

Appendix B: Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 2 and 25 as follows:

PART 2 -- FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

1. The authority citation for Part 2 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. Section 2.106, the Table of Frequency Allocations, is amended to read as follows:
 - a. Revise pages 43, 44, 45, 46, 48, 49, and 52.
 - b. In the list of United States (US) Footnotes, add footnote US380.

§ 2.106 Table of Frequency Allocations.

The revisions and additions read as follows:

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International Table			United States Table		FCC Rule Part(s)
Region 1	Region 2	Region 3	Federal Government	Non-Federal Government	
1429-1452 FIXED MOBILE except aeronautical Mobile	1429-1452 FIXED MOBILE 5.343		1429.5-1432	See previous page	See previous page
			5.341 US352	1430-1432 FIXED (telemetry) LAND MOBILE (telemetry) FIXED-SATELLITE (space-to-Earth) US368	Private Land Mobile (90) Personal (95)
			1432-1435	5.341 US350 US352	
5.341 5.342	5.341		5.341 US361	1432-1435 FIXED MOBILE except aeronautical mobile	Wireless Communications (27)
1452-1492 FIXED MOBILE except aeronautical mobile BROADCASTING 5.345 5.347 BROADCASTING- SATELLITE 5.345 5.347	1452-1492 FIXED MOBILE 5.343 BROADCASTING 5.345 5.347 BROADCASTING-SATELLITE 5.345 5.347		1435-1525 MOBILE (aeronautical telemetry)		Aviation (87)
5.341 5.342	5.341 5.344				
1492-1525 FIXED MOBILE except aeronautical mobile	1492-1525 FIXED MOBILE 5.343 MOBILE-SATELLITE (space-to-Earth) 5.348A	1492-1525 FIXED MOBILE			
5.341 5.342	5.341 5.344 5.348	5.341 5.348A	5.341 US78		
1525-1530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Mobile except aeronautical mobile 5.349	1525-1530 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Fixed Mobile 5.343	1525-1530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Mobile 5.349	1525-1530 MOBILE-SATELLITE (space-to-Earth) US380 Mobile (aeronautical telemetry)		Satellite Communications (25) Aviation (87)
5.341 5.342 5.350 5.351 5.352A 5.354	5.341 5.351 5.354	5.341 5.351 5.352A 5.354	5.341 5.351 US78		

1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space- to-Earth) 5.351A 5.353A Earth exploration-satellite Fixed Mobile except aeronautical mobile	1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.343	1530-1535 MOBILE-SATELLITE (space-to-Earth) US380 MARITIME MOBILE-SATELLITE (space-to-Earth) Mobile (aeronautical telemetry)	
5.341 5.342 5.351 5.354	5.341 5.351 5.354	5.341 5.351 US78 US315	
1535-1559 MOBILE-SATELLITE (space-to-Earth) 5.351A		1535-1544 MOBILE-SATELLITE (space-to-Earth) US380 MARITIME MOBILE-SATELLITE (space-to-Earth)	Satellite Communications (25) Maritime (80)
		5.341 5.351 US315	
		1544-1545 MOBILE-SATELLITE (space-to-Earth)	
		5.341 5.356	
		1545-1549.5 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) Mobile-satellite (space-to-Earth) US380	Aviation (87)
		5.341 5.351 US308 US309	
		1549.5-1558.5 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US380	
		5.341 5.351 US308 US309	
		1558.5-1559 AERONAUTICAL MOBILE-SATELLITE (R) (space-to-Earth)	
5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A		5.341 5.351 US308 US309 US380	
1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.329A		1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth)	Note: The NTIA Manual (footnote G126) states that differential GPS stations may be authorized in the 1559- 1610 MHz band, but the FCC has not yet addressed this footnote.
5.341 5.362B 5.362C 5.363		5.341 US208 US260	

International Table			United States Table		FCC Rule Part(s)
Region 1	Region 2	Region 3	Federal Government	Non-Federal Government	
1610-1610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION 5.341 5.355 5.359 5.363 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1610-1610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to- space) 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1610-1610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372	1610-1610.6 MOBILE-SATELLITE (Earth-to-space) US319 US380 AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE(Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.372 US208		Satellite Communications (25) Aviation (87)
1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION 5.149 5.341 5.355 5.359 5.363 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to- space) 5.149 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) US319 US380 RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) 5.149 5.341 5.364 5.366 5.367 5.368 5.372 US208		
1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.341 5.355 5.359 5.363 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to- space) Mobile-satellite (space-to- Earth) 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to- Earth) Radiodetermination- satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) US319 AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.341 5.364 5.365 5.366 5.367 5.368 5.372 US208 US380		

