6712-01

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 2

[ET Docket No. 13-115; RM 11341; FCC 21-44; FR ID 33506]

Allocation of Spectrum for Non-Federal Space Launch Operations

AGENCY: Federal Communications Commission.

ACTION: Final rule**.**

SUMMARY: In this document, the Federal Communications Commission (Commission) takes steps towards establishing a spectrum allocation and licensing framework that will provide regulatory certainty and improved efficiency and that will promote innovation and investment in the United States commercial space launch industry. Specifically, in the Report and Order, the Commission allocates the 2200-2290 MHz band for space operations on a secondary basis to permit non-federal use in specific portions of this band for purposes of space launch operations to help meet the increasing demands for space exploration and development.

DATES: Effective **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Federal Communications Commission, 45 L Street, NE, Washington, DC 20554.

FOR FURTHER INFORMATION CONTACT: Nicholas Oros, Deputy Chief, Policy and Rules Division, Office of Engineering and Technology, at (202) 418-0636 or *nicholas.oros@fcc.gov*.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's *Report and Order*, ET Docket No. 13-115, FCC 21-44, adopted April 22, 2020, and released April 22, 2020. This document is available by downloading the text from the Commission's web site at https://www.fcc.gov/document/fcc-seeks-make-spectrum-available-commercial-space-launches-0. When the FCC Headquarters reopens to the public, the full text of this document also will be available for public inspection and copying during regular business hours in the FCC Reference Center, 45 L Street, NE, Washington, DC 20554. Alternative formats are available for people with disabilities (Braille, large print, electronic files, audio format) by sending an email to FCC504@fcc.gov or calling the Commission's Consumer and Governmental Affairs Bureau at (202) 418–0530 (voice), (202) 418–0432 (TTY).

Synopsis

1. Commercial space launch entities are proliferating and are increasingly involved in all aspects of U.S.-based space activities, such as transportation of cargo and people into space, orbital launches to place satellites and other payloads into space, and suborbital launches. There are a growing number of companies offering services to both private entities and government organizations. For example, the National Aeronautics and Space Administration (NASA) has engaged two private companies to take cargo and crew to the International Space Station (ISS), and companies such as Space Exploration Technologies (SpaceX) and Northrop Grumman have completed numerous successful missions to the ISS. SpaceX has recently ferried people to the ISS, and Boeing is developing a spacecraft to do the same. Other companies, such as Virgin Galactic and Blue Origin, intend to take private citizens on suborbital flights. These commercial space launch companies are also actively transporting communications satellites into orbit. SpaceX, for example, has conducted over 100 launches. Several companies, such as Rocket Lab and Astra, are focusing on propelling small satellites into orbit. Bigelow Aerospace plans to deploy a manned space station. To support these commercial space ventures, entities such as the New Mexico Spaceport Authority, the Virginia Commercial Space Flight Authority and the Houston Airport System have established non-Federal spaceports.

2. The Commission adopts a footnote to the Allocation Table for specified frequencies in the 2200-2290 MHz band to support commercial space launches and enable continued growth of a vibrant commercial space industry. This allocation shall be limited to use by space operations for the telemetry and tracking operations of launch vehicles during pre-launch testing and space launch operations.

3. The *NPRM* made two alternative proposals for providing access to this band for launch telemetry use. Under the first proposal, the Commission would add a footnote to the U.S. Table providing primary non-Federal Space Operation service allocations to portions of the 2200-2290 MHz band. This footnote would require successful coordination of the assignment and use of the band for space launch operations with NTIA; restrict non-Federal use of the band to pre-launch testing and launches at Federal ranges; limit non-Federal transmissions to the 2207-2219 MHz, 2270.5-2274.5 MHz, and 2285-2290 MHz portions of the band; and limit non-Federal use of the band to channel bandwidths less than 5 megahertz by launch vehicles. Under a second proposal, the Commission would amend the

U.S. Table to add a primary non-Federal Space Operation service allocation to the 2200-2290 MHz band. This allocation would be accompanied by a footnote to the U.S. Table with the same restrictions specified in the footnote proposed in the first alternative. The *NPRM* also asked whether there is sufficient spectrum available to support the growth of the commercial launch industry.

