FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 1, 2, 25, 27, 74, 78, 80, 87, 90, 97, and 101

[ET Docket No. 12–338 and IB Docket No. 06–123; FCC 15–50]

WRC–07 Implementation Report and Order and WRC–12 Order

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: In this document, the Commission implemented allocation changes from the World Radiocommunication Conference (Geneva, 2007) (WRC–07) and updated related service rules. The Commission took this action in order to conform its rules, to the extent practical, to the decisions that the international community made at WRC–07. This action will promote the advancement of new and expanded services and provide significant benefits to the American people. In addition, the Commission revised the International Table of Frequency Allocations within its rules to generally reflect the allocation changes made at the World Radiocommunication Conference (Geneva, 2012) (WRC–12).

DATES: Effective August 6, 2015.

FOR FURTHER INFORMATION CONTACT: Tom Mooring, Office of Engineering and Technology, 202–418–2450, *Tom.Mooring@fcc.gov*.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's *Report and Order* and *Order,* ET Docket No. 12–338 and IB Docket No. 06–123, FCC 15–50, adopted April 23, 2015, and released April 27, 2015. The full text of this document is available for inspection and copying during normal business hours in the FCC Reference Center (Room CY–A257), 445 12th Street SW., Washington, DC 20554. The full text may also be downloaded at: *www.fcc.gov*. People with Disabilities: To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an email to *fcc504@fcc.gov* or call the Consumer & Governmental Affairs Bureau at 202–418–0530 (voice), 202–418–0432 (tty).

Summary of Report and Order

On November 15, 2012, the Commission adopted a *Notice of Proposed Rulemaking and Order* (*WRC–07 NPRM*) in this proceeding, 77 FR 76250, December 27, 2012. In this *Report and Order* (*WRC–07 R&O*), the Commission amended the Table of Frequency Allocations (Allocation Table) in § 2.106 of its rules and a number of related service rules to implement certain radio frequency (RF) allocation decisions from the Final Acts of the World Radiocommunication Conference (Geneva, 2007) (*WRC–07 Final Acts*). In the *Order* (*WRC–12 Order*), the Commission updated the International Table portion of its Allocation Table to reflect the allocation decisions from the Final Acts of the World Radiocommunication Conference (Geneva, 2012) (*WRC–12 Final Acts*).

Background

In the *WRC–07 R&O,* the Commission implemented allocation decisions from the *WRC–07 Final Acts* and made certain related updates to its service rules, including those for the Amateur Radio Service, Aviation Services, passive sensors, and maritime Automatic Identification Systems (AIS). Specifically, the Commission:

- Allocated the 135.7–137.8 kHz band (2200 meter band) to the amateur service on a secondary basis.
- Raised the secondary amateur service allocation in the 1900–2000 kHz band to primary status, while providing for continued use by commercial fishing vessels of radio buoys on the ''open sea.''
- Allocated the 108–117.975 MHz and 960–1164 MHz bands to the aeronautical mobile (route) service (AM(R)S) on a primary basis for Federal and non-Federal use.
- Allocated the 5091–5150 MHz band to the aeronautical mobile service (AMS) on a primary basis for Federal and non-Federal use, limited to aeronautical mobile telemetry (AMT) for flight testing of aircraft and ''Aeronautical Mobile Airport Communications System'' (AeroMACS) networks.
- Removed non-Federal AMT allocations from the 2310–2320 MHz and 2345–2360 MHz bands and an unused radionavigation service allocation from the 24.75–25.05 GHz band.
- Revised part 87 of the Commission's rules to update and correct the aviation services rules.
- Extended AIS capability by allocating the 161.9625–161.9875 MHz (AIS 1) and 162.0125–162.0375 MHz (AIS 2) bands to the mobile-satellite service (MSS) (Earth-to-space) and the aeronautical mobile (off-route) service (AM(OR)S) on a primary basis for Federal and non-Federal use.
- Protected passive sensors in the 1400–1427 MHz, 10.6–10.68 GHz, 23.6–24 GHz, 31.3–31.8 GHz, 50.2–50.4 GHz, and 52.6–54.25 GHz bands from harmful interference by generally adopting WRC–07's unwanted emissions levels for active services in six adjacent bands (1390–1395 MHz, 1427–1452 MHz, 22.55–23.55 GHz, 49.7–50.2 GHz, 50.4–50.9 GHz, and 51.4–52.6 GHz) and its in-band sharing criteria for the 10.6–10.68 GHz and 36–37 GHz bands.
- Established Federal coordination areas in California and Guam for non-Federal terrestrial operations in the 17.7–19.7 GHz range.

A. Amateur Service Use of LF and MF Bands

2200 Meter Band (135.7–137.8 kHz). Previously, in the *WRC–07 NPRM* the Commission stated that it would add an amateur radio allocation to the 135.7–137.8 kHz band only if it was comfortable that amateur stations and power line carrier (PLC) systems could coexist. The Commission has now concluded that such sharing of the band is possible. Since the Commission last considered this issue, amateurs have successfully operated in the band under experimental licenses without reported PLC interference. The Commission was also encouraged by the fact that numerous fixed radionavigation beacons, which operate at much higher powers, share spectrum with PLC systems without reported interference. As discussed the exact scope of acceptable amateur operations in the band is a matter that warrants further examination.

The Commission was unconvinced by the claims of the Utilities Telecom Council (UTC) and electric utility commenters that coexistence of amateur stations and PLC systems is not possible. These claims largely rest on the assumption that amateur stations in the band would operate under the rules applicable to other amateur bands which, in general, permit mobile operations and operations at high power and with any type of antenna. The Commission determined that it will have to establish appropriate requirements to ensure compatibility with PLC systems. Such requirements will likely include limiting amateur operation to fixed locations that are suitably distant from the transmission lines upon which PLC systems operate, as well as imposing power limits and other technical rules to govern amateur operations. The Commission found that the existing record offers useful comments in this regard. For example, American Electric Power Company (AEP), while opposed to the proposed allocation, also acknowledged that amateur radio operations would likely have to ''include an extremely large

antenna or [be in] very close proximity to a transmission line'' to raise interference concerns. Amateur radio operator John H. Davis agreed with UTC's statement that the Commission's suggestion in the *WRC–07 NPRM* to limit antenna height ''would help to provide some basis upon which to further develop a coexistence mechanism for fixed amateur radio operations, but not for mobile.''

The Commission reached this decision because there are tangible benefits in providing for licensed amateur use in the 135.7–137.8 kHz band. Besides promoting harmonization with relevant WRC–07 decisions, the addition of a secondary amateur allocation provides amateur operators with new opportunities for experimentation with equipment, techniques, antennas, and propagation phenomena in a frequency range that is significantly different from all other bands allocated for this service. However, given that the band is of interest to the amateur community for its experimentation potential—in contrast to the routine and widespread communication activities among users that are common characteristics of other amateur bands—the Commission anticipates that the amateur interest in the band will continue to be limited and specialized.

The Commission also recognized the importance of PLC systems operating under § 15.113 of its rules. UTC and the utilities emphasized the continued importance of PLC systems to the reliability of electric service. AEP stated that PLC systems are used extensively because they are a cost-effective component of a power system protection scheme. According to UTC there are now almost 2,100 PLC transmitters operating in this frequency band. Great River Energy (GRE) stated that interference from amateur stations could potentially cause protective relaying equipment to fail to operate, which could result in damage to transformers and other equipment that cost millions of dollars, in addition to causing power outages to thousands of people. NextEra Energy, Inc. (NextEra) stated that it and other utilities are in fact being required to use the band more extensively to help ensure the reliability and security of electric service to the public. American Transmission Company LLC claimed that reallocation would require it and other electric utilities to abandon a large swath of already-crowded PLC spectrum for which there is no practical, cost- or time-effective substitute.

The amateur community made it clear that it has no intent to diminish or supplant PLC operations. Accordingly, the Commission took a measured and deliberate approach to the introduction of licensed amateur operations into the band. The secondary amateur allocation the Commission adopted does not by itself convey authority to amateur licensees to operate in the band. Rather, the Commission deferred consideration of the appropriate amateur rules for operation in the band to the accompanying *WRC–12 NPRM.* Amateur use will be governed by any future service rules that specify when, how, and under what conditions the Commission will permit amateur use of the 135.7–137.8 kHz band. The Commission intends to structure these service rules to promote compatible shared use of the band among amateurs and PLC systems, so that amateurs will not be able to use their allocation status to either force unlicensed PLC operations out of the band or impose costs on utilities to modify or abandon their existing PLC systems.

The Commission determined that taking steps to enhance efficient, shared use of the scarce spectrum resource both serves the public interest and promotes fundamental Commission spectrum management goals. The Commission recognized the relative public benefits of PLC and amateur radio, and it explicitly rejected the suggestion that it must choose one to the exclusion of the other, stating that its objective was to allocate spectrum on a secondary basis to amateur stations in a manner that is compatible with existing PLC systems. However, the Commission also anticipated that amateur operators would make use of the allocation in a manner that is less burdensome and more productive than they are currently afforded under the experimental authorization process.

In making this secondary amateur service allocation, the Commission acknowledged that it followed a different path than the Commission did in its *2003 Amateur Radio R&O.* However, the Commission's decision both recognized and built on the foundation the Commission laid in its *2003 Amateur Radio R&O.* The *2003 Amateur Radio R&O* implicitly assumed that amateur stations would not operate at fixed locations. The service rules that the Commission proposed include appropriate limitations, such as restricting amateur stations to fixed locations suitably distant from PLC operations, that it believes will permit shared use of the band. Moreover, the Commission observed that the spectrum management landscape has changed since 2003. The Commission has adopted spectrum sharing arrangements in a number of other bands, which makes it confident that a coexistence arrangement between amateur stations and PLC systems is possible. Advancements in geographic information system (GIS) technologies and mapping capabilities provide further assurances that mechanisms exist for maintaining sufficient distances between amateur sites and the transmission lines used by PLC systems.

For these reasons, the Commission concluded that it is in the public interest to add a secondary amateur service allocation to the non-Federal Table in the 135.7–137.8 kHz band. In accordance with the *WRC–07 Final Acts,* the Commission also restricted use of this secondary amateur service allocation to amateur stations transmitting a maximum equivalent isotropically radiated power (EIRP) of 1 watt, by adding a reference to RR 5.67A to the U.S Table for this band.

Raising the Amateur Service in the 1900–2000 kHz Band to Primary Status. The Commission allocated the 1900–2000 kHz (160 meter) band to the amateur service on a primary basis, and as described below, removed the primary radiolocation service (RLS) allocation from the U.S. Table. This action supported the increased spectrum use of the 160 meter band reported by commenters and provided spectrum support for the emergency communications that the amateur radio community provides. This action also provided the amateur service with the long-term security that primary status entails, to the benefit of those licensees who seek to operate in the 160 meter band. The National Telecommunications and Information Administration (NTIA) did not inform the Commission of any Federal RLS requirements in the 1900–2000 kHz band, and thus the Commission took no additional action in this regard.

Although the Commission had believed that there was no non-Federal RLS use of the 1900–2000 kHz band, the record indicated that there are maritime users, including the U.S. ''high seas'' migratory species fishing fleet, which make use of radio buoys in both the Atlantic and Pacific oceans as well as within 200 nautical miles of the coastline. The Commission did not identify these users in the *WRC–07 NPRM* because they did not appear in its licensing database. The Commission's part 90 rules allow any person engaged in commercial activity to obtain a license to use the 1900–2000 kHz band for radiolocation. ITM Marine (ITM) holds a Grant of Equipment Authorization issued under the authority of the Commission to sell

''radio buoys'' that operate in the 1900–1999 kHz band pursuant to its part 90 rules. Apparently, fishing vessels have operated radio buoys in U.S. waters under the belief that a ship station license issued under part 80 of the Commission's rules permits operation of the buoys. However, the Commission noted that a part 80 license applies only to stations in the maritime services and does not permit operation of radio stations that require a part 90 license, such as the radio buoys at issue here.

For purposes of updating and revising the Allocation Table, the Commission took account of radio buoy use on the open sea by continuing to provide for a significantly restricted use of the current RLS allocation in the 1900–2000 kHz band. Specifically, the Commission removed the primary RLS allocation from the U.S. Table and added new footnote NG92, which provides for radio buoy operations in the 1900–2000 kHz band on a primary basis in Region 2 and on a secondary basis in Region 3 (which is consistent with the existing primary/secondary Regional distinction for RLS), limited to operations on the open sea. In addition, the Commission amended the Radiolocation Service Frequency Table in § 90.103(b) of its rules by removing the 1900–2000 kHz band. By doing so, the Commission provided the amateur service with primary and exclusive use of the 1900–2000 kHz band on the land territory of the United States and its insular areas. Further, the Commission implemented its proposal to remove the 1900–2000 kHz segment from § 97.303(c), and consistent with ARRL's comments, to remove § 97.303(g) in its entirety from its rules.

The Commission nevertheless recognized the public benefit associated with the use of radio buoys by the U.S. commercial fishing fleet. In the companion *WRC–12 NPRM,* the Commission proposed revisions to the Commission's rules that would provide radio buoy operators a legitimate path to operate. In the meantime, the Commission adopted a waiver, on its own motion, of §§ 80.375 and 90.103 of the rules to allow operation of Commission-approved 1900–2000 kHz radio buoys on the open sea by commercial fishing vessels that have a valid ship station license under § 80.13 of its rules. The Commission concluded that grant of this waiver is in the public interest. Use of these radio buoys allows such commercial fishing vessels to locate their fishing lines and nets more quickly, which saves them fuel and time and reduces the likelihood that fishing lines and nets will be lost. Given that the radio buoys appear to use low power and narrow bandwidths, the Commission stated its belief that they can be accommodated with minimal impact on amateur users. Based on the information that the Commission received from ITM, it structured the waiver to authorize offshore radio buoy use by commercial fishing vessels. However, the Commission noted that, if there are commercial fishermen currently using radio buoys on the Great Lakes or inland waters, they may request waivers regarding their current operations. Lastly, the Commission granted this waiver pending the outcome of the *WRC–12 NPRM,* and without prejudice to enforcement regarding prior unauthorized radio buoy operations.

Finally, in their comments, Todd Carpenter and Ken Reid suggested that since few, if any, signals of any type are heard in the 2000–3300 kHz range, secondary amateur band privileges could be authorized in this band. James E. Whedbee requested that the Commission permit the amateur service to operate in the spectrum below 9 kHz on an unallocated basis. The Commission observed that these issues fall outside the scope of the *WRC–07 NPRM* and raise new technical and policy considerations. The Commission therefore declined to address these comments in this proceeding.

B. Aviation Services Use of VHF, UHF, and SHF Bands

Aeronautical Mobile (R) Service Allocation in the 108–117.975 MHz Band. In view of the Federal Aviation Administration's decision to not pursue its proposed frequency notification requirements for FM radio stations, the Commission implemented NTIA's recommended changes in the 108–117.975 MHz band. Specifically, the Commission added a reference to international footnote (RR) 5.197A in the 108–117.975 MHz band within the U.S. Table. By this action, the Commission allocated the 108–117.975 MHz band to the AM(R)S on a primary basis for Federal and non-Federal use, limited the use of this allocation to systems operating in accordance with recognized international aeronautical standards, required that such use be in accordance with Resolution 413 (Rev. WRC–12), and limited AM(R)S use of the 108–112 MHz sub-band to systems composed of ground-based transmitters and associated receivers that provide navigational information in support of air navigation functions. Because Differential-Global-Positioning-System (DGPS) stations in the 108–117.975 MHz band will be authorized under the AM(R)S allocation, now codified in RR 5.197A, the Commission revised footnote US343 to remove the reference to the 108–117.975 MHz band and renumber this footnote as US85.

Aeronautical Mobile Service Allocation in the 5091–5150 MHz Band. The Commission allocated the 5091–5150 MHz band to the AMS on a primary basis for Federal and non-Federal use, and limited the use of this allocation by adopting new footnote US444B. This footnote restricts the use of the AMS allocation to AM(R)S systems, limited to surface applications at airports that operate in accordance with international aeronautical standards and Resolution 748, and to AMT transmissions from aircraft stations that operate in accordance with Resolution 418. These use restrictions are based on the WRC–12 version of RR 5.444B.

In response to NTIA's request, the Commission expressly permitted aeronautical fixed communications that are an integral part of the AeroMACS system to be authorized on a primary basis for Federal and non-Federal use. The AeroMACS system has been designed to support both fixed and mobile applications, and is consistent with the intent of the U.S. Proposals and WRC–07's actions. These fixed applications will be part of a larger system of surface applications at airports. Adopting NTIA's request of extending primary status to these fixed applications does not undercut, nor does it fundamentally depart from, the Commission's initial proposal. This allocation, together with the AM(R)S allocation, is expected to support the introduction of applications and concepts in air traffic management that are data intensive. This decision is also codified in new footnote US444B.

The Commission also adopted its proposal to restrict AMT use of the 5091–5150 MHz band to the 52 flight test areas listed in proposed footnote US111 and to allow additional locations to be authorized for flight testing on a case-by-case basis. At the request of commenters, the Commission authorized the use of this AMT band at Boeing's new facility in Charleston, South Carolina as an additional location. Also, at the request of NTIA, the Commission urged operators of AM(R)S and AMT systems at the six requested airports to cooperate with each other and exchange information about planned deployments of their respective systems, noting that such cooperation will enhance the prospects for compatible sharing of the band. The Commission further noted that other airport locations may be addressed in a similar manner on a case-by-case basis. Finally, at NTIA's request, the

Commission provided airport surface wireless systems operating in the AM(R)S, *i.e.,* AeroMACS, with priority over AMT systems in the 5091–5150 MHz band.

The Commission took four additional actions. First, it implemented WRC–07's decision to reduce the amount of spectrum in which Microwave Landing System (MLS) requirements take precedence over other uses by removing the 5091–5150 MHz band from footnote US444. Second, the Commission extended the date after which no new assignments may be made to fixed-satellite service (FSS) earth stations providing feeder links for to non-geostationary satellite orbit systems in the mobile-satellite service to January 1, 2016 by revising footnote US444A. Third, with the concurrence of NTIA, the Commission declined to authorize aeronautical security transmissions in the 5091–5150 MHz band. These three actions conform these Commission's rules to the 2012 ITU *Radio Regulations.* Consistent with NTIA's WRC–12 Implementation Recommendations, the Commission codified these decisions by revising the text of footnotes US444 and US444A in the Allocation Table. Fourth, the Commission moved the portion of RR 5.367 that was deleted by WRC–12 into footnote US367. This action allows the Commission to update the International Table within § 2.106, while maintaining the *status quo* in the U.S. Table, until such time as it can consider any pertinent comments that may be filed in response to the *WRC–12 NRM.*

Deletion of the AMT Allocations from 2310–2320 MHz and 2345–2360 MHz. The Commission removed the non-Federal AMT allocation from the 2310–2320 MHz band and restricted the availability of the non-Federal AMT allocation in 2345–2360 MHz band to incumbent licensees. The Commission also removed the availability of two unused commercial launch frequencies. To provide for the orderly relocation of incumbent AMT operations from the 2345–2360 MHz band, the Commission established a transition period that will end on January 1, 2020. The Commission codified these decisions by modifying the text of footnote US339 and by renumbering the resultant text as footnote US100. Because the Commission adopted a transition plan that is consistent with AFTRCC's recommendation, it agreed with Boeing that there will likely be little to no adverse impact on AMT operations.

Deletion of the Radionavigation Service Allocation from 24.75–25.05 GHz. The Commission removed the radionavigation service (RNS) allocation in the 24.75–25.05 GHz band from the Federal and non-Federal Tables. As a result of this action, the 300 megahertz of RF spectrum contained within this band is allocated exclusively to the FSS (Earth-to-space) for non-Federal use. The Commission also expanded the permitted uses of this FSS allocation from BSS feeder links to all FSS uses. Consistent with the international use limitation contained in RR 5.535, the Commission provided broadcasting-satellite service (BSS) feeder links with ''priority'' over all other FSS uses, *i.e.,* all other FSS uses ''shall protect and shall not claim protection from existing and future'' BSS feeder link networks. The Commission codified this decision in the Allocation Table by revising the text of footnote NG167 to parallel the text of RR 5.535 for the 24.75–25.05 GHz band, and by renumbering the resulting footnote as NG535. In addition, the Commission removed the 24.75–25.05 GHz band from §§ 87.173(b) and 87.187(x) of the Commission's rules, and consequently, deleted the part 87 cross-reference for this band from the Allocation Table. While the Commission adopted in part the proposal from the Xanadoo Company and Spectrum Five LLC with respect to removal of the unused RNS allocation, it found that no further action on the other elements of their petition is warranted at this time. If, in the future, requests for licensing or other market developments suggest a demand exists for additional FSS uses of the 24.75–25.05 GHz band, the Commission will initiate a separate rulemaking proceeding to examine whether any specific rules are necessary to support such uses consistent with the priority afforded to BSS feeder links in this band.

Updates to Part 87 Aviation Services Rules. Consistent with the changes proposed to the Allocation Table in the *WRC–07 NPRM,* the Commission proposed to make amendments to nine rule sections in part 87 of its rules. In the *WRC–07 R&O,* the Commission adopted those proposals. Specifically, the Commission amended part 87 of its rules to bring the new AMT allocation in the 5091–5150 MHz band into immediate effect and to remove all references to the unused secondary AMT allocation in the 2310–2320 MHz band. The Commission also amended part 87 by removing all references to two previously deleted AMT bands (1525–1535 MHz and 2320–2345 MHz) and by listing a previously allocated AMT band (2390–2395 MHz, generally shown as part of the larger 2345–2395 MHz band) in all appropriate rule sections. As a result of this action, the correct AMT bands—1435–1525 MHz, 2345–2360 MHz (until the conclusion of the transition period), 2360–2395 MHz, and 5091–5150 MHz—are specified throughout part 87. In addition, the Commission amended part 87 of the Commission's rules as follows:

- Added the term ''flight telemetering mobile station'' to the list of definitions in § 87.5, used this term in the affected rules, clarified that five frequencies in the 1435–1525 MHz band (1444.5, 1453.5, 1501.5, 1515.5, and 1524.5 MHz) are shared with flight telemetering mobile stations ''on a co-equal basis'' with AMT operations, and renumbered footnote US78 as US343.
- Amended § 87.133(f) by specifying that the carrier frequency tolerance of all transmitters that operate in the 5091–5150 MHz band is 0.005 percent, and revised the existing text to specify that the carrier frequency tolerance of all transmitters that operate in the 1435–1525 MHz or 2345–2395 MHz band is 0.002 percent.
- Updated the AMT bands listed in § 87.137(a), note 8, § 87.139, and § 87.173(b).
- Amended § 87.173(b) by revising the entry for the ''5000–5250 MHz'' band to read ''5030–5150 MHz'' and by adding an entry for the ''24450–24650 MHz'' band in the frequency table. The Commission also specified that the 24450–24650 MHz band is available under Subpart F (Aircraft Stations) and Subpart Q (Stations in the Radiodetermination Service), restricted the use of this band to aircraft stations and radionavigation land stations, and listed aeronautical radionavigation under the ''Remarks'' heading.
- Update the AMT bands listed in § 87.187(p), by listing the 2360–2395 MHz (primary allocation) and 2345–2360 MHz (secondary allocation) bands and the three frequencies (2364.5 MHz, 2370.5 MHz, and 2382.5 MHz) that may be assigned for telemetry and associated telecommand operations of expendable and re-usable launch vehicles, whether or not such operations involve flight testing.
- Amended § 87.303(d) to make the 5091–5150 MHz band available for aeronautical mobile telemetry. Specifically, the Commission inserted introductory language listing the available bands; added new text to paragraph (d)(2) to specify use of the 5091–5150 MHz band and to cross-reference footnote US111; and moved and updated the text that is currently listed in paragraph (d)(2) to paragraph (d)(3).
- Amended § 87.475(b)(11) by revising the frequency band that can be used for microwave landing systems (MLS) from ''5000–5250 MHz'' to ''5030–5150 MHz'' and § 87.475(b)(14) by revising a frequency band that can be used for land-based radionavigation aids that operate with airborne radionavigation devices from ''24,250–25,250'' to ''24,450–24,650'' MHz.

The Commission observed that it certifies frequency coordinators, considers petitions seeking review of coordinator actions, and engages in oversight of coordinator actions and practices, and further observed that

AFTRCC is the ''frequency advisory committee'' specified in § 87.305(a)(1) of the Commission's rules. As a consequence of its actions in this proceeding, and at its explicit request, the Commission noted that AFTRCC's authority to act as the non-Federal coordinator for flight test frequencies now extends to the 1435–1525 MHz, 2360–2395 MHz, and 5091–5150 MHz bands, and until the conclusion of the transition period, to the 2345–2360 MHz band.

C. Protecting Passive Sensors From Unwanted Emissions and In-Band Active Services

WRC–07 adopted provisions to protect passive sensors from the interference caused by the operation of certain radiocommunication services that: (1) Transmit in two bands (10.6–10.68 GHz and 36–37 GHz) that are allocated to the Earth exploration-satellite service (EESS) (passive) (*i.e.,* in-band active services); and (2) transmit in frequency bands that are near or adjacent to five EESS (passive) bands (1400–1427 MHz, 23.6–24 GHz, 31.3–31.5 GHz, 50.2–50.4 GHz, and 52.6–54.25 GHz). Specifically, WRC–07 added RR 5.338A to the International Table and adopted Resolution 750. In this section, the Commission adopted new rules to protect passive sensors from certain non-Federal services that operate in the 1435–1452 MHz, 10.6–10.68 GHz, 22.55–23.55 GHz, and 31–31.3 GHz bands.

Aeronautical Mobile Telemetry in the 1435–1452 MHz Sub-band. The Commission adopted its proposal to add new footnote US338A to the Allocation Table. That footnote encourages operators of aeronautical telemetry stations in the 1435–1452 MHz sub-band to take all reasonable steps to ensure that their AMT transmitters' unwanted emissions power does not exceed −28 dBW/27 MHz in the 1400–1427 MHz band. In addition, the Commission required operators of AMT stations that do not meet WRC–07's recommended unwanted emissions level first attempt to operate in the 1452–1525 MHz sub-band before operating in the 1435–1452 MHz sub-band. Given that the record indicates that most AMT operations now meet the WRC–07 unwanted emissions level, the Commission observed that this requirement should not impact most AMT operations. The Commission also amended § 87.139 by adding paragraph (m) to reflect the text of footnote US338A.

