US82 In the bands 4146-4152 kHz, 6224-6233 kHz, 8294-8300 kHz, 12.353-12.368 MHz, 16.528-16.549 MHz, 18.825-18.846 MHz, 22.159-22.18 MHz, and 25.1-25.121 MHz, 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).

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(83) 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 table 4 to this paragraph (c)(83). 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.

**Table 4 to Paragraph (c)(83)**

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°	086° 31'	140

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		28'		
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

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SC	Beaufort MCAS	32° 26'	080° 40'	160
SC	Savannah River	33° 15'	081° 39'	3
UT	Utah Test and 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 3 to table 4 to paragraph (c)(83): 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.

(84) 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 part 74, subpart H of this chapter.

(85) 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.

(86) [Reserved]

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(87) 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.

(88) US88 In the bands 1675-1695 MHz and 1695-1710 MHz, the following provisions shall apply:

(i) 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:

(A) All base stations within the 27 protection zones listed in paragraph (ii) that enable mobiles to operate at a maximum e.i.r.p. of 20 dBm; and

(B) 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.

(ii) 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.

**Table 5 to Paragraph (c)(88)(ii) - 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



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AK	Fairbanks .....	64° 58'	147° 30'	.....	20
		22"	02"		
AZ	Yuma .....	32° 39'	114° 36'	.....	95
		24"	22"		
CA	Monterey .....	36° 35'	121° 51'	.....	76
		34"	20"		
CA	Twenty-Nine Palms...	34° 17'	116° 09'	.....	80
		46"	44"		
FL	Miami .....	25° 44'	080° 09'	.....	51
		05"	45"		
HI	Hickam AFB .....	21° 19'	157° 57'	.....	28
		18"	30"		
MD	Suitland .....	38° 51'	076° 56'	.....	98
		07"	12"		
MS	Stennis Space Center	30° 21'	089° 36'	.....	57
		23"	41"		
SD	Sioux Falls .....	43° 44'	096° 37'	.....	42
		09"	33"		
VA	Wallops Island .....	37° 56'	075° 27'	.....	30

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		45"	45"	
GU	Andersen AFB .....	13° 34'	144° 55'	..... 42
		52"	28"	

**Table 6 to paragraph (c)(88)(ii) - Protection Zones For Federal Earth Stations Receiving in the  
Band 1675-1695 MHz**

State	Location	Latitude	Longitude	Radius (km)
CA	Sacramento .....	38° 35'	121° 32'	..... 55
		50"	34"	
CO	Boulder .....	39° 59'	105° 15'	..... 02
		26"	51"	
ID	Boise .....	43° 35'	116° 13'	..... 39
		42"	49"	
IL	Rock Island .....	41° 31'	090° 33'	..... 19
		04"	46"	
MO	Kansas City .....	39° 16'	094° 39'	..... 40
		40"	44"	
MO	St. Louis .....	38° 35'	090° 12'	..... 34

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		26"	25"	
MS	Columbus Lake .....	33° 32'	088° 30'	..... 03
		04"	06"	
MS	Vicksburg .....	32° 20'	090° 50'	..... 16
		47"	10"	
NE	Omaha .....	41° 20'	095° 57'	..... 30
		56"	34"	
OH	Cincinnati .....	39° 06'	084° 30'	..... 32
		10"	35"	
OK	Norman .....	35° 10'	097° 26'	..... 03
		52"	21"	
TN	Knoxville .....	35° 57'	083° 55'	..... 50
		58"	13"	
WV	Fairmont .....	39° 26'	080° 11'	..... 04
		02"	33"	
PR	Guaynabo .....	18° 25'	066° 06'	..... 48
		26"	50"	

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Note 4 to paragraph (c)(88)(ii): 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.

(89) [Reserved]

(90) 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: -154 dBW/m<sup>2</sup> for angles of arrival above the horizontal plane ( $\delta$ ) of 0° to 5°,  $-154 + 0.5(\delta-5)$  dBW/m<sup>2</sup> for  $\delta$  of 5° to 25°, and -144 dBW/m<sup>2</sup> for  $\delta$  of 25° to 90°.

(91) US91 In the band 1755-1780 MHz, the following provisions shall apply:

(i) 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.

(ii) 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 part 301 of this chapter.

(A) Joint Tactical Radio Systems (JTRS) may operate indefinitely at the locations provided in table 7.

**Table 7 to Paragraph (c)(91)(ii)(A)**

State	Training area	Latitude	Longitude
AZ	Yuma Proving Ground	33° 12' 14"	114° 13'
	.....		47"
CA	Fort Irwin .....	35° 23' 19"	116° 37'
			43"

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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"

(B) Air combat training system (ACTS) stations may operate on two frequencies within two geographic zones that are defined by the coordinates provided in table 8.

**Table 8 to Paragraph (c)(91)(ii)(B)**

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"

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	44° 11' 00"	103° 06' 00"
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Note 5 to paragraph (c)(91)(ii)(B): ACTS transmitters may cause interference to AWS base stations between separation distances of 285 km (minimum) and 415 km (maximum).

(C) In the sub-band 1761-1780 MHz, Federal earth stations in the space operation service (Earth-to-space) may transmit at the 25 sites identified in table 9 and non-Federal base stations must accept harmful interference caused by the operation of these earth stations.

**Table 9 to Paragraph (c)(91)(ii)(C)**

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"

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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'

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			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 6 to paragraph (c)(91)(ii)(C): 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.

(iii) 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.

(92) 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:

(i) 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.

(ii) 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.

(93) 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

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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.

(94) [Reserved]

(95) [Reserved]

(96) 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:

(i) 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);

(ii) restricted to use for pre-launch testing and space launch operations, except as provided under US303; and

(iii) subject to coordination with NTIA prior to each launch.

(97) US97 The following provisions shall apply in the band 2305-2320 MHz:

(i) In the sub-band 2305-2310 MHz, space-to-Earth operations are prohibited.

(ii) 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 7 to paragraph (c)(97): NASA operates a deep space facility in Goldstone in the band 2290-2300 MHz.

(98) [Reserved]

(99) 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*.

(100) US100 The following provisions shall apply to the bands 2310-2320 MHz and 2345-2360 MHz:

(i) 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

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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 paragraph (c)(100)(i).

(ii) 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.

(101) 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 part 95 of this chapter.

(102) 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.

(103) 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.

(104) 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.

(105) 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.