4. The 2200-2290 MHz band is currently allocated on a primary basis to multiple services for Federal use and is widely used. The only permitted non-Federal use of the band is for stations in the space research, space operation, and Earth exploration-satellite services to transmit to NASA's Tracking and Data Relay Satellite System (TDRSS) on a non-interference basis. According to NTIA, the 2200-2290 MHz band is heavily used by the Department of Defense (DoD) and other agencies and these uses are vital for mission-critical systems. NTIA emphasizes that use of the band during commercial launches must be carefully coordinated to protect these Federal operations and suggests that the commercial space launch industry be limited to four frequency segments to facilitate this coordination. Because of the importance of Federal systems in the band, NTIA supports adding a secondary non-Federal space operations allocation to this band instead of the proposed primary allocation. As the private sector began to participate in launch activities, companies needed access to spectrum to facilitate communications associated with launch activities, a need that has continued to increase in recent years. The STA mechanism that the Commission and NTIA have used to provide access to the 2200-2290 MHz band during launches is not ideal to handle the increased volume of commercial space launch activities because applicants are often required to file multiple STAs for a single launch and the STAs expire after six months. STA requests are coordinated with NTIA manually, through e-mail, whereas other non-Federal applications requiring coordination are processed through the Office of Engineering and Technology's Frequency Assignment System (OFACS). In the *NPRM*, the Commission tentatively concluded that creating a non-Federal allocation for this band would be preferable to continuing to issue STAs on a launch-by-launch basis because licenses would better support the forecasted increased number of commercial launches in the future. Accordingly, in the *NPRM* the Commission invited comment on adopting such an allocation, as a first step towards establishing rules that would allow for issuing licenses to commercial launch operators to permit their use of this spectrum band on an interference-protected basis.

5. Although commenters disagreed as to whether a non-Federal allocation is warranted or whether continued reliance on STAs is acceptable, all commenters agreed that access to this band for telemetry during launches is necessary. The Commercial Spaceflight Federation expressed the importance of access to this band on a co-primary basis for launch telemetry and pointed out that allocating spectrum even on a secondary basis can eliminate the unnecessary STA process. A coalition of several space launch providers asserted that they must make one or more requests for STAs for every launch and reentry because no spectrum is currently allocated for these purposes, even on a secondary basis. SpaceX supports the first proposal to add a footnote to the U.S. Table providing a primary non-Federal allocation with the understanding that such a Table footnote is the legal equivalent of a Table allocation, while the Commercial Spaceflight Federation and XCOR have no preference between the two proposals. Blue Origin prefers adding a non-Federal co-primary allocation to the band. SpaceX states that it will need an additional 4 megahertz of bandwidth beyond what is provided in the proposals to support operations of its heavy lift launch vehicles. Orbital ATK favors adding non-Federal allocations in the band at 2225.5 MHz, 2241.5 MHz, 2259.5 MHz, 2269.5 MHz, and 2288.5 MHz.

6. SpaceX states that the STA process is suboptimal as commercial space launches are occurring more frequently. SpaceX explains that the STA process creates significant business planning challenges due to the lack of certainty regarding approval timing as it relates to the scheduled launch date as well as the inherent uncertainty of non-interference status. Both SpaceX and the Commercial Spaceflight Federation note that applicants have no visibility into the coordination process. According to SpaceX, implementing the proposed allocation will streamline licensing, reduce the amount of required coordination, and provide greater certainty regarding approvals. Orbital Sciences (now Northrop Grumman) endorses the addition of a co-primary allocation to a subset of the frequencies in the relevant band to remedy the STA process shortcomings—notably, that communications can be interrupted at any time and that it takes a significant amount of time to obtain STAs.

7. The Satellite Industry Association, Boeing, and Lockheed Martin argue that a non-Federal allocation in this band is unnecessary and that non-Federal launches currently enjoy *de facto* interference protection because they are coordinated with Federal frequency coordinators. Boeing claims that a non-Federal allocation will not simplify Federal coordination in these bands because non-Federal

users will not be empowered to interfere with Federal users except to the extent coordinated with a Federal spectrum coordinator. Boeing suggests that once SpaceX gains experience with the current process, it will realize that the process provides reliable interference-free access to launch spectrum and that the current well-understood and effective system should not be abandoned without a clear, superior alternative. Boeing also suggests that, instead of adding a non-Federal allocation, the Commission could adopt a U.S. Table footnote that provides that non-Federal stations may access the spectrum for launch operations without an allocation under the condition they may not cause harmful interference to Federal stations.