Fixed Stations in the 10.6–10.68 GHz Band. The Commission adopted the proposed changes to footnote US265. Specifically, the Commission restricted the transmitter power delivered to the antenna to not more than −3 dBW, added WRC–07's recommended sharing criteria for fixed point-to-point systems (and explicitly restrict use of the 10.6–10.68 GHz band to fixed point-to-point systems), urge (but not require) the use of ATPC, and permitted licensees holding a valid authorization as of the effective date of this *Report and Order* to continue to operate as authorized. Based on the record, the Commission found that it should also restrict the elevation angle of the antenna main beam of fixed stations that transmit in the 10.6–10.68 GHz band to a maximum of 20°, instead of simply urging operators of fixed stations to apply this limit. The Commission found that doing so will ensure that EESS operations are afforded protection, without appearing to impose a significant burden on existing operations. The Commission did not adopt the other proposals that were discussed in the *WRC–07 NPRM.* Specifically, the Commission found that making ATPC use mandatory would impose costs that are unwarranted, given its decision to adopt a 20° elevation angle limit. The Commission also found compelling Comsearch's arguments about the burdens associated with requiring fixed stations using paired frequencies to transmit on frequencies in the 10.6–10.68 GHz band using the lower elevation angle. By contrast, the Commission's decision to adopt of a maximum 20° elevation angle limit will provide benefits to EESS operations with little or no effect on 10.6–10.68 GHz band licensees.

The Commission codified this decision by revising the text of footnote US265 and renumbering this footnote as US482. The Commission amended § 101.111 by adding new paragraph (d)(1) to reflect this decision in part 101 of its rules.

Inter-Satellite Links in the 22.55–23.55 GHz Band. In Resolution 750, WRC–07 adopted mandatory unwanted emissions limits of: (1) −36 dBW in any 200 megahertz of the 23.6–24 GHz EESS (passive) band for non-geostationary satellite orbit systems in the inter-satellite service (NGSO ISS) that operate in the 22.55–23.55 GHz band for which complete advance publication information is received by the ITU (*i.e.,* its Radiocommunication Bureau) before January 1, 2020; and (2) −46 dBW in any 200 megahertz of the 23.6–24 GHz EESS (passive) band for NGSO ISS systems that operate in the 22.55–23.55 GHz band for which complete advance publication information is received by the ITU on or after January 1, 2020.

The Commission implemented WRC–07's mandatory unwanted emissions limits in the 23.6–24 GHz band for all new NGSO ISS systems that will operate in the 22.55–23.55 GHz band. The Commission codified this decision by adding footnote US145 to the Allocation Table and by amending § 25.202 to reflect the text of footnote US145 in part 25 of the Commission's rules.

Fixed Stations in the 31–31.3 GHz Band. In Resolution 750, WRC–07 adopted a mandatory unwanted emissions limit of −38 dBW in any 100 megahertz (−38 dBW/100 MHz) of the 31.3–31.5 GHz EESS (passive) band for stations in the fixed service that operate in the 31–31.3 GHz band and are brought into use after January 1, 2012. The Commission adopted WRC–07's mandatory unwanted emissions limit for new fixed stations transmitting in the 31–31.3 GHz band. To ensure that equipment meeting this new requirement is designed, authorized, and manufactured in an orderly manner, the Commission delayed this rule from taking effect until three years from the effective date of this *Report and Order.* As such, this rule will not apply to previously constructed facilities or to new facilities authorized prior to that date. The Commission codified its decision by adding new footnote NG60 to the Allocation Table. The Commission also amended § 101.111 by adding paragraph (d)(2) in order to reflect the text of footnote NG60 in part 101 of the Commission's rules.

VHF Maritime Mobile Band (156–162 MHz)

In this section, the Commission implemented its proposed actions for the VHF maritime mobile band (156–162 MHz), except that, based on its review of the NTIA WRC–12 Implementation Recommendations, the Commission: (1) Declined to adopt two of the proposed changes, as discussed below; and (2) implemented the WRC–12 allocation changes in the two bands currently used by Automatic Identification Systems (AIS). By these actions, together with the proposals in the *WRC–12 NPRM,* the Commission fully addressed NTIA's recommendations for the VHF maritime mobile band.

156.2475–156.7625 MHz. In this sub-section, the Commission adopted the proposals regarding this band that it made in the *WRC–07 NPRM,* except as described below. First, the Commission amended the U.S. Table by: (1) Dividing the 156.2475–156.7625 MHz band into three bands (156.2475–156.5125 MHz, 156.5125–156.5375 MHz, and 156.5375–156.7625 MHz); (2) allocating the new 156.5125–156.5375 MHz band (channel 70 with the center frequency 156.525 MHz) to the maritime mobile service (MMS) on a primary basis for Federal and non-Federal use; (3) restricting the use of the MMS allocation in the 156.5125–156.5375 MHz band to distress, urgency, safety, and calling via digital selective calling (DSC); and (4) maintaining the existing primary MSS allocation for non-Federal use in the 156.2475–156.5125 MHz and 156.5375–156.7625 MHz bands.

Second, the Commission allocated the 156.4875–156.5125 MHz and 156.5375–156.5625 MHz bands (50 kilohertz in total) to the fixed and land mobile services on a primary basis for non-Federal use in VHF Public Coast Station Areas 10–42. In making these allocations, the Commission required that the use of these bands by the fixed and land mobile services not cause harmful interference to, nor claim protection from, the maritime mobile VHF radiocommunication service. The Commission codified these decisions by adding footnote US227 to the Allocation Table.

Third, the Commission made the frequencies 156.525 MHz (channel 70) and 156.800 MHz (channel 16) available for search and rescue (SAR) operations that involve manned space vehicles by adding references to RR 5.111 in the bands within the U.S. Table that contain these frequencies, *i.e.,* the 156.5125–156.5375 MHz and 156.7625–156.8375 MHz bands.

Fourth, the Commission re-inserted RR 5.226 (previously numbered as RR 5.227) into the U.S. Table and deleted footnote US226. Fifth, the Commission corrected two grammatical/typographical errors in the text of NG117 and renumbered that footnote as NG22.

Sixth, the Commission simplified the U.S. Table by combining the text from footnotes US77 (which specified that certain channels could be assigned to Federal stations in the MMS) and US106 (which specified the

frequency to be used for environmental communications) and numbered the resultant footnote as US52. The Commission also permitted aircraft stations to use the frequency 156.3 MHz for search and rescue operations and other safety-related communications. However, based on its review of the NTIA WRC–12 Implementation Recommendations, the Commission declined to adopt two of the proposed changes in new footnote US52 because those modifications would be inconsistent with NTIA's recommendations. Specifically, the Commission declined to adopt proposed paragraph (c), which pertains to MMS use of 156.775 (channel 75) and 156.825 MHz (channel 76), because WRC–12 designated these frequencies for AIS use. The Commission also declined to adopt proposed paragraph (a), which would have limited Federal use of the frequency 156.375 MHz to the lower Mississippi River.

Extending Automatic Identification System (AIS) Capabilities. In this sub-section, the Commission addressed NTIA's recommended restrictions on AIS operations, and codified its decision in new footnote US52. The Commission implemented the *WRC–12 Final Acts* in the two existing AIS bands as follows. First, consistent with both the *WRC–07 NPRM* and with the *U.S. Proposals for WRC–12,* the Commission allocated the AIS 1 and AIS 2 bands to the AM(OR)S and MSS (Earth-to-space) on a primary and co-equal basis with the MMS for Federal and non-Federal use, limited to the transmission of AIS emissions, and added a reference to RR 5.228C in the U.S. Table. This action provided the allocations that are necessary to support maritime safety requirements. Specifically, the primary AM(OR)S and MSS (Earth-to-space) allocations support the IMO's decision to include a distress alert notification within AIS Class A position report messages.

Second, the Commission revised the text of footnote US228 by applying the existing MMS restriction to AIS emissions to the new MSS (Earth-to-space) allocation. The Commission also restricted the use of these frequencies by the AM(OR)S to AIS emissions from search and rescue aircraft operations. The Commission also further simplified the grandfathering text that is currently in footnote US228. In doing so, the Commission retained the existing March 2, 2024 sunset date, by which all non-AIS operations must cease operations in the AIS 1 band. The Commission noted that RR 5.228D encourages it ''to make all practicable efforts to discontinue the use of these bands by the fixed and mobile services prior to the transition date.'' The Commission placed the revised text of US228 into new footnote US52 as new paragraph (a). Finally, the Commission declined to add a reference to RR 5.228D in the U.S. Table. The Commission did not list this international footnote in the U.S. Table because paragraph (a) of new footnote US52 will codify its decision to grandfather the only non-AIS uses in these bands.

The Commission also updated § 80.371(c) of its rules by removing the second and last sentences from note 3 (which conveys the same now-obsolete grandfathering information that was listed in paragraphs (a) and (c) of footnote US228).

Additional Federal Coordination Areas in the 17.7–20.2 GHz Range

The Commission adopted its proposal to add the San Miguel, California and Guam coordination areas to the Allocation Table and to §§ 1.924(e), 74.32, and 78.19(f) of its rules. The Commission also adopted its proposal to amend footnote US334 by limiting the primary allocation status of Federal earth stations to the Denver, Washington, DC, San Miguel, and Guam coordination areas; however, on its own motion, the Commission applied these geographic restrictions across the entire 17.8–20.2 GHz range (instead of the just 17.8–18.3 GHz and 19.3–19.7 GHz bands). In taking this action, the Commission did not preclude the consideration of a limited number of future Federal earth stations that would support critical national security requirements. The Commission stated that it expects that NTIA will carefully coordinate any future sites with the Commission to ensure minimal impact to fixed stations.

In order to simplify and clarify its decision in the Allocation Table, the Commission moved the coordination requirement for fixed stations that support Multichannel Video Programming Distributor (MVPD) operations in the 17.7–17.8 GHz band from footnote US401 to US334. By this action, the Commission required that if the station or proposed station is located in whole or in part within the Denver, Washington, DC, San Miguel, or Guam coordination area, any application for a new station license to provide MVPD operations in the 17.7–17.8 GHz band or to operate in the 17.8–19.7 GHz band for any service, or for modification of an existing station license in these bands that would change the frequency, power, emission, modulation, polarization, antenna height or directivity, or location of such a station, must be coordinated with NTIA before an authorization will be issued. The Commission stated that it is convinced that this action is necessary to support important national defense interests, as described by NTIA.

The Commission declined to make any of the coordination and authorization process changes suggested by Comsearch. The Commission agreed with NTIA that the existing procedures—in particular the Frequency Advisory Subcommittee (FAS) coordination process and its established standards for timely review—represent the most appropriate mechanism for accommodating the differing Federal/non-Federal interests in the band. The Commission observed that, currently, NTIA responds to an assignment request through the existing process within nine business days on average, unless the request is tabled for insufficient information. The approach that the Commission took to facilitate Federal/non-Federal shared use—coordination only in limited geographic areas—allowed it to balance the need to protect important national priorities with the interest in promoting robust commercial use. Additionally the Commission observed that there is nothing distinctive about the new San Miguel and Guam areas that would preclude the use of that approach there. While the Commission recognized that parties may logically differentiate between deciding to pursue licensing in spectrum requiring coordination with Federal government users versus spectrum that does not have such a pre-condition to use, it could not conclude that such differences warrant a departure from its present practices. The Commission stated that it believes that the most effective way to address Comsearch's concerns is to work to facilitate greater efficiencies within the existing coordination framework. NTIA noted that ''federal agencies have worked proactively and directly with fixed station applicants to develop plans to mitigate potential interference where predicted,'' and suggested that the Commission continue to promote such dialogue at the beginning stages of the coordination process. The Commission agreed and encouraged prospective licensees to engage in early discussions with the relevant federal agencies when they wish to apply for frequencies in the Denver, Washington, San Miguel, and Guam coordination areas.

Finally, the Commission took additional steps, consistent with the proposals set forth in the *WRC–07 NPRM,* to promote efficient use of the 17.7–19.7 GHz range and to otherwise improve its existing rules. Specifically, the Commission removed the unused circular area for Morrison, Colorado from § 78.19(f). The Commission also moved the revised text in paragraph (e) of § 1.924 to paragraph (f). The Commission amended footnote NG144 and renumbered this footnote as US139. The Commission also amended § 101.31(b)(1) by removing the 11.7–12.2 GHz and 18.3–19.3 GHz bands from the list of frequency bands eligible for conditional authorization. However, the Commission declined to make any changes to the coordination requirements for MVPD operations in § 74.32, or to references in § 1.924 to MVPD operations pursuant to parts 74 and 78. Because no commenter addressed the question raised in the *WRC–07 NPRM* regarding whether these references remain relevant, the Commission found no pressing need to address these rules at this time.

Rulemaking Proposals That Did Not Receive Any Specific Comments

In this section, the Commission considered proposals that it made in the *WRC–07 NPRM,* but that did not receive any specific comments. In the *WRC–07 NPRM,* the Commission set forth in detail why it believed each of the proposals discussed below would implement important U.S. policy goals and serve the public interest. As there is nothing in the record to give the Commission cause to revise or reconsider these proposals, it amended §§ 2.1, 2.100, and 2.106 of its rules, as described below.

Active Service Issues

Radiolocation Use of 420–450 MHz. The Commission amended the quiet zone rules in § 1.924(f) to reflect the areas listed in paragraph (a) of footnote US270, limit the applicability of this rule to radiolocation systems, and move the revised text from paragraph (f) to paragraph (e).

Mobile Meter Reading Use of 928–960 MHz. The Commission amended footnote NG120 by revising ''band 928–960 MHz'' and ''mobile operations'' to ''bands 928–929 MHz, 932–932.5 MHz, 941–941.5 MHz, and 952–960 MHz'' and ''associated mobile operations,'' respectively, and deleting the phrase ''as specified in 47 CFR part 101.'' The Commission codified this decision by renumbering the revised text from footnote NG120 as NG35 in the Allocation Table.

Aeronautical mobile (R) service allocation in the 960–1164 MHz band. The Commission allocated the 960–1164 MHz band to AM(R)S on a primary basis for Federal and non-Federal use, and restricted the use of this allocation by adding a reference to RR 5.327A in the U.S. Table. By adding RR 5.327A to the U.S. Table, the Commission required that any AM(R)S systems operating in the 960–1164 MHz band do so in accordance with recognized international aeronautical standards and with Resolution 417. In Resolution 417, WRC–12 resolved, *inter alia,* that any AM(R)S systems operating in the 960–1164 MHz band shall meet standards and recommended practices (SARPs) requirements published in Annex 10 to the Convention on International Civil Aviation; and that administrations intending to implement AM(R)S in the 960–1164 MHz band, in order not to cause harmful interference to the radionavigation-satellite service in the band 1164–1215 MHz, shall utilize the specified criteria. The Commission also removed footnote US400, which is now duplicative of the broader AM(R)S allocation, from the Allocation Table.

Feeder Link Allocations near 1.4 GHz. The Commission removed the non-Federal FSS allocations from the 1390–1392 MHz and 1430–1432 MHz bands and removed footnote US368 from the list of U.S. footnotes. As the Commission proposed in the *WRC–07 NPRM,* it also combined the text of footnote US37 and the portion of footnote US398 that prohibits airborne and space-to-Earth operations, and numbered the resulting footnote as US79. In addition, the Commission removed footnotes US37 and US398 from the list of U.S. footnotes and revised footnote US74 to remove the phrase ''(see US368).''

Radiolocation and Active Sensors in the 9–10 GHz Range. The Commission upgraded the secondary Federal radiolocation service allocation in the 9000–9200 MHz and 9300–9500 MHz bands to primary status, allocated the 9300–9500 MHz band to the EESS (active) and the space research service (SRS) (active) on a primary basis for Federal use, allocated the 9800–9900 MHz band to the EESS (active) and the SRS (active) on a secondary basis for Federal use, and removed footnotes US48 and US51 from the U.S. Table. In addition, the Commission added RR 5.473A to the Federal Table in the 9000–9200 MHz band, RR 5.475A and RR 5.475B to the Federal Table in the 9300–9500 MHz band, and footnote US476A to the U.S. Table in the 9300–9500 MHz band.

The Commission allocated the 9300–9500 MHz and 9800–9900 MHz bands to the EESS (active) and SRS (active) on a secondary basis for non-Federal use. The Commission merged the 9500–9800 MHz and 9800–9900 MHz bands to form the 9500–9900 MHz band in the non-Federal Table.

The Commission listed RR 5.475 to the right of the radionavigation service allocation in the 9300–9500 MHz band of the International Table, so that it is clear that RR 5.475 applies only to the aeronautical radionavigation service. To help simplify the U.S. Table, the Commission renumbered footnote US66 as US475.

Meteorological Satellite Use of 18–18.1 GHz. The Commission allocated the 18–18.1 GHz band to the meteorological satellite-service (space-to-Earth) (MetSat downlink) on a primary basis for Federal and non-Federal use. This action extended the existing 18 GHz MetSat downlink band (18.1–18.3 GHz) from 200 to 300 megahertz. The Commission codified this decision by amending footnote US519.

Passive Service Issues

Urging for 1.4 GHz Licensees. To protect passive sensors in the 1400–1427 MHz band from harmful interference, in Resolution 750, WRC–07 adopted non-mandatory unwanted emissions levels in the 1400–1427 MHz band for stations in the fixed service (FS) and mobile service (MS) that operate in the 1390–1395 MHz and 1427–1435 MHz bands. As proposed, the Commission urged licensees authorized under parts 27 and 90 of its rules that operate fixed point-to-point stations or stations in the mobile service in the 1390–1395 MHz and 1427–1435 MHz bands to take all reasonable steps to ensure that their stations' unwanted emissions power does not exceed the unwanted emissions levels specified in ITU Resolution 750 in the 1400–1427 MHz band. The Commission codified this decision by adding footnote NG338A to the Allocation Table. To reflect the text of footnote NG338A in parts 27 and 90 of the rules, the Commission amended § 27.53 by renumbering paragraph (j) as paragraph (j)(1) and adding paragraph (j)(2) and amended § 90.210 by adding paragraph (c)(4).

Radio Astronomy Observatories in the 4 and 14 GHz Bands. As proposed, the Commission updated the list of radio astronomy stations observing in the 4825–4835 MHz (4 GHz) and 14.47–14.5 GHz (14 GHz) bands by revising the text of footnote US203 and renumbering it as footnote US113.

Sharing Criteria in the 36–37 GHz Band. To protect passive sensors in the 36–37 GHz band from harmful interference, WRC–07 adopted Resolution 752, which has mandatory sharing criteria for the Earth exploration-satellite service (EESS) (passive), FS, and MS in that band. As proposed, the Commission required that future MS and FS stations operating in the 36–37 GHz band do so in accordance with ITU Resolution 752. The Commission codified this decision by adding footnote US550A to the Allocation Table. However, the Commission declined to reflect this decision in part 101 of the rules at this time because it appears to be more appropriate to consider this issue in the context of a service rule proceeding. The Commission also revised footnote US263 by removing the 36–37 GHz band. The Commission codified this decision by renumbering the revised text of footnote US263 as US532 in the Allocation Table.

Earth Station Restrictions in the 49.7–50.2 GHz and 50.4–50.9 GHz Band. To protect passive sensors in the 50.2–50.4 GHz band from harmful interference, WRC–07 adopted in Resolution 750 with mandatory unwanted emissions limits in the 50.2–50.4 GHz band for earth stations in the fixed-satellite service (FSS) (Earth-to-space) that transmit in the 49.7–50.2 GHz and 50.4–50.9 GHz sub-bands. As proposed, the Commission required that licensees of these FSS earth stations comply with the mandatory unwanted emissions limits in ITU Resolution 750 in the 50.2–50.4 GHz band. The Commission codified this decision in its rules by adding footnote US156 to the Allocation Table. To reflect the text of footnote US156 in part 25 of the Commission's rules, the Commission amended § 25.202 by revising paragraph (f) to provide for an exception to the general emission limitations and by adding the adopted emission limits to new paragraph (j).

Fixed Station Restrictions in the 51.4–52.6 GHz Band. To protect passive sensors in the 52.6–54.25 GHz band from harmful interference, WRC–07 adopted Resolution 750 with a mandatory unwanted emissions limit in the 52.6–54.25 GHz EESS (passive) band for fixed stations that operate in the 51.4–52.6 GHz band. As proposed, the Commission required that future licensees of fixed stations transmitting in the 51.4–52.6 GHz band comply with the unwanted emissions limit in ITU Resolution 750 in the 52.6–54.25 GHz band. The Commission codified this decision by adding footnote US157 to the Allocation Table. However, the Commission declined to reflect this decision in part 101 of the rules at this time because it appears to be more appropriate to consider this issue in the context of a service rule proceeding.

Radio Astronomy Observatories in the 81–95 GHz Range. As proposed, the Commission updated footnote US388 by removing the Five Colleges Radio Observatory, adding the Heinrich Hertz Submillimeter Observatory (located at Mount Graham, Arizona), simplifying the text, and renumbering this footnote as US161. As a result, all non-Federal applications within 150 kilometers of the coordinates of the Heinrich Hertz Submillimeter Observatory (32°42′06″ N, 109°53′28″ W.) must be coordinated with NTIA to protect radio astronomy observations in the 81–86 GHz, 92–94 GHz, and 94.1–95 GHz bands.

Other Matters

The Commission amended the definition of two terms currently in § 2.1 of the rules and updated § 2.100 of the rules. For the definition of Earth exploration-satellite service in Section 2.1, the Commission made minor changes so that it agrees with the definition in the ITU *Radio Regulations.* For the definition of equivalent isotropically radiated power in § 2.1, the Commission added the parenthetical statement ''(absolute or isotropic gain).''

The Commission amended § 2.100 of the rules to state that the ITU *Radio Regulations,* Edition of 2008, have been incorporated to the extent practicable in part 2, except that the International Table within § 2.106 has been updated to reflect the ITU *Radio Regulations,* Edition of 2012.

Order (WRC–12 Order)

In the *Order,* the Commission took several non-substantive, editorial actions to update the Commission's rules. None of the rule changes discussed in this *Order* require prior notice and an opportunity for comment under the Administrative Procedure Act (APA). Section 553(b)(B) of the APA provides exceptions to the notice-and-comment requirements for rulemakings when, among other things, the agency finds for good cause that the notice and comment procedures are ''impracticable, unnecessary, or contrary to the public interest'' with respect to the rules at issue. The changes the Commission made in the rules correct minor errors in the Allocation Table, implement revisions adopted in prior Commission orders, and otherwise entail non-substantive matters. As such, they constitute routine, ''clean-up'' matters that entail no substantive decisions of any consequence or significance to industry or the general public. Accordingly, the Commission found that it is ''unnecessary,'' within the meaning of § 553(b)(B), to provide notice and an opportunity for comment before adopting these rule revisions.

First, the Commission updated the International Table within § 2.106 of the rules to reflect Article 5, § IV of the ITU *Radio Regulations,* Edition of 2012, except as described herein. Because WRC–12 made substantive changes to RR 5.565, which is currently referenced in the U.S. Table, it was necessary for the Commission to create new footnote US565, which replicates the pre-WRC–12 text of this international footnote. This action allowed the Commission to update the International Table within § 2.106, while maintaining the *status quo* in the U.S. Table until such time as it can consider any pertinent comments that may be filed in response to the *WRC–12 NPRM.*

During its preparation of this *Order,* the Commission discovered several display errors in the International Table. Consistent with past practice, the Commission did not replicate typographical or other errors that convey misleading information or could potentially cause reader confusion. Accordingly, the Commission incorporated the following corrections and updates in the International Table in § 2.106 of the Commission's Rules: First, the Commission removed various references to international footnotes in the Region 1 Table (*i.e.,* RR 5.72 in the 283.5–415 kHz range, RR 5.101 in the 1810–1850 kHz band, RR 5.272 and/or RR 5.273 in the 430–440 MHz range, and RR 5.397 in the 2450–2483.5 MHz band) because WRC–12 suppressed these footnotes. Second, the Commission alphabetically listed (per the French spelling) the services in the Region 3 Table for the 24.25–24.45 GHz band. The Commission based these corrections and updates upon the format specified in the ITU *Radio Regulations.*

With regard to international footnotes, the Commission simplified ten of them (5.197A, 5.286AA, 5.351A, 5.353A, 5.384A, 5.388, 5.389A, 5.389C, 5.444A, and 5.547). Specifically, the Commission updated the cross-references to eight ITU Resolutions (Resolutions 75, 114, 222, 223, 224, 225, 413, and 716) in these footnotes to the version listed in Volume 3 of the 2012 Edition of the ITU *Radio Regulations.* The Commission added the notation ''(FCC)'' to the end of the footnotes that it simplified. In addition, the Commission added the abbreviation ''(WRC–12)'' to the end of the international footnotes that were added or revised at WRC–12 to signify the source of the current footnote text. As a result of this action, note 1 of the FCC Online Table will be revised to read as follows: The International Table (columns 1–3 of § 2.106) reflects Article 5, Section IV of the ITU *Radio Regulations,* Edition of 2012, except for the revisions listed below:

Band; Table	Action
283.5–415 kHz range; Region 1	References to 5.72 have been removed.
1810–1850 kHz; Region 1	Reference to 5.101 has been removed.
430–440 MHz range; Region 1	References to 5.272 and/or 5.273 have been removed.
2120-2170 MHz; Regions 1 & 3	The bands 2120–2160 and 2160–2170 MHz have been merged.
2450–2583.5 MHz; Region 1	Reference to 5.397 has been removed.
24.25–24.45 GHz; Region 3	The services are listed in alphabetical order according to the French language.
International Footnote	Action (The notation ''(FCC)'' has been added to the end of these footnote).
5.197A, 5.286AA, 5.345, 5.351A, 5.353A, 5.384A, 5.388, 5.389A, 5.389C, 5.396, 5.444A, 5.516B, 5.547.	The cross-references to ITU Resolutions 33, 75, 114, 143, 222, 223, 224, 225, 413, 528, and 716 have been updated to reflect the version listed in the *Radio Regulations.*
5.208B	Note is not shown.
5.462A	Reflect ITU staff's correction of a typographical error.