(106) [Reserved]

(107) US107 In the band 3600-3650 MHz, the following provisions shall apply to earth stations in the fixed-satellite service (space-to-Earth):

(i) 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.

(ii) The assignment of frequencies to new earth stations after July 23, 2015 shall be authorized on a secondary basis.

(108) 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.

(109) 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 part 90 of this chapter 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 §§ 96.15(b) and 96.67 of this chapter.

(110) 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.

(111) US111 In the band 5091-5150 MHz, aeronautical mobile telemetry operations for flight testing are conducted at the locations specified in table 10 to this paragraph (c)(111). Flight testing at additional locations may be authorized on a case-by-case basis.

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**Table 10 to Paragraph (c)(111)**

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'

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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°	122° 03'

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		25'	
Charleston	Charleston, SC	32°	80° 02'
		52'	

(112) 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.

(113) 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 in table 11 to paragraph (c)(113). 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.

**Table 11 to Paragraph (c)(113)—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

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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

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(114) [Reserved]

(115) US115 In the bands 5000-5010 MHz and 5010-5030 MHz, the following provisions shall apply:

(i) 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).

(ii) 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.

(iii) 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.

(116) 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.



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(117) US117 In the band 406.1-410 MHz, the following provisions shall apply:

(i) 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:

(A) 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*.

(B) 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*.

(C) 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.blrdoc.gov*.

(ii) Non-Federal use is limited to the radio astronomy service and as provided by footnote US13.

(118) - (127) [Reserved]

(128) 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.

(129) [Reserved]

(130) 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 paragraph (c)(131) of this section.

(131) 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 radio astronomy observatories listed in table 12 to this paragraph (c)(131) to achieve a mutually acceptable agreement regarding the protection of the radio telescope facilities operating in the band 10.6-10.7 GHz:

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Table 12 to Paragraph (c)(131)

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

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St. Croix, VI.....	17° 45' 24"	64° 35' 01"	16
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(132) 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.

(133) 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):

(i) In the band 14-14.2 GHz, ESAA licensees proposing to operate within radio line-of-sight of the coordinates specified in § 25.228(j)(1) of this chapter 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).

(ii) In the band 14.47-14.5 GHz, operations within radio line-of-sight of the radio astronomy stations specified in § 25.228(j)(3) of this chapter are subject to coordination with the National Science Foundation in accordance with the requirements set forth in that rule section.

(134) - (135) [Reserved]

(136) 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.

(i) 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 § 80.387 of this chapter.

(ii) 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 in table 13 to this paragraph (c)(136)(ii). 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.

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(A) *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.

(B) *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.

**Table 13 to Paragraph (c)(136)(ii)—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)		

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	dBW)		
12.05-12.10	*12 MHz: FS .....	FS	
13.57-13.60	*FS and MS except AM(R)S .....	MMS .....	13.57-
13.80-13.87	*FS and MS except AM(R)S .....	MMS	13.87
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 8 to paragraph (c)(136)(ii): Non-Federal stations may continue to operate in nine HF NIB Bands as follows: in the 6, 7, 13.6, 13.8, and 19 MHz bands, stations in the MMS; in the 7 and 9 MHz bands, stations in the FS and LMS; and in the 11, 12, and 15 MHz band, stations in the FS.

(137) - (138) [Reserved]

(139) US139 Fixed stations authorized in the band 18.3-19.3 GHz under the provisions of §§ 74.502(c), 74.602(g), 78.18(a)(4), and 101.147(r) of this chapter may continue operations consistent with the provisions of those sections.

(140) - (141) [Reserved]

(142) US142 In the bands 7.2-7.3 and 7.4-7.45 MHz, the following provisions shall apply:

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(i) In the U.S. Pacific insular areas located in Region 3 (see § 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.

(ii) 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.

(143) - (144) [Reserved]

(145) 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:

(i) For information received before January 1, 2020: -36 dBW/200 MHz.

(ii) For information received on or after January 1, 2020: -46 dBW/200 MHz.

(146) - (150) [Reserved]

(151) 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 § 30.205 of this chapter.

(152) - (155) [Reserved]

(156) 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.

(157) 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).

(158) - (160) [Reserved]

(161) 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

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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.

(i) Within 25 km of the National Radio Astronomy Observatory's (NRAO's) Very Long Baseline Array (VLBA) Stations listed in table 14 to this paragraph (c)(161)(i).

**Table 14 to Paragraph (c)(161)(i)**

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"

(ii) Within 150 km of the observatories in table 15 to this paragraph (c)(161)(ii):

**Table 15 to Paragraph (c)(161)(ii)**

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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"



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Note 9 to paragraph (c)(161)(ii): Satisfactory completion of the coordination procedure utilizing the automated mechanism, see § 101.1523 of this chapter, will be deemed to establish sufficient separation from radio astronomy observatories, regardless of whether the distances set forth above are met.

(162) - (204) [Reserved]

(205) US205 Tropospheric scatter systems are prohibited in the band 2500-2690 MHz.

(206) - (207) [Reserved]

(208) 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.

(209) 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.

(210) 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 Section 8.2.42 of the NTIA Manual for Federal use, or § 90.248 of this chapter for non-Federal use. After January 1, 2002, no new assignments shall be authorized in the band 216-217 MHz.

(211) 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.

(212) 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).

(213) 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

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resources, agencies, including forestry management and fire suppression, fish and game management and protection and environmental monitoring and protection.

(214) US214 The frequency 157.1 MHz is the primary frequency for liaison communications between ship stations and stations of the United States Coast Guard.

(215) - (217) [Reserved]

(218) 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.

(219) [Reserved]

(220) 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.

(221) 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.

(222) 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).

(223) [Reserved]

(224) 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.

(225) 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

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non-Federal ship-helicopter operations when beyond 100 nautical miles from shore and required for aeronautical radionavigation.

(226) [Reserved]

(227) 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.

(228) - (229) [Reserved]

(230) 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).

(231) 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.

(232) - (238) [Reserved]

(239) 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.

(240) 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).

(241) US241 The following provision shall apply to Federal operations in the band 216-220.035 MHz:

(i) 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

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associated telecommand operations. New stations in the fixed and land mobile services shall not be authorized in the sub-band 216-217 MHz.

(ii) 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.

(A) 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).

(B) 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).

(iii) 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.

(242) US242 Use of the fixed and land mobile services in the band 220-222 MHz shall be in accordance with the following plan:

(i) 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.