8. The Commission concludes that adopting a non-Federal secondary allocation for this band for use during commercial space launches will help meet the future needs of the growing commercial space industry. Adopting this new allocation is the first step in a process that will allow the Commission to adopt technical and other service rules to govern commercial launch operations which, in turn, will give operators more certainty with respect to spectrum use in these bands during commercial space launches. Access to spectrum under a more predictable, collaborative, and transparent regulatory process is important to the fledgling commercial space launch industry because of the large monetary investment required for each launch. By operating on a regular, licensed basis, commercial space operators will have certainty as to which frequency bands can be used for non-federal space launch operations, which will promote the advance planning and investment necessary for future space launch activities. Although there will be coordination with NTIA prior to each launch, the Commission will continue to work with NTIA to facilitate efforts to streamline the coordination process to further improve certainty with respect to spectrum access. The need for reliable access to launch spectrum is becoming even more important as commercial launch operators shift beyond cargo supply activities into manned space missions. SpaceX recently completed a successful manned mission to the ISS and Boeing is developing a craft to take people to the ISS. The Commission also notes that the current process of obtaining an STA places burdens on launch providers, which must prepare numerous duplicative applications. Significantly, SpaceX and Blue Origin, who have obtained dozens of STAs for spectrum in the 2200-2290 MHz band, favor an allocation in lieu of continued reliance on STAs. As the U.S.

commercial space industry continues to expand, the Commission expect the burdens and uncertainties associated with continuing the current STA process would only increase.

9. The Commission is not convinced by the claims of several commenters that there is no need for change because the current STA process provides *de facto* interference protection. While that may be the case today when there are still relatively few launches, there is no guarantee that the current approach is sustainable as the number of commercial launches increases. In 2012, there were only seven Federal Aviation Administration (FAA) licensed commercial launches; in 2020, there were 39 FAA-licensed commercial launches. The Commission expect that number will continue to increase. In addition, use of private spaceports located outside of the established Federal ranges do not fit the existing pattern the Commission has established for issuing STAs. Thus, as the space launch landscape continues to evolve, the current *ad hoc* experimental licensing approach based on uncertain temporary authorizations becomes increasingly risky. The Commission also does not believe it is necessary to delay adopting an allocation for the 2200-2290 MHz band because of the time that has passed since the *NPRM* as several commenters suggest. The *NPRM* clearly raised the issue of whether the Commission should adopt an allocation for this band as a first step toward adopting service rules. The current record, including the comments received in response to the *NPRM* and the more recent *ex parte* filings, along with our experience issuing experimental licenses demonstrate that taking this step is the best course of action. In fact, there is nothing to suggest that the issues commenters have raised regarding the current STA process have changed and our experience over the past eight years only further supports the need for a non-Federal allocation for this band.

10. Adopting a non-Federal Space Operation allocation for the 2200-2290 MHz band will allow us to develop rules that meet the specific needs of the commercial space industry, rather than trying to stretch the experimental rules to meet these unique needs. There are several reasons for this. First, because the dynamics for frequency use during launch activities are now well established, they are no longer considered truly experimental and should be transitioned to a set of permanent rules to bring certainty to the process. Second, because of the nature of experimentation, which often involves transmitters that have not gone through the equipment approval process, the rules governing experimental use do not provide any long term sustainability or interference protection from allocated services. Third,

the Commission finds that carving out a specific exemption from our experimental rules to provide interference protection for launch activities—as requested by Boeing, Lockheed Martin, and the Satellite Industry Association—could create confusion among licensees and is an inferior solution compared to providing an allocation and adopting service rules. Fourth, because the experimental rules are not intended to cover long-term commercial enterprises and STAs are limited by the Communications Act to periods of no more than 180 days, they are not suited to covering multiple launches over time. Thus, the current STA process cannot accommodate multiple launches over extended time periods as requested by Boeing, SpaceX, and Orbital ATK.

11. As advised by NTIA, the Commission is adopting a secondary Space Operation service allocation for the 2200-2290 MHz band rather than the primary allocation proposed in the *NPRM*. Given that the use of this band necessitates close coordination with NTIA, adopting a secondary allocation for this band would accomplish many of the goals the Commission sought to achieve with the proposed primary allocation. With a secondary allocation, the Commission will be able to adopt service rules for use of the band and issue spectrum authorizations for space launch operations. This will reduce the uncertainty of the launch-by-launch STA process and provide well-defined technical rules that licensees can design their equipment to comply with. While individual launches will still need to be coordinated, once the service rules are adopted and applicants will no longer have to apply for STAs for each launch, a streamlined process that will save time and effort on the part of space launch operators, NTIA, and the Commission will be more achievable. The Commission notes that even if it had adopted a primary non-Federal allocation for this band, individual launches would still have needed to be coordinated because of the heavy existing Federal use of the band. Several commenters advocate adoption of a primary allocation claiming that it will lead to streamlined licensing, eliminate repeated licensing work, require less coordination, and provide greater certainty with respect to approvals. The service rules the Commission will be able to adopt under a secondary allocation should be able to provide these benefits to the same extent as rules adopted under a primary allocation. The Commission defers further consideration of adopting a primary allocation for this band to the Further Notice of Proposed Rulemaking (FNPRM) published June 10, 2021 (86 FR 30860).