<p>1626.5-1660 MOBILE-SATELLITE (Earth-to-space) 5.351A</p> <p>5.341 5.351 5.353A 5.354 5.355 5.357A 5.359 5.362A 5.374 5.375 5.376</p>	<p>1626.5-1645.5 MOBILE-SATELLITE (Earth-to-space) US380 MARITIME MOBILE-SATELLITE (Earth-to-space)</p> <p>5.341 5.351 US315</p> <p>1645.5-1646.5 MOBILE-SATELLITE (Earth-to-space)</p> <p>5.341 5.375</p> <p>1646.5-1651 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) Mobile-satellite (Earth-to-space) US380</p> <p>5.341 5.351 US308 US309</p> <p>1651-1660 MOBILE-SATELLITE (Earth-to-space) US380 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space)</p> <p>5.341 5.351 US308 US309</p>	<p>Satellite Communications (25) Maritime (80)</p> <p>Aviation (87)</p>
<p>1660-1660.5 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY</p> <p>5.149 5.341 5.351 5.354 5.362A 5.376A</p>	<p>1660-1660.5 AERONAUTICAL MOBILE-SATELLITE (R) (Earth-to-space) RADIO ASTRONOMY</p> <p>5.149 5.341 5.351 US308 US309 US380</p>	
<p>1660.5-1668.4 RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile</p> <p>5.149 5.341 5.379 5.379A</p>	<p>1660.5-1668.4 RADIO ASTRONOMY US74 SPACE RESEARCH (passive)</p> <p>5.341 US246</p>	
<p>1668.4-1670 METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY</p> <p>5.149 5.341</p>	<p>1668.4-1670 METEOROLOGICAL AIDS (radiosonde) RADIO ASTRONOMY US74</p> <p>5.149 5.341 US99</p>	

			1755-1850 FIXED MOBILE G42	1755-1850	
5.149 5.341 5.385 5.386 5.387 5.388			1850-2025	1850-2000 FIXED MOBILE NG177	RF Devices (15) Personal Communications (24) Fixed Microwave (101)
1930-1970 FIXED MOBILE 5.388A	1930-1970 FIXED MOBILE 5.388A Mobile-satellite (Earth-to-space)	1930-1970 FIXED MOBILE 5.388A			
5.388	5.388	5.388			
1970-1980 FIXED MOBILE 5.388A 5.388					
1980-2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A				2000-2020 MOBILE-SATELLITE (Earth-to-space) US380	Satellite Communications (25)
5.388 5.389A 5.389B 5.389F				NG156	
2010-2025 FIXED MOBILE 5.388A	2010-2025 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)	2010-2025 FIXED MOBILE 5.388A		2020-2025 FIXED MOBILE	
5.388	5.388 5.389C 5.389D 5.389E 5.390	5.388		NG177	
2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space)			2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION- SATELLITE (Earth-to- space) (space-to-space) SPACE RESEARCH (Earth- to-space) (space-to-space)	2025-2110 FIXED NG23 NG118 MOBILE 5.391	TV Auxiliary Broadcasting (74F) Cable TV Relay (78) Local TV Transmission (101J)
5.392			5.391 5.392 US90 US222 US346 US347	5.392 US90 US222 US346 US347	

International Table			United States Table		FCC Rule Part(s)
Region 1	Region 2	Region 3	Federal Government	Non-Federal Government	
2110-2120 FIXED MOBILE 5.388A SPACE RESEARCH (deep space) (Earth-to-space) 5.388			2110-2120 US252	2110-2155 FIXED NG23 MOBILE	Domestic Public Fixed (21) Public Mobile (22) Fixed Microwave (101)
2120-2160 FIXED MOBILE 5.388A 5.388	2120-2160 FIXED MOBILE 5.388A Mobile-satellite (space-to-Earth) 5.388	2120-2170 FIXED MOBILE 5.388A	2120-2200	US252 2155-2160 FIXED NG23	Domestic Public Fixed (21) Fixed Microwave (101)
2160-2170 FIXED MOBILE 5.388A 5.388 5.392A	2160-2170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.388 5.389C 5.389D 5.389E 5.390	5.388		2160-2180 FIXED NG23 NG153 MOBILE	Domestic Public Fixed (21) Public Mobile (22) Fixed Microwave (101)
2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F 5.392A				NG178 2180-2200 MOBILE-SATELLITE (space-to-Earth) US380	Satellite Communications (25)
2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space)			2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED (line-of-sight only)	2200-2290	