Second, The Commission reflected in the Allocation Table the reallocation of the 700 MHz D Block for use by public safety services. As background, the Middle Class Tax Relief and Job Creation Act of 2012 established the First Responder Network Authority (FirstNet) to oversee the construction and operation of a nationwide public safety broadband network as licensee of both the existing public safety broadband spectrum (763–768/793–798 MHz) and the spectrally adjacent 700 MHz D Block spectrum (758–763/788–793 MHz). Accordingly, the Commission amended the U.S. Table by revising the upper or lower frequency limits of four frequency bands (698–763 MHz, 763–775 MHz, 775–793 MHz, and 793–805 MHz) to shift the 700 MHz D Block spectrum from the 700 MHz Band Commercial Services bands to the 700 MHz Public Safety bands. In addition, the Commission amended footnote NG158 by revising the ''763–775 MHz and 793–805 MHz'' bands to read ''758–775 MHz and 788–805 MHz,'' and renumbered revised footnote NG158 as NG34.

Third, the Commission revised § 27.803(b)(4) to reflect two previous Commission actions. The *WRC–07 Table Clean-up Order* revised footnote US351 to remove the expired grandfathering provision which allowed Federal operations in the 1390–1400 MHz band at 17 sites on a fully protected basis, and combined the resultant text with footnote US352 in a single new footnote US37 (renumbered as footnote US79, *supra*). In the *WRC–07 Order,* the Commission amended footnote US361 to correct the name of a grandfathered site, to remove a different grandfathered site, and to simplify the text. The Commission renumbered that footnote as US83. The Commission updated § 27.803 to remove paragraph (b)(4)(i) because no protected sites are listed in footnote US37. In addition, the Commission combined the text of § 27.803(b)(4) with that of § 27.803(b)(4)(ii) and renumber it as § 27.803(b)(4).

Finally, the Commission revised § 2.106 to add missing cross-references to parts 15 and 25 of its rules and revised § 2.101(c) to reinsert the terms for the eight named frequency ranges.

Final Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Notice of Proposed Rulemaking* in ET Docket No. 12–338 (*WRC–07 NPRM*).[2] The Commission sought written public comment on the proposals in the *WRC–07 NPRM,* including comment on the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.[3]

[1] *See* 5 U.S.C. 603. The RFA, *see* 5 U.S.C. 601–612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Public Law 104–121, Title II, 110 Stat. 857 (1996), and the Small Business Jobs Act of 2010, Public Law 111–240, 124 Stat. 2504 (2010).

[2] *See* Amendment of Parts 1, 2, 15, 74, 78, 87, 90, and 97 of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2007) (WRC–07), Other Allocation Issues, and Related Rule Updates, ET Docket No. 12–338, *Notice of Proposed Rulemaking and Order,* 27 FCC Rcd 14598 (2012) (*WRC–07 NPRM*).

[3] *See* 5 U.S.C. 604.

A. Need for, and Objectives of the Report and Order

In this *Report and Order,* the Commission amends parts 1, 2, 25, 27, 74, 78, 80, 87, 90, 97, and 101 of its rules to complete implementation of various allocation decisions from the Final Acts of the World Radiocommunications Conference (Geneva, 2007) (WRC–07) in the Commission's Table of Frequency Allocations, to revise certain other allocations in the Table, and to update certain related service rules. The decisions adopted in this *Report and Order* conform the Commission's rules, to the extent practical, to the decisions that the international community made at WRC–07 and will collectively promote the advancement of new and expanded services and provide significant benefits to the American public.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

No comments were filed in direct response to the IRFA.

C. Response to Comments by the Chief Counsel for Advocacy of the Small Business Administration

Pursuant to the Small Business Jobs Act of 2010, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the proposed rules as a result of those comments. The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

D. Description and Estimate of the Number of Small Entities to Which the Adopted Rules Will Apply

The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.[4] The RFA generally defines the term ''small entity'' as having the same meaning as the terms ''small business,'' ''small organization,'' and ''small governmental jurisdiction.'' In addition, the term ''small business'' has the same meaning as the term ''small business concern'' under the Small Business Act.[5] A small business concern is one which: (1) Is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[6]

Small Businesses, Small Organizations, and Small Governmental Jurisdictions. The Commission's action may, over time, affect small entities that are not easily categorized at present. The Commission therefore described here, at the outset, three comprehensive, statutory small entity size standards.[7] First, nationwide, there are a total of 28.2 million small businesses, according to the SBA.[8] In addition, a ''small organization'' is generally ''any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.''[9] Nationwide, as of 2012, there were approximately 2,300,000 small organizations.[10] Finally, the term ''small governmental jurisdiction'' is defined generally as ''governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.''[11] Census Bureau data for 2012 indicate that there were 90,056 local governments in the United States.[12] Thus, the Commission estimated that most governmental jurisdictions are small.

Amateur Radio Service. Because ''small entities,'' as defined in the RFA, are not persons eligible for licensing in the amateur service, this rule does not apply to ''small entities.'' Rather, it applies exclusively to individuals who are the control operators of amateur radio stations.

Satellite Telecommunications and All Other Telecommunications. Two economic census categories address the satellite industry. Both of these categories have a small business size standard of $32.5 million or less in annual receipts under SBA rules.[13]

The category of Satellite Telecommunications ''comprises establishments primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications.''[14] Census Bureau data for 2007 show that 512 Satellite Telecommunications firms operated for that entire year.[15] Of this total, 464 firms had annual receipts of under $10 million, and 18 firms had receipts of $10 million to $24,999,999.[16] Consequently, the Commission estimates that the majority of Satellite Telecommunications firms are small entities that might be affected by its action.

The second category, *i.e.* ''All Other Telecommunications'' comprises ''establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of Transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.''[17] For this category, Census Bureau data for 2007 show that there were a total of 2,383 firms that operated for the entire year.[18] Of this total, 2,347 firms had annual receipts of under $25 million and 12 firms had annual receipts of $25 million to $49, 999,999.[19] Consequently, the Commission estimates that the majority of All Other Telecommunications firms are small entities.

Fixed Microwave Services. Fixed microwave services include common carrier,[20] private operational-fixed,[21] and broadcast auxiliary radio services.[22] At present, there are approximately 22,015 common carrier fixed licensees and 61,670 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. The Commission has not created a size standard for a small business specifically with respect to fixed microwave services. For purposes of this analysis, the Commission uses the SBA small business size standard for the category Wireless Telecommunications Carriers (except Satellite), which is 1,500 or fewer employees.[23] The Commission does not have data specifying the number of these licensees

[4] *Id.* at 603(b)(3).

[5] 5 U.S.C. 601(3) (incorporating by reference the definition of ''small business concern'' in 15 U.S.C. 632). Pursuant to the RFA, the statutory definition of a small business applies ''unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the **Federal Register**.'' 5 U.S.C. 601(3).

[6] Small Business Act, 15 U.S.C. 632 (1996).

[7] *See* 5 U.S.C. 601(3)–(6).

[8] *See* SBA, Office of Advocacy, ''Frequently Asked Questions,'' *http://www.sba.gov/sites/default/files/FAQ_March_2014_0.pdf* (last visited May 2, 2014; figures are from 2011).

[9] 5 U.S.C. 601(4).

[10] National Center for Charitable Statistics, The Nonprofit Almanac (2012).

[11] 5 U.S.C. 601(5).

[12] U.S. Census Bureau, Government Organization Summary Report: 2012 (rel. Sep. 26, 2013), *http://www2.census.gov/govs/cog/g12_org.pdf* (last visited May 2, 2014).

[13] 13 CFR 121.201, North American Industry Classification System (''NAICS'') codes 517410 and 517919.

[14] U.S. Census Bureau, 2007 NAICS Definitions, ''517410 Satellite Telecommunications.''

[15] *See http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.*

[16] *See http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.*

[17] *http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517919&search=2007%20NAICS%20Search.*

[18] *http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.*

[19] *http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.*

[20] *See* 47 CFR 101 *et seq.* for common carrier fixed microwave services (except Multipoint Distribution Service).

[21] Persons eligible under parts 80 and 90 of the Commission's Rules can use Private Operational-Fixed Microwave services. *See* 47 CFR parts 80 and 90. Stations in this service are called operational-fixed to distinguish them from common carrier and public fixed stations. Only the licensee may use the operational-fixed station and only for communications related to the licensee's commercial, industrial, or safety operations.

[22] Auxiliary Microwave Service is governed by part 74 of Title 47 of the Commission's rules. *See* 47 CFR part 74. This service is available to licensees of broadcast stations and to broadcast and cable network entities. Broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes mobile television pickups, which relay signals from a remote location back to the studio.

[23] 13 CFR 121.201, NAICS code 517210.

that have no more than 1,500 employees, and thus the Commission was unable at this time to estimate with greater precision the number of fixed microwave service licensees that would qualify as small business concerns under the SBA's small business size standard. Consequently, the Commission estimates that there are 22,015 or fewer common carrier fixed licensees and 61,670 or fewer private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services that may be small and may be affected by the rules and policies proposed herein. The Commission noted, however, that the common carrier microwave fixed licensee category includes some large entities.

Wireless Telecommunications Carriers (except satellite). This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular phone services, paging services, wireless Internet access, and wireless video services.[24] The appropriate size standard under SBA rules is for the category Wireless Telecommunications Carriers. The size standard for that category is that a business is small if it has 1,500 or fewer employees.[25] Under the present and prior categories, the SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.[26] For this category, census data for 2007 show that there were 11,163 firms that operated for the entire year.[27] Of this total, 10,791 firms had employment of 999 or fewer employees and 372 had employment of 1,000 employees or more.[28] Thus under this category and the associated small business size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities that may be affected by its proposed action.[29]

Wireless Equipment Manufacturers. This industry is comprised of businesses primarily engaged in manufacturing radio, television broadcast, and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, cordless phones, global positioning system (GPS) equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.[30] In this category, the SBA has deemed a business manufacturing radio and television broadcasting equipment, wireless telecommunications equipment, or both, to be small if it has fewer than 750 employees.[31] For this category of manufacturing, Census data for 2007 show that there were 919 firms that operated that year. Of those establishments, 531 had between 1 and 19 employees; 240 had between 20 and 99 employees; and 148 had more than 100 employees.[32] Since 771 establishments had fewer than 100 employees, and since only 148 had more than 100 employees, the vast majority of manufacturers in this category would be considered small under applicable standards.

Frequency Coordinators. Neither the Commission nor the SBA has developed a small business size standard specifically applicable to spectrum frequency coordinators. Since 2007, the Census Bureau has placed wireless firms within the broad, economic census category of Wireless Telecommunications Carriers (except Satellite).[33] Under this category, the SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.[34] Census data for 2007 show that there were 1,383 firms that operated that year. Of those, 1,368 had fewer than 100 employees, and 15 firms had more than 100 employees.[35] Thus, under this category and the associated small business standard, the majority of firms can be considered small.

E. Description of Projected Reporting, Recordkeeping and Other Compliance Requirements for Small Entities

The WRC–07 R&O did not establish any new reporting or recordkeeping requirements for small entities. The WRC–07 R&O established ''other'' compliance requirements for manufacturers of equipment, applicants/licensees, and frequency coordinators. Licensees are required to use equipment and operate licensed stations in a manner that complies with the Commission's existing and newly adopted rules. The compliance requirements established in the WRC–07 R&O are the same for small and large entities.

Manufacturers of aircraft stations transmitting telemetry in the 1435–1525 MHz, 2345–2395 MHz, or 5091–5150 MHz band must meet the following emissions limitations and frequency stability requirements:

• Except for emergency locator transmitters (ELTs) and when using single sideband (R3E, H3E, J3E), or frequency modulation (F9) or digital modulation (F9Y) for telemetry or telecommand in the 1435–1525 MHz, 2345–2395 MHz, or 5091–5150 MHz band or digital modulation (G7D) for differential GPS, the mean power of any emission must be attenuated below the mean power of the transmitter (pY) as follows: 1) When the frequency is removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth the attenuation must be at least 25 dB; 2) When the frequency is removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth the attenuation must be at least 35 dB; 3) When the frequency is removed from the assigned frequency by more than 250 percent of the authorized bandwidth the attenuation for aircraft station transmitters' emissions must be at least 40 dB; and the attenuation for aeronautical station transmitters' emissions must be at least $43 + 10 \log_{10}$ pY dB.

• When using frequency modulation or digital modulation for telemetry or telecommand in the 1435–1525 MHz, 2345–2395 MHz, or 5091–5150 MHz band with an authorized bandwidth equal to or less than 1 megahertz the emissions must be attenuated as follows: (1) On any frequency removed from the assigned frequency by more than 100 percent of the authorized bandwidth up to and including 100 percent plus 0.5 megahertz, the attenuation must be at least 60 dB, when measured in a 3.0 kilohertz bandwidth. This signal need not be attenuated more than 25 dB below 1 milliwatt. (2) On any frequency removed from the assigned frequency by more than 100 percent of the authorized bandwidth plus 0.5 megahertz, the attenuation must be at least $55 + 10 \log_{10}$ pY dB when measured in a 3.0 kilohertz bandwidth.

• When using frequency modulation or digital modulation for telemetry or telecommand in the 1435–1525 MHz, 2345–2395 MHz, or 5091–5150 MHz band with an authorized bandwidth greater than 1 megahertz, the emissions must be attenuated as follows: 1) On any frequency removed from the assigned frequency by more than 50 percent of the authorized bandwidth plus 0.5 megahertz up to and including 50 percent of the authorized bandwidth plus 1.0 megahertz, the attenuation must be 60 dB, when measured in a 3.0 kilohertz bandwidth. The signal need not be attenuated more than 25 dB below 1 milliwatt. 2) On any frequency removed from the assigned frequency by more than 50 percent of the authorized bandwidth plus 1.0 megahertz, the attenuation must be at least $55 + 10 \log_{10}$ pY dB, when measured in a 3.0 kilohertz bandwidth.

• The carrier frequency tolerance of all transmitters that operate in the 1435–1525 MHz or 2345–2395 MHz band is 0.002 percent. The carrier frequency tolerance of all transmitters that operate in the 5091–5150 MHz band is 0.005 percent.

In addition, manufacturers of equipment must meet the following requirements:

• The following unwanted emission power limits for non-geostationary satellites

[24] *See http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517210&search=2007%20NAICS%20Search.*

[25] 13 CFR 121.201, NAICS code 517210.

[26] 13 CFR 121.201, NAICS code 517210. The now-superseded, pre-2007 CFR citations were 13 CFR 121.201, NAICS codes 517211 and 517212 (referring to the 2002 NAICS).

[27] U.S. Census Bureau, Subject Series: Information, Table 5, ''Establishment and Firm Size: Employment Size of Firms for the United States: 2007 NAICS Code 517210'' (issued Nov. 2010).

[28] Id. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with ''100 employees or more.''

[29] *See http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ2&prodType=table.*

[30] *http://www.census.gov/econ/industry/def/d334220.htm.*

[31] *See* 13 CFR 121.201, NAICS code 334220.

[32] *http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=300&-ds_name+EC0731I1&-_lang=en.*

[33] U.S. Census Bureau, 2007 NAICS Definitions, ''517210 Wireless Telecommunications Categories (Except Satellite)''; *http://www.census.gov/naics/2007/def/ND517210.HTM#N517210.*

[34] 13 CFR 121.201, NAICS code 517210 (2007 NAICS).

[35] U.S. Census Bureau, 2007 Economic Census, Sector 51, 2007 NAICS cod 517210 (rel. Oct. 20, 2009), *http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=700&-ds_name=EC0751SSSZ5&-_lang=en.*

operating in the inter-satellite service that transmit in the 22.55–23.55 GHz band shall apply in any 200 megahertz of the 23.6–24 GHz passive band, based on the date that complete advance publication information is received by the ITU's Radiocommunication Bureau: For information received before January 1, 2020: −36 dBW/200 MHz. For information received on or after January 1, 2020: −46 dBW/200 MHz.

• For new fixed stations in the 31–31.3 GHz band authorized three years after the effective date of the WRC–07 R&O, the unwanted emission power in any 100 megahertz of the 31.3–31.5 GHz band shall be limited to −38 dBW (−38 dBW/100 MHz), as measured at the input to the antenna.

• For earth stations in the Fixed-Satellite Service (Earth-to-space) that transmit in the 49.7–50.2 GHz and 50.4–50.9 GHz bands, the unwanted emission power in the 50.2–50.4 GHz band shall not exceed −20 dBW/200 MHz (measured at the input of the antenna), except that the maximum unwanted emission 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.

The following requirements apply to applicants/licensees or frequency coordinators:

• In the 1435–1452 MHz band, operators of aeronautical telemetry stations are encouraged to take all reasonable steps to ensure that unwanted emissions power level does not exceed −28 dBW/27 MHz in the 1400–1427 MHz band. Operators of aeronautical telemetry stations that do not meet this limit shall first attempt to operate in the 1452–1525 MHz band prior to operating in the 1435–1452 MHz band.

• In the 1435–1525 MHz, 2345–2360 MHz (only until January 1, 2020), 2360–2395 MHz, and 5091–5150 MHz bands, each application for a new station license, renewal or modification of an existing license concerning flight test frequencies, except as provided in paragraph (b) of § 87.305, must be accompanied by a statement from a frequency advisory committee. The committee must comment on the frequencies requested or the proposed changes in the authorized station and the probable interference to existing stations. The committee must consider all stations operating on the frequencies requested or assigned within 320 km (200 mi) of the proposed area of operation and all prior coordinations and assignments on the proposed frequency(ies). The committee must also recommend frequencies resulting in the minimum interference. The committee must coordinate in writing all requests for frequencies or proposed operating changes in the 1435–1525 MHz, 2345–2360 MHz (only until January 1, 2020), 2360–2395 MHz, and 5091–5150 MHz bands with the responsible Government Area Frequency Coordinators listed in the NTIA ''Manual of Regulations and Procedures for Federal Radio Frequency Management.'' In addition, committee recommendations may include comments on other technical factors and may contain recommended restrictions which it believes should appear on the license.

• New fixed stations in the 10.6–10.68 GHz band are restricted to point-to-point operations, with each station supplying not more than −3 dBW of transmitter power to the antenna, producing not more than 40 dBW of EIRP, and radiating at an antenna main beam elevation angle of 20° or less.

• Any application for a new station license to provide Multichannel Video Programming Distributors operations in the 17.7–17.8 GHz band or to operate in the 17.8–19.7 GHz band for any service, or for modification of an existing station license in these bands which would change the frequency, power, emission, modulation, polarization, antenna height or directivity, or location of such a station, be coordinated with the Federal Government by the Commission before an authorization will be issued, if the station or proposed station is located in whole or in part within any of the following areas: (1) *San Miguel, CA area:* Between latitudes 34°39′ N. and 34°00′ N. and between longitudes 118°52′ W. and 119°24′ W. or within 200 km of 35°44′ N., 120°45′ W.; and (2) *Guam area:* Within 100 km of 13°35′ N., 144°51′ E.

F. Steps Taken To Minimize Significant Economic Impact on Small Entities and Significant Alternatives Considered

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[36]

In the *WRC–07 NPRM,* the Commission proposed to delete the non-Federal radiolocation service (RLS) allocation from the 1900–2000 kHz band, stating that a review of its licensing database found that no one is licensed to use this allocation. In its reply comments to the *WRC–07 NPRM,* ITM Marine stated that the U.S.-based high seas migratory species fishing fleets operate radio buoys in the 1900–2000 kHz band. In order to remove the otherwise unused RLS allocation from the Allocation Table without affecting existing radio buoy use by U.S. commercial fishing vessels, the WRC–07 R&O added a new footnote to the Allocation Table (footnote NG92) that authorizes U.S. commercial fishing vessels to continue to use radio buoys on the open sea under a ship station license. This action is expected to have a positive non-burdensome impact on commercial fishing vessels, many of which are owned by small businesses, by authorizing these entities to operate radio buoys under a ship station license instead of obtaining separate licenses for the radio buoys.

The WRC–07 R&O delays the implementation of the unwanted emissions power limit for new fixed stations in the 31–31.3 GHz band. Because the Commission has delayed the implementation of this new requirement for 3 years, it appears that the economic impact of this requirement has been minimized to the extent practicable for all licensees, including small entities.

Report to Congress: The Commission will send a copy of the *Report and Order,* including this FRFA, in a report to Congress pursuant to the Congressional Review Act.[37] In addition, the Commission will send a copy of the *Report and Order,* including this FRFA, to the Chief Counsel for Advocacy of the SBA.

Paperwork Reduction Analysis

This document contains no new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104–13. In addition, therefore, it does not contain any new or modified ''information collection burden for small business concerns with fewer than 25 employees,'' pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107–198, *see* 44 U.S.C. 3506(c)(4).

Congressional Review Act

The Commission will send a copy of this *Report and Order, Order, and WRC–12 Notice of Proposed Rulemaking* to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. 801(a)(1)(A).

Ordering Clauses

Pursuant to section 1, 4, 301, 302, and 303 of the Communications Act of 1934, as amended, 47 U.S.C. 151, 154, 301, 302a, and 303, and § 553(b)(B) of the Administrative Procedure Act, 5 U.S.C. 553(b)(B), this *report and order* and *order* is hereby *adopted* and the Commission's rules *are amended* as set forth below.

Pursuant to § 1.3 of the Commission's rules, 47 CFR 1.3, that §§ 80.375 and 90.103 of the Commission's rules are *waived* to allow operation of FCC authorized radio buoys in the 1900–2000 kHz band on the open sea by commercial fishing vessels that have a valid ship station license or are licensed by rule under § 80.13 of the Commission's rules.

The Petition for Rulemaking of ARRL filed on Nov. 29, 2012 is *granted.*

The Joint Petition for Rulemaking of Xanadoo Company and Spectrum Five LLC in IB Docket No. 06–123 is *denied in part,* as described herein.

The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *report and order* and *order,* including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

The rule amendments adopted herein *shall be effective* 30 days after date of **Federal Register** publication of the *report and order* and *order* and ET Docket No. 12–338 *shall be*

[36] 5 U.S.C. 603(c).

[37] *See* 5 U.S.C. 801(a)(1)(A).

terminated, unless one or more petitions for reconsideration are filed in response to the *report and order.*

It is further ordered that the Commission *shall send* a copy of this *report and order* and *order* in a report to be sent to Congress and the General Accounting Office pursuant to the Congressional Review Act, see 5 U.S.C. 801(a)(1)(A).

List of Subjects

Part 2

Radio, telecommunications.

Part 25

Radio, satellites.

Parts 1, 27, 74, 78, 80, 87, 90, 97, and 101

Recordkeeping requirements.

Federal Communications Commission.

Marlene H. Dortch,

Secretary.

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 1, 2, 25, 27, 74, 78, 80, 87, 90, 97, and 101 as follows:

PART 1—PRACTICE AND PROCEDURE

■ 1. The authority citation for part 1 continues to read as follows:

Authority: 15 U.S.C. 79 *et seq.;* 47 U.S.C. 151, 154(i), 154(j), 155, 157, 160, 201, 225, 227, 303, 309, 332, 1403, 1404, 1451, 1452, and 1455.

■ 2. Section 1.924 is amended by revising paragraphs (e) and (f) to read as follows:

§ 1.924 Quiet zones.

* * * * *

(e) *420–450 MHz band.* Applicants for pulse-ranging radiolocation systems operating in the 420–450 MHz band along the shoreline of the conterminous United States and Alaska, and for spread spectrum radiolocation systems operating in the 420–435 MHz sub-band within the conterminous United States and Alaska, should not expect to be accommodated if their area of service is within:

(1) Arizona, Florida, or New Mexico;

(2) Those portions of California and Nevada that are south of latitude 37°10′ N.;

(3) That portion of Texas that is west of longitude 104° W.; or

(4) The following circular areas:

(i) 322 kilometers (km) of 30°30′ N., 86°30′ W.

(ii) 322 km of 28°21′ N., 80°43′ W.

(iii) 322 km of 34°09′ N., 119°11′ W.

(iv) 240 km of 39°08′ N., 121°26′ W.

(v) 200 km of 31°25′ N., 100°24′ W.

(vi) 200 km of 32°38′ N., 83°35′ W.

(vii) 160 km of 64°17′ N., 149°10′ W.

(viii) 160 km of 48°43′ N., 97°54′ W.

(ix) 160 km of 41°45′ N., 70°32′ W.

(f) *17.7–19.7 GHz band.* The following exclusion areas and coordination areas are established to minimize or avoid harmful interference to Federal Government earth stations receiving in the 17.7–19.7 GHz band:

(1) No application seeking authority for fixed stations, under parts 74, 78, or 101 of this chapter, supporting the operations of Multichannel Video Programming Distributors (MVPD) in the 17.7–17.8 GHz band or to operate in the 17.8–19.7 GHz band for any service will be accepted for filing if the proposed station is located within 20 km (or within 55 km if the modification application is for an outdoor low power operation pursuant to § 101.147(r)(14) of this chapter) of Denver, CO (39°43′ N., 104°46′ W.) or Washington, DC (38°48′ N., 76°52′ W.).

(2) Any application for a new station license to provide MVPD operations in the 17.7–17.8 GHz band or to operate in the 17.8–19.7 GHz band for any service, or for modification of an existing station license in these bands which would change the frequency, power, emission, modulation, polarization, antenna height or directivity, or location of such a station, must be coordinated with the Federal Government by the Commission before an authorization will be issued, if the station or proposed station is located in whole or in part within any of the following areas:

(i) *Denver, CO area:*

(A) Between latitudes 41°30′ N. and 38°30′ N. and between longitudes 103°10′ W. and 106°30′ W.

(B) Between latitudes 38°30′ N. and 37°30′ N. and between longitudes 105°00′ W. and 105°50′ W.

(C) Between latitudes 40°08′ N. and 39°56′ N. and between longitudes 107°00′ W. and 107°15′ W.

(ii) *Washington, DC area:*

(A) Between latitudes 38°40′ N. and 38°10′ N. and between longitudes 78°50′ W. and 79°20′ W.

(B) Within 178 km of 38°48′ N., 76°52′ W.

(iii) *San Miguel, CA area:*

(A) Between latitudes 34°39′ N. and 34°00′ N. and between longitudes 118°52′ W. and 119°24′ W.

(B) Within 200 km of 35°44′ N., 120°45′ W.