12. The Commission believes that providing access to the spectrum by adding a footnote to the U.S. Table is a better alternative than establishing an allocation in the U.S. Table for these bands. Adding a footnote instead of establishing an allocation is consistent with existing precedent that an allocation that is lightly used or highly restricted is implemented by using a footnote rather than placing in the U.S. Table. In this case, use of the band will continue to be restricted even as the U.S. commercial space industry continues to grow because of the need to coordinate with the Federal operations in the band. The Commission notes that either a direct table entry or footnote entry will provide future space operations licensees with equivalent status in the band.

13. Hence, the Commission is implementing this secondary non-Federal Space Operation allocation by adding a footnote (US96) to the 2200-2290 MHz band in the U.S. Table. This footnote limits use of the allocation to use during pre-launch testing and during space launch operations; requires coordination with NTIA prior to each launch; and limits non-Federal use to the 2208.5-2213.5 MHz, 2212.5-2217.5 MHz, 2270-2275 MHz, and 2285-2290 MHz portions of the 2200-2290 MHz band. The limitation to use during pre-launch testing and space launches is consistent with NTIA's advisement as well as the proposal in the *NPRM*. Despite this limitation, the current use of the space operation allocation to enable access to TDRSS will continue to be permitted on a non-interference basis under the current allocation. The requirement that the channel assignments be coordinated with NTIA was proposed in the *NPRM* and is necessary because of the existing Federal use of the band.

14. The limitation on non-Federal use of the band to the 2208.5-2213.5 MHz, 2212.5-2217.5 MHz, 2270-2275 MHz, and 2285-2290 MHz portions of the band was requested by NTIA. The *NPRM* proposed that non-Federal use of the band be restricted to a slightly different set of subbands: 2207-2219 MHz, 2270.5-2274.5 MHz, and 2285-2290 MHz. SpaceX has indicated that its recent launches have used a set of frequencies that differ both from what was proposed in the *NPRM* and what is requested by NTIA. Blue Origin states that it has used two frequencies that match NTIA's request and two that are different. Boeing suggests that the Commission avoid identifying discrete portions of the 2200-2290 MHz band as available for non-Federal launches as non-Federal and Federal launch vehicles must be interoperable. The Commission identifies the four portions of the 2200-2290 MHz band for non-Federal use, as specified by NTIA, but proposes in the *FNPRM* that the Commission consider extending the

secondary allocation to the full 90 megahertz. The Commission also notes that until service rules are adopted, non-Federal use of even the four subbands will continue to require an STA. The Commission notes that launches precipitated by successful coordination with NTIA have been conducted using this spectrum for many decades. The Commission sees no indication that this legacy of successful coexistence between launch operations and Federal users cannot continue to thrive under the allocation the Commission adopts today.

15. In addition, the Commission will not add developmental testing to the permitted uses of the Space Operations allocation, as requested by SpaceX and the Commercial Spaceflight Federation. As SpaceX admits, developmental testing is relatively infrequent and likely to occur at only a few discrete locations. Such testing can, and should, be conducted under Part 5 experimental licenses.

16. When the Commission proposed allocating the three band segments in the 2200-2290 MHz band for commercial launch operations, the Commission also invited comment on whether the spectrum in those band segments would be sufficient to support the expected growth of the commercial launch industry. In its comments, SpaceX requests that the Commission expand the lower sub-band proposed in the *NPRM* by 4 megahertz to meet the needs of future launches—*i.e.*, establish a 16 megahertz (2205-2221 MHz) band segment. While the Commission is cognizant that as launch technology continues to develop there may be a need for greater amounts of telemetry data which will require wider bandwidths, the Commission declines to expand the band segments available for telemetry beyond those bands specified in the previous two paragraphs. Instead, the Commission believes any need for wider bandwidths can be adequately met on a case-by-case basis using the STA process.