2483.5-2500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A Radiolocation 5.150 5.371 5.397 5.398 5.399 5.400 5.402	2483.5-2500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION- SATELLITE (space-to- Earth) 5.398	2483.5-2500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION Radiodetermination-satellite (space-to-Earth) 5.398	2483.5-2500 MOBILE-SATELLITE (space-to-Earth) US319 US380 RADIODETERMINATION- SATELLITE (space-to- Earth) 5.398	2483.5-2500 MOBILE-SATELLITE (space-to-Earth) US319 US380 RADIODETERMINATION- SATELLITE (space-to- Earth) 5.398	ISM Equipment (18) Satellite Communications (25) Private Land Mobile (90) Fixed Microwave (101)
2500-2520 FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (space- to-Earth) 5.351A 5.403 5.405 5.407 5.412 5.414	2500-2520 FIXED 5.409 5.411 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (space-to-Earth) 5.351A 5.403 5.404 5.407 5.414 5.415A		2500-2655	2500-2655 FIXED 5.409 5.411 US205 FIXED-SATELLITE (space-to-Earth) NG102 MOBILE except aeronautical mobile BROADCASTING- SATELLITE NG101	Domestic Public Fixed (21) Auxiliary Broadcasting (74)
2520-2655 FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING- SATELLITE 5.413 5.416 5.339 5.403 5.405 5.412 5.418 5.418B 5.418C	2520-2655 FIXED 5.409 5.411 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING- SATELLITE 5.413 5.416 5.339 5.403 5.418B 5.418C	2520-2535 FIXED 5.409 5.411 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING- SATELLITE 5.413 5.416 5.403 5.415A 2535-2655 FIXED 5.409 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING- SATELLITE 5.413 5.416 5.339 5.418 5.418A 5.418B 5.418C	5.339 US205 US269	5.339 US269	

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UNITED STATES (US) FOOTNOTES

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US380 In the bands 1525-1544 MHz, 1545-1559 MHz, 1610-1645.5 MHz, 1646.5-1660.5 MHz, 2000-2020 MHz, 2180-2200 MHz, and 2483.5-2500 MHz, a non-Federal Government 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.

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PART 25--SATELLITE COMMUNICATIONS

3. The authority citation for Part 25 continues to read as follows:

AUTHORITY: 47 U.S.C. 701-744. Interprets or applies sec. 303, 47 U.S.C. 303. 47 U.S.C. sections 154, 301, 302, 303, 307, 309 and 332, unless otherwise noted.

4. Section 25.117 is amended to read as follows:

§ 25.117 Modification of station license.

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(f) An application for modification of a space station license to add an ancillary terrestrial component to an eligible satellite network will be treated as a request for a minor modification if the particulars of operations provided by the applicant comply with the criteria specified in § 25.147.

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5. Section 25.143 is amended to read as follows:

§ 25.143 Licensing provisions for the 1.6/2.4 GHz mobile-satellite service and the 2 GHz mobile-satellite service.

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(i) Incorporation of ancillary terrestrial component base stations into a 1.6/2.4 GHz mobile-satellite service network or a 2 GHz mobile-satellite service network. Any licensee authorized to construct and launch a 1.6/2.4 GHz or a 2 GHz mobile-satellite system may construct ancillary terrestrial component (ATC) base stations as defined in § 25.201 of this part at its own risk and subject to the conditions specified in this subpart any time after commencing construction of the mobile-satellite service system.

(j) Pre-Operational Testing. An MSS ATC licensee may, without further authority from the Commission, conduct equipment tests for the purpose of making such adjustments and measurements as may be necessary to assure compliance with the terms of the technical provisions of its MSS license, its ATC authorization, the rules and regulations in this Part and the applicable engineering standards. An MSS licensee may not offer ATC service to the public for compensation during pre-operational testing. In order to operate any ATC base stations, such a licensee must meet all the requirements set forth in § 25.147 and must have been granted ATC authority through a modification of its space station license.

(k) Aircraft. ATC mobile terminals must be operated in accordance with 25.136(a). All portable or hand-held transceiver units (including transceiver units installed in other devices that are themselves portable or hand-held) having operating capabilities in the 2000-2020/2180-2200 MHz or 1610-1626.5 MHz/2483.5-2500 MHz bands shall bear the following statement in a conspicuous location on the device: "This device may not be operated while on board aircraft. It must be turned off at all times while on board aircraft."

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6. Section 25.146 is amended to read as follows:

§ 25.146 Licensing provisions for the L-Band mobile-satellite service.

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(g) Incorporation of ancillary terrestrial component base station into an L-band Mobile-Satellite Service System. Any licensee authorized to construct and launch an L-band mobile-satellite system may construct ancillary terrestrial component (ATC) base stations as defined in § 25.201 of this part at its own risk and subject to the conditions specified in this subpart any time after commencing construction of the mobile-satellite service system.