(ii) In the non-Federal exclusive sub-bands, temporary fixed geophysical telemetry operations are also permitted on a secondary basis.

(iii) The use of Channels 161-170 is restricted to public safety/mutual aid communications.

(iv) The use of Channels 181-185 is restricted to emergency medical communications.

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Table 16 to paragraph (c)(242)—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

(243) [Reserved]

(244) 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.

(245) 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 § 2.108.

(246) US246 No station shall be authorized to transmit in the following bands: 73-74.6 MHz, 608-614 MHz, except for medical telemetry equipment and white space devices, 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. 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 § 95.1119 of this chapter. 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 § 15.712(h) of this chapter.

(247) US247 The band 10.1-10.15 MHz 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 must not cause harmful interference to this fixed service use and stations in the amateur service must make all necessary adjustments (including termination of transmission) if harmful interference is caused.

(248) - (250) [Reserved]

(251) 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).

(252) 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).

(253) [Reserved]

(254) 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.

(255) 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

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space station under assumed free-space propagation conditions shall not exceed  $-95$  dB(W/m<sup>2</sup>) for all angles of arrival. This limit may be exceeded by up to 3 dB for no more than 5% of the time.

(256) - (257) [Reserved]

(258) 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.

(259) 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.

(260) 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.

(261) 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).

(262) 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).

(263) [Reserved]

(264) US264 In the band 48.94-49.04 GHz, airborne stations shall not be authorized.

(265) [Reserved]

(266) 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.

(267) 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

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of Colorado and Wyoming, bounded by the area of latitudes 39° N and 42° N and longitudes 103° W and 108° W.

(268) 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.

(269) US269 In the band 420-450 MHz, the following provisions shall apply to the non-Federal radiolocation service:

(i) Pulse-ranging radiolocation systems may be authorized for use along the shoreline of the conterminous United States and Alaska.

(ii) In the sub-band 420-435 MHz, spread spectrum radiolocation systems may be authorized within the conterminous United States and Alaska.

(iii) All stations operating in accordance with this provision shall be secondary to stations operating in accordance with the Table of Frequency Allocations in this section.

(iv) Authorizations shall be granted on a case-by-case basis; however, operations proposed to be located within the areas listed in paragraph (i) of US270 should not expect to be accommodated.

(270) US270 In the band 420-450 MHz, the following provisions shall apply to the amateur service:

(i) 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 (E) through (G), the appropriate military coordinator is located at Peterson AFB, CO.

(A) Arizona, Florida and New Mexico.

(B) Within those portions of California and Nevada that are south of latitude 37° 10' N.

(C) Within that portion of Texas that is west of longitude 104° W.

(D) 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).

(E) Within 240 km of Beale AFB, CA (39° 08' N, 121° 26' W).

(F) Within 200 km of Goodfellow AFB, TX (31° 25' N, 100° 24' W) and Warner Robins AFB, GA (32° 38' N, 83° 35' W).



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(G) 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).

(ii) In the sub-band 420-430 MHz, the amateur service is not allocated north of Line A (def. § 2.1).

(271) - (272) [Reserved]

(273) 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.

(274) [Reserved]

(275) 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.

(276) 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.

(277) [Reserved]

(278) 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.

(279) 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.

(280) [Reserved]

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(281) US281 In the band 25.07-25.21 MHz, non-Federal stations in the Industrial/Business Pool must 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.

(282) 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 in this section.

(283) US283 In the bands 2850-3025 kHz, 3400-3500 kHz, 4650-4700 kHz, 5450-5680 kHz, 6525-6685 kHz, 10.005-10.1 MHz, 11.275-11.4 MHz, 13.26-13.36 MHz, and 17.9-17.97 MHz, 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.

(284) [Reserved]

(285) US285 Under exceptional circumstances, the carrier frequencies 2635 kHz, 2638 kHz, and 2738 kHz may be authorized to coast stations.

(286) [Reserved]

(287) 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.

(288) 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.

(289) US289 In the bands 460-470 MHz and 1690-1695 MHz, the following provisions shall apply:

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(i) 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  $-152 \text{ dBW/m}^2/4 \text{ kHz}$ .

(ii) 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 in this section.

(290) - (295) [Reserved]

(296) 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, 12.37 MHz, 12.418 MHz, 16.551 MHz, 16.615 MHz, 18.848 MHz, 18.868 MHz, 22.182 MHz, 22.238 MHz, 25.123 MHz, and 25.159 MHz.

(297) US297 The bands 47.2-49.2 GHz and 81-82.5 GHz are also available for feeder links for the broadcasting-satellite service.

(298) 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).

(299) 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.

(300) 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.

(301) 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 in this section.

(302) [Reserved]

(303) 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/m<sup>2</sup>/4 kHz, depending on angle of arrival, in accordance with ITU Radio Regulation 21.16.

(304) - (306) [Reserved]

(307) 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/m<sup>2</sup> per 4 kHz for all angles of arrival.

(308) 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.

(309) 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.

(310) 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:

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(i)  $-124 \text{ dB(W/m}^2\text{)}$  for  $0^\circ < \theta < 5^\circ$ , (ii)  $-124 + (\theta-5)/2 \text{ dB(W/m}^2\text{)}$  for  $5^\circ < \theta < 25^\circ$ , (iii) and  $-114 \text{ dB(W/m}^2\text{)}$  for  $25^\circ < \theta < 90$ , where  $\theta$  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.

(ii) [Reserved]

(311) [Reserved]

(312) 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 and an authorized bandwidth not to exceed 12.5 kHz, for stolen vehicle recovery systems.

(313) - (314) [Reserved]

(315) 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.

(316) 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.

(317) - (318) [Reserved]

(319) 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.

(320) 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.

(321) - (322) [Reserved]

(323) 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

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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.

(324) US324 In the band 400.15-401 MHz, Federal and non-Federal satellite systems shall be subject to electromagnetic compatibility analysis and coordination.

(325) 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.

(326) [Reserved]

(327) 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.

(328) - (333) [Reserved]

(334) US334 In the bands between 17.7 GHz and 20.2 GHz, the following provisions shall apply:

(i) 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,  $70$ - $120^\circ$  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 in this section is required.

(ii) 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 §§ 1.924(f), 74.32, and 78.19(f) of this chapter. 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

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that support the operations of Multichannel Video Programming Distributors (MVPD) in these areas, as specified in §§ 1.924(f), 74.32, and 78.19(f).