(iv) *Guam area:* Within 100 km of 13°35′ N., 144°51′ E.

Note to § 1.924(f): The coordinates cited in this section are specified in terms of the ''North American Datum of 1983 (NAD 83).''

* * * * *

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

■ 3. The authority citation for part 2 continues to read as follows:

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

■ 4. Section 2.1 is amended by revising the definitions of ''*Earth Exploration-Satellite Service*'' and ''*Equivalent Isotropically Radiated Power (e.i.r.p.)*'' in paragraph (c) to read as follows:

§ 2.1 Terms and definitions.

* * * * *

(c) * * *

Earth Exploration-Satellite Service. A radiocommunication service between earth stations and one or more space stations, which may include links between space stations, in which:

(1) Information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from active sensors or passive sensors on Earth satellites;

(2) Similar information is collected from airborne or Earth-based platforms;

(3) Such information may be distributed to earth stations within the system concerned; and

(4) Platform interrogation may be included. This service may also include feeder links necessary for its operation. (RR)

* * * * *

Equivalent Isotropically Radiated Power (e.i.r.p.). The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain). (RR)

* * * * *

■ 5. Section 2.100 is revised to read as follows:

§ 2.100 International regulations in force.

The ITU *Radio Regulations,* Edition of 2008, have been incorporated to the extent practicable in this part, except that the International Table within § 2.106 has been updated to reflect the ITU *Radio Regulations,* Edition of 2012.

■ 6. Section 2.101 is amended by revising paragraph (c) to read as follows:

§ 2.101 Frequency and wavelength bands.

* * * * *

(c) In communications between administrations and the ITU, no names, symbols or abbreviations should be used for the various frequency bands other than those specified in this section.

Band No.	Symbols (terms) [2]	Frequency range (lower limit exclusive, upper limit inclusive)	Corresponding metric subdivision	Metric abbreviations for the bands
4	VLF (very low frequency)	3 to 30 kHz	Myriametric waves	B.Mam
5	LF (low frequency)	30 to 300 kHz	Kilometric waves	B.km
6	MF (medium frequency)	300 to 3,000 kHz	Hectometric waves	B.hm
7	HF (high frequency)	3 to 30 MHz	Decametric waves	B.dam
8	VHF (very high frequency)	30 to 300 MHz	Metric waves	B.m
9	UHF (ultra high frequency)	300 to 3,000 MHz	Decimetric waves	B.dm
10	SHF (super high frequency)	3 to 30 GHz	Centimetric waves	B.cm
11	EHF (extremely high frequency)	30 to 300 GHz	Millimetric waves	B.mm
12		300 to 3,000 GHz	Decimillimetric waves.	

NOTE 1: "Band N" (N = band number) extends from 0.3×10^N Hz to 3×10^N Hz.
NOTE 2: Prefix: k = kilo (10^3), M = mega (10^6), G = giga (10^9).

■ 7. Section 2.106, the Table of Frequency Allocations, is amended as follows:

■ a. The table is revised.

■ b. In the list of International Footnotes, footnotes 5.53, 5.54, 5.56, 5.67B, 5.68, 5.70, 5.77, 5.82, 5.87, 5.93, 5.98, 5.99, 5.107, 5.112, 5.114, 5.117, 5.128, 5.133, 5.140, 5.141, 5.141B, 5.142, 5.143A, 5.143B, 5.143C, 5.143D, 5.160, 5.162, 5.162A, 5.163, 5.164, 5.165, 5.166, 5.169, 5.171, 5.178, 5.179, 5.197, 5.197A, 5.201, 5.202, 5.211, 5.212, 5.214, 5.221, 5.231, 5.237, 5.259, 5.262, 5.274, 5.275, 5.276, 5.277, 5.286AA, 5.288, 5.290, 5.293, 5.294, 5.296, 5.300, 5.312, 5.313A, 5.314, 5.315, 5.316, 5.316A, 5.316B, 5.317A, 5.322, 5.323, 5.327A, 5.330, 5.331, 5.335, 5.338, 5.338A, 5.342, 5.351A, 5.352A, 5.353A, 5.355, 5.357A, 5.359, 5.362B, 5.362C, 5.367, 5.369, 5.371, 5.381, 5.382, 5.384A, 5.387, 5.388, 5.388A, 5.388B, 5.389A, 5.389C, 5.399, 5.410, 5.412, 5.418, 5.422, 5.428, 5.429, 5.430, 5.430A, 5.431A, 5.432B, 5.433A, 5.439, 5.440A, 5.443B, 5.444, 5.444A, 5.444B, 5.446, 5.446A, 5.446C, 5.447, 5.447A, 5.448, 5.450, 5.453, 5.454, 5.457B, 5.457C, 5.461B, 5.462A, 5.466, 5.468, 5.469, 5.471, 5.477, 5.481, 5.482, 5.483, 5.494, 5.495, 5.499, 5.500, 5.501, 5.504C, 5.505, 5.508, 5.508A, 5.509A, 5.511, 5.512, 5.514, 5.522C, 5.524, 5.536A, 5.536B, 5.536C, 5.537A, 5.542, 5.543A, 5.545, 5.546, 5.547, 5.549, 5.550, and 5.565 are revised; footnotes 5.54A, 5.54B, 5.54C, 5.80A, 5.80B, 5.132A, 5.132B, 5.133A, 5.145A, 5.145B, 5.149A, 5.158, 5.159, 5.161A, 5.161B, 5.225A, 5.228, 5.228A, 5.228B, 5.228C, 5.228D, 5.228E, 5.228F, 5.312A, 5.398A, 5.401, 5.443AA, 5.443C, 5.443D, 5.457, 5.511E, 5.511F, 5.530A, 5.530B, 5.530C, 5.530D, 5.532A, and 5.532B are added; and footnotes 5.72, 5.82A, 5.82B, 5.101, 5.138A, 5.139, 5.141C, 5.143E, 5.227A, 5.272, 5.273, 5.302, 5.397, 5.400, 5.405, and 5.530 are removed.

■ c. In the list of United States (US) Footnotes, footnotes US37, US48, US51, US66, US77, US78, US106, US203, US226, US228, US263, US265, US290, US339, US368, US388, US398, US400, and US401 are removed; footnotes US52, US79, US85, US100, US111, US113, US139, US145, US156, US157, US161, US227, US338A, US367, US444B, US475, US476A, US482, US532, US550A, and US565 are added; and footnotes US74, US334, US343, US444, US444A, and US519 are revised.

■ d. In the list of non-Federal Government (NG) Footnotes, footnotes NG22, NG34, NG35, NG60, NG92, NG338A, and NG535 are added; and footnotes NG117, NG120, NG144, NG158, and NG167 are removed.

The revisions and additions read as follows:

§ 2.106 Table of Frequency Allocations.

* * * * *

BILLING CODE 6712–01–P

[2] The terms are no longer shown in the ITU *Radio Regulations,* and thus, they should not be used in communications with the ITU.

Table of Frequency Allocations			0-137.8 kHz (VLF/LF)		Page 1
International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
Below 8.3 (Not Allocated) 5.53 5.54			Below 9 (Not Allocated) 5.53 5.54		
8.3-9 METEOROLOGICAL AIDS 5.54A 5.54B 5.54C					
9-11.3 METEOROLOGICAL AIDS 5.54A RADIONAVIGATION			9-14 RADIONAVIGATION US18		
11.3-14 RADIONAVIGATION			US2		
14-19.95 FIXED MARITIME MOBILE 5.57 5.55 5.56			14-19.95 FIXED MARITIME MOBILE 5.57 US2	14-19.95 Fixed US2	
19.95-20.05 STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)			19.95-20.05 STANDARD FREQUENCY AND TIME SIGNAL (20 kHz) US2		
20.05-70 FIXED MARITIME MOBILE 5.57			20.05-59 FIXED MARITIME MOBILE 5.57 US2	20.05-59 FIXED US2	
			59-61 STANDARD FREQUENCY AND TIME SIGNAL (60 kHz) US2		
5.56 5.58			61-70 FIXED MARITIME MOBILE 5.57 US2	61-70 FIXED US2	
70-72 RADIONAVIGATION 5.60	70-90 FIXED MARITIME MOBILE 5.57 MARITIME RADIONAVIGATION 5.60 Radiolocation	70-72 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59	70-90 FIXED MARITIME MOBILE 5.57 Radiolocation	70-90 FIXED Radiolocation	Private Land Mobile (90)
72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60 5.56		72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60			
84-86 RADIONAVIGATION 5.60		84-86 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59			

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

Table of Frequency Allocations — 137.8-1800 kHz (LF/MF) — Page 3

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

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

Table of Frequency Allocations		1800-3230 kHz (MF/HF)			Page 5
International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
1800-1810 RADIOLOCATION 5.93	1800-1850 AMATEUR	1800-2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIONAVIGATION Radiolocation	1800-2000	1800-2000 AMATEUR NG92	Amateur Radio (97)
1810-1850 AMATEUR 5.98 5.99 5.100					
1850-2000 FIXED MOBILE except aeronautical mobile 5.92 5.96 5.103	1850-2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIOLOCATION RADIONAVIGATION 5.102	5.97			
2000-2025 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103	2000-2065 FIXED MOBILE		2000-2065 FIXED MOBILE US340	2000-2065 MARITIME MOBILE US340 NG7	Maritime (80) Private Land Mobile (90)
2025-2045 FIXED MOBILE except aeronautical mobile (R) Meteorological aids 5.104 5.92 5.103					
2045-2160 FIXED MARITIME MOBILE LAND MOBILE 5.92	2065-2107 MARITIME MOBILE 5.105 5.106		2065-2107 MARITIME MOBILE 5.105 US296 US340		Maritime (80)
2160-2170 RADIOLOCATION 5.93 5.107	2107-2170 FIXED MOBILE		2107-2170 FIXED MOBILE US340	2107-2170 FIXED MOBILE except aeronautical mobile US340 NG7	Maritime (80) Private Land Mobile (90)
2170-2173.5 MARITIME MOBILE			2170-2173.5 MARITIME MOBILE (telephony) US340	2170-2173.5 MARITIME MOBILE US340	Maritime (80)
2173.5-2190.5 MOBILE (distress and calling) 5.108 5.109 5.110 5.111			2173.5-2190.5 MOBILE (distress and calling) 5.108 5.109 5.110 5.111 US279 US340		Maritime (80) Aviation (87)
2190.5-2194 MARITIME MOBILE			2190.5-2194 MARITIME MOBILE (telephony) US340	2190.5-2194 MARITIME MOBILE US340	Maritime (80)

2194-2300 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103 5.112	2194-2300 FIXED MOBILE 5.112	2194-2495 FIXED MOBILE US22 US340	2194-2495 FIXED MOBILE except aeronautical mobile US22 US340 NG7	Maritime (80) Private Land Mobile (90)
2300-2498 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.103	2300-2495 FIXED MOBILE BROADCASTING 5.113			
2498-2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)	2495-2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)	2495-2505 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)		
2501-2502 STANDARD FREQUENCY AND TIME SIGNAL Space research				
2502-2625 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103 5.114	2502-2505 STANDARD FREQUENCY AND TIME SIGNAL	US1 US340		
2625-2650 MARITIME MOBILE MARITIME RADIONAVIGATION 5.92	2505-2850 FIXED MOBILE	2505-2850 FIXED MOBILE US285	2505-2850 FIXED MOBILE except aeronautical mobile US285	Maritime (80) Aviation (87) Private Land Mobile (90)
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	3.5-3.9 AMATEUR FIXED MOBILE	3.5-4 US340	3.5-4 AMATEUR US340	Amateur Radio (97)
3.8-3.9 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	3.75-4 AMATEUR FIXED MOBILE except aeronautical mobile (R)				
3.9-3.95 AERONAUTICAL MOBILE (OR) 5.123		3.9-3.95 AERONAUTICAL MOBILE BROADCASTING			
3.95-4 FIXED BROADCASTING	5.122 5.125	3.95-4 FIXED BROADCASTING 5.126			
4-4.063 FIXED MARITIME MOBILE 5.127 5.126			4-4.063 FIXED MARITIME MOBILE US340		Maritime (80)
4.063-4.438 MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 5.128			4.063-4.438 MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 US82 US296 US340		Maritime (80) Aviation (87)
4.438-4.488 FIXED MOBILE except aeronautical mobile (R) Radiolocation 5.132A 5.132B	4.438-4.488 FIXED MOBILE except aeronautical mobile (R) RADIOLOCATION 5.132A	4.438-4.488 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A	4.438-4.65 FIXED MOBILE except aeronautical mobile (R) US22 US340		Maritime (80) Aviation (87) Private Land Mobile (90)
4.488-4.65 FIXED MOBILE except aeronautical mobile (R)		4.488-4.65 FIXED MOBILE except aeronautical mobile			
4.65-4.7 AERONAUTICAL MOBILE (R)			4.65-4.7 AERONAUTICAL MOBILE (R) US282 US283 US340		Aviation (87)

4.7-4.75 AERONAUTICAL MOBILE (OR)			4.7-4.75 AERONAUTICAL MOBILE (OR) US340		
4.75-4.85 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE BROADCASTING 5.113	4.75-4.85 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113	4.75-4.85 FIXED BROADCASTING 5.113 Land mobile	4.75-4.85 FIXED MOBILE except aeronautical mobile (R) US340		Maritime (80) Private Land Mobile (90)
4.85-4.995 FIXED LAND MOBILE BROADCASTING 5.113			4.85-4.995 FIXED MOBILE US340	4.85-4.995 FIXED US340	Aviation (87) Private Land Mobile (90)
4.995-5.003 STANDARD FREQUENCY AND TIME SIGNAL (5 MHz)			4.995-5.005 STANDARD FREQUENCY AND TIME SIGNAL (5 MHz) US1 US340		
5.003-5.005 STANDARD FREQUENCY AND TIME SIGNAL Space research					
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			5.06-5.45 FIXED US22 Mobile except aeronautical mobile US23 US212 US340		Maritime (80) Aviation (87) Private Land Mobile (90) Amateur Radio (97)
5.25-5.275 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A 5.133A	5.25-5.275 FIXED MOBILE except aeronautical mobile RADIOLOCATION 5.132A	5.25-5.275 FIXED MOBILE except aeronautical mobile Radiolocation 5.132A			
5.275-5.45 FIXED MOBILE except aeronautical mobile					
5.45-5.48 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5.45-5.48 AERONAUTICAL MOBILE (R)	5.45-5.48 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5.45-5.68 AERONAUTICAL MOBILE (R) 5.111 5.115 US283 US340		Aviation (87)
5.48-5.68 AERONAUTICAL MOBILE (R) 5.111 5.115					
5.68-5.73 AERONAUTICAL MOBILE (OR) 5.111 5.115			5.68-5.73 AERONAUTICAL MOBILE (OR) 5.111 5.115 US340		
5.73-5.9 FIXED LAND MOBILE	5.73-5.9 FIXED MOBILE except aeronautical mobile (R)	5.73-5.9 FIXED Mobile except aeronautical mobile (R)	5.73-5.9 FIXED MOBILE except aeronautical mobile (R) US340		Maritime (80) Aviation (87) Private Land Mobile (90)

Table of Frequency Allocations			5.9-11.175 MHz (HF)		Page 9
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Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
5.9-5.95 BROADCASTING 5.134 5.136			5.9-6.2 BROADCASTING 5.134 US136 US340		International Broadcast Stations (73F)
5.95-6.2 BROADCASTING					
6.2-6.525 MARITIME MOBILE 5.109 5.110 5.130 5.132 5.137			6.2-6.525 MARITIME MOBILE 5.109 5.110 5.130 5.132 US82 US296 US340		Maritime (80)
6.525-6.685 AERONAUTICAL MOBILE (R)			6.525-6.685 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
6.685-6.765 AERONAUTICAL MOBILE (OR)			6.685-6.765 AERONAUTICAL MOBILE (OR) US340		
6.765-7 FIXED MOBILE except aeronautical mobile (R) 5.138			6.765-7 FIXED US22 MOBILE except aeronautical mobile (R) 5.138 US340		ISM Equipment (18) Private Land Mobile (90)
7-7.1 AMATEUR AMATEUR-SATELLITE 5.140 5.141 5.141A			7-7.2 US340	7-7.1 AMATEUR AMATEUR-SATELLITE US340	Amateur Radio (97)
7.1-7.2 AMATEUR 5.142 5.141A 5.141B				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) Private Land Mobile (90)
7.4-7.45 BROADCASTING 5.143B 5.143C	7.4-7.45 FIXED MOBILE except aeronautical mobile (R)	7.4-7.45 BROADCASTING 5.143A 5.143C	7.4-7.45 FIXED MOBILE except aeronautical mobile (R) US142 US340		
7.45-8.1 FIXED MOBILE except aeronautical mobile (R) 5.144			7.45-8.1 FIXED US22 MOBILE except aeronautical mobile (R) US340		Maritime (80) Aviation (87) Private Land Mobile (90)

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

Table of Frequency Allocations			11.175-15.1 MHz (HF)		Page 11
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		International Broadcast Stations (73F)
11.65-12.05 BROADCASTING 5.147					
12.05-12.1 BROADCASTING 5.134 5.146			US136 US340		
12.1-12.23 FIXED			12.1-12.23 FIXED US340		Private Land Mobile (90)
12.23-13.2 MARITIME MOBILE 5.109 5.110 5.132 5.145			12.23-13.2 MARITIME MOBILE 5.109 5.110 5.132 5.145 US82 US296 US340		Maritime (80)
13.2-13.26 AERONAUTICAL MOBILE (OR)			13.2-13.26 AERONAUTICAL MOBILE (OR) US340		
13.26-13.36 AERONAUTICAL MOBILE (R)			13.26-13.36 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
13.36-13.41 FIXED RADIO ASTRONOMY 5.149			13.36-13.41 RADIO ASTRONOMY US342 G115	13.36-13.41 RADIO ASTRONOMY US342	
13.41-13.45 FIXED Mobile except aeronautical mobile (R)			13.41-13.57 FIXED Mobile except aeronautical mobile (R)	13.41-13.57 FIXED	ISM Equipment (18) 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			
13.55-13.57 FIXED Mobile except aeronautical mobile (R) 5.150		5.150 US340	5.150 US340	
13.57-13.6 BROADCASTING 5.134 5.151		13.57-13.87 BROADCASTING 5.134		International Broadcast Stations (73F)
13.6-13.8 BROADCASTING				
13.8-13.87 BROADCASTING 5.134 5.151		US136 US340		
13.87-14 FIXED Mobile except aeronautical mobile (R)		13.87-14 FIXED Mobile except aeronautical mobile (R) US340	13.87-14 FIXED US340	Private Land Mobile (90)
14-14.25 AMATEUR AMATEUR-SATELLITE		14-14.35	14-14.25 AMATEUR AMATEUR-SATELLITE US340	Amateur Radio (97)
14.25-14.35 AMATEUR 5.152		US340	14.25-14.35 AMATEUR US340	
14.35-14.99 FIXED Mobile except aeronautical mobile (R)		14.35-14.99 FIXED Mobile except aeronautical mobile (R) US340	14.35-14.99 FIXED US340	Private Land Mobile (90)
14.99-15.005 STANDARD FREQUENCY AND TIME SIGNAL (15 MHz) 5.111		14.99-15.01 STANDARD FREQUENCY AND TIME SIGNAL (15 MHz)		
15.005-15.01 STANDARD FREQUENCY AND TIME SIGNAL Space research		5.111 US1 US340		
15.01-15.1 AERONAUTICAL MOBILE (OR)		15.01-15.1 AERONAUTICAL MOBILE (OR) US340		Page 12

Table of Frequency Allocations			15.1-22.855 MHz (HF)		Page 13
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Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
15.1-15.6 BROADCASTING			15.1-15.8 BROADCASTING 5.134		International Broadcast Stations (73F)
15.6-15.8 BROADCASTING 5.134 5.146			US136 US340		
15.8-16.1 FIXED 5.153			15.8-16.36 FIXED		Private Land Mobile (90)
16.1-16.2 FIXED Radiolocation 5.145A 5.145B	16.1-16.2 FIXED RADIOLOCATION 5.145A	16.1-16.2 FIXED Radiolocation 5.145A			
16.2-16.36 FIXED			US340		
16.36-17.41 MARITIME MOBILE 5.109 5.110 5.132 5.145			16.36-17.41 MARITIME MOBILE 5.109 5.110 5.132 5.145 US82 US296 US340		Maritime (80)
17.41-17.48 FIXED			17.41-17.48 FIXED US340		Private Land Mobile (90)
17.48-17.55 BROADCASTING 5.134 5.146			17.48-17.9 BROADCASTING 5.134		International Broadcast Stations (73F)
17.55-17.9 BROADCASTING			US136 US340		
17.9-17.97 AERONAUTICAL MOBILE (R)			17.9-17.97 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
17.97-18.03 AERONAUTICAL MOBILE (OR)			17.97-18.03 AERONAUTICAL MOBILE (OR) US340		
18.030-18.052 FIXED			18.03-18.068 FIXED		Maritime (80) Private Land Mobile (90)
18.052-18.068 FIXED Space research			US340		
18.068-18.168 AMATEUR AMATEUR-SATELLITE 5.154			18.068-18.168 US340	18.068-18.168 AMATEUR AMATEUR-SATELLITE US340	Amateur Radio (97)
18.168-18.78 FIXED Mobile except aeronautical mobile			18.168-18.78 FIXED Mobile US340		Maritime (80) Private Land Mobile (90)

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

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

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

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)					
27.5-28 METEOROLOGICAL AIDS FIXED MOBILE			27.41-27.54 US340	27.41-27.54 FIXED LAND MOBILE US340	Private Land Mobile (90)
			27.54-28 FIXED MOBILE US298 US340	27.54-28 US298 US340	
28-29.7 AMATEUR AMATEUR-SATELLITE			28-29.7 US340	28-29.7 AMATEUR AMATEUR-SATELLITE US340	Amateur Radio (97)
29.7-30.005 FIXED MOBILE			29.7-29.89 US340	29.7-29.8 LAND MOBILE US340	Private Land Mobile (90)
				29.8-29.89 FIXED US340	
			29.89-29.91 FIXED MOBILE US340	29.89-29.91 US340	
			29.91-30 US340	29.91-30 FIXED 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 5.149			37.5-38 Radio astronomy US342	37.5-38 LAND MOBILE Radio astronomy US342 NG59 NG124	
			38-38.25 FIXED MOBILE RADIO ASTRONOMY US81 US342	38-38.25 RADIO ASTRONOMY US81 US342	
38.25-39 FIXED MOBILE	38.25-39.986 FIXED MOBILE	38.25-39.5 FIXED MOBILE	38.25-39 FIXED MOBILE	38.25-39	
39-39.5 FIXED MOBILE Radiolocation 5.132A 5.159			39-40	39-40 LAND MOBILE NG124	Private Land Mobile (90)
39.5-39.986 FIXED MOBILE		39.5-39.986 FIXED MOBILE RADIOLOCATION 5.132A			
39.986-40.02 FIXED MOBILE Space research		39.986-40 FIXED MOBILE RADIOLOCATION 5.132A Space research			
		40-40.02 FIXED MOBILE Space research	40-42 FIXED MOBILE 5.150 US210 US220	40-42 5.150 US210 US220	ISM Equipment (18) Private Land Mobile (90) Page 18
40.02-40.98 FIXED MOBILE 5.150					

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Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
40.98-41.015 FIXED MOBILE Space research 5.160 5.161			(See previous page)		
41.015-42 FIXED MOBILE 5.160 5.161 5.161A					
42-42.5 FIXED MOBILE Radiolocation 5.132A 5.160 5.161B	42-42.5 FIXED MOBILE 5.161		42-46.6	42-43.69 FIXED LAND MOBILE NG124 NG141	Public Mobile (22) Private Land Mobile (90)
42.5-44 FIXED MOBILE 5.160 5.161 5.161A				43.69-46.6 LAND MOBILE NG124 NG141	Private Land Mobile (90)
44-47 FIXED MOBILE 5.162 5.162A			46.6-47 FIXED MOBILE	46.6-47	
47-68 BROADCASTING 5.162A 5.163 5.164 5.165 5.169 5.171	47-50 FIXED MOBILE	47-50 FIXED MOBILE BROADCASTING 5.162A	47-49.6	47-49.6 LAND MOBILE NG124	Private Land Mobile (90)
			49.6-50 FIXED MOBILE	49.6-50	
	50-54 AMATEUR 5.162A 5.166 5.167 5.167A 5.168 5.170		50-73	50-54 AMATEUR	Amateur Radio (97)
	54-68 BROADCASTING Fixed Mobile 5.172	54-68 FIXED MOBILE BROADCASTING 5.162A		54-72 BROADCASTING NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/ Booster (74G) Low Power Auxiliary (74H)
68-74.8 FIXED MOBILE except aeronautical mobile	68-72 BROADCASTING Fixed Mobile 5.173	68-74.8 FIXED MOBILE			

	72-73 FIXED MOBILE			72-73 FIXED MOBILE NG3 NG49 NG56	Public Mobile (22) Maritime (80) Aviation (87) Private Land Mobile (90) Personal Radio (95)
	73-74.6 RADIO ASTRONOMY 5.178		73-74.6 RADIO ASTRONOMY US74 US246		
	74.6-74.8 FIXED MOBILE		74.6-74.8 FIXED MOBILE US273		Private Land Mobile (90)
5.149 5.175 5.177 5.179		5.149 5.176 5.179			
74.8-75.2 AERONAUTICAL RADIONAVIGATION 5.180 5.181			74.8-75.2 AERONAUTICAL RADIONAVIGATION 5.180		Aviation (87)
75.2-87.5 FIXED MOBILE except aeronautical mobile	75.2-75.4 FIXED MOBILE 5.179		75.2-75.4 FIXED MOBILE US273		Private Land Mobile (90)
	75.4-76 FIXED MOBILE	75.4-87 FIXED MOBILE	75.4-88	75.4-76 FIXED MOBILE NG3 NG49 NG56	Public Mobile (22) Maritime (80) Aviation (87) Private Land Mobile (90) Personal Radio (95)
	76-88 BROADCASTING Fixed Mobile 5.185	5.182 5.183 5.188 87-100 FIXED MOBILE BROADCASTING		76-88 BROADCASTING NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/ Booster (74G) Low Power Auxiliary (74H)
5.175 5.179 5.187 87.5-100 BROADCASTING 5.190	88-100 BROADCASTING		88-108 US93	88-108 BROADCASTING NG2 US93 NG5	Broadcast Radio (FM)(73) FM Translator/Booster (74L)
100-108 BROADCASTING 5.192 5.194					
108-117.975 AERONAUTICAL RADIONAVIGATION 5.197 5.197A			108-117.975 AERONAUTICAL RADIONAVIGATION 5.197A US93		Aviation (87) Page 20