(h) Pre-Operational Testing. An MSS ATC licensee may, without further authority from the Commission, conduct equipment tests for the purpose of making such adjustments and measurements as may be necessary to assure compliance with the terms of the technical provisions of its MSS license, its ATC authorization, the rules and regulations in this Part and the applicable engineering standards. An MSS licensee may not offer ATC service to the public for compensation during pre-operational testing. In order to operate any ATC base stations, such a licensee must meet all the requirements set forth in § 25.147 and must have been granted ATC authority through a modification of its space station license.

(i) Aircraft. All portable or hand-held transceiver units (including transceiver units installed in other devices that are themselves portable or hand-held) having operating capabilities in the 1626.5-1660.5 MHz and 1525-1559 MHz bands shall bear the following statement in a conspicuous location on the device: "This device may not be operated while on board aircraft. It must be turned off at all times while on board aircraft."

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7. New Section 25.147 is added to read as follows:

§ 25.147 Application requirements for ancillary terrestrial components in the mobile-satellite service networks operating in the 1.5/1.6 GHz, 1.6/2.4 GHz and 2 GHz mobile-satellite service.

- (a) Applicants for ancillary terrestrial component authority shall demonstrate compliance with the following through certification or explanatory technical exhibit, as appropriate:
- (1) ATC shall be deployed in the forward-band mode of operation whereby the ATC mobile terminals transmit in the MSS uplink bands and the ATC base stations transmit in the MSS downlink bands in portions of the 2000-2020 MHz/2180-2200 MHz bands (2 GHz band), the 1626.5-1660.5 MHz/1525-1559 MHz bands (L-band), and the 1610-1626.5 MHz/2483.5-2500 MHz bands (Big LEO band).
 - (2) ATC operations shall be limited to certain frequencies:
 - (i) In the 2000-2020 MHz/2180-2200 MHz bands (2 GHz MSS band), ATC operations are limited to the selected assignment of the 2 GHz MSS licensee that seeks ATC authority.
 - (ii) In the 1626.5-1660.5 MHz/1525-1559 MHz bands (L-band), ATC operations are limited to the frequency assignments authorized and internationally coordinated for the MSS system of the MSS licensee that seeks ATC authority.
 - (iii) In the 1610-1626.5 MHz/2483.5-2500 MHz bands (Big LEO band), ATC operations are limited to the 1610-1615.5 MHz, 1621.35-1626.5 MHz, and 2492.5-2498.0 MHz bands and to the specific frequencies authorized for use by the MSS licensee that seeks ATC authority.
 - (3) ATC operations shall not exceed the geographical coverage area of the mobile-satellite service network of the applicant for ATC authority.
 - (4) ATC base stations shall comply with all applicable antenna and structural clearance requirements established in Part 17 of the Commission's rules.
 - (5) ATC base stations and mobile terminals shall comply with Part 1 of the Commission's rules, Subpart I – Procedures Implementing the National Environmental Policy Act of 1969, including

- the guidelines for human exposure to radio frequency electromagnetic fields as defined in §§ 1.1307(b) and 1.1310 of the Commission's rules for PCS networks.
- (6) ATC base station operations shall use less than all available MSS frequencies when using all available frequencies for ATC base station operations would exclude otherwise available signals from MSS space-stations.
- (b) Applicants for an ancillary terrestrial component shall demonstrate compliance with the following criteria through certification:
- (1) Geographic and Temporal Coverage.
 - (i) For the 2 GHz MSS band, an applicant must demonstrate that it can provide space-segment service covering all 50 states, Puerto Rico, and the U.S. Virgin Islands one-hundred percent of the time, consistent with the coverage requirements for 2 GHz MSS GSO operators.
 - (ii) For the L-band, an applicant must demonstrate that it can provide space-segment service covering all 50 states, Puerto Rico, and the U.S. Virgin Islands one-hundred percent of the time, unless it is not technically possible for the MSS operator to meet the coverage criteria from its orbital position.
 - (iii) For the Big LEO band, an applicant must demonstrate that it can provide space-segment service (i) to all locations as far north as 70° North latitude and as far south as 55° South latitude for at least seventy-five percent of every 24-hour period, i.e., that at least one satellite will be visible above the horizon at an elevation angle of at least 5° for at least 18 hours each day, and (ii) on a continuous basis throughout the fifty states, Puerto Rico and the U.S. Virgin Islands, i.e., that at least one satellite will be visible above the horizon at an elevation angle of at least 5° at all times.
 - (2) Replacement Satellites.
 - (i) Operational NGSO MSS ATC systems shall maintain an in-orbit spare satellite.
 - (ii) Operational GSO MSS ATC systems shall maintain a spare satellite on the ground within one year of commencing operations and launch it into orbit during the next commercially reasonable launch window following a satellite failure.
 - (iii) All MSS ATC licensees must report any satellite failures, malfunctions or outages that may require satellite replacement within ten days of their occurrence.
 - (3) Commercial availability. Mobile-satellite service must be commercially available (*viz.*, offering services for a fee) in accordance with the coverage requirements that pertain to each band as a prerequisite to an MSS licensee's offering ATC service.
 - (4) Integrated Services. MSS licensees shall offer an integrated service of MSS and MSS ATC. Applicants for MSS ATC may establish an integrated service offering by affirmatively demonstrating that:
 - (i) The MSS ATC operator will use a dual-mode handset that can communicate with both the MSS network and the MSS ATC component to provide the proposed ATC service; or,
 - (ii) Other evidence establishing that the MSS ATC operator will provide an integrated service offering to the public.
 - (5) In-band Operation.
 - (i) In the 2 GHz MSS band, MSS ATC is limited to an MSS's licensee's selected assignment. MSS ATC operations beyond the MSS licensee's selected assignment are prohibited.
 - (ii) In the Big LEO band, MSS ATC is limited to no more than 5.5 MHz of spectrum in each direction of operation. Licensees in these bands may implement ATC only on those channels on which MSS is authorized, consistent with the Big LEO band-sharing arrangement.
 - (iii) In the L-band, MSS ATC is limited to those frequency assignments available for MSS use in accordance with the Mexico City Memorandum of Understanding, its successor agreements or the result of other organized efforts of international coordination.
- (c) Equipment certification.