(iii) 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:

(A)  $-115 \text{ dB(W/m}^2\text{)}$  for angles of arrival above the horizontal plane ( $\delta$ ) between  $0^\circ$  and  $5^\circ$ ,

(B)  $-115 + 0.5(\delta - 5) \text{ dB(W/m}^2\text{)}$  for  $\delta$  between  $5^\circ$  and  $25^\circ$ , and

(C)  $-105 \text{ dB(W/m}^2\text{)}$  for  $\delta$  between  $25^\circ$  and  $90^\circ$ .

(iv) 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:

(A)  $-115 - X \text{ dB(W/m}^2\text{)}$  for  $\delta$  between  $0^\circ$  and  $5^\circ$ ,

(B)  $-115 - X + ((10 + X)/20)(\delta - 5) \text{ dB(W/m}^2\text{)}$  for  $\delta$  between  $5^\circ$  and  $25^\circ$ , and

(C)  $-105 \text{ dB(W/m}^2\text{)}$  for  $\delta$  between  $25^\circ$  and  $90^\circ$ ; where X is defined as a function of the number of satellites, n, in an NGSO constellation as follows:

For  $n \leq 288$ ,  $X = (5/119) (n - 50) \text{ dB}$ ; and

For  $n > 288$ ,  $X = (1/69) (n + 402) \text{ dB}$ .

(335) - (336) [Reserved]

(337) 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).

(338) 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  $-28 \text{ dBW/27 MHz}$  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.

(339) [Reserved]

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(340) 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 § 87.149 of this chapter 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.

(341) [Reserved]

(342) US342 In making assignments to stations of other services to which the bands in table 17 to paragraph (c)(342) of this section are allocated (\*indicates radio astronomy use for spectral line observations), all practicable steps must 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*).

**Table 17 to paragraph (c)(342)**

13.36-13.41 MHz	42.77-42.87 GHz*
25.55-25.67 MHz	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*



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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

(343) 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.

(344) 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.

(345) [Reserved]

(346) US346 Except as provided for in table 18 to this paragraph (c)(346) 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:

**Table 18 to Paragraph (c)(346)**

Facility	Coordinates
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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

(347) 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 in this section.

(348) [Reserved]

(349) 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-

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shore ocean areas on the condition that harmful interference is not caused to non-Federal operations.

(350) 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:

(i) *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.

(A) 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.

(B) In the carved-out locations, medical operations shall be authorized in the band 1429-1431.5 MHz.

(C) Medical operations may operate on frequencies in the band 1427-1432 MHz other than those described in paragraphs (c)(350)(i)(A) and (B) of this section only if the operations were registered with a designated frequency coordinator prior to April 14, 2010.

(ii) *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.

(A) 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.

(B) 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.

(351) - (352) [Reserved]

(353) 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.

(354) US354 In the band 58.422-58.472 GHz, airborne stations and space stations in the space-to-Earth direction shall not be authorized.

(355) [Reserved]

(356) 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 in this section. ITU Radio Regulation No. 5.43A does not apply.

(357) 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.

(i) 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.

(ii) 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.

(358) [Reserved]

(359) 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).

(360) 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

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service systems and non-Federal systems operating in accordance with the United States Table of Frequency Allocations in this section is required.

(361) [Reserved]

(362) 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 § 1.924 of this chapter.

(363) [Reserved]

(364) 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.

(365) - (377) [Reserved]

(378) US378 In the band 1710-1755 MHz, the following provisions apply:

(i) 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).

(ii) Federal fixed and tactical radio relay stations shall operate on a secondary basis to primary non-Federal operations at the 14 sites listed in table 19 to this paragraph (c)(378).

(iii) 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.

(iv) 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.

**Table 19 to Paragraph (c)(378)**

80 km radius of operation centered on:

State	Location	Coordinates
CA	China Lake	35° 41' N, 117° 41' W

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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

(379) 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).

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(380) 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.

(381) [Reserved]

(382) 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.

(383) [Reserved]

(384) 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.

(385) 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 radio astronomy observatories in table 20 to paragraph (c)(385)(ii) of this section.

(i) 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 in table 20 to paragraph (c)(385)(ii) of this section. 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.

(ii) In the band 2655-2690 MHz, for radio astronomy observations performed at the locations listed in table 20 to this paragraph (c)(385)(ii), 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*.

**Table 20 to Paragraph (c)(385)(ii)**

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Allen Telescope Array, Hat Creek, CA	Rectangle between latitudes 40° 00' N and 42° 00' N
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	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'



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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.	

(386) - (388) [Reserved]

(389) 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 28 military installations in table 21 to this paragraph (c)(389).

**Table 21 to Paragraph (c)(389)**

<b>Military Installation</b>	<b>State</b>	<b>Nearby city</b>
Redstone Arsenal	AL	Huntsville
Fort Huachuca	AZ	Sierra Vista
Yuma Proving Ground	AZ	Yuma
Beale AFB	CA	Marysville

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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

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(390) 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.

(391) 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.

(392) - (396) [Reserved]

(397) 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.

(398) - (401) [Reserved]

(402) 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 and fixed-satellite services within the bands and areas listed below shall not claim protection from Federal earth stations in the fixed-satellite service.

(i) 17.600-17.700 GHz for stations within a 120 km radius of 38° 49' N latitude and 76° 52' W longitude.

(ii) 17.375-17.475 GHz for stations within a 160 km radius of 39° 42' N latitude and 104° 45' W longitude.

(403) - (430) [Reserved]

(431) 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.

(i) *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. Table 22 to this paragraph (c)(431) 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.

(ii) *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 table 18 to this paragraph (c)(431). Restrictions and authorizations for the CPAs remain in effect during periodic use unless specifically relieved in the coordination process.

(iii) 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.