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Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
117.975-137 AERONAUTICAL MOBILE (R) 5.111 5.200 5.201 5.202			117.975-121.9375 AERONAUTICAL MOBILE (R) 5.111 5.200 US26 US28 US36		Aviation (87)
			121.9375-123.0875 US30 US31 US33 US80 US102 US213	121.9375-123.0875 AERONAUTICAL MOBILE US30 US31 US33 US80 US102 US213	
			123.0875-123.5875 AERONAUTICAL MOBILE 5.200 US32 US33 US112		
			123.5875-128.8125 AERONAUTICAL MOBILE (R) US26 US36		
			128.8125-132.0125	128.8125-132.0125 AERONAUTICAL MOBILE (R)	
			132.0125-136 AERONAUTICAL MOBILE (R) US26		
			136-137 US244	136-137 AERONAUTICAL MOBILE (R) US244	
137-137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			137-137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US319 US320 SPACE RESEARCH (space-to-Earth) 5.208		Satellite Communications (25)
137.025-137.175 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209 Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			137.025-137.175 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Mobile-satellite (space-to-Earth) US319 US320 5.208		
137.175-137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			137.175-137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US319 US320 SPACE RESEARCH (space-to-Earth) 5.208		

137.825-138 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209 Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			137.825-138 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Mobile-satellite (space-to-Earth) US319 US320 5.208		
138-143.6 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	138-143.6 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	138-143.6 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213	138-144 FIXED MOBILE G30	138-144	
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (space-to-Earth) 5.211 5.212 5.214	143.6-143.65 FIXED MOBILE RADIOLOCATION SPACE RESEARCH (space-to-Earth)	143.6-143.65 FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.207 5.213			
143.65-144 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	143.65-144 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	143.65-144 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213			
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 5.219 5.221	148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209 5.218 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 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 5.224A RADIONAVIGATION-SATELLITE 5.224B 5.220 5.222 5.223			149.9-150.05 MOBILE-SATELLITE (Earth-to-space) US319 US320 RADIONAVIGATION-SATELLITE 5.223		
150.05-153 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149	150.05-154 FIXED MOBILE 5.225		150.05-150.8 FIXED MOBILE US73 G30	150.05-150.8 US73	

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)	(See previous page)		150.8-152.855 US73	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) 5.225A 5.226	154-156.4875 FIXED MOBILE 5.226	154-156.4875 FIXED MOBILE 5.225A 5.226		154-156.2475 FIXED LAND MOBILE NG112 5.226 NG22 NG124 NG148	Maritime (80) Private Land Mobile (90) Personal Radio (95)
156.4875-156.5625 MARITIME MOBILE (distress and calling via DSC) 5.111 5.226 5.227			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		
156.5625-156.7625 FIXED MOBILE except aeronautical mobile (R) 5.226	156.5625-156.7625 FIXED MOBILE 5.226		156.5375-156.7625 5.226 US52 US227 US266	156.5375-156.7625 MARITIME MOBILE 5.226 US52 US227 US266	
156.7625-156.7875 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228	156.7625-156.7875 MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space) 5.111 5.226 5.228	156.7625-156.7875 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228	156.7625-156.8375 MARITIME MOBILE (distress, urgency, safety and calling) 5.111 5.226 US266		
156.7875-156.8125 MARITIME MOBILE (distress and calling) 5.111 5.226					
156.8125-156.8375 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228	156.8125-156.8375 MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space) 5.111 5.226 5.228	156.8125-156.8375 MARITIME MOBILE Mobile-satellite (Earth-to-space) 5.111 5.226 5.228			
156.8375-161.9625 FIXED MOBILE except aeronautical mobile	156.8375-161.9625 FIXED MOBILE		156.8375-157.0375 5.226 US52 US266	156.8375-157.0375 MARITIME MOBILE 5.226 US52 US266	
			157.0375-157.1875 MARITIME MOBILE US214 5.226 US266 G109	157.0375-157.1875 5.226 US214 US266	Maritime (80)

			157.1875-161.575	157.1875-157.45 MOBILE except aeronautical mobile US266 5.226 NG111	Maritime (80) Aviation (87) Private Land Mobile (90)
				157.45-161.575 FIXED LAND MOBILE NG28 NG111 NG112 5.226 NG6 NG70 NG124 NG148 NG155	Public Mobile (22) Remote Pickup (74D) Maritime (80) Private Land Mobile (90)
			161.575-161.625 5.226 US52	161.575-161.625 MARITIME MOBILE 5.226 US52 NG6 NG17	Public Mobile (22) Maritime (80)
			161.625-161.9625	161.625-161.775 LAND MOBILE NG6 5.226	Public Mobile (22) Remote Pickup (74D) Low Power Auxiliary (74H)
				161.775-161.9625 MOBILE except aeronautical mobile US266 NG6	Maritime (80) Private Land Mobile (90)
5.226	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		Maritime (80)
161.9875-162.0125 FIXED MOBILE except aeronautical mobile 5.226 5.229	161.9875-162.0125 FIXED MOBILE 5.226		161.9875-162.0125	161.9875-162.0125 MOBILE except aeronautical mobile 5.226	
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		
162.0375-174 FIXED MOBILE except aeronautical mobile	162.0375-174 FIXED MOBILE		162.0375-173.2 FIXED MOBILE US8 US11 US13 US73 US300 US312 G5	162.0375-173.2 US8 US11 US13 US73 US300 US312	Remote Pickup (74D) Private Land Mobile (90)
			173.2-173.4	173.2-173.4 FIXED Land mobile	Private Land Mobile (90)
			173.4-174 FIXED MOBILE	173.4-174	
5.226 5.229	5.226 5.230 5.231 5.232		G5		Page 24

Table of Frequency Allocations — 174-400.15 MHz (VHF/UHF) — Page 25

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
174-223 BROADCASTING 5.235 5.237 5.243	174-216 BROADCASTING Fixed Mobile 5.234	174-223 FIXED MOBILE BROADCASTING 5.233 5.238 5.240 5.245	174-216	174-216 BROADCASTING NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/ Booster (74G) Low Power Auxiliary (74H)
	216-220 FIXED MARITIME MOBILE Radiolocation 5.241 5.242		216-217 Fixed Land mobile US210 US241 G2	216-219 FIXED MOBILE except aeronautical mobile US210 US241 NG173	Maritime (80) Private Land Mobile (90) Personal Radio (95)
			217-220 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)
	220-225 AMATEUR FIXED MOBILE Radiolocation 5.241		220-222 FIXED LAND MOBILE US241 US242		Private Land Mobile (90)
223-230 BROADCASTING Fixed Mobile 5.243 5.246 5.247		223-230 FIXED MOBILE BROADCASTING AERONAUTICAL RADIONAVIGATION Radiolocation 5.250	222-225	222-225 AMATEUR	Amateur Radio (97)
	225-235 FIXED MOBILE		225-235 FIXED MOBILE G27	225-235	
230-235 FIXED MOBILE 5.247 5.251 5.252		230-235 FIXED MOBILE AERONAUTICAL RADIONAVIGATION 5.250			
235-267 FIXED MOBILE 5.111 5.252 5.254 5.256 5.256A			235-267 FIXED MOBILE 5.111 5.256 G27 G100	235-267 5.111 5.256	
267-272 FIXED MOBILE Space operation (space-to-Earth) 5.254 5.257			267-322 FIXED MOBILE	267-322	

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 FIXED MOBILE RADIO ASTRONOMY 5.149	322-328.6 FIXED MOBILE US342 G27	322-328.6 US342	
328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258 5.259	328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258		Aviation (87)
335.4-387 FIXED MOBILE 5.254	335.4-399.9 FIXED MOBILE	335.4-399.9	
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 5.224A RADIONAVIGATION-SATELLITE 5.222 5.224B 5.260 5.220	399.9-400.05 MOBILE-SATELLITE (Earth-to-space) US319 US320 RADIONAVIGATION-SATELLITE 5.260		Satellite Communications (25)
400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261 5.262	400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261		Page 26

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
400.15-401 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.262 5.264			400.15-401 METEOROLOGICAL AIDS (radiosonde) US70 METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US319 US320 US324 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.264	400.15-401 METEOROLOGICAL AIDS (radiosonde) US70 MOBILE-SATELLITE (space-to-Earth) US319 US320 US324 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.264	Satellite Communications (25)
401-402 METEOROLOGICAL AIDS SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile			401-402 METEOROLOGICAL AIDS (radiosonde) US70 SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) US64 US384	401-402 METEOROLOGICAL AIDS (radiosonde) US70 SPACE OPERATION (space-to-Earth) Earth exploration-satellite (Earth-to-space) Meteorological-satellite (Earth-to-space) US64 US384	MedRadio (95I)
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) US64 US384	402-403 METEOROLOGICAL AIDS (radiosonde) US70 Earth exploration-satellite (Earth-to-space) Meteorological-satellite (Earth-to-space) US64 US384	
403-406 METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile			403-406 METEOROLOGICAL AIDS (radiosonde) US70 US64 G6	403-406 METEOROLOGICAL AIDS (radiosonde) US70 US64	
406-406.1 MOBILE-SATELLITE (Earth-to-space) 5.266 5.267			406-406.1 MOBILE-SATELLITE (Earth-to-space) 5.266 5.267		Maritime (EPIRBs) (80V) Aviation (ELTs) (87F) Personal Radio (95)
406.1-410 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149			406.1-410 FIXED MOBILE RADIO ASTRONOMY US74 US13 US117 G5 G6	406.1-410 RADIO ASTRONOMY US74 US13 US117	Private Land Mobile (90)
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 US64 G5	410-420 US13 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 5.286 US64 US87 US230 US269 US270 US397 G8	420-450 Amateur US270 5.282 5.286 US64 US87 US230 US269 US397	Private Land Mobile (90) MedRadio (95I) Amateur Radio (97)
430-432 AMATEUR RADIOLOCATION 5.271 5.274 5.275 5.276 5.277	430-432 RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279				
432-438 AMATEUR RADIOLOCATION Earth exploration-satellite (active) 5.279A 5.138 5.271 5.276 5.277 5.280 5.281 5.282	432-438 RADIOLOCATION Amateur Earth exploration-satellite (active) 5.279A 5.271 5.276 5.277 5.278 5.279 5.281 5.282				
438-440 AMATEUR RADIOLOCATION 5.271 5.274 5.275 5.276 5.277 5.283	438-440 RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279				
440-450 FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271 5.284 5.285 5.286					
450-455 FIXED MOBILE 5.286AA 5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E			450-454 5.286 US64 US87	450-454 LAND MOBILE 5.286 US64 US87 NG112 NG124	Remote Pickup (74D) Low Power Auxiliary (74H) Private Land Mobile (90) MedRadio (95I)
			454-456 US64	454-455 FIXED LAND MOBILE US64 NG32 NG112 NG148	Public Mobile (22) Maritime (80) MedRadio (95I)
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		455-456 LAND MOBILE US64	Remote Pickup (74D) Low Power Auxiliary (74H) MedRadio (95I)

Table of Frequency Allocations — 456-894 MHz (UHF) — Page 29

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
456-459 FIXED MOBILE 5.286AA 5.271 5.287 5.288			456-459 5.287 US64 US288	456-460 FIXED LAND MOBILE 5.287 US64 US288 NG32 NG112 NG124 NG148	Public Mobile (22) Maritime (80) Private Land Mobile (90) MedRadio (95I)
459-460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460 FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	459-460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460		
460-470 FIXED MOBILE 5.286AA Meteorological-satellite (space-to-Earth) 5.287 5.288 5.289 5.290			460-470 Meteorological-satellite (space-to-Earth) 5.287 US73 US209 US288 US289	460-462.5375 FIXED LAND MOBILE US209 US289 NG124	Private Land Mobile (90)
				462.5375-462.7375 LAND MOBILE US289	Personal Radio (95)
				462.7375-467.5375 FIXED LAND MOBILE 5.287 US73 US209 US288 US289 NG124	Maritime (80) Private Land Mobile (90)
				467.5375-467.7375 LAND MOBILE 5.287 US288 US289	Maritime (80) Personal Radio (95)
				467.7375-470 FIXED LAND MOBILE US73 US288 US289 NG124	Maritime (80) Private Land Mobile (90)
470-790 BROADCASTING	470-512 BROADCASTING Fixed Mobile 5.292 5.293	470-585 FIXED MOBILE BROADCASTING 5.291 5.298	470-608	470-512 FIXED LAND MOBILE BROADCASTING NG5 NG14 NG66 NG115 NG149	Public Mobile (22) Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H) Private Land Mobile (90)
	512-608 BROADCASTING 5.297	585-610 FIXED MOBILE BROADCASTING RADIONAVIGATION 5.149 5.305 5.306 5.307		512-608 FIXED MOBILE BROADCASTING NG5 NG14 NG115 NG149	Wireless Communications (27) Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)
	608-614 RADIO ASTRONOMY Mobile-satellite except aeronautical mobile-satellite (Earth-to-space)	610-890 FIXED MOBILE 5.313A 5.317A BROADCASTING	608-614 LAND MOBILE (medical telemetry and medical telecommand) RADIO ASTRONOMY US74 US246		Personal Radio (95)

	614-698 BROADCASTING Fixed Mobile 5.293 5.309 5.311A		614-698	614-698 FIXED MOBILE BROADCASTING NG5 NG14 NG115 NG149	Wireless Communications (27) Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)
	698-806 MOBILE 5.313B 5.317A BROADCASTING Fixed		698-758	698-758 FIXED MOBILE BROADCASTING NG159	Wireless Communications (27) LPTV and TV Translator (74G)
			758-775	758-775 FIXED MOBILE NG34 NG159	Public Safety Land Mobile (90R)
5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.311A 5.312 5.312A			775-788	775-788 FIXED MOBILE BROADCASTING NG159	Wireless Communications (27) LPTV and TV Translator (74G)
790-862 FIXED MOBILE except aeronautical mobile 5.316B 5.317A BROADCASTING			788-805	788-805 FIXED MOBILE NG34 NG159	Public Safety Land Mobile (90R)
			805-806	805-806 FIXED MOBILE BROADCASTING NG159	Wireless Communications (27) LPTV and TV Translator (74G)
	5.293 5.309 5.311A				
	806-890 FIXED MOBILE 5.317A BROADCASTING		806-809	806-809 LAND MOBILE	Public Safety Land Mobile (90S)
			809-851	809-849 FIXED LAND MOBILE	Public Mobile (22) Private Land Mobile (90)
				849-851 AERONAUTICAL MOBILE	Public Mobile (22)
			851-854	851-854 LAND MOBILE	Public Safety Land Mobile (90S)
5.312 5.314 5.315 5.316 5.316A 5.319			854-890	854-894 FIXED LAND MOBILE	Public Mobile (22) Private Land Mobile (90)
862-890 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322					
5.319 5.323	5.317 5.318	5.149 5.305 5.306 5.307 5.311A 5.320		US116 US268	Page 30

Table of Frequency Allocations — 894-1400 MHz (UHF) — Page 31

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
890-942 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 Radiolocation	890-902 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation 5.318 5.325	890-942 FIXED MOBILE 5.317A BROADCASTING Radiolocation	890-902 US116 US268 G2	(See previous page)	
				894-896 AERONAUTICAL MOBILE US116 US268	Public Mobile (22)
				896-901 FIXED LAND MOBILE US116 US268	Private Land Mobile (90)
				901-902 FIXED MOBILE US116 US268	Personal Communications (24)
	902-928 FIXED Amateur Mobile except aeronautical mobile 5.325A Radiolocation 5.150 5.325 5.326		902-928 RADIOLOCATION G59 5.150 US218 US267 US275 G11	902-928 5.150 US218 US267 US275	ISM Equipment (18) Private Land Mobile (90) Amateur Radio (97)
	928-942 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation		928-932 US116 US268 G2	928-929 FIXED US116 US268 NG35	Public Mobile (22) Private Land Mobile (90) Fixed Microwave (101)
				929-930 FIXED LAND MOBILE US116 US268	Private Land Mobile (90)
				930-931 FIXED MOBILE US116 US268	Personal Communications (24)
				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)
			935-941 US116 US268 G2	935-940 FIXED LAND MOBILE US116 US268	Private Land Mobile (90)
				940-941 FIXED MOBILE US116 US268	Personal Communications (24)

5.323	5.325	5.327	941-944 FIXED US268 US301 G2	941-944 FIXED US268 US301 NG30 NG35	Public Mobile (22) Aural Broadcast Auxiliary (74E) Fixed Microwave (101)
942-960 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 5.323	942-960 FIXED MOBILE 5.317A	942-960 FIXED MOBILE 5.317A BROADCASTING 5.320	944-960	944-960 FIXED NG35	Public Mobile (22) Aural Broadcast Auxiliary (74E) Low Power Auxiliary (74H) Fixed Microwave (101)
960-1164 AERONAUTICAL MOBILE (R) 5.327A AERONAUTICAL RADIONAVIGATION 5.328			960-1164 AERONAUTICAL MOBILE (R) 5.327A AERONAUTICAL RADIONAVIGATION 5.328 US224		Aviation (87)
1164-1215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.328A			1164-1215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328A US224		
1215-1240 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) 5.330 5.331 5.332			1215-1240 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G56 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) G132 SPACE RESEARCH (active) 5.332	1215-1240 Earth exploration-satellite (active) Space research (active)	
1240-1300 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) Amateur 5.282 5.330 5.331 5.332 5.335 5.335A			1240-1300 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G56 SPACE RESEARCH (active) AERONAUTICAL RADIONAVIGATION 5.332 5.335	1240-1300 AERONAUTICAL RADIONAVIGATION Amateur Earth exploration-satellite (active) Space research (active) 5.282	Amateur Radio (97)
1300-1350 RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.337 RADIONAVIGATION-SATELLITE (Earth-to-space) 5.149 5.337A			1300-1350 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation G2 US342	1300-1350 AERONAUTICAL RADIONAVIGATION 5.337 US342	Aviation (87)
1350-1400 FIXED MOBILE RADIOLOCATION 5.149 5.338 5.338A 5.339	1350-1400 RADIOLOCATION 5.338A 5.149 5.334 5.339		1350-1390 FIXED MOBILE RADIOLOCATION G2 5.334 5.339 US342 US385 G27 G114	1350-1390 5.334 5.339 US342 US385	
			1390-1395 5.339 US79 US342 US385	1390-1395 FIXED MOBILE except aeronautical mobile 5.339 US79 US342 US385 NG338A	Wireless Communications (27)
			1395-1400 LAND MOBILE (medical telemetry and medical telecommand) 5.339 US79 US342 US385		Personal Radio (95)

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
1400-1427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341			1400-1427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) 5.341 US246		
1427-1429 SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 5.338A 5.341			1427-1429.5 LAND MOBILE (medical telemetry and medical telecommand) US350 5.341 US79	1427-1429.5 LAND MOBILE (telemetry and telecommand) Fixed (telemetry) 5.341 US79 US350 NG338A	Private Land Mobile (90) Personal Radio (95)
1429-1452 FIXED MOBILE except aeronautical mobile 5.338A 5.341 5.342	1429-1452 FIXED MOBILE 5.343 5.338A 5.341		1429.5-1432 5.341 US79 US350	1429.5-1432 FIXED (telemetry and telecommand) LAND MOBILE (telemetry and telecommand) 5.341 US79 US350 NG338A	
			1432-1435 5.341 US83	1432-1435 FIXED MOBILE except aeronautical mobile 5.341 US83 NG338A	Wireless Communications (27)
1452-1492 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.342 5.345	1452-1492 FIXED MOBILE 5.343 BROADCASTING BROADCASTING-SATELLITE 5.208B 5.341 5.344 5.345		1435-1525 MOBILE (aeronautical telemetry) US338A 5.341 US343		Aviation (87)
1492-1518 FIXED MOBILE except aeronautical mobile 5.341 5.342	1492-1518 FIXED MOBILE 5.343 5.341 5.344	1492-1518 FIXED MOBILE 5.341			
1518-1525 FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A 5.341 5.342	1518-1525 FIXED MOBILE 5.343 MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A 5.341 5.344	1518-1525 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.351A 5.341			

1525-1530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A Earth exploration-satellite Mobile except aeronautical mobile 5.349 5.341 5.342 5.350 5.351 5.352A 5.354	1525-1530 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354	1525-1530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A Earth exploration-satellite Mobile 5.349 5.341 5.351 5.352A 5.354	1525-1535 MOBILE-SATELLITE (space-to-Earth) US315 US380 5.341 5.351	Satellite Communications (25) Maritime (80)
1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A Earth exploration-satellite Fixed Mobile except aeronautical mobile 5.341 5.342 5.351 5.354	1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354			
1535-1559 MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A			1535-1559 MOBILE-SATELLITE (space-to-Earth) US308 US309 US315 US380 5.341 5.351 5.356	Satellite Communications (25) Maritime (80) Aviation (87)
1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.208B 5.328B 5.329A 5.341 5.362B 5.362C			1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.341 US85 US208 US260	Aviation (87)
1610-1610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION 5.341 5.355 5.359 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 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) 5.149 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) US319 US380 RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.372 US208 US342	
1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) US319 US380 AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.341 5.364 5.365 5.366 5.367 5.368 5.372 US208	

International Table			United States Table		FCC Rule Part(s)
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1626.5-1660 MOBILE-SATELLITE (Earth-to-space) 5.351A 5.341 5.351 5.353A 5.354 5.355 5.357A 5.359 5.362A 5.374 5.375 5.376			1626.5-1660 MOBILE-SATELLITE (Earth-to-space) US308 US309 US315 US380 5.341 5.351 5.375		Satellite Communications (25) Maritime (80) Aviation (87)
1660-1660.5 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY 5.149 5.341 5.351 5.354 5.362A 5.376A			1660-1660.5 MOBILE-SATELLITE (Earth-to-space) US308 US309 US380 RADIO ASTRONOMY 5.341 5.351 US342		Satellite Communications (25) Aviation (87)
1660.5-1668 RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A			1660.5-1668.4 RADIO ASTRONOMY US74 SPACE RESEARCH (passive) 5.341 US246		
1668-1668.4 MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A					
1668.4-1670 METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.379C RADIO ASTRONOMY 5.149 5.341 5.379D 5.379E			1668.4-1670 METEOROLOGICAL AIDS (radiosonde) RADIO ASTRONOMY US74 5.341 US99 US342		
1670-1675 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.341 5.379D 5.379E 5.380A			1670-1675 5.341 US211 US362	1670-1675 FIXED MOBILE except aeronautical mobile 5.341 US211 US362	Wireless Communications (27)
1675-1690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341			1675-1695 METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (space-to-Earth) US88 5.341 US211 US289		
1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile 5.289 5.341 5.382	1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341 5.381		1695-1710 METEOROLOGICAL-SATELLITE (space-to-Earth) US88	1695-1710 FIXED MOBILE except aeronautical mobile	Wireless Communications (27)

1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341		1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341 5.384	5.341	5.341 US88	
1710-1930 FIXED MOBILE 5.384A 5.388A 5.388B 5.149 5.341 5.385 5.386 5.387 5.388			1710-1761 5.341 US91 US378 US385	1710-1780 FIXED MOBILE 5.341 US91 US378 US385	
			1761-1780 SPACE OPERATION (Earth-to-space) G42 US91		
			1780-1850 FIXED MOBILE SPACE OPERATION (Earth-to-space) G42	1780-1850	
1930-1970 FIXED MOBILE 5.388A 5.388B 5.388	1930-1970 FIXED MOBILE 5.388A 5.388B Mobile-satellite (Earth-to-space) 5.388	1930-1970 FIXED MOBILE 5.388A 5.388B 5.388	1850-2025	1850-2000 FIXED MOBILE	RF Devices (15) Personal Communications (24) Wireless Communications (27) Fixed Microwave (101)
1970-1980 FIXED MOBILE 5.388A 5.388B 5.388					
1980-2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F					
2010-2025 FIXED MOBILE 5.388A 5.388B 5.388	2010-2025 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.388 5.389C 5.389E	2010-2025 FIXED MOBILE 5.388A 5.388B 5.388		2000-2020 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)	Satellite Communications (25) Wireless Communications (27)
				2020-2025 FIXED MOBILE	
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) 5.392			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) FIXED MOBILE 5.391 5.392 US90 US92 US222 US346 US347	2025-2110 FIXED NG118 MOBILE 5.391 5.392 US90 US92 US222 US346 US347	TV Auxiliary Broadcasting (74F) Cable TV Relay (78) Local TV Transmission (101J)

International Table			United States Table		FCC Rule Part(s)
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2110-2120 FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space) 5.388			2110-2120 US252	2110-2120 FIXED MOBILE US252	Public Mobile (22) Wireless Communications (27) Fixed Microwave (101)
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	
2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F				2180-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)	Satellite Communications (25)
2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392			2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED (line-of-sight only) MOBILE (line-of-sight only including aeronautical telemetry, but excluding flight testing of manned aircraft) 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392 US303	2200-2290 US303	
2290-2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)			2290-2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)	2290-2300 SPACE RESEARCH (deep space) (space-to-Earth)	
2300-2450 FIXED MOBILE 5.384A Amateur Radiolocation	2300-2450 FIXED MOBILE 5.384A RADIOLOCATION Amateur		2300-2305 G122	2300-2305 Amateur	Amateur Radio (97)
			2305-2310 US97 G122	2305-2310 FIXED MOBILE except aeronautical mobile RADIOLOCATION Amateur US97	Wireless Communications (27) Amateur Radio (97)