- (1) Each ATC MET utilized for operation under this part and each transmitter marketed, as set forth in Sec. 2.803 of this chapter, must be of a type that has been authorized by the Commission under its certification procedure for use under this part.
- (2) Any manufacturer of radio transmitting equipment to be used in these services may request equipment authorization following the procedures set forth in subpart J of part 2 of this chapter. Equipment authorization for an individual transmitter may be requested by an applicant for a station authorization by following the procedures set forth in part 2 of this chapter.
- (3) Licensees and manufacturers are subject to the radiofrequency radiation exposure requirements specified in 1.1307(b), 2.1091 and 2.1093 of this chapter, as appropriate. MSS ATC base stations must comply with the requirements specified in 1.1307(b) for PCS base stations. MSS ATC mobile terminals must comply with the requirements specified for mobile and portable PCS transmitting devices in 1.1307(b). MSS ATC mobile terminals must also comply with the requirements in 2.1091 and 2.1093 for Satellite Communications Services devices. Applications for equipment authorization of mobile or portable devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.
- (d) Applicants for an ancillary terrestrial component authority shall demonstrate compliance with the provisions of §§ 1.924 and 25.203(e)-(g) and with §§ 25.252, 25.253, or 25.254, as appropriate, through certification or explanatory technical exhibit.
- (e) Upon receipt of ATC authority, all ATC licensees must ensure continued compliance with this section and §§ 25.252, 25.253, or 25.254, as appropriate.

8. Section 25.201 is amended by amending and adding the following definitions in alphabetical order to read as follows:

§ 25.201 Definitions.

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Ancillary terrestrial component. The term “ancillary terrestrial component” means a terrestrial communications network used in conjunction with a qualifying satellite network system authorized pursuant to these rules and the conditions established in the Report and Order issued in IB Docket 01-185, Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Band.

Ancillary terrestrial component base station. The term “ancillary terrestrial component base station” means a terrestrial fixed facility used to transmit communications to or receive communications from one or more ancillary terrestrial component mobile terminals.

Ancillary terrestrial component mobile terminal. The term “ancillary terrestrial component mobile terminal” means a terrestrial mobile facility used to transmit communications to or receive communications from an ancillary terrestrial component base station or a space station.

Selected assignment. The term “selected assignment” means a spectrum assignment voluntarily identified by a 2 GHz MSS licensee at the time that the licensee’s first 2 GHz mobile-satellite service satellite reaches its intended orbit, or other mobile-satellite service spectrum in which the Commission permits a 2 GHz mobile-satellite service licensee to conduct mobile-satellite service operations with authority superior to that of other in-band, mobile-satellite service licensees.

Structural attenuation. The term “structural attenuation” means the signal attenuation caused by transmitting to and from mobile terminals which are located in buildings or other man-made structures that attenuate the transmission of radiofrequency radiation.

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9. New Section 25.252 is added to read as follows:

§ 25.252 Special requirements for ancillary terrestrial components operating in the 2000-2020 MHz/2180-2200 MHz bands.