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(iv) Table 22 to this paragraph (c)(431) 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 22 to Paragraph (c)(431)—Department of Defense Cooperative Planning Areas and Periodic Use Areas**

Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Little Rock	AR	Yes	-	37° 28' 34"	94° 28' 24"	N/A
				37° 42' 55"	88° 54' 36"	
				36° 38' 29"	87° 52' 34"	
				34° 57' 57"	88° 09' 26"	
				32° 09' 36"	92° 06' 54"	
				31° 51' 52"	93° 10' 35"	
				32° 12' 11"	94° 37' 07"	
				33° 42' 22"	95° 49' 52"	
				35° 17' 35"	96° 23' 06"	
36° 12' 18"	96° 08' 46"					

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Yuma Complex  (includes Yuma Proving Grounds and MCAS Yuma)	AZ	Yes	Yes	33° 36' 44"	115° 10'	N/A
				34° 03' 08"	44"	
				34° 03' 56"	114° 41'	
				33° 26' 54"	08"	
				32° 51' 17"	114° 05'	
				32° 16' 54"	56"	
				32° 14' 39"	113° 03'	
				32° 20' 06"	54"	
				32° 28' 30"	113° 02'	
				32° 53' 20"	17"	
	113° 45'					
	54"					
	114° 40'					
	39"					
	114° 55'					
	06"					
	115° 02'					
	30"					

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Camp Pendleton	CA	Yes	-	33° 21' 46"	117° 25'25"	50



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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Edwards Air Force Base	CA	Yes	Yes	35° 19' 16"	118° 03'	N/A
				35° 17' 54"	16"	
				35° 11' 43"	117° 26'	
				35° 00' 52"	54"	
				34° 44' 17"	117° 15'	
				34° 34' 16"	43"	
				34° 26' 55"	117° 10'	
				34° 26' 55"	52"	
				34° 28' 59"	117° 10'	
				34° 41' 36"	17"	
				35° 07' 32"	117° 19'	
					16"	
					117° 47'	
					55"	
	118° 16'					
	59"					
	118° 28'					
	36"					

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
National Training Center	CA	Yes	Yes	36°0 3' 31"	117° 00'	N/A
				36° 03' 09"	45"	
				35° 41' 46"	116° 20'	
				35° 07' 24"	43"	
				34° 42' 43"	115° 44'	
				34° 44' 22"	31"	
				35° 02' 28"	115° 44'	
				35° 34' 49"	09"	
					116° 17'	
					58"	
	117° 05'					
	19"					
	117° 35'					
	18"					
	117° 27'					
	37"					

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<b>Location name</b>	<b>State</b>	<b>CPA</b>	<b>PUA</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Radius (km)</b>
Naval Air Weapons Station, China Lake*	CA	Yes	Yes	36° 36' 42" 35° 54' 45" 35° 00' 01" 34° 54' 34" 35° 44' 22" 36° 30' 18"	117° 20' 42" 116° 31' 45" 116° 39' 01" 117° 26' 34" 118° 17' 22" 118° 07' 18"	N/A
Point Mugu	CA	Yes	Yes	34° 06' 44"	119° 06' 36"	38

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
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

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<b>Location name</b>	<b>State</b>	<b>CPA</b>	<b>PUA</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Radius (km)</b>
Eglin Air Force Base (includes Santa Rosa Island & Cape San Blas site)	FL	Yes	Yes	Eglin and Santa Rosa Island: 30° 29' 28.5"  Cape San Blas: 29° 40' 37"	Eglin and Santa Rosa Island: 86° 45' 00"  Cape San Blas: 85° 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

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<b>Location name</b>	<b>State</b>	<b>CPA</b>	<b>PUA</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Radius (km)</b>
Joint Readiness Training  Center	LA	Yes	Yes	31° 54' 23"	93° 20' 53"	N/A
				31° 50' 54"	92° 52' 46"	
				31° 18' 13"	92° 26' 31"	
				30° 46' 33"	92° 28' 32"	
				30° 29' 14"	93° 4' 1"	
				30° 46' 22"	93° 41' 26"	
				31° 25' 16"	94° 3' 19"	
Chesapeake Beach*	MD	Yes	Yes	38° 39' 24"	76° 31' 41"	95

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Naval Air Station, Patuxent River	MD	Yes	Yes	38° 26' 22"	76° 14' 12"	N/A
CPA				38° 51' 51"	75° 48' 34"	
				38° 28' 11"	75° 28' 53"	
				38° 03' 40"	75° 30' 31"	
				37° 45' 33"	75° 45' 50"	
				37° 34' 34"	76° 20' 09"	
				37° 38' 10"	76° 44' 37"	
				38° 09' 32"	76° 29' 28"	
				38° 18' 46"	76° 34' 36"	
PUA				38° 26' 59"	76° 26' 27"	

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
				38° 33' 38"	76° 07' 29"	
				39° 11' 10"	75° 29' 28"	
				38° 38' 51"	75° 00' 40"	
				37° 52' 13"	75° 03' 24"	
				37° 29' 44"	75° 22' 25"	
				37° 10' 24"	76° 16' 42"	
				37° 20' 05"	77° 06' 52"	
				38° 01' 11"	76° 36' 06"	
				38° 20' 54"	76° 46' 41"	
				38° 35' 47"	76° 30' 02"	
St. Inigoes*	MD	Yes	Yes	38° 08' 41"	76° 26' 03"	87



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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Bath*	ME	Yes	Yes	44° 02' 29"	70° 10' 41"	N/A
				43° 52' 27"	70° 10' 29"	
				43° 48' 53"	70° 01' 6"	
				43° 32' 50"	69° 57' 30"	
				43° 27' 16"	69° 42' 52"	
				43° 44' 26"	69° 13' 52"	
				43° 54' 57"	69° 24' 50"	
				44° 06' 56"	69° 25' 13"	
				44° 17' 2"	69° 16' 56"	
				44° 26' 54"	69° 45' 13"	
				44° 36' 16"	69° 56' 50"	
				44° 33' 45"	70° 04' 01"	
				44° 57' 05"	70° 14' 55"	
				44° 56' 27"	70° 19' 38"	
				44° 32' 13"	70° 08' 17"	
				44° 24' 08"	70° 36' 36"	

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<b>Location name</b>	<b>State</b>	<b>CPA</b>	<b>PUA</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Radius (km)</b>
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"	79° 31' 19"	N/A
				37° 45' 56"	77° 14' 14"	
				37° 22' 33"	76° 18' 30"	
				36° 38' 56"	75° 51' 26"	
				34° 43' 13"	76° 15' 37"	
				33° 29' 44"	78° 29' 53"	
				33° 24' 04"	80° 29' 07"	
				34° 01' 05"	81° 23' 49"	
				35° 27' 24"	81° 37' 00"	
				36° 27' 46"	81° 22' 49"	