		2310-2320 Fixed Mobile US100 Radiolocation G2 US97 US327	2310-2320 FIXED MOBILE BROADCASTING-SATELLITE RADIOLOCATION 5.396 US97 US100 US327	Wireless Communications (27)
		2320-2345 Fixed Radiolocation G2 US327	2320-2345 BROADCASTING-SATELLITE 5.396 US327	Satellite Communications (25)
		2345-2360 Fixed Mobile US100 Radiolocation G2 US327	2345-2360 FIXED MOBILE US100 BROADCASTING-SATELLITE RADIOLOCATION 5.396 US327	Wireless Communications (27)
		2360-2390 MOBILE US276 RADIOLOCATION G2 G120 Fixed US101	2360-2390 MOBILE US276 US101	Aviation (87) Personal Radio (95)
		2390-2395 MOBILE US276 US101	2390-2395 AMATEUR MOBILE US276 US101	Aviation (87) Personal Radio (95) Amateur Radio (97)
		2395-2400 US101 G122	2395-2400 AMATEUR US101	Personal Radio (95) Amateur Radio (97)
		2400-2417 5.150 G122	2400-2417 AMATEUR 5.150 5.282	ISM Equipment (18) Amateur Radio (97)
5.150 5.282 5.395	5.150 5.282 5.393 5.394 5.396	2417-2450 Radiolocation G2 5.150	2417-2450 Amateur 5.150 5.282	
2450-2483.5 FIXED MOBILE Radiolocation 5.150	2450-2483.5 FIXED MOBILE RADIOLOCATION 5.150	2450-2483.5 5.150 US41	2450-2483.5 FIXED MOBILE Radiolocation 5.150 US41	ISM Equipment (18) TV Auxiliary Broadcasting (74F) Private Land Mobile (90) Fixed Microwave (101)

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 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 Radiolocation 5.398A 5.150 5.399 5.401 5.402	2483.5-2500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 5.150 5.402	2483.5-2500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 5.150 5.401 5.402	2483.5-2500 MOBILE-SATELLITE (space-to-Earth) US319 US380 US391 RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 5.150 5.402 US41	2483.5-2495 MOBILE-SATELLITE (space-to-Earth) US380 RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 5.150 5.402 US41 US319 NG147	ISM Equipment (18) Satellite Communications (25)
				2495-2500 FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) US380 RADIODETERMINATION-SATELLITE (space-to-Earth) 5.398 5.150 5.402 US41 US319 US391 NG147	ISM Equipment (18) Satellite Communications (25) Wireless Communications (27)
2500-2520 FIXED 5.410 MOBILE except aeronautical mobile 5.384A 5.412	2500-2520 FIXED 5.410 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A 5.404	2500-2520 FIXED 5.410 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 5.404 5.415A	2500-2655 5.339 US205	2500-2655 FIXED US205 MOBILE except aeronautical mobile 5.339	Wireless Communications (27)
2520-2655 FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.412 5.417C 5.417D 5.418B 5.418C	2520-2655 FIXED 5.410 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.417C 5.417D 5.418B 5.418C	2520-2535 FIXED 5.410 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.403 5.414A 5.415A 2535-2655 FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.417A 5.417B 5.417C 5.417D 5.418 5.418A 5.418B 5.418C			
2655-2670 FIXED 5.410 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.208B 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412	2655-2670 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.208B	2655-2670 FIXED 5.410 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.208B 5.420	2655-2690 Earth exploration-satellite (passive) Radio astronomy US385 Space research (passive)	2655-2690 FIXED US205 MOBILE except aeronautical mobile Earth exploration-satellite (passive) Radio astronomy Space research (passive)	

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			2690-2700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) 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 RADIONAVIGATION 5.426 5.425 5.427			2900-3100 RADIOLOCATION 5.424A G56 MARITIME RADIONAVIGATION 5.427 US44 US316	2900-3100 MARITIME RADIONAVIGATION Radiolocation US44 5.427 US316	Maritime (80) Private Land Mobile (90)
3100-3300 RADIOLOCATION Earth exploration-satellite (active) Space research (active) 5.149 5.428			3100-3300 RADIOLOCATION G59 Earth exploration-satellite (active) Space research (active) US342	3100-3300 Earth exploration-satellite (active) Space research (active) Radiolocation US342	Private Land Mobile (90)
3300-3400 RADIOLOCATION 5.149 5.429 5.430	3300-3400 RADIOLOCATION Amateur Fixed Mobile 5.149	3300-3400 RADIOLOCATION Amateur 5.149 5.429	3300-3500 RADIOLOCATION US108 G2	3300-3500 Amateur Radiolocation US108	Private Land Mobile (90) Amateur Radio (97)
3400-3600 FIXED FIXED-SATELLITE (space-to-Earth) Mobile 5.430A Radiolocation 5.431	3400-3500 FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile 5.431A Radiolocation 5.433 5.282	3400-3500 FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile 5.432B Radiolocation 5.433 5.282 5.432 5.432A	US342	5.282 US342	

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			3550-3650 RADIOLOCATION G59 AERONAUTICAL RADIONAVIGATION (ground-based) G110 US105 US107 US245 US433	3550-3600 FIXED MOBILE except aeronautical mobile US105 US433	Citizens Broadband (96)
3600-4200 FIXED FIXED-SATELLITE (space-to-Earth) Mobile		3600-3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 5.433 5.435		3600-3650 FIXED FIXED-SATELLITE (space-to-Earth) US107 US245 MOBILE except aeronautical mobile US105 US433	Satellite Communications (25) Citizens Broadband (96)
			3650-3700 US109 US349	3650-3700 FIXED FIXED-SATELLITE (space-to-Earth) NG169 NG185 MOBILE except aeronautical mobile US109 US349	
	3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile		3700-4200	3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) NG180	Satellite Communications (25) Fixed Microwave (101)
4200-4400 AERONAUTICAL RADIONAVIGATION 5.438 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 5.442 Radio astronomy 5.149 5.339 5.443			US113 US245 US342	4800-4940 US113 US342	
			4940-4990 5.339 US342 US385 G122	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) 5.149			4990-5000 RADIO ASTRONOMY US74 Space research (passive) US246		

5000-5010 AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (Earth-to-space)	5000-5010 AERONAUTICAL RADIONAVIGATION US260 RADIONAVIGATION-SATELLITE (Earth-to-space) US211 US367		Aviation (87)
5010-5030 AERONAUTICAL MOBILE-SATELLITE (R) 5.443AA AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.443B	5010-5030 AERONAUTICAL RADIONAVIGATION US260 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.443B US211 US367		
5030-5091 AERONAUTICAL MOBILE (R) 5.443C AERONAUTICAL MOBILE-SATELLITE (R) 5.443D AERONAUTICAL RADIONAVIGATION 5.444	5030-5091 AERONAUTICAL RADIONAVIGATION US260 5.444 US211 US367		
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International Footnotes

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

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

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

5.54B *Additional allocation:* In Algeria, Saudi Arabia, Egypt, the United Arab Emirates, the Russian Federation, Iraq, Lebanon, Morocco, Qatar, the Syrian Arab Republic, Sudan and Tunisia, the frequency band 8.3–9 kHz is also allocated to the radionavigation, fixed and mobile services on a primary basis. (WRC–12)

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

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

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

5.68 *Alternative allocation:* In Angola, Congo (Rep. of the), the Dem. Rep. of the Congo and South Africa, the band 160–200 kHz is allocated to the fixed service on a primary basis. (WRC–12)

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

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

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

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

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

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

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5.93 *Additional allocation:* In Angola, Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Mongolia, Nigeria, Uzbekistan, Poland, Kyrgyzstan, Slovakia, Tajikistan, Chad, Turkmenistan and Ukraine, the bands 1625–1635 kHz, 1800–1810 kHz and 2160–2170 kHz are also allocated to the fixed and land mobile services on a primary basis, subject to agreement obtained under No. 9.21. (WRC–12)

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5.98 *Alternative allocation:* In Angola, 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, Turkey and Ukraine, the band 1810–1830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC–12)

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

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

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

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

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

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5.128 Frequencies in the bands 4063–4123 kHz and 4130–4438 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W, on condition that harmful interference is not caused to the maritime mobile service. In addition, in Afghanistan, Argentina, Armenia, Azerbaijan, Belarus, Botswana, Burkina Faso, the Central African Rep., China, the Russian Federation, Georgia, India, Kazakhstan, Mali, Niger, Pakistan, Kyrgyzstan, Tajikistan, Chad, Turkmenistan and Ukraine, in the bands 4063–4123 kHz, 4130–4133 kHz and 4408–4438 kHz, stations in the fixed service, with a mean power not exceeding 1 kW, can be operated on condition that they are situated at least 600 km from the coast and that harmful interference is not caused to the maritime mobile service. (WRC–12)

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

5.132B *Alternative allocation:* In Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 4438–4488 kHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. (WRC–12)

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

5.133A *Alternative allocation:* In Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency bands 5250–5275 kHz and 26200–26350 kHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC–12)

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5.140 *Additional allocation:* In Angola, Iraq, Kenya, Somalia and Togo, the band 7000–7050 kHz is also allocated to the fixed service on a primary basis. (WRC–12)

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

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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, Indonesia, Iran (Islamic Republic of), Japan, Jordan, Kuwait, Libya, Morocco, Mauritania, Niger, New Zealand, Oman, Papua New Guinea, Qatar, the Syrian Arab Republic, Singapore, Sudan, South Sudan, Tunisia, Viet Nam and Yemen, the band 7100–7200 kHz is also allocated to the fixed and the mobile, except aeronautical mobile (R), services on a primary basis. (WRC–12)

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

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

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

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

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

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

5.145B *Alternative allocation:* in Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency bands 9305–9355 kHz and 16100–16200 kHz are allocated to the fixed service on a primary basis. (WRC–12)

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5.149A *Alternative allocation:* In Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 13450–13550 kHz is allocated to the fixed service on a primary basis and to the mobile, except aeronautical mobile (R), service on a secondary basis. (WRC–12)

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5.158 *Alternative allocation:* In Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 24450–24600 kHz is allocated to the fixed and land mobile services on a primary basis. (WRC–12)

5.159 *Alternative allocation:* In Armenia, Austria, Belarus, Moldova, Uzbekistan and Kyrgyzstan, the frequency band 39–39.5 MHz is allocated to the fixed and mobile services on a primary basis. (WRC–12)

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

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

5.161B *Alternative allocation:* In Albania, Germany, Armenia, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Cyprus, Vatican, Croatia, Denmark, Spain, Estonia, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Rep. of Macedonia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Norway, Uzbekistan, Netherlands, Poland, Portugal, Kyrgyzstan, Slovakia, Czech Rep., Romania, United Kingdom, San Marino, Slovenia, Sweden, Switzerland, Turkey and Ukraine, the frequency band 42–42.5 MHz is allocated to the fixed and mobile services on a primary basis. (WRC–12)

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

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

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

5.164 *Additional allocation:* In Albania, Algeria, Germany, Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Côte d'Ivoire, Denmark, Spain, Estonia, Finland, France, Gabon, Greece, Ireland, Israel, Italy, Jordan, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Montenegro, Nigeria, Norway, the Netherlands, Poland, Syrian Arab Republic, Slovakia, Czech Rep., Romania, the United Kingdom, Serbia, Slovenia, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the band 47–68 MHz, in South Africa the band 47–50 MHz, and in Latvia the band 48.5–56.5 MHz, are also allocated to the land mobile service on a primary basis. However, stations of the land mobile service in the countries mentioned in connection with each 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 band. (WRC–12)

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

5.166 *Alternative allocation:* In New Zealand, the band 50–51 MHz is allocated to the fixed and mobile services on a primary basis; the band 53–54 MHz is allocated to the fixed and mobile services on a primary basis. (WRC–12)

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

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

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

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

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

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

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5.201 *Additional allocation:* In Angola, Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq (Republic of), Japan, Kazakhstan, Latvia, Moldova, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the band 132–136 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC–12)

5.202 *Additional allocation:* In Saudi Arabia, Armenia, Azerbaijan, Belarus, Bulgaria, the United Arab Emirates, the Russian Federation, Georgia, Iran (Islamic Republic of), Jordan, Latvia, Oman, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the band 136–137 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service. (WRC–12)

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5.211 *Additional allocation:* In Germany, Saudi Arabia, Austria, Bahrain, Belgium, Denmark, the United Arab Emirates, Spain, Finland, Greece, Ireland, Israel, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lebanon, Liechtenstein, Luxembourg, Mali, Malta, Montenegro, Norway, the Netherlands, Qatar, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sweden, Switzerland, Tanzania, Tunisia and Turkey, the band 138–144 MHz is also allocated to the maritime mobile and land mobile services on a primary basis. (WRC–12)

5.212 *Alternative allocation:* In Angola, Botswana, Cameroon, the Central African Rep., Congo (Rep. of the), Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Lesotho, Liberia, Libya, Malawi, Mozambique, Namibia, Niger, Oman, Uganda, Syrian Arab Republic, the Dem. Rep. of the Congo, Rwanda, Sierra Leone, South Africa, Swaziland, Chad, Togo, Zambia and Zimbabwe, the band 138–144 MHz is allocated to the fixed and mobile services on a primary basis. (WRC–12)

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

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5.221 Stations of the mobile-satellite service in the band 148–149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Croatia, Cuba, Denmark, Djibouti, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, the Russian Federation, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland, Iceland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Montenegro, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, the Philippines, Poland, Portugal, Qatar, the Syrian Arab Republic, Kyrgyzstan, Dem. People's Rep. of Korea, Slovakia, Romania, the United Kingdom, Senegal, Serbia, Sierra Leone, Singapore, Slovenia, Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia and Zimbabwe. (WRC–12)

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

m above ground level in the 25 kHz reference frequency band at the border of the territory of any other administration shall be used. For the identification of potentially affected administrations in Region 3, the interference-to-noise ratio ($I/$ -161 dBW/4 kHz), or -10 dB for applications with greater protection requirements, such as public protection and disaster relief (PPDR ($N = -161$ dBW/4 kHz)), for 1% of the time produced at 60 m above ground level at the border of the territory of any other administration shall be used. In the frequency bands 156.7625–156.8375 MHz, 156.5125–156.5375 MHz, 161.9625–161.9875 MHz, 162.0125–162.0375 MHz, out-of-band e.i.r.p. of space surveillance radars shall not exceed -16 dBW. Frequency assignments to the radiolocation service under this allocation in Ukraine shall not be used without the agreement of Moldova. (WRC–12)

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

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

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

5.228C The use of the frequency bands 161.9625–161.9875 MHz and 162.0125–162.0375 MHz by the maritime mobile service and the mobile-satellite (Earth-to-space) service is limited to the automatic identification system (AIS). The use of these frequency bands by the aeronautical mobile (OR) service is limited to AIS emissions from search and rescue aircraft operations. The AIS operations in these frequency bands shall not constrain the development and use of the fixed and mobile services operating in the adjacent frequency bands. (WRC–12)

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

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

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

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

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

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

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

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

5.275 *Additional allocation:* In Croatia, Estonia, Finland, Libya, The Former Yugoslav Republic of Macedonia, Montenegro, Serbia and Slovenia, the bands 430–432 MHz and 438–440 MHz are also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC–07)

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, Tanzania, Thailand, Togo, Turkey and Yemen, the band 430–440 MHz is also allocated to the fixed service on a primary basis and the bands 430–435 MHz and 438–440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis. (WRC–12)

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

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5.286AA The band 450–470 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). See Resolution 224 (Rev.WRC–12). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (FCC)

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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.1174–2. (WRC–03)

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

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5.293 *Different category of service:* In Canada, Chile, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the 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 Canada, Chile, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the 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 band 470–512 MHz to the fixed and mobile services is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC–12)

5.294 *Additional allocation:* In Saudi Arabia, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Israel, Kenya, Libya, the Syrian Arab Republic, South Sudan, Chad and Yemen, the band 470–582 MHz is also allocated to the fixed service on a secondary basis. (WRC–12)

5.296 *Additional allocation:* In Albania, Germany, Saudi Arabia, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Burkina Faso, Cameroon, Congo (Rep. of the), Côte d'Ivoire, Croatia, Denmark, Djibouti, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Gabon, Ghana, Iraq, Ireland, Iceland, Israel, Italy, Jordan, Kuwait, Latvia, The Former Yugoslav Republic of Macedonia, Libya, Liechtenstein, Lithuania, Luxembourg, Mali, Malta, Morocco, Moldova, Monaco, Niger, Norway, Oman, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Slovakia, the Czech Republic, the United Kingdom, Sudan, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the band 470–790 MHz, and in Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Tanzania, Zambia and Zimbabwe, the band 470–698 MHz are also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote. (WRC–12)

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5.300 *Additional allocation:* In Saudi Arabia, Cameroon, Egypt, United Arab Emirates, Israel, Jordan, Libya, Oman, Qatar, the Syrian Arab Republic, Sudan and South Sudan, the band 582–790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC–12)

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5.312 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 645–862 MHz, in Bulgaria the bands 646–686 MHz, 726–758 MHz, 766–814 MHz and 822–862 MHz, in Romania the band 830–862 MHz, and in Poland, the band 830–860 MHz until 31 December 2012 and the band 860–862 MHz until 31 December 2017, are also allocated to the aeronautical radionavigation service on a primary basis. (WRC–12)

5.312A In Region 1, the use of the band 694–790 MHz by the mobile, except aeronautical mobile, service is subject to the provisions of Resolution 232 (WRC–12). See also Resolution 224 (Rev. WRC–12). (WRC–12)

5.313A The band, or portions of the band 698–790 MHz, in Bangladesh, China, Korea (Rep. of), India, Japan, New Zealand, Pakistan, Papua New Guinea, Philippines and Singapore are identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. In China, the use of IMT in this band will not start until 2015. (WRC–12)

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5.314 *Additional allocation:* in Austria, Italy, Moldova, Uzbekistan, Kyrgyzstan and the United Kingdom, the band 790–862 MHz is also allocated to the land mobile service on a secondary basis. (WRC–12)

5.315 *Alternative allocation:* in Greece, the band 790–838 MHz is allocated to the broadcasting service on a primary basis. (WRC–12)

5.316 *Additional allocation:* in Germany, Saudi Arabia, Bosnia and Herzegovina, Burkina Faso, Cameroon, Côte d'Ivoire, Croatia, Denmark, Egypt, Finland, Greece, Israel, Jordan, Kenya, Libya, The Former Yugoslav Republic of Macedonia, Liechtenstein, Mali, Monaco, Montenegro, Norway, the Netherlands, Portugal, the United Kingdom, the Syrian Arab Republic, Serbia, Sweden and Switzerland, the band 790–830 MHz, and in these same countries and in Spain, France, Gabon and Malta, the band 830–862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis. However, stations of the mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, stations of services operating in accordance with the Table in countries other than those mentioned in connection with the band. This allocation is effective until 16 June 2015. (WRC–07)

5.316A *Additional allocation:* in Spain, France, Gabon and Malta, the band 790–830 MHz, in Albania, Angola, Bahrain, Benin, Botswana, Burundi, Congo (Rep. of the), Egypt, United Arab Emirates, Estonia, Gambia, Ghana, Guinea, Guinea-Bissau, Hungary, Iraq, Kuwait, Lesotho, Latvia, Lebanon, Lithuania, Luxembourg, Malawi, Morocco, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Uganda, Poland, Qatar, Slovakia, Czech Rep., Romania, Rwanda, Senegal, Sudan, South Sudan, South Africa, Swaziland, Tanzania, Chad, Togo, Yemen, Zambia, Zimbabwe and French overseas departments and communities of Region 1, the band 790–862 MHz and in Georgia, the band 806–862 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis subject to the agreement by the administrations concerned obtained under No. 9.21 and under the GE06 Agreement, as appropriate, including those administrations mentioned in No. 5.312 where appropriate. See Resolutions 224 (Rev. WRC–12) and 749 (Rev. WRC–12). This allocation is effective until 16 June 2015. (WRC–12)

5.316B In Region 1, the allocation to the mobile, except aeronautical mobile, service on a primary basis in the frequency band 790–862 MHz shall come into effect from 17 June 2015 and shall be 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–12) and 749 (Rev. WRC–12) shall apply, as appropriate. (WRC–12)

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5.317A Those parts of the band 698–960 MHz in Region 2 and the band 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–12) and 749 (Rev. WRC–12), as appropriate. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC–12)

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

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

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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–12). (WRC–12)

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

5.331 *Additional allocation:* in Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, China, Korea (Rep. of), Croatia, Denmark, Egypt, the United Arab Emirates, Estonia, the Russian Federation, Finland, France, Ghana, Greece, Guinea, Equatorial

Guinea, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Jordan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritania, Montenegro, Nigeria, Norway, Oman, Pakistan, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the United Kingdom, Serbia, Slovenia, Somalia, Sudan, South Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the band 1215–1300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the band 1240–1300 MHz is also allocated to the radionavigation service, and use of the radionavigation service shall be limited to the aeronautical radionavigation service. (WRC–12)

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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.

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

5.338A In the bands 1350–1400 MHz, 1427–1452 MHz, 22.55–23.55 GHz, 30–31.3 GHz, 49.7–50.2 GHz, 50.4–50.9 GHz, 51.4–52.6 GHz, 81–86 GHz and 92–94 GHz, Resolution 750 (Rev. WRC–12) applies. (WRC–12)

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5.342 *Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Uzbekistan, Kyrgyzstan and Ukraine, the band 1429–1535 MHz, and in Bulgaria the band 1525–1535 MHz, are 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 band 1452–1492 MHz is subject to agreement between the administrations concerned. (WRC–12)

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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–07) and 225 (Rev. WRC–12). (FCC)

5.352A In the band 1525–1530 MHz, stations in the mobile-satellite service, except stations in the maritime mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed service in Algeria, Saudi Arabia, Egypt, France and French overseas communities of Region 3, Guinea, India, Israel, Italy, Jordan, Kuwait, Mali, Morocco, Mauritania, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Tanzania, Viet Nam and Yemen notified prior to 1 April 1998. (WRC–12)

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

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

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

5.359 *Additional allocation:* in Germany, Saudi Arabia, Armenia, Austria, Azerbaijan, Belarus, Benin, Cameroon, the Russian Federation, France, Georgia, Greece, 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, Tanzania, Tunisia, Turkmenistan and Ukraine, the 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 bands. (WRC–12)

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5.362B *Additional allocation:* The band 1559–1610 MHz is also allocated to the fixed service on a secondary basis in Algeria, Saudi Arabia, Armenia, Azerbaijan, Belarus, Benin, Cameroon, Russian Federation, Gabon, Georgia, Guinea, Guinea-Bissau, Jordan, Kazakhstan, Libya, Lithuania, Mali, Mauritania, Nigeria, Uzbekistan, Pakistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Dem. People's Rep. of Korea, Romania, Senegal, Tajikistan, Tanzania, Tunisia, Turkmenistan and Ukraine until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band. (WRC–12)

5.362C *Additional allocation:* in Congo (Rep. of the), Eritrea, Iraq, Israel, Jordan, Qatar, the Syrian Arab Republic, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the band 1559–1610 MHz is also allocated to the fixed service on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and not authorize new frequency assignments to fixed-service systems in this band. (WRC–12)

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

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

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

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

5.382 *Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Guinea, Iraq, Israel, Jordan, Kazakhstan, Kuwait, the Former Yugoslav Republic of Macedonia, Lebanon, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Tanzania, Turkmenistan, Ukraine and

Yemen, the allocation of the 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 band 1690–1700 MHz to the fixed service is on a primary basis (see No. 5.33) and to the mobile, except aeronautical mobile, service on a secondary basis. (WRC–12)

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5.384A The bands, or portions of the bands, 1710–1885 MHz, 2300–2400 MHz and 2500–2690 MHz, are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution 223 (Rev. WRC–12). This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (FCC)

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

5.388 The 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 bands by other services to which they are allocated. The bands should be made available for IMT in accordance with Resolution 212 (Rev. WRC–07). (See also Resolution 223 (Rev. WRC–12).) (WRC–12) (FCC)

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

5.388B In Algeria, Saudi Arabia, Bahrain, Benin, Burkina Faso, Cameroon, Comoros, Côte d'Ivoire, China, Cuba, Djibouti, Egypt, United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, India, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Libya, Mali, Morocco, Mauritania, Nigeria, Oman, Uganda, Pakistan, Qatar, the Syrian Arab Republic, Senegal, Singapore, Sudan, South Sudan, Tanzania, Chad, Togo, Tunisia, Yemen, Zambia and Zimbabwe, for the purpose of protecting fixed and mobile services, including IMT mobile stations, in their territories from co-channel interference, a high altitude platform station (HAPS) operating as an IMT base station in neighbouring countries, in the bands referred to in No. 5.388A, shall not exceed a co-channel power flux-density of -127 dB(W/(m^2 · MHz)) at the Earth's surface outside a country's borders unless explicit agreement of the affected administration is provided at the time of the notification of HAPS. (WRC–12)

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

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

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

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

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

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

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

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5.418 *Additional allocation:* in Korea (Rep. of), India, Japan and Thailand, the 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–03). The provisions of No. 5.416 and Table 21–4 of Article 21, do not apply to this additional allocation. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) is subject to Resolution 539 (Rev. WRC–03). 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 band 2630–2655 MHz, and for which complete Appendix 4 coordination information has been received after 1 June 2005, shall not exceed the following limits, for all conditions and for all methods of modulation:

-130 dB (W/(m^2 · MHz)) for $0° \leq \theta \leq 5°$

$-130 + 0.4\ (\theta - 5)$ dB (W/(m^2 · MHz)) for $5° < \theta \leq 25°$

-122 dB (W/(m^2 · MHz)) for $25° < \theta \leq 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. As an exception to the limits above, the pfd value of -122 dB(W/(m^2 · MHz)) shall be used as a threshold for coordination under No. 9.11 in an area of 1500 km around the territory of the administration notifying the broadcasting-satellite service (sound) system.