(a) Applicants for an ancillary terrestrial component in these bands must demonstrate that ATC base stations shall not:

- (1) exceed -100.6 dBW/4 kHz out-of-channel emissions at the edge of the MSS licensee’s selected assignment.
- (2) exceed a peak EIRP of 27 dBW in 1.23 MHz.
- (3) exceed an EIRP toward the physical horizon (not to include man-made structures) of 25.5 dBW in 1.23 MHz.
- (4) be located less than 190 meters from all airport runways and aircraft stand areas, including takeoff and landing paths.
- (5) exceed an aggregate power flux density of -51.8 dBW/m² in a 1.23 MHz bandwidth at all airport runways and aircraft stand areas, including takeoff and landing paths and all ATC base station antennas shall have an overhead gain suppression according to the following.
- (6) be located less than 820 meters from a U.S. Earth Station facility operating in the 2200-2190 MHz band. In its MSS ATC application, the MSS licensee should request a list of operational stations in the 2200-2190 MHz band.
- (7) exceed an EIRP in the 1559-1605 MHz band of -70 dBW/MHz for wideband emissions and -80 dBW for narrow-band emissions. The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a minimum resolution bandwidth of 1 MHz and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of no less than 1 kHz. The measurements are to be made over a 20 millisecond averaging period when the base station is transmitting data.

Angle from Direction of Maximum Gain, in Vertical Plane, Above Antenna (Degrees)	Antenna Discrimination Pattern (dB)
0 to 15	Meet or exceed ITU-R Rec. F.1336, Annex 1, for P-MP Antennas
15 to 180	Not to Exceed Gmax – 25

Where: Gmax is the maximum gain of the base station antenna in dBi.

- (8) use ATC base station antennas that have again greater than 17 dBi and must have an overhead gain suppression according to the following:

Angle from Direction of Maximum Gain, in Vertical Plane, Above Antenna (Degrees)	Antenna Discrimination Pattern (dB)
0	Gmax
2.....	Not to Exceed Gmax – 14
8 to 180	Not to Exceed Gmax – 25

(b) Applicants for an ancillary terrestrial component in these bands must demonstrate that ATC mobile terminals shall:

- (1) observe a peak EIRP limit of 1.0 dBW in 1.23 MHz.
- (2) limit out-of-channel emissions at the edge of a MSS licensee's selected assignment to -67 dBW/4 kHz.
- (3) not exceed an EIRP in the 1559-1605 MHz band of -70 dBW/MHz for wideband emissions and -80 dBW for narrow-band emissions. The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a minimum resolution bandwidth of 1 MHz and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of no less than 1 kHz. The measurements are to be made over a 20 millisecond averaging period when the base station is transmitting data.

(c) For ATC operations in the 2000-2020 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency within the 2000 to 2020 MHz band outside the licensee's frequency band(s) of operations, emissions shall be attenuated by at least $43 + 10 \log(P)$ dB.
- (2) Emissions on frequencies lower than 1995 MHz and higher than 2025 MHz shall be attenuated by at least $70 + 10 \log P$. Emissions in the bands 1995-2000 MHz and 2020-2025 MHz shall be attenuated by at least a value as determined by linear interpolation from $70 + 10 \log P$ at 1995 MHz or 2025 MHz, to $43 + 10 \log P$ dB at the nearest MSS band edge at 2000 MHz or 2020 MHz respectively.
- (3) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, in its discretion, require greater attenuation than specified in paragraphs (1) and (2) above.
- (4) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

Note: The preceding rules of § 25.252 are based on cdma2000 system architecture. To the extent that a 2 GHz MSS licensee is able to demonstrate that the use of a different system architecture would produce no greater potential interference than that produced as a result of implementing the rules of this section, an MSS licensee is permitted to apply for ATC authorization based on another system architecture.

10. New Section 25.253 is added to read as follows:

§ 25.253 Special requirements for ancillary terrestrial components operating in the 1626.5-1660.5 MHz/1525-1559 MHz bands.

(a) An applicant for an ancillary terrestrial component in these bands shall:

- (1) implement the maximum available power control for all ATC base stations and mobile terminals under GSM 800 or GSM 1800 standard (dynamic range of 30 dB in steps of 2 dB).
- (2) implement a variable rate vocoder in the ATC mobile terminal such that the duty cycle of the mobile terminal is reduced when the EIRP of the mobile terminals requested by the power control system is increased above a nominal -7.4 dBW. The duty cycle will be reduced by refraining from transmitting on consecutive time slots. The duty cycle of the mobile terminal, as measured over a 0.25 second period, shall comply with the following schedule:

Nominal Mobile Terminal Peak EIRP	Mobile Terminal Transmit Duty Cycle
Equal to or less than -7.4 dBW	100%
Greater than -7.4 dBW	50%
Greater than -4.4 dBW	25%