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Portsmouth*	NH	Yes	Yes	42° 23' 06"	71° 10' 23"	N/A
				42° 25' 05"	71° 05' 43"	
				42° 21' 36"	71° 00' 54"	
				42° 18' 28"	70° 54' 35"	
				42° 13' 01"	70° 44' 53"	
				42° 06' 30"	70° 41' 11"	
				42° 02' 54"	70° 37' 44"	
				42° 08' 03"	70° 33' 35"	
				42° 10' 25"	70° 20' 54"	
				42° 15' 39"	70° 02' 39"	
				42° 22' 44"	69° 48' 42"	
				42° 34' 56"	69° 36' 01"	
				42° 52' 26"	69° 26' 24"	
				43° 13' 48"	69° 28' 18"	
				43° 31' 21"	69° 40' 13"	
				43° 45' 21"	70° 01' 31"	

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Moorestown*	NJ	Yes	Yes	40° 27' 26"	75° 42' 60"	N/A
				40° 02' 54"	75° 55' 12"	
				39° 48' 19"	75° 55' 55"	
				39° 38' 27"	75° 51' 48"	
				39° 24' 59"	75° 21' 41"	
				39° 17' 18"	74° 54' 09"	
				39° 22' 16"	74° 27' 56"	
				39° 29' 35"	74° 12' 59"	
				39° 54' 43"	74° 00' 05"	
				40° 15' 03"	74° 06' 20"	
				40° 23' 29"	74° 08' 28"	
				40° 42' 46"	74° 21' 54"	
				40° 50' 59"	74° 31' 36"	
				40° 52' 49"	74° 42' 53"	
				40° 47' 42"	75° 03' 00"	
40° 33' 25"	75° 28' 15"					

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
White Sands Missile Range	NM	Yes	Yes	34° 35' 05"	107° 06'	N/A
				34° 43' 50"	05"	
				34° 43' 17"	106° 46'	
				34° 26' 28"	50"	
				32° 36' 02"	106° 03'	
				31° 45' 47"	17"	
				31° 18' 18"	105° 26'	
				31° 27' 23"	28"	
				32° 38' 49"	104° 55'	
				33° 32' 40"	02"	
	105° 22'					
	47"					
	106° 06'					
	18"					
	106° 54'					
	23"					
	107° 25'					
	49"					

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Nevada Test and Training Range	NV	Yes	Yes	35° 58' 48"	115° 31'	N/A
					55"	
				36° 38' 22"	116° 23'	
				36° 22' 37"	51"	
				36° 54' 03"	117° 41'	
				37° 58' 01"	35"	
				38° 59' 48"	117° 59'	
				38° 58' 35"	18"	
				37° 52' 34"	118° 01'	
				36° 20' 30"	17"	
				36° 21' 15"	116° 46'	
					01"	
					114° 49'	
	25"					
	113° 35'					
	46"					
	113° 39'					
	51"					

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<b>Location name</b>	<b>State</b>	<b>CPA</b>	<b>PUA</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Radius (km)</b>
Fort Sill	OK	Yes	Yes	35° 03' 39"	99° 02' 38"	N/A
				35° 10' 31"	98° 05' 47"	
				34° 42' 54"	97° 45' 20"	
				34° 13' 49"	98° 05' 49"	
				34° 13' 46"	98° 56' 09"	
				34° 38' 26"	99° 16' 57"	
Tobyhanna Army Depot	PA	Yes	-	41° 30' 25"	75° 51' 60"	N/A
				41° 38' 51"	75° 26' 33"	
				41° 31' 41"	75° 1' 39"	
				41° 11' 31"	74° 50' 07"	
				40° 52' 07"	75° 1' 2"	
				40° 44' 53"	75° 23' 50"	
				40° 51' 43"	75° 48' 52"	
				41° 07' 40"	76° 00' 38"	

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Dahlgren*	VA	Yes	Yes	38° 23' 10"	76° 23' 21"	N/A
				38° 41' 25"	76° 35' 56"	
				38° 46' 14"	76° 44' 44"	
				38° 49' 37"	76° 54' 57"	
				38° 50' 16"	76° 58' 18"	
				38° 46' 30"	77° 01' 57"	
				38° 49' 42"	77° 04' 08"	
				38° 54' 42"	77° 7' 35"	
				38° 55' 37"	77° 12' 04"	
				38° 56' 05"	77° 23' 5"	
				38° 44' 45"	77° 25' 23"	
				38° 44' 22"	77° 28' 48"	
				38° 35' 14"	77° 36' 11"	
				38° 51' 04"	78° 12' 06"	
				38° 26' 52"	78° 29' 02"	
				38° 22' 59"	77° 42' 19"	



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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Newport News-Norfolk*(includes Fort Story SESEF range)	VA	Yes	Yes	36° 58' 24"	76° 26' 07"	93
Wallops Island*	VA	Yes	Yes	37° 51' 25"	75° 27' 59"	76

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Bremerton*	WA	Yes	Yes	47° 28' 40"	122° 31'	N/A
				47° 31' 16"	22"	
				47° 31' 13"	122° 31'	
				47° 34' 12"	26"	
				47° 45' 36"	122° 32'	
				47° 59' 07"	37"	
				48° 12' 20"	122° 31'	
				47° 39' 46"	52"	
				47° 39' 12"	121° 32'	
				47° 39' 12"	28"	
				47° 45' 23"	121° 34'	
				47° 44' 48"	09"	
				47° 57' 40"	121° 44'	
				47° 31' 15"	51"	
				47° 35' 53"	122° 29'	
				47° 35' 53"	60"	
47° 27' 33"	122° 34'					
47° 27' 07"	35"					

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Location name	State	CPA	PUA	Latitude	Longitude	Radius (km)
Everett* (includes Ediz Hook SESEF range)	WA	Yes	-	47° 51' 11"	122° 57'	N/A
				47° 25' 13"	47"	
				47° 54' 45"	123° 18' 6"	
				47° 36' 60"	122° 10'	
				47° 51' 57"	13"	
				48° 35' 49"	121° 37'	
				48° 00' 8"	60"	
				47° 51' 10"	121° 22'	
					57"	
					122° 08'	
	13"					
	123° 29'					
	33"					
	122° 57'					
	47"					

(432) [Reserved]

(433) 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:

(i) 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 §§ 96.15 and 96.67 of this chapter.

(ii) Non-Federal fixed and mobile stations shall not claim protection from Federal airborne radar systems.

(iii) 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.

(434) - (443) [Reserved]

(444) 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, paragraph (c)(444(i) of this section and Resolution 114 (Rev.WRC-12) of the ITU Radio Regulations apply.

(i) 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);

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(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.

(ii) US444B In the band 5091-5150 MHz, the following provisions 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-19).