In addition, an administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. 5.416 for systems for which complete Appendix 4 coordination information has been received after 1 June 2005. (WRC–12)

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

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5.428 *Additional allocation:* in Azerbaijan, Mongolia, Kyrgyzstan and

Turkmenistan, the band 3100–3300 MHz is also allocated to the radionavigation service on a primary basis. (WRC–12)

5.429 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Oman, Uganda, Pakistan, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea and Yemen, the band 3300–3400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service. (WRC–12)

5.430 *Additional allocation:* In Azerbaijan, Mongolia, Kyrgyzstan and Turkmenistan, the band 3300–3400 MHz is also allocated to the radionavigation service on a primary basis. (WRC–12)

5.430A *Different category of service:* In Albania, Algeria, Germany, Andorra, Saudi Arabia, Austria, Azerbaijan, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cameroon, Cyprus, Vatican, Congo (Rep. of the), Côte d'Ivoire, Croatia, Denmark, Egypt, Spain, Estonia, Finland, France and French overseas departments and communities in Region 1, Gabon, Georgia, Greece, Guinea, Hungary, Ireland, Iceland, Israel, Italy, Jordan, Kuwait, Lesotho, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Malawi, Mali, Malta, Morocco, Mauritania, Moldova, Monaco, Mongolia, Montenegro, Mozambique, Namibia, Niger, Norway, Oman, Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Slovakia, Czech Rep., Romania, United Kingdom, San Marino, Senegal, Serbia, Sierra Leone, Slovenia, South Africa, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia, Turkey, Ukraine, Zambia and Zimbabwe, the band 3400–3600 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 band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a (base or mobile) station of the mobile service in this band, it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed -154.5 dB(W/(m^2 · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the band 3400–3600 MHz shall not claim more protection from space stations than that provided in Table 21–4 of the Radio Regulations (Edition of 2004). This allocation is effective from 17 November 2010. (WRC–12)

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5.431A *Different category of service:* In Argentina, Brazil, Chile, Costa Rica, Cuba, French overseas departments and communities in Region 2, Dominican Republic, El Salvador, Guatemala, Mexico, Paraguay, Suriname, Uruguay and Venezuela, the 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. Stations of the mobile service in the band 3400–3500 MHz shall not claim more protection from space stations than that provided in Table 21–4 of the Radio Regulations (Edition of 2004). (WRC–12)

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5.432B *Different category of service:* In Bangladesh, China, French overseas communities of Region 3, India, Iran (Islamic Republic of), New Zealand and Singapore, the 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 band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a (base or mobile) station of the mobile service in this band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed -154.5 dB(W/(m^2 · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station) with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the band 3400–3500 MHz shall not claim more protection from space stations than that provided in Table 21–4 of the Radio Regulations (Edition of 2004). This allocation is effective from 17 November 2010. (WRC–12)

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5.433A In Bangladesh, China, French overseas communities of Region 3, Korea (Rep. of), India, Iran (Islamic Republic of), Japan, New Zealand and Pakistan, the band 3500–3600 MHz is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. 9.17 and 9.18 also apply. Before an administration brings into use a (base or mobile) station of the mobile service in this band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed -154.5 dB (W/(m^2 · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the band 3500–3600 MHz shall not claim more protection from space stations than that provided in Table 21–4 of the Radio Regulations (Edition of 2004). (WRC–12)

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

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

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

5.443B In order not to cause harmful interference to the microwave landing system operating above 5030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5030–5150 MHz by all

the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5010–5030 MHz shall not exceed –124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4990–5000 MHz, radionavigation-satellite service systems operating in the band 5010–5030 MHz shall comply with the limits in the band 4990–5000 MHz defined in Resolution 741 (Rev. WRC–12). (WRC–12)

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

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

5.444 The frequency band 5030–5150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. In the frequency band 5030–5091 MHz, the requirements of this system shall have priority over other uses of this band. For the use of the frequency band 5091–5150 MHz, No. 5.444A and Resolution 114 (Rev. WRC–12) apply. (WRC–12)

5.444A *Additional allocation:* The band 5091–5150 MHz is also allocated to the fixed-satellite service (Earth-to-space) 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 coordination under No. 9.11A.

In the band 5091–5150 MHz, the following conditions also apply:

—prior to 1 January 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);

—after 1 January 2016, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems;

—after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service. (FCC)

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–12);

—aeronautical telemetry transmissions from aircraft stations (see No. 1.83) in accordance with Resolution 418 (Rev. WRC–12). (WRC–12)

5.446 *Additional allocation:* In the countries listed in No. 5.369, the 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, the 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 Nos. 5.369 and Bangladesh, the 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 bands 1610–1626.5 MHz and/or 2483.5–2500 MHz. The total power flux-density at the Earth's surface shall in no case exceed –159 dB (W/m²) in any 4 kHz band for all angles of arrival. (WRC–12)

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

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5.446C *Additional allocation:* In Region 1 (except in Algeria, Saudi Arabia, Bahrain, Egypt, United Arab Emirates, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Syrian Arab Republic, Sudan, South Sudan and Tunisia) and in Brazil, the band 5150–5250 MHz is also allocated to the aeronautical mobile service on a primary basis, limited to aeronautical telemetry transmissions from aircraft stations (see No. 1.83), in accordance with Resolution 418 (Rev. WRC–12). These stations shall not claim protection from other stations operating in accordance with Article 5. No. 5.43A does not apply. (WRC–12)

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

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

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

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

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5.453 *Additional allocation:* In Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Djibouti, Egypt, the United Arab Emirates, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Libya, Madagascar, Malaysia, Niger, Nigeria, Oman, Uganda, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sri Lanka, Swaziland, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the band 5650–5850 MHz is also allocated to the fixed and mobile services on a primary basis. In this case, the provisions of Resolution 229 (Rev. WRC–12) do not apply. (WRC–12)

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

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

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5.457B In the 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, South Sudan, Tunisia and Yemen, in the maritime mobile-satellite service on a secondary basis. Such use shall be in accordance with Resolution 902 (WRC–03). (WRC–12)

5.457C In Region 2 (except Brazil, Cuba, French overseas departments and communities, Guatemala, Paraguay, Uruguay and Venezuela), the 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, nor claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of this band by other mobile service applications or by other services to which this band is allocated on a co-primary basis and does not establish priority in the Radio Regulations. (WRC–07)

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5.461B The use of the band 7750–7900 MHz by the meteorological-satellite service

(space-to-Earth) is limited to non-geostationary satellite systems. (WRC–12)

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

—135 dB (W/m²) in a 1 MHz band for $0° \leq \theta < 5°$

—$135 + 0.5 (\theta - 5)$ dB (W/m²) in a 1 MHz band for $5° \leq \theta < 25°$

—125 dB (W/m²) in a 1 MHz band for $25° \leq \theta \leq 90°$ (WRC–12) (FCC)

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

5.468 *Additional allocation:* In Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, Congo (Rep. of the), Costa Rica, Djibouti, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Uganda, Pakistan, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Senegal, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad, Togo, Tunisia and Yemen, the band 8500–8750 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC–12)

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

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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, Sudan and South Sudan, the bands 8825–8850 MHz and 9000–9200 MHz are also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars only. (WRC–12)

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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, 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 band 9800–10000 MHz to the fixed service is on a primary basis (see No. 5.33). (WRC–12)

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5.481 *Additional allocation:* In Germany, Angola, Brazil, China, Costa Rica, Côte d'Ivoire, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Pakistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Romania, Tanzania, Thailand and Uruguay, the band 10.45–10.5 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC–12)

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

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

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5.494 *Additional allocation:* In Algeria, Angola, 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 band 12.5–12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC–12)

5.495 *Additional allocation:* In France, Greece, Monaco, Montenegro, Uganda, Romania, Tanzania and Tunisia, the band 12.5–12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC–12)

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

5.500 *Additional allocation:* In Algeria, Angola, 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 band 13.4–14 GHz is also allocated to the fixed and mobile services on a primary basis. In Pakistan, the band 13.4–13.75 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC–12)

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

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5.504C In the band 14–14.25 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, 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, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29. (WRC–12)

5.505 *Additional allocation:* In Algeria, Angola, Saudi Arabia, Bahrain, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Djibouti, Egypt, the United Arab Emirates, Gabon, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, South Sudan, Swaziland, Tanzania, Chad, Viet Nam and Yemen, the band 14–14.3 GHz is also allocated to the fixed service on a primary basis. (WRC–12)

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

5.508A In the band 14.25–14.3 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, 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, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29. (WRC–12)

5.509A In the band 14.3–14.5 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, 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, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29. (WRC–12)

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

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

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

5.512 *Additional allocation:* In Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Congo (Rep. of the), Costa Rica, 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, Serbia, Singapore, Somalia, Sudan, South Sudan, Tanzania, Chad, Togo and Yemen, the band 15.7–17.3 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC–12)

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5.514 *Additional allocation:* In Algeria, Angola, 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 band 17.3–17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. 21.3 and 21.5 shall apply. (WRC–12)

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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.

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5.524 *Additional allocation:* In Afghanistan, Algeria, Angola, 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, Tanzania, Chad, Togo and Tunisia, the 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 band 19.7–21.2 GHz and of space stations in the mobile-satellite service in the band 19.7–20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter band. (WRC–12)

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5.530A Unless otherwise agreed between the administrations concerned, any station in the fixed or mobile services of an administration shall not produce a power flux-density in excess of -120.4 dB(W/(m^2 · MHz)) at 3 m above the ground of any point of the territory of any other administration in Regions 1 and 3 for more than 20% of the time. In conducting the calculations, administrations should use the most recent version of Recommendation ITU–R P.452 (see Recommendation ITU–R BO.1898). (WRC–12)

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

5.530C The use of the band 21.4–22 GHz is subject to the provisions of Resolution 755 (WRC–12). (WRC–12)

5.530D See Resolution 555 (WRC–12). (WRC–12)

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

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

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

5.536B In Saudi Arabia, Austria, Belgium, Brazil, Bulgaria, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Estonia, Finland, Hungary, India, Iran (Islamic Republic of), Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Liechtenstein, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, the Syrian Arab Republic, Dem. People's Rep. of Korea, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Sweden, Switzerland, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the band 25.5–27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC–12)

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

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

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

limits specified in Nos. 21.3 and 21.5 shall apply. (WRC–12)

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

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

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

5.547 The bands 31.8–33.4 GHz, 37–40 GHz, 40.5–43.5 GHz, 51.4–52.6 GHz, 55.78–59 GHz and 64–66 GHz are available for high-density applications in the fixed service (see Resolution 75 (WRC–12)). Administrations should take this into account when considering regulatory provisions in relation to these bands. Because of the potential deployment of high-density applications in the fixed-satellite service in the bands 39.5–40 GHz and 40.5–42 GHz (see No. 5.516B), administrations should further take into account potential constraints to high-density applications in the fixed service, as appropriate. (FCC)

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

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

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

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

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

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

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

United States (US) Footnotes

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

(a) Except as provided for below, the use of the bands 161.9625–161.9875 MHz (AIS 1 with center frequency 161.975 MHz) and 162.0125–162.0375 MHz (AIS 2 with center frequency 162.025 MHz) by the maritime mobile and mobile-satellite (Earth-to-space) services is restricted to Automatic Identification Systems (AIS). The use of these bands by the aeronautical mobile (OR) service is restricted to AIS emissions from search and rescue aircraft operations. Frequencies in the AIS 1 band may continue to be used by non-Federal base, fixed, and land mobile stations until March 2, 2024.

(b) The frequency 156.3 MHz may also be used by aircraft stations for the purpose of search and rescue operations and other safety-related communications.

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

(1) Vessel traffic services under the control of the U.S. Coast Guard on a simplex basis by coast and ship stations on the frequencies 156.25, 156.55, 156.6 and 156.7 MHz;

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

(3) Navigational bridge-to-bridge and navigational communications on a simplex basis by coast and ship stations on the frequencies 156.375 and 156.65 MHz;

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

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

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

* * * * *

US74 In the bands 25.55–25.67, 73–74.6, 406.1–410, 608–614, 1400–1427, 1660.5–1670, 2690–2700, and 4990–5000 MHz, and in the bands 10.68–10.7, 15.35–15.4, 23.6–24.0, 31.3–31.5, 86–92, 100–102, 109.5–111.8, 114.25–116, 148.5–151.5, 164–167, 200–209, and 250–252 GHz, the radio astronomy service shall be protected from unwanted emissions only to the extent that such radiation exceeds the level which would be present if the offending station were operating in compliance with the technical standards or criteria applicable to the service in which it operates. Radio astronomy observations in these bands are performed at the locations listed in US385.

US79 In the bands 1390–1400 MHz and 1427–1432 MHz, the following provisions shall apply:

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

(b) Federal operations (except for devices authorized by the FCC for the Wireless Medical Telemetry Service) are on a non-interference basis to non-Federal operations and shall not constrain implementation of non-Federal operations.

* * * * *

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.

* * * * *

US100 The following provisions shall apply to the bands 2310–2320 MHz and 2345–2360 MHz:

(a) The bands 2310–2320 and 2345–2360 MHz are available for Federal aeronautical telemetering and associated telecommand operations for flight testing of manned or unmanned aircraft, missiles, or major components thereof, on a secondary basis to the Wireless Communications Service (WCS).

The frequencies 2312.5 MHz and 2352.5 MHz are shared on a co-equal basis by Federal stations for telemetering and associated telecommand operations of expendable and reusable launch vehicles, irrespective of whether such operations involve flight testing. Other Federal mobile telemetering uses may be provided in the bands 2310–2320 and 2345–2360 MHz on a non-interference basis to all other uses authorized pursuant to this footnote.

(b) The band 2345–2360 MHz is available for non-Federal aeronautical telemetering and associated telecommand operations for flight testing of manned or unmanned aircraft, missiles, or major components thereof, on a secondary basis to the WCS until January 1, 2020. The use of this allocation is restricted to non-Federal licensees in the Aeronautical and Fixed Radio Service holding a valid authorization on April 23, 2015.

* * * * *

US111 In the band 5091–5150 MHz, aeronautical mobile telemetry operations for flight testing are conducted at the following locations. Flight testing at additional locations may be authorized on a case-by-case basis.

Location	Test sites	Lat. (N)	Long. (W)
Gulf Area Ranges Complex (GARC)	Eglin AFB, Tyndall AFB, FL; Gulfport ANG Range, MS; Ft. Rucker, Redstone, NASA Marshall Space Flight Center, AL.	30° 28′	86° 31′
Utah Ranges Complex (URC)	Dugway PG; Utah Test & Training Range (Hill AFB), UT	40° 57′	113° 05′
Western Ranges Complex (WRC)	Pacific Missile Range; Vandenberg AFB, China Lake NAWS, Pt. Mugu NAWS, Edwards AFB, Thermal, Nellis AFB, Ft. Irwin, NASA Dryden Flight Research Center, Victorville, CA.	35° 29′	117° 16′
Southwest Ranges Complex (SRC)	Ft. Huachuca, Tucson, Phoenix, Mesa, Yuma, AZ	31° 33′	110° 18′
Mid-Atlantic Ranges Complex (MARC).	Patuxent River, Aberdeen PG, NASA Langley Research Center, NASA Wallops Flight Facility, MD.	38° 17′	76° 24′
New Mexico Ranges Complex (NMRC).	White Sands Missile Range, Holloman AFB, Albuquerque, Roswell, NM; Amarillo, TX.	32° 11′	106° 20′
Colorado Ranges Complex (CoRC)	Alamosa, Leadville, CO	37° 26′	105° 52′
Texas Ranges Complex (TRC)	Dallas/Ft. Worth, Greenville, Waco, Johnson Space Flight Center/Ellington Field, TX.	32° 53′	97° 02′
Cape Ranges Complex (CRC)	Cape Canaveral, Palm Beach-Dade, FL	28° 33′	80° 34′
Northwest Range Complex (NWRC)	Seattle, Everett, Spokane, Moses Lake, WA; Klamath Falls, Eugene, OR	47° 32′	122° 18′
St. Louis	St Louis, MO	38° 45′	90° 22′
Wichita	Wichita, KS	37° 40′	97° 26′
Marietta	Marietta, GA	33° 54′	84° 31′
Glasgow	Glasgow, MT	48° 25′	106° 32′
Wilmington/Ridley	Wilmington, DE/Ridley, PA	39° 49′	75° 26′
San Francisco Bay Area (SFBA)	NASA Ames Research Center, CA	37° 25′	122° 03′
Charleston	Charleston, SC	32° 52′	80° 02′

* * * * *

US113 Radio astronomy observations of the formaldehyde line frequencies 4825–4835 MHz and 14.47–14.5 GHz may be made at certain radio astronomy observatories as indicated below:

BANDS TO BE OBSERVED

4 GHz	14 GHz	Observatory
X		National Astronomy and Ionosphere Center (NAIC), Arecibo, PR
X	X	National Radio Astronomy Observatory (NRAO), Green Bank, WV
X	X	NRAO, Socorro, NM
X		Allen Telescope Array (ATA), Hat Creek, CA
X	X	Owens Valley Radio Observatory (OVRO), Big Pine, CA
X	X	NRAO's ten Very Long Baseline Array (VLBA) stations (see US131)
X	X	University of Michigan Radio Astronomy Observatory, Stinchfield Woods, MI
X		Pisgah Astronomical Research Institute, Rosman, NC

Every practicable effort will be made to avoid the assignment of frequencies to stations in the fixed or mobile services in these bands. Should such assignments result in harmful interference to these observations, the situation will be remedied to the extent practicable.

* * * * *

US139 Fixed stations authorized in the band 18.3–19.3 GHz under the provisions of 47 CFR 74.502(c), 74.602(g), 78.18(a)(4), and 101.147(r) may continue operations consistent with the provisions of those sections.

* * * * *

US145 The following unwanted emissions power limits for non-geostationary satellites operating in the inter-satellite service that transmit in the band 22.55–23.55 GHz shall apply in any 200 MHz of the passive band 23.6–24 GHz, based on the date that complete advance publication information is received by the ITU's Radiocommunication Bureau:

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

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

US156 In the bands 49.7–50.2 GHz and 50.4–50.9 GHz, for earth stations in the fixed-satellite service (Earth-to-space), the unwanted emissions power in the band 50.2–50.4 GHz shall not exceed –20 dBW/200 MHz (measured at the input of the antenna), except that the maximum unwanted emissions power may be increased to –10 dBW/200 MHz for earth stations having an antenna gain greater than or equal to 57 dBi. These limits apply under clear-sky conditions. During fading conditions, the limits may be exceeded by earth stations when using uplink power control.

US157 In the band 51.4–52.6 GHz, for stations in the fixed service, the unwanted emissions power in the band 52.6–54.25 GHz shall not exceed –33 dBW/100 MHz (measured at the input of antenna).

US161 In the bands 81–86 GHz, 92–94 GHz, and 94.1–95 GHz and within the coordination distances indicated below, assignments to allocated services shall be coordinated with the following radio

astronomy observatories. New observatories shall not receive protection from fixed stations that are licensed to operate in the one hundred most populous urbanized areas as defined by the U.S. Census Bureau for the year 2000.

(a) Within 25 km of the National Radio Astronomy Observatory's (NRAO's) Very Long Baseline Array (VLBA) Stations:

State	VLBA station	Lat. (N)	Long. (W)
AZ	Kitt Peak	31° 57′ 23″	111° 36′ 45″
CA	Owens Valley	37° 13′ 54″	118° 16′ 37″
HI	Mauna Kea	19° 48′ 05″	155° 27′ 20″
IA	North Liberty	41° 46′ 17″	091° 34′ 27″
NH	Hancock	42° 56′ 01″	071° 59′ 12″
NM	Los Alamos	35° 46′ 30″	106° 14′ 44″
NM	Pie Town	34° 18′ 04″	108° 07′ 09″
TX	Fort Davis	30° 38′ 06″	103° 56′ 41″
VI	Saint Croix	17° 45′ 24″	064° 35′ 01″
WA	Brewster	48° 07′ 52″	119° 41′ 00″

(b) Within 150 km of the following observatories:

State	Telescope and site	Lat. (N)	Long. (W)
AZ	Heinrich Hertz Submillimeter Observatory, Mt. Graham	32° 42′ 06″	109° 53′ 28″
AZ	University of Arizona 12-m Telescope, Kitt Peak	31° 57′ 12″	111° 36′ 53″
CA	Caltech Telescope, Owens Valley	37° 13′ 54″	118° 17′ 36″
CA	Combined Array for Research in Millimeter-wave Astronomy (CARMA)	37° 16′ 43″	118° 08′ 32″
HI	James Clerk Maxwell Telescope, Mauna Kea	19° 49′ 33″	155° 28′ 47″
MA	Haystack Observatory, Westford	42° 37′ 24″	071° 29′ 18″
NM	NRAO's Very Large Array, Socorro	34° 04′ 44″	107° 37′ 06″
WV	NRAO's Robert C. Byrd Telescope, Green Bank	38° 25′ 59″	079° 50′ 23″

NOTE: Satisfactory completion of the coordination procedure utilizing the automated mechanism, see 47 CFR 101.1523, will be deemed to establish sufficient separation from radio astronomy observatories, regardless of whether the distances set forth above are met.

* * * * *

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.

* * * * *

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

(a) In the bands between 17.8 GHz and 20.2 GHz, Federal space stations in both geostationary (GSO) and non-geostationary satellite orbits (NGSO) and associated earth stations in the fixed-satellite service (FSS) (space-to-Earth) may be authorized on a primary basis. For a Federal GSO FSS network to operate on a primary basis, the space station shall be located outside the arc, measured from east to west, 70–120° West longitude. Coordination between Federal FSS systems and non-Federal space and terrestrial systems operating in accordance with the United States Table of Frequency Allocations is required.

(b) In the bands between 17.8 GHz and 20.2 GHz, Federal earth stations operating with Federal space stations shall be authorized on a primary basis only in the following areas: Denver, Colorado; Washington, DC; San Miguel, California; and Guam. Prior to the commencement of non-Federal terrestrial operations in these areas, the FCC shall coordinate with NTIA all applications for new stations and modifications to existing stations as specified in 47 CFR 1.924(f), 74.32, and 78.19(f). In the band 17.7–17.8 GHz, the FCC shall also coordinate with NTIA all applications for new stations and modifications to existing stations that support the operations of Multichannel Video Programming Distributors (MVPD) in these areas, as specified in the aforementioned regulations.

(c) In the bands between 17.8 GHz and 19.7 GHz, the power flux-density (pfd) at the surface of the Earth produced by emissions from a Federal GSO space station or from a Federal space station in a NGSO constellation of 50 or fewer satellites, for all conditions and for all methods of modulation, shall not exceed the following values in any 1 MHz band:

(1) -115 dB(W/m^2) for angles of arrival above the horizontal plane (δ) between 0° and 5°,

(2) $-115 + 0.5(\delta - 5)$ dB(W/m^2) for δ between 5° and 25°, and

(3) -105 dB(W/m^2) for δ between 25° and 90°.

(d) In the bands between 17.8 GHz and 19.3 GHz, the pfd at the surface of the Earth produced by emissions from a Federal space station in an NGSO constellation of 51 or more satellites, for all conditions and for all methods of modulation, shall not exceed the following values in any 1 MHz band:

(1) $-115 - X$ dB(W/m^2) for δ between 0° and 5°,

(2) $-115 - X + ((10 + X)/20)(\delta - 5)$ dB(W/m^2) for δ between 5° and 25°, and

(3) -105 dB(W/m^2) for δ between 25° and 90°; where X is defined as a function of the number of satellites, n, in an NGSO constellation as follows:

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

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

* * * * *

US338A In the band 1435–1452 MHz, operators of aeronautical telemetry stations are encouraged to take all reasonable steps to ensure that the unwanted emissions power does not exceed -28 dBW/27 MHz in the band 1400–1427 MHz. Operators of aeronautical telemetry stations that do not meet this limit shall first attempt to operate in the band 1452–1525 MHz prior to operating in the band 1435–1452 MHz.

* * * * *

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.

* * * * *

US367 The band 5000–5150 MHz is also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. 9.21 of the ITU *Radio Regulations.*

* * * * *

US444 The frequency band 5030–5150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. In the frequency band 5030–5091 MHz, the requirements of this system shall have priority over other uses of this band. For the use of the frequency band 5091–5150 MHz, US444A and Resolution 114 (Rev.WRC–12) of the ITU *Radio Regulations* apply.

US444A The band 5091–5150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis for non-Federal use. This allocation is limited to feeder links of non-geostationary satellite systems in the mobile-satellite service and is subject to coordination under No. 9.11A of the ITU *Radio Regulations.* In the band 5091–5150 MHz, the following conditions also apply:

(a) Prior to January 1, 2018, the use of the band 5091–5150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution 114 (Rev.WRC–12);

(b) After January 1, 2016, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems; and

(c) After January 1, 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service.

US444B In the band 5091–5150 MHz, the following provisions shall apply to the aeronautical mobile service:

(a) Use is restricted to:

(1) Systems operating in the aeronautical mobile (R) service (AM(R)S) in accordance with international aeronautical standards, limited to surface applications at airports, and in accordance with Resolution 748 (Rev. WRC–12) (*i.e.,* AeroMACS); and

(2) Aeronautical telemetry transmissions from aircraft stations (AMT) in accordance with Resolution 418 (Rev. WRC–12).

(b) Consistent with Radio Regulation No. 4.10, airport surface wireless systems operating in the AM(R)S have priority over AMT systems in the band.

(c) Operators of AM(R)S and AMT systems at the following airports are urged to cooperate with each other in the exchange of information about planned deployments of their respective systems so that the prospects for compatible sharing of the band are enhanced:

(1) Boeing Field/King County Intl Airport, Seattle, WA;

(2) Lambert-St. Louis Intl Airport, St. Louis, MO;

(3) Charleston AFB/Intl Airport, Charleston, SC;

(4) Wichita Dwight D. Eisenhower National Airport, Wichita, KS;

(5) Roswell Intl Air Center Airport, Roswell, NM; and

(6) William P. Gwinn Airport, Jupiter, FL. Other airports may be addressed on a case-by-case basis.

(d) Aeronautical fixed communications that are an integral part of the AeroMACS system authorized in paragraph (a)(1) are also authorized on a primary basis.

US475 The use of the band 9300–9500 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons. In addition, ground-based radar beacons in the aeronautical radionavigation service are permitted in the band 9300–9320 MHz on the condition that harmful interference is not caused to the maritime radionavigation service.

US476A In the band 9300–9500 MHz, Federal stations in the Earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, nor claim protection from, stations of the radionavigation and Federal radiolocation services.

US482 In the band 10.6–10.68 GHz, the following provisions and urgings apply:

(a) Non-Federal use of the fixed service shall be restricted to point-to-point stations, with each station supplying not more than ∧3 dBW of transmitter power to the antenna, producing not more than 40 dBW of EIRP, and radiating at an antenna main beam elevation angle of 20° or less. Licensees holding a valid authorization on August 6, 2015 to operate in this band may continue to operate as authorized, subject to proper license renewal.