Greater than -1.4 dBW	20%
Greater than -0.4 dBW	18.2%

- (3) implement the provisions of subsection (2) in a manner that precludes other ATC mobile terminals from using the open time slots.
 - (4) demonstrate, at the time of application, how the ATC network will comply with the requirements of subsections (a) and (b)(1) through (b)(3) above.
 - (5) demonstrate, at the time of application, how its ATC network will comply with the requirements of footnotes US308 and US315 to the table of frequency allocations contained in § 2.106 of the Commission's rule regarding priority and preemptive access to the L-band MSS spectrum by the aeronautical mobile-satellite en-route service (AMS(R)S) and the global maritime distress and safety system (GMDSS).
 - (6) demonstrate how its ATC network base stations and mobile terminals will comply with the Global Mobile Personal Communications by Satellite (GMPCS) system requirements to protect the radionavigation satellite services (RNSS) operations in the allocation above 1559 MHz.
 - (7) coordinate with the terrestrial CMRS operators prior to initiating ATC transmissions when co-locating ATC base stations with terrestrial commercial mobile radio service (CMRS) base stations that make use of Global Positioning System (GPS) time-based receivers.
 - (8) demonstrate that the cellular structure of the ATC network design includes 18 dB of link margin allocated to structural attenuation. If less structural attenuation is used, the maximum number of base stations permitted under paragraph (c) of this section must be reduced or a showing must be made that there would be no increase in interference to other MSS operators and that the applicant's satellite would continue to meet the other requirements of this section.
- (b) ATC base stations shall not exceed an out-of-channel emissions measurement of -57.9 dBW/MHz at the edge of a MSS licensee's authorized and internationally coordinated MSS frequency assignment.
- (c) The maximum number of base stations operating in the U.S. on any one 200 kHz channel shall not exceed 1725. During the first 18 months following activation for testing of the first ATC base station, the L-band ATC operator shall not implement more than 863 base stations on the same 200 kHz channel. L-band ATC operators shall notify the Commission of the date of the activation for testing of the first ATC base station and shall maintain a record of the total number of ATC base stations operating in the U.S. on any given 200 kHz of spectrum. Upon request by the Commission, L-band ATC operators shall provide this information to resolve any claim it receives from an L-band MSS operator that ATC operations are causing interference to its MSS system.
- (d) Applicants for an ancillary terrestrial component in these bands must demonstrate that ATC base stations shall not:
- (1) exceed peak EIRP of 19.1 dBW, in 200 kHz, per carrier with no more than three carriers per sector;
 - (2) exceed an EIRP toward the physical horizon (not to include man-made structures) of 14.1 dBW per carrier in 200 kHz;
 - (3) locate any ATC base station less than 470 meters from all airport runways and aircraft stand areas, including takeoff and landing paths;
 - (4) exceed an aggregate power flux density level of -73.0 dBW/m²/200 kHz at the edge all airport runways and aircraft stand areas, including takeoff and landing paths;
 - (5) locate any ATC base station less than 1.5 km from the boundaries of all navigable waterways or the ATC base stations shall not exceed a power flux density level of -64.6 dBW/m²/200 kHz at the water's edge of any navigable waterway;
 - (6) exceed a peak gain of 16 dBi;
 - (7) exceed an EIRP in the 1559-1605 MHz band of -70 dBW/MHz for wideband emissions and -80 dBW for narrow-band emissions. After January 1, 2005, the ATC station shall not exceed an EIRP in the 1605-1610 MHz frequency range that is determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -10 dBW/MHz at 1610 MHz for wideband emissions. The wideband

EIRP level is to be measured using a root mean square (RMS) detector function with a minimum resolution bandwidth of 1 MHz and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of no less than 1 kHz. The measurements are to be made over a 20 millisecond averaging period when the base station is transmitting data.

- (e) Applicants for an ancillary terrestrial component in these bands must demonstrate, at the time of the application, that ATC base stations shall use left-hand-circular polarization, maximum gain of 16 dBi and overhead gain suppression according to the following:

Angle from Direction of Maximum Gain, in Vertical Plane, Above Antenna (Degrees)	Antenna Discrimination Pattern (dB)
0	Gmax
5.....	Not to Exceed Gmax – 5
10.....	Not to Exceed Gmax -19
15 to 30.....	Not to Exceed Gmax – 27
30 to 55.....	Not to Exceed Gmax – 35
55 to 145	Not to Exceed Gmax – 40
145 to 180.....	Not to Exceed Gmax – 26