(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 (c)(444)(ii)(A)(1) of this section are also authorized on a primary basis.

(445) - (474) [Reserved]

(475) 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

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9300-9320 MHz on the condition that harmful interference is not caused to the maritime radionavigation service.

(476) 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.

(477) - (481) [Reserved]

(482) US482 In the band 10.6-10.68 GHz, the following provisions and urgings apply:

(i) 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  $20^\circ$  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.

(ii) 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: (A) limit the maximum transmitter power supplied to the antenna to  $-15$  dBW; and (B) 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.

(483) - (510) [Reserved]

(511) 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.

(512) - (518) [Reserved]

(519) 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.

(520) - (531) [Reserved]

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(532) 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 in this section.

(533) - (549) [Reserved]

(550) US550A In the band 36-37 GHz, the following provisions shall apply:

(i) 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.

(ii) 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:

(A) -5 dBW for hub stations of point-to-multipoint systems; or

(B) -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.

(551) - (564) [Reserved]

(565) US565 The following frequency bands in the range 275-1000 GHz are identified for passive service applications:

(i) 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;

(ii) 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.

Note 10 to paragraph (c)(565): 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 in this section, 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

(d) *Non-Federal Government (NG) Footnotes.* Non-Federal Government (non-Federal) footnotes, each in the format “NG” followed by one or more digits, denote stipulations applicable only to non-Federal operations and thus appear solely in the non-Federal Table. The list of non-Federal footnotes follows:

(1) 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 § 90.242 of this chapter on 10 kilohertz spaced channels from 540 kHz to 1700 kHz.

(2) NG2 Facsimile broadcasting stations may be authorized in the band 88-108 MHz.

(3) 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.

(4) 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 in this section.

(5) 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 paragraph (d)(33) of this section.

(6) 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.

(7) 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



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accordance with the Table of Frequency Allocations in this section. See § 80.371(a) of this chapter for the list of available carrier frequencies.

(8) 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.

(9) - (13) [Reserved]

(14) 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 paragraph (d)(33) of this section.

(15) [Reserved]

(16) 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.

(17) 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.

(18) - (21) [Reserved]

(22) 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.

(23) - (27) [Reserved]

(28) 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.

(29) [Reserved]

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(30) NG30 In Puerto Rico, the band 942-944 MHz is alternatively allocated to the fixed service (aural broadcast auxiliary stations).

(31) [Reserved]

(32) 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.

(33) NG33 In the band 614-698 MHz, the following provisions apply. In the sub-bands 617-652 MHz and 663-698 MHz, low power television and TV translator stations may operate on a secondary basis to stations in the fixed and mobile services until required to terminate their operations in accordance with § 73.3700(g)(4) of this chapter, and white space devices may also operate in these sub-bands, except in those areas where their use is prohibited in accordance with §§ 15.707(a)(5) and 15.713(b)(2)(iv) of this chapter. In addition, white space devices may operate in the sub-band 657-663 MHz in accordance with § 15.707(a)(2) of this chapter, low power auxiliary stations 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.

(34) NG34 The bands 758-775 MHz and 788-805 MHz are available for assignment to the public safety services, as described in part 90 of this chapter.

(35) 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.

(36) - (40) [Reserved]

(41) NG41 In the band 2120-2180 MHz, the following provisions shall apply to grandfathered stations in the fixed service:

(i) 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 §§ 27.1250 through 27.1255 of this chapter.

(ii) In the sub-band 2160-2180 MHz, fixed stations authorized pursuant to part 101 of this chapter may continue to operate on a secondary basis to AWS.

(42) - (49) [Reserved]

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(50) 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.

(51) 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.

(52) NG52 Except as provided for by paragraph (d)(527) of this section, 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.

(53) NG53 In the band 13.15-13.25 GHz, the following provisions shall apply:

(i) 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 § 76.51 of this chapter; and outside these areas, TVPU stations, CARS stations and non-geostationary satellite orbit fixed-satellite service (NGSO FSS) gateway earth stations operate on a co-primary basis.

(ii) 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 § 76.51 of this chapter; and outside these areas, TVPU stations and NGSO FSS gateway earth stations operate on a co-primary basis and CARS stations operate on a secondary basis.

(iii) 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.

(iv) 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 11 to paragraph (d)(53): The provisions of paragraphs (d)(53)(i) through (iii) of this section shall not apply to geostationary satellite orbit (GSO) FSS operations in the band 12.75-13.25 GHz.

(54) - (55) [Reserved]

(56) 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.

(57) 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.

(58) NG58 In the band 17.3-17.8 GHz, the following provisions shall apply to the broadcasting-satellite, fixed, and fixed-satellite services:

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

(59) 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.

(60) 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.

(61) [Reserved]

(62) 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.

(63) 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

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services, except where individually licensed earth stations are authorized pursuant to § 25.136 of this chapter.

(64) [Reserved]

(65) 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 § 25.136 of this chapter. 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 part 30 of this chapter. 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.

(66) 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 in paragraphs (d)(66)(i) through (iv) of this section:

(i) In the urbanized areas listed in table 23 to this paragraph (d)(66)(i), 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:

(A) 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.

(B) The use of the band 482-488 MHz (TV channel 16) is limited to eligibles in the Public Safety Radio Pool in or near:

(1) The Los Angeles urbanized area; and

(2) New York City; Nassau, Suffolk, and Westchester Counties in New York State; and Bergen County, NJ.

**Table 23 to Paragraph (d)(66)(i)**

Urbanized area	Bands (MHz)	TV channels
Boston, MA.....	470-476, 482-488.....	14, 16
Chicago, IL-Northwestern IN.....	470-476, 476-482.....	14, 15

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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

(ii) 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.

(iii) 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.

(iv) The use of these allocations is further subject to the conditions set forth in parts 22 and 90 of this chapter.

(67) - (69) [Reserved]

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(70) 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.

(71) - (91) [Reserved]

(92) 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.

(93) - (110) [Reserved]

(111) NG111 The band 157.4375-157.4625 MHz may be used for one way paging operations in the special emergency radio service.

(112) 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.

(113) - (114) [Reserved]

(115) 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 part 74, subpart H of this chapter.

(116) - (117) [Reserved]

(118) 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 in this section.

(119) - (123) [Reserved]

(124) 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 §§ 2.803 and 90.20(e)(5) of this chapter.