(b) In order to minimize interference to the Earth exploration-satellite service (passive) receiving in this band, licensees of stations in the fixed service are urged to:

(1) Limit the maximum transmitter power supplied to the antenna to −15 dBW; and

(2) Employ automatic transmitter power control (ATPC).

The maximum transmitter power supplied to the antenna of stations using ATPC may be increased by a value corresponding to the ATPC range, up to a maximum of −3 dBW.

US519 The band 18–18.3 GHz is also allocated to the meteorological-satellite service (space-to-Earth) on a primary basis. Its use is limited to geostationary satellites and shall be in accordance with the provisions of Article 21, Table 21–4 of the ITU *Radio Regulations.*

US532 In the bands 21.2–21.4 GHz, 22.21–22.5 GHz, and 56.26–58.2 GHz, the space research and Earth exploration-satellite services shall not receive protection from the fixed and mobile services operating in accordance with the Table of Frequency Allocations.

US550A In the band 36–37 GHz, the following provisions shall apply:

(a) For stations in the mobile service, the transmitter power supplied to the antenna shall not exceed −10 dBW, except that the maximum transmitter power may be increased to ∧3 dBW for stations used for public safety and disaster management.

(b) For stations in the fixed service, the elevation angle of the antenna main beam shall not exceed 20° and the transmitter power supplied to the antenna shall not exceed:

(1) −5 dBW for hub stations of point-to-multipoint systems; or

(2) −10 dBW for all other stations, except that the maximum transmitter power of stations using automatic transmitter power control (ATPC) may be increased by a value corresponding to the ATPC range, up to a maximum of −7 dBW.

US565 The frequency band 275–1000 GHz may be used by administrations for experimentation with, and development of, various active and passive services. In this band a need has been identified for the following spectral line measurements for passive services:

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

—Earth exploration-satellite service (passive) and space research service (passive): 275–277 GHz, 294–306 GHz, 316–334 GHz, 342–349 GHz, 363–365 GHz, 371–389 GHz, 416–434 GHz, 442–444 GHz, 496–506 GHz, 546–568 GHz, 624–629 GHz, 634–654 GHz, 659–661 GHz, 684–692 GHz, 730–732 GHz, 851–853 GHz and 951–956 GHz.

Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations are urged to take all practicable steps to protect these passive services from harmful interference until the date when the allocation Table is established in the above-mentioned frequency band.

Non-Federal Government (NG) Footnotes

* * * * *

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.

* * * * *

NG34 The bands 758–775 MHz and 788–805 MHz are available for assignment to the public safety services, as described in 47 CFR part 90.

NG35 Frequencies in the bands 928–929 MHz, 932–932.5 MHz, 941–941.5 MHz, and 952–960 MHz may be assigned for multiple address systems and associated mobile operations on a primary basis.

* * * * *

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.

* * * * *

NG92 The band 1900–2000 kHz is also allocated to the radiolocation service on a primary basis in Region 2 and on a secondary basis in Region 3. This use is restricted to radio buoy operations on the open sea.

* * * * *

NG338A In the bands 1390–1395 MHz and 1427–1435 MHz, licensees are encouraged to take all reasonable steps to ensure that unwanted emissions power does not exceed the following levels in the band 1400–1427 MHz:

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

(b) For stations in the mobile service (except for devices authorized by the FCC for

the Wireless Medical Telemetry Service): −60 dBW/27 MHz.

NG535 The following provisions shall apply to the use of the 24.75–25.25 GHz range by the fixed-satellite service (Earth-to-space):

(a) In the band 24.75–25.05 GHz, feeder links to stations of the broadcasting-satellite service have priority over other uses. Such other uses must protect and may not claim protection from existing and future operating feeder-link networks to such broadcasting satellite stations.

(b) The use of the band 25.05–25.25 GHz is restricted to feeder links for the broadcasting-satellite service.

PART 25—SATELLITE COMMUNICATIONS

■ 8. The authority citation for part 25 continues to read as follows:

Authority: Interprets or applies sections 4, 301, 302, 303, 307, 309, 319, 332, 705, and 721 of the Communications Act, as amended, 47 U.S.C. 154, 301, 302, 303, 307, 309, 319, 332, 605, and 721, unless otherwise noted.

■ 9. Section 25.202 is amended by revising paragraph (f) introductory text and adding paragraphs (i) and (j) to read as follows:

§ 25.202 Frequencies, frequency tolerance and emission limitations.

* * * * *

(f) *Emission limitations.* Except for SDARS terrestrial repeaters and as provided for in paragraph (i), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the schedule set forth in paragraphs (f)(1) through (f)(4) of this section. The out-of-band emissions of SDARS terrestrial repeaters shall be attenuated in accordance with the schedule set forth in paragraph (h) of this section.

* * * * *

(i) The following unwanted emissions power limits for non-geostationary satellites operating in the inter-satellite service that transmit in the 22.55–23.55 GHz band shall apply in any 200 MHz of the 23.6–24 GHz passive band, based on the date that complete advance publication information is received by the ITU's Radiocommunication Bureau:

(1) For information received before January 1, 2020: −36 dBW.

(2) For information received on or after January 1, 2020: −46 dBW.

(j) For earth stations in the Fixed-Satellite Service (Earth-to-space) that transmit in the 49.7–50.2 GHz and 50.4–50.9 GHz bands, the unwanted emission power in the 50.2–50.4 GHz band shall not exceed −20 dBW/200 MHz (measured at the input of the antenna), except that the maximum unwanted emission 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.

PART 27—MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

■ 10. The authority citation for part 27 continues to read as follows:

Authority: 47 U.S.C. 154, 301, 302a, 303, 307, 309, 332, 336, 337, 1403, 1404, 1451, and 1452, unless otherwise noted.

■ 11. Section 27.53 is amended by revising paragraph (j) to read as follows:

§ 27.53 Emission limits.

* * * * *

(j)(1) For operations in the unpaired 1390–1392 MHz band and the paired 1392–1395 MHz and 1432–1435 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB. Compliance with these provisions is based on the procedures described in paragraph (a)(4) of this section.

(2) In the 1390–1395 MHz and 1432–1435 MHz bands, licensees are encouraged to take all reasonable steps to ensure that unwanted emission 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: −60 dBW/27 MHz.

* * * * *

■ 12. Section 27.803 is amended by revising paragraph (b)(4) to read as follows:

§ 27.803 Coordination requirements.

* * * * *

(b) * * *

* * * * *

(4) That requires approval of the Frequency Advisory Subcommittee (FAS) of the Interdepartment Radio Advisory Committee (IRAC). Licensees in the 1432–1435 MHz band must receive FAS approval, prior to operation of fixed sites or mobile units within the NTIA recommended protection radii of the Government sites listed in footnote US83 of § 2.106 of this chapter.

* * * * *

PART 74—EXPERIMENTAL RADIO, AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTIONAL SERVICES

■ 13. The authority citation for part 74 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, 307, 309, 336 and 554.

■ 14. Section 74.32 is revised to read as follows:

§ 74.32 Operation in the 17.7–17.8 GHz and 17.8–19.7 GHz bands.

The following exclusion areas and coordination areas are established to minimize or avoid harmful interference to Federal Government earth stations receiving in the 17.7–19.7 GHz band:

(a) No application seeking authority for fixed stations supporting the operations of Multichannel Video Programming Distributors (MVPD) in the 17.7–17.8 GHz band or to operate in the 17.8–19.7 GHz band for any service will be accepted for filing if the proposed station is located within 20 km of Denver, CO (39°43′ N., 104°46′ W.) or Washington, DC (38°48′ N., 76°52′ W.).

(b) Any application for a new station license to provide MVPD operations in the 17.7–17.8 GHz band or to operate in the 17.8–19.7 GHz band for any service, or for modification of an existing station license in these bands which would change the frequency, power, emission, modulation, polarization, antenna height or directivity, or location of such a station, must be coordinated with the Federal Government by the Commission before an authorization will be issued, if the station or proposed station is located in whole or in part within any of the following areas:

(1) *Denver, CO area:*

(i) Between latitudes 41°30′ N. and 38°30′ N. and between longitudes 103°10′ W. and 106°30′ W.

(ii) Between latitudes 38°30′ N. and 37°30′ N. and between longitudes 105°00′ W. and 105°50′ W.

(iii) Between latitudes 40°08′ N. and 39°56′ N. and between longitudes 107°00′ W. and 107°15′ W.

(2) *Washington, DC area:*

(i) Between latitudes 38°40′ N. and 38°10′ N. and between longitudes 78°50′ W. and 79°20′ W.

(ii) Within 178 km of 38°48′ N, 76°52′ W.

(3) *San Miguel, CA area:*

(i) Between latitudes 34°39′ N. and 34°00′ N. and between longitudes 118°52′ W. and 119°24′ W.

(ii) Within 200 km of 35°44′ N., 120°45′ W.

(4) *Guam area:* Within 100 km of 13°35′ N., 144°51′ E.

Note to § 74.32: The coordinates cited in this section are specified in terms of the ''North American Datum of 1983 (NAD 83).''

PART 78—CABLE TELEVISION RELAY SERVICE

■ 15. The authority citation for part 78 continues to read as follows:

Authority: Secs. 2, 3, 4, 301, 303, 307, 308, 309, 48 Stat., as amended, 1064, 1065, 1066, 1081, 1082, 1083, 1084, 1085; 47 U.S.C. 152, 153, 154, 301, 303, 307, 308, 309.

■ 16. Section 78.19 is amended by revising paragraph (f) to read as follows:

§ 78.19 Interference.

* * * * *

(f) *17.7–19.7 GHz band.* The following exclusion areas and coordination areas are established to minimize or avoid harmful interference to Federal Government earth stations receiving in the 17.7–19.7 GHz band:

(1) No application seeking authority to operate in the 17.7–19.7 GHz band will be accepted for filing if the proposed station is located within 50 km of Denver, CO (39°43′ N., 104°46′ W.) or Washington, DC (38°48′ N., 76°52′ W.).

(2) Any application seeking authority for a new fixed station license supporting the operations of Multichannel Video Programming Distributors (MVPD) in the 17.7–17.8 GHz band or to operate in the 17.8–19.7 GHz band for any service, or for modification of an existing station license in these bands which would change the frequency, power, emission, modulation, polarization, antenna height or directivity, or location of such a station, must be coordinated with the Federal Government by the Commission before an authorization will be issued, if the station or proposed station is located in whole or in part within any of the following areas:

(i) *Denver, CO area:*

(A) Between latitudes 41°30′ N. and 38°30′ N. and between longitudes 103°10′ W. and 106°30′ W.

(B) Between latitudes 38°30′ N. and 37°30′ N. and between longitudes 105°00′ W. and 105°50′ W.

(C) Between latitudes 40°08′ N. and 39°56′ N. and between longitudes 107°00′ W. and 107°15′ W.

(ii) *Washington, DC area:*

(A) Between latitudes 38°40′ N. and 38°10′ N. and between longitudes 78°50′ W. and 79°20′ W.

(B) Within 178 km of 38°48′ N, 76°52′ W.

(iii) *San Miguel, CA area:*

(A) Between latitudes 34°39′ N. and 34°00′ N. and between longitudes 118°52′ W. and 119°24′ W.

(B) Within 200 km of 35°44′ N., 120°45′ W.

(iv) *Guam area:* Within 100 km of 13°35′ N., 144°51′ E.

NOTE TO § 78.19(f): The coordinates cited in this section are specified in terms of the ''North American Datum of 1983 (NAD 83).''

* * * * *

PART 80—STATIONS IN THE MARITIME SERVICES

■ 17. The authority citation for part 80 continues to read as follows:

Authority: Secs. 4, 303, 307(e), 309, and 332, 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303, 307(e), 309, and 332, unless otherwise noted. Interpret or apply 48 Stat. 1064–1068, 1081–1105, as amended; 47 U.S.C. 151–155, 301–609; 3 UST 3450, 3 UST 4726, 12 UST 2377.

■ 18. Section 80.371 is amended by revising note 3 to the table in paragraph (c) to read as follows:

§ 80.371 Public correspondence frequencies.

* * * * *

(c) * * *

* * * * *

[3] The frequency 161.975 MHz is available only for Automatic Identification System communications. In VPCSAs 10–42, site-based stations licensed to operate on frequency 161.975 MHz prior to March 2, 2009 may continue to operate on a co-primary basis on that frequency until March 2, 2024.

* * * * *

PART 87—AVIATION SERVICES

■ 19. The authority citation for part 87 continues to read as follows:

Authority: 47 U.S.C. 154, 303 and 307(e), unless otherwise noted.

■ 20. Section 87.5 is amended by adding a definition of ''Flight telemetering mobile station'' in alphabetical order to read as follows:

§ 87.5 Definitions.

* * * * *

Flight telemetering mobile station. A telemetering mobile station used for transmitting data from an airborne vehicle, excluding data related to airborne testing of the vehicle itself (or major components thereof).

* * * * *

■ 21. Section 87.133 is amended by revising paragraph (f) to read as follows:

§ 87.133 Frequency stability.

* * * * *

(f) The carrier frequency tolerance of all transmitters that operate in the 1435–1525 MHz or 2345–2395 MHz band is 0.002 percent. The carrier frequency tolerance of all transmitters that operate in the 5091–5150 MHz band is 0.005 percent.

* * * * *

■ 22. Section 87.137 is amended by revising note 8 to the table in paragraph (a) to read as follows:

§ 87.137 Types of emission.

(a) * * *

Notes: * * *

[8] The authorized bandwidth is equal to the necessary bandwidth for frequency or digitally modulated transmitters used in aeronautical telemetering and associated aeronautical telemetry or telecommand stations that operate in the 1435–1525 MHz, 2345–2395 MHz, or 5091–5150 MHz band. The necessary bandwidth must be computed in accordance with part 2 of this chapter.

* * * * *

■ 23. Section 87.139 is amended by revising paragraph (a) introductory text, paragraph (d), paragraph (e) introductory text, and paragraph (f) introductory text and by adding paragraph (m) to read as follows:

§ 87.139 Emission limitations.

(a) Except for ELTs and when using single sideband (R3E, H3E, J3E), or frequency modulation (F9) or digital modulation (F9Y) for telemetry or telecommand in the 1435–1525 MHz, 2345–2395 MHz, or 5091–5150 MHz band or digital modulation (G7D) for differential GPS, the mean power of any emissions must be attenuated below the mean power of the transmitter (pY) as follows:

* * * * *

(d) Except for telemetry in the 1435–1525 MHz band, when the frequency is removed from the assigned frequency by more than 250 percent of the authorized bandwidth for aircraft stations above 30 MHz and all ground stations the attenuation must be at least 43+10 $\log_{10}$pY dB.

(e) When using frequency modulation or digital modulation for telemetry or telecommand in the 1435–1525 MHz, 2345–2395 MHz, or 5091–5150 MHz band with an authorized bandwidth equal to or less than 1 MHz the emissions must be attenuated as follows:

* * * * *

(f) When using frequency modulation or digital modulation for telemetry or telecommand in the 1435–1525 MHz, 2345–2395 MHz, or 5091–5150 MHz band with an authorized bandwidth

greater than 1 MHz, the emissions must be attenuated as follows:

* * * * *

(m) In the 1435–1452 MHz band, operators of aeronautical telemetry stations are encouraged to take all reasonable steps to ensure that unwanted emissions power does not exceed −28 dBW/27 MHz in the 1400–1427 MHz band. Operators of aeronautical telemetry stations that do not meet this limit shall first attempt to operate in the 1452–1525 MHz band prior to operating in the 1435–1452 MHz band.

■ 24. Section 87.173 is amended in the frequency table in paragraph (b) as follows:

■ a. The entries for the 2310–2320 MHz band and the 24750–25050 MHz band are removed.

■ b. The entry for the 5000–5250 MHz band is removed and an entry for the 5030–5150 MHz band is added in its place.

■ c. Entries for the 5091–5150 MHz and 24450–24650 MHz bands are added in numerical order.

The additions read as follows:

§ 87.173 Frequencies.

* * * * *

(b) Frequency table:

Frequency or frequency band	Subpart	Class of station	Remarks
*	*	*	*
5030–5150 MHz	Q	MA, RLW	Microwave landing systems.
*	*	*	*
5031.000 MHz	Q	RLT	
5091–5150 MHz	J	MA, FAT	Aeronautical telemetry.
*	*	*	*
24450–24650 MHz	F, Q	MA, RL	Aeronautical radionavigation.
*	*	*	*

* * * * *

■ 25. Section 87.187 is amended by revising paragraph (p), Note to paragraph (p) and paragraph (x) to read as follows:

§ 87.187 Frequencies.

* * * * *

(p) The 1435–1525 MHz and 2360–2395 MHz bands are available on a primary basis, and the 2345–2360 MHz band is available on a secondary basis (the latter band only until January 1, 2020), for telemetry and telecommand associated with the flight testing of aircraft, missiles, or related major components. This includes launching into space, reentry into the Earth's atmosphere and incidental orbiting prior to reentry. In the 1435–1525 MHz band, 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. In the 2360–2395 MHz band, the following frequencies may be assigned for telemetry and associated telecommand operations of expendable and re-usable launch vehicles, whether or not such operations involve flight testing: 2364.5, 2370.5 and 2382.5 MHz. *See* § 87.303(d).

Note to paragraph (p): Aeronautical telemetry operations must protect Miscellaneous Wireless Communications Services operating in the 2345–2360 MHz band.

* * * * *

(x) The frequency bands 24450–24650 MHz and 32300–33400 MHz are available for airborne radionavigation devices.

* * * * *

■ 26. Section 87.303 is amended by revising paragraph (d) to read as follows:

§ 87.303 Frequencies.

* * * * *

(d) Aeronautical mobile telemetry (AMT) operations are conducted in the 1435–1525 MHz, 2345–2395 MHz, and 5091–5150 MHz bands on a co-equal basis with U.S. Government stations.

(1) Frequencies in the 1435–1525 MHz and 2360–2395 MHz bands are assigned in the mobile service primarily for aeronautical telemetry and associated telecommand operations for flight testing of aircraft and missiles, or their major components. Until January 1, 2020, the 2345–2360 MHz band is also available to licensees holding a valid authorization on April 23, 2015 for these purposes on a secondary basis. Permissible uses of these bands include telemetry and associated telecommand operations associated with the launching and reentry into the Earth's atmosphere, as well as any incidental orbiting prior to reentry, of objects undergoing flight tests. In the 1435–1525 MHz band, 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. In the 2360–2395 MHz band, the following frequencies may be assigned for telemetry and associated telecommand operations of expendable and re-usable launch vehicles, whether or not such operations involve flight testing: 2364.5, 2370.5 and 2382.5 MHz. All other mobile telemetry uses of the 2360–2395 MHz band shall be on a non-interfering and unprotected basis to the above uses.

(2) Frequencies in the 5091–5150 MHz band are assigned in the aeronautical mobile service on a primary basis for flight testing of aircraft. AMT use of these frequencies is restricted to aircraft stations transmitting to aeronautical stations (AMT ground stations) in the flight test areas listed in 47 CFR 2.106, footnote US111.

(3) The authorized bandwidths for stations that operate in the 1435–1525 MHz, 2345–2395 MHz, or 5091–5150 MHz bands are normally 1, 3 or 5 MHz. Applications for greater bandwidths will be considered in accordance with the provisions of § 87.135. Each assignment will be centered on a frequency between 1435.5 MHz and 1524.5 MHz, between 2345.5 MHz and 2394.5 MHz, or between 5091.5 MHz and 5149.5 MHz, with 1 MHz channel spacing.

* * * * *

■ 27. Section 87.305 is amended by revising paragraph (a)(1) to read as follows:

§ 87.305 Frequency coordination.

(a)(1) Each application for a new station license, renewal or modification of an existing license concerning flight test frequencies, except as provided in paragraph (b) of this section, must be accompanied by a statement from a frequency advisory committee. The committee must comment on the frequencies requested or the proposed changes in the authorized station and the probable interference to existing stations. The committee must consider all stations operating on the frequencies requested or assigned within 320 km (200 mi) of the proposed area of operation and all prior coordinations and assignments on the proposed frequency(ies). The committee must also recommend frequencies resulting in the minimum interference. The committee must coordinate in writing all requests for frequencies or proposed operating changes in the 1435–1525 MHz, 2345–2360 MHz (only until January 1, 2020), 2360–2395 MHz, and 5091–5150 MHz bands with the responsible Government Area Frequency Coordinators listed in the NTIA ''Manual of Regulations and Procedures for Federal Radio Frequency Management.'' In addition, committee recommendations may include comments on other technical factors and may contain recommended restrictions which it believes should appear on the license.

* * * * *

■ 28. Section 87.475 is amended by adding paragraphs (b)(11) and (b)(14) to read as follows:

§ 87.475 Frequencies.

* * * * *

(b) * * *

(11) 5030–5150 MHz: This band is to be used for the operation of the international standard system (microwave landing system).

* * * * *

(14) 24,450–24,650 MHz and 32,300–33,400 MHz: In these bands, land-based radionavigation aids are permitted where they operate with airborne radionavigation devices.

* * * * *

PART 90—PRIVATE LAND MOBILE RADIO SERVICES

■ 29. The authority citation for part 90 continues to read as follows:

Authority: Sections 4(i), 11, 303(g), 303(r), and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 161, 303(g), 303(r), and 332(c)(7), and Title VI of the Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. 112–96, 126 Stat. 156.

■ 30. Section 90.103 is amended by removing and reserving paragraphs (c)(25) through (28) and by revising the Kilohertz portion of the Radiolocation Service Frequency Table in paragraph (b) to read as follows:

§ 90.103 Radiolocation Service.

* * * * *

(b) * * *

RADIOLOCATION SERVICE FREQUENCY TABLE

Frequency or band	Class of station(s)	Limitation
Kilohertz		
70 to 90	Radiolocation land or mobile.	1
90 to 110	Radiolocation land.	2
110 to 130	Radiolocation land or mobile.	1
1705 to 1715	do	4, 5, 6
1715 to 1750	do	5, 6
1750 to 1800	do	5, 6

RADIOLOCATION SERVICE FREQUENCY TABLE—Continued

Frequency or band	Class of station(s)	Limitation
3230 to 3400	do	6, 8
*	*	*

* * * * *

■ 31. Section 90.210 is amended by adding paragraph (c)(4) to read as follows:

§ 90.210 Emission masks.

* * * * *

(c) * * *

(4) In the 1427–1432 MHz band, licensees are encouraged to take all reasonable steps to ensure that unwanted emissions power does not exceed the following levels in the 1400–1427 MHz band:

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

(ii) For stations in the mobile service: −60 dBW/27 MHz.

* * * * *

PART 97—AMATEUR RADIO SERVICE

■ 32. The authority citation for part 97 continues to read as follows:

Authority: 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303. Interpret or apply 48 Stat. 1064–1068, 1081–1105, as amended; 47 U.S.C. 151–155, 301–609, unless otherwise noted.

■ 33. Section 97.301 is amended by revising the entries for ''160 m'' in the tables in paragraphs (b), (c), and (d) to read as follows:

§ 97.301 Authorized frequency bands.

* * * * *

(b) * * *

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
MF 160 m	kHz 1810–1850	kHz 1800–2000	kHz. 1800–2000	(a)
*	*	*	*	*

(c) * * *

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
MF 160 m	kHz 1810–1850	kHz 1800–2000	kHz. 1800–2000	(a)
*	*	*	*	*

(d) * * *

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
MF 160 m	kHz 1810–1850	kHz 1800–2000	kHz. 1800–2000	(a)
*	*	*	*	*

* * * * *

■ 34. Section 97.303 is amended by removing and reserving paragraph (g) and by revising paragraph (c) to read as follows:

§ 97.303 Frequency sharing requirements.

* * * * *

(c) Amateur stations transmitting in the 76–77.5 GHz segment, the 78–81 GHz segment, the 136–141 GHz segment, or the 241–248 GHz segment must not cause harmful interference to, and must accept interference from, stations authorized by the United States Government, the FCC, or other nations in the radiolocation service.

* * * * *

PART 101—FIXED MICROWAVE SERVICES

■ 35. The authority citation for part 101 continues to read as follows:

Authority: 47 U.S.C. 154, 303.

■ 36. Section 101.31 is amended by revising paragraph (b)(1) introductory text to read as follows:

§ 101.31 Temporary and conditional authorizations.

* * * * *

(b) *Conditional authorization.* (1) An applicant for a new point-to-point microwave radio station(s) or a modification of an existing station(s) in the 952.95–956.15 and 956.55–959.75 MHz band segments; the 3700–4200, 5925–6425, 6525–6875, and 6875–7125 MHz bands; the 10.550–10.680, 10.700–11.700, 12.700–13.150, 13.200–13.250, 17.700–18.300, and 19.300–19.700 GHz bands; and the 21.800–22.000 and 23.000–23.200 GHz band segments (see § 101.147(s)(8) for specific service usage) may operate the proposed station(s) during the pendency of its applications(s) upon the filing of a properly completed formal application(s) that complies with subpart B of this part, if the applicant certifies that the following conditions are satisfied:

* * * * *

■ 37. Section 101.111 is amended by adding paragraph (d) to read as follows:

§ 101.111 Emission limitations.

* * * * *

(d) *Interference to passive sensors.* These limitations are necessary to minimize the probability of harmful interference to reception in the 10.6–10.68 GHz and 31–31.3 GHz bands onboard space stations in the Earth exploration-satellite service (passive).

(1) *10.6–10.68 GHz.* (i) Fixed stations are restricted to point-to-point operations, with each station supplying not more than ∧3 dBW of transmitter power to the antenna, producing not more than 40 dBW of EIRP, and radiating at an antenna main beam elevation angle of 20° or less. Licensees holding a valid authorization on August 6, 2015 to operate in this band may continue to operate as authorized, subject to proper license renewal. Licensees are urged to:

(A) Limit the maximum transmitter power supplied to the antenna to ∧15 dBW; and

(B) Employ automatic transmitter power control (ATPC).

(ii) 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.

(2) *31–31.3 GHz.* For fixed stations authorized after August 6, 2018, the unwanted emissions power in any 100 MHz of the 31.3–31.5 GHz band shall be limited to − 38 dBW (− 38 dBW/100 MHz), as measured at the input to the antenna.

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