- (f) Prior to operation, ancillary terrestrial component licensees shall:
 - (1) provide the Commission with sufficient information to complete coordination of ATC base stations with Search-and-Rescue Satellite-Aided Tracking (SARSAT) earth stations operating in the 1544-1545 MHz band for any ATC base station located either within 27 km of a SARSAT station, or within radio horizon of the SARSAT station, whichever is less.
 - (2) take all practicable steps to avoid locating ATC base stations within radio line of sight of MAT receive sites in order to protect U.S. MAT systems consistent with ITU-R Recommendation ITU-R M.1459. MSS ATC base stations located within radio line of sight of a MAT receiver must be coordinated with the Aerospace and Flight Test Radio Coordinating Council (AFTRCC) for non-Government MAT receivers on a case-by-case basis prior to operation. For government MAT receivers, the MSS licensee shall supply sufficient information to the Commission to allow coordination to take place. A listing of current and planned MAT receiver sites can be obtained from AFTRCC for non-Government sites and through the FCC’s IRAC Liaison for Government MAT receiver sites.
- (g) Applicants for an ancillary terrestrial component in these bands must demonstrate that ATC mobile terminals shall:
 - (1) be limited to a peak EIRP level of 0 dBW and an out-of-channel emissions of -67dBW/4 kHz at the edge of a MSS licensee’s authorized and internationally coordinated MSS frequency assignment.
 - (2) take all practicable steps to avoid ATC mobile terminals from causing interference to U.S. radio astronomy service (RAS) observations in the 1660-1660.5 MHz band.
 - (3) not exceed an EIRP in the 1559-1610 MHz band of -70 dBW/MHz for wideband emissions and -80 dBW for narrow-band emissions. The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a minimum resolution bandwidth of 1 MHz and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of no less than 1 kHz. The measurements are to be made over a 20 millisecond averaging period when the base station is transmitting data.

Note: The preceding rules of § 25.253 are based on GSM/TDMA 800 or GSM 1800 system architecture. To the extent that an L-band MSS licensee is able to demonstrate that the use of a different system architecture would produce no greater potential interference than that produced as a result of implementing the rules of this section, an MSS licensee is permitted to apply for ATC authorization based on another system architecture.

11. New Section 25.254 is added to read as follows:

§ 25.254 Special requirements for ancillary terrestrial components operating in the 1610-1626.5 MHz/2483.5-2500 MHz bands.

(a) An applicant for an ancillary terrestrial component in these bands must demonstrate that ATC base stations shall:

- (1) not exceed a peak EIRP of 32 dBW in 1.25 MHz;
- (2) not cause unacceptable interference to systems identified section 25.254(c) and, in any case, shall not exceed out-of-channel emission of -44.1 dBW/30 kHz at the edge of the MSS licensee's authorized frequency assignment;
- (3) at the time of application, that it has taken, or will take steps necessary to avoid causing interference to other services sharing the use of the 2450-2500 MHz band through frequency coordination; and
- (4) not exceed an EIRP in the 1559-1605 MHz band of -70 dBW/MHz for wideband emissions and -80 dBW for narrow-band emissions. After January 1, 2005, the ATC station shall not exceed an EIRP in the 1605-1610 MHz frequency range that is determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -10 dBW/MHz at 1610 MHz for wideband emissions. The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a minimum resolution bandwidth of 1 MHz and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of no less than 1 kHz. The measurements are to be made over a 20 millisecond averaging period when the base station is transmitting data.

(b) An applicant for an ancillary terrestrial component in these bands must demonstrate that mobile terminals shall:

- (1) meet the requirements contained in § 25.213 to protect radio astronomy service (RAS) observations in the 1610.6-1613.8 MHz band from unacceptable interference;
- (2) observe a peak EIRP limit of 1.0 dBW in 1.25 MHz;
- (3) observe an out-of-channel EIRP limit of -57.1 dBW/30 kHz at the edge of the licensed MSS frequency assignment.
- (4) not exceed an EIRP in the 1559-1605 MHz band of -70 dBW/MHz for wideband emissions and -80 dBW for narrow-band emissions. The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a minimum resolution bandwidth of 1 MHz and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of no less than 1 kHz. The measurements are to be made over a 20 millisecond averaging period when the base station is transmitting data.

(c) Applicants for an ancillary terrestrial component to be used in conjunction with a mobile-satellite service system using CDMA technology shall coordinate the use of the Big LEO MSS spectrum designated for CDMA systems using the framework established by the ITU in Recommendation ITU-R M.1186.

Note: The preceding rules of § 25.254 are based on cdma2000 and IS-95 system architecture. To the extent that a Big LEO MSS licensee is able to demonstrate that the use of different system architectures would produce no greater potential interference than that produced as a result of implementing the rules

of this section, an MSS licensee is permitted to apply for ATC authorization based on another system architecture.

12. New Section 25.255 is added to read as follows:

§ 25.255 Procedures for resolving harmful interference related to operation of ancillary terrestrial components operating in the 1.5./1.6 GHz, 1.6/2.4 GHz and 2 GHz bands.

If harmful interference is caused to other services by ancillary MSS ATC operations, either from ATC base stations or mobile terminals, the ATC operator must resolve any such interference. If the MSS ATC operator claims to have resolved the interference and other operators claim that interference has not been resolved, then the parties to the dispute may petition the Commission for a resolution of their claims.