(125) - (140) [Reserved]

(141) 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 part 22 of this chapter. 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 part 90 of this chapter. 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 in this section.

(142) [Reserved]

(143) 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.

(144) - (146) [Reserved]

(147) NG147 In the band 2483.5-2500 MHz, non-Federal stations in the fixed and mobile services that are licensed under part 74, 90, or 101 of this chapter, 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 part 27 of this chapter.

(148) 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.

(149) 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 part 73 of this chapter. Use of the band 614-698 MHz is subject to the provisions specified in paragraph (d)(33) of this section.

(150) - (151) [Reserved]



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(152) 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.

(153) - (154) [Reserved]

(155) NG155 The bands 159.500-159.675 MHz and 161.375-161.550 MHz are allocated to the maritime service as described in part 80 of this chapter. Additionally, the frequencies 159.550, 159.575 and 159.600 MHz are available for low-power intership communications.

(156) - (158) [Reserved]

(159) NG159 In the band 698-806 MHz, stations authorized under part 74, subparts F and G of this chapter may continue to operate indefinitely on a secondary basis to all other stations operating in that band.

(160) 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.

(161) - (163) [Reserved]

(164) NG164 The use of the band 18.6-18.8 GHz by the fixed-satellite service is limited to geostationary-satellite networks.

(165) 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.

(166) 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.

(167) - (168) [Reserved]

(169) NG169 In the band 3650-3700 MHz, use of the non-Federal fixed-satellite service (space-to-Earth) is limited to international inter-continental systems and, after December 1, 2000, primary operations are limited to grandfathered earth stations. All other earth station operations in the band 3650-3700 MHz are authorized 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, will 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, will not be accepted, except for changes in polarization, antenna orientation or ownership of a grandfathered earth station.

(170) [Reserved]

(171) 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.

(172) NG172 In the band 7025-7075 MHz, use of the primary fixed-satellite service (space-to-Earth) allocation shall be limited to two grandfathered satellite systems. Associated earth stations located within 300 meters of the following locations shall be grandfathered:

(i) In the band 7025-7075 MHz, Brewster, WA (48° 08' 46.7" N, 119° 42' 8.0" W); and

(ii) In the sub-band 7025-7055 MHz, Clifton, TX (31° 47' 58.5" N, 97° 36' 46.7" W) and Finca Pascual, PR (17° 58' 41.8" N, 67° 8' 12.6" W).

(173) NG173 In the band 216-220 MHz, secondary telemetry operations are permitted subject to the requirements of § 90.259 of this chapter. After January 1, 2002, no new assignments shall be authorized in the sub-band 216-217 MHz.

(174) [Reserved]

(175) 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 in this section.

(176) - (181) [Reserved]

(182) NG182 In the band 3700-4200 MHz, the following provisions shall apply:

(i) Except as provided in paragraph (d)(182)(iii)(A) of this section, 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.

(ii) 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.

(iii) 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:

(A) 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;

(B) 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;

(C) In the band 3980-4000 MHz, no new fixed or mobile operations will be permitted until specified by Commission rule, order, or notice.

(183) - (184) [Reserved]

(186) - (337) [Reserved]

(338) 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:

(i) For stations of point-to-point systems in the fixed service: -45 dBW/27 MHz.

(ii) For stations in the mobile service (except for devices authorized by the FCC for the Wireless Medical Telemetry Service): -60 dBW/27 MHz.

(339) - (456) [Reserved]

(457) NG457A Earth stations on vessels (ESVs), as regulated under part 25 of this chapter, are an application of the fixed-satellite service and the following provisions shall apply:

(i) 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. Paragraph d(182) of this section applies to incumbent licensees that provide service to ESVs in the band 3700-4000 MHz.

(ii) In the band 5925-6425 MHz, ESVs may be authorized to transmit to geostationary satellites on a primary basis.

(458) - (526) [Reserved]

(527) NG527A Earth Stations in Motion (ESIMs), as regulated under part 25 of this chapter, are an application of the fixed-satellite service (FSS) and the following provisions shall apply:

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(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

(v) 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.

(vi) 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.

(528) - (534) [Reserved]

(535) 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

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(e) *Federal Government (G) footnotes.* Federal Government (Federal) footnotes, each in the format "G" followed by one or more digits, denote stipulations applicable only to Federal operations and thus appear solely in the Federal Table. The list of Federal footnotes follows:

(1) [Reserved]

(2) 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.

(3) - (4) [Reserved]

(5) 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.

(6) G6 Military tactical fixed and mobile operations may be conducted nationally on a secondary basis:

(i) To the meteorological aids service in the band 403-406 MHz; and

(ii) 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.

(7) [Reserved]

(8) G8 Low power Federal radio control operations are permitted in the band 420-450 MHz.

(9) - (10) [Reserved]

(11) 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.

(12) - (14) [Reserved]

(15) 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.

(16) - (18) [Reserved]

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(19) 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.

(20) - (26) [Reserved]

(27) 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.

(28) - (29) [Reserved]

(30) 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.

(31) [Reserved]

(32) G32 Except for weather radars on meteorological satellites in the band 9.975-10.025 GHz and for Federal survey operations (see paragraph (c)(108) of this section), Federal radiolocation in the band 10-10.5 GHz is limited to the military services.

(33) [Reserved]

(34) 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.

(35) - (41) [Reserved]

(42) 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.

(43) - (55) [Reserved]

(56) 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.

(57) - (58) [Reserved]

(59) 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

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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.

(60) - (99) [Reserved]

(100) 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.

(101) - (103) [Reserved]

(104) 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.

(105) - (108) [Reserved]

(109) 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).

(110) 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.

(111) - (113) [Reserved]

(114) 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.

(115) G115 In the band 13.36-13.41 MHz, 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.

(116) 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.

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(117) 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.

(118) - (119) [Reserved]

(120) 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.

(121) [Reserved]

(122) 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.

(123) - (126) [Reserved]

(127) 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.

(128) 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/m<sup>2</sup>/100 MHz) for all angles of arrival.

(129) 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:

(i) Wind profiler locations must be pre-coordinated with the military services to protect fixed military radars; and

(ii) 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.

(130) 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.

(131) 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.

(132) 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 paragraph (b)(331) of this section. 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-19) shall apply.

(133) [Reserved]

(134) 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:

(i) Earth stations are limited to those communicating with the Department of Commerce Geostationary Operational Environmental Satellites (GOES).

(ii) There shall not be more than five earth stations authorized at one time.

(iii) 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).