17. Adopting a non-Federal allocation for the 2200-2290 MHz band, however, is only a first step in providing licenses for commercial launch operations. In the *FNPRM*, the Commission proposes non-Federal allocations for three more bands and the Commission seeks comment on appropriate service rules for each band that will enable spectrum sharing between Federal users and commercial space operators. The Commission fully intends that the important Federal operations in these bands will be protected when introducing a new licensing regime to accommodate existing and future non-Federal launch activities. Until service rules for these bands are adopted, the Commission will continue to accept and process STA applications to approve and authorize commercial space launch activities. A separate

STA will continue to be required for each launch and the Commission will coordinate these STAs with NTIA prior to each launch.

18. *Use of spectrum other than 2200-2290 MHz for launch telemetry.* The *NPRM* pointed out that three frequencies in the 2360-2395 MHz band are "available for both Federal and non-Federal use for telemetry and telecommand of launch and reentry vehicles." The *NPRM* sought comment on the use of these and other frequencies as an alternative to the 2200-2290 MHz band for communications during launches. The *NPRM* also noted that the 2360-2395 MHz band is primarily used for aeronautical telemetry and telecommand operations for flight testing of aircraft and missiles and sought comment on whether the current and expected future use of the 2360-2395 MHz band for aeronautical telemetry for flight testing make it unsuitable for communications associated with launch activity. SpaceX, the Aerospace Industries Association, Boeing, the New Mexico Spaceport Authority, and the Commercial Spaceflight Federation assert that the 2360-2395 MHz band is not an appropriate alternative for telemetry because of the additional cost of supporting different frequency bands depending on whether a launch is Federal or non-Federal. Orbital ATK claims that using this band would require the Federal launch ranges to modify their equipment and would require Orbital ATK to replace radios costing millions of dollars. The Aerospace and Flight Test Radio Coordinating Council (AFTRCC) questions whether there is a demand for the frequencies in the 2360-2395 MHz band for launch telemetry, and it notes that the spectrum requirements for flight test in the band have changed dramatically since frequencies in the band were made available for space launch telemetry. The Commercial Spaceflight Federation supports keeping the 2360-2395 MHz band available for space launch telemetry as an alternative to 2200-2290 MHz, rather than as a replacement. Blue Origin views use of the 2360-2395 MHz band as an addition to the 2200-2290 MHz band and states that it would evaluate use of the band for future architectures that require additional transmitters. However, XCOR, which does support adding an allocation to 2200-2290 MHz, strongly encourages use of the 2360-2395 MHz band for commercial launch requirements because it would be able to use the same antenna for the nearby 2312.5 and 2352.5 MHz frequencies that it has been examining for telemetry use. In the *FNPRM*, the Commission seeks comment on the technology development for the 2360-2395 MHz band.

19. The Commission concludes based on the record that other bands are not suitable alternatives to the 2200-2290 MHz band for telemetry to support space launch operations. No commenters supported use of 2360-2395 MHz as a replacement for the 2200-2290 MHz band. The increasing use of the 2200-2290 MHz band for space launch telemetry justifies the allocation the Commission is adopting. Allowing access to the 2200-2290 MHz band for commercial space launches will allow space launch providers to benefit from the economies of scale inherent from using the same radio systems for both Federal agencies and commercial customers. Requiring commercial space launches to use another band, such as 2360-2395 MHz, would require space launch providers to develop separate communications systems for use depending on whether the space launch operation they are conducting is considered a Federal or non-Federal launch. Such an approach would impose considerable burden on the nascent commercial space launch industry, undermining the United States' leadership on space-based services.

20. *No Restriction to use at Federal Ranges*. The *NPRM* proposed restricting the non-Federal Space Operation allocation for the 2200-2290 MHz band to use at Federal ranges. Federal ranges are designated areas over which rocket and missile launches occur. These ranges are typically located over sparsely populated areas or over the ocean, and they have a designated launch site and associated radar tracking facilities. This proposal would limit use of the allocation to Federal launch ranges, such as the eastern range, which extends eastward over the Atlantic Ocean from Cape Canaveral. The *NPRM* stated that this restriction would limit the potential for interference to Federal operations to a few locations, and it asked whether this restriction would unduly limit the growth of the commercial space launch industry.

21. All industry commenters who addressed this issue opposed the restriction to Federal launch ranges. The New Mexico Spaceport Authority is concerned that this restriction may prevent access to spectrum for launches at FAA-licensed commercial launch sites and argues that limiting use of this band to Federal ranges would be inconsistent with the National Space Policy. SpaceX claims to be pursuing a launch site that is not in a Federal range. The New Mexico Spaceport Authority and SpaceX suggest permitting use of the spectrum at both Federal ranges and FAA-licensed launch sites. Blue Origin would not be able to operate its New Shepard launch vehicle in its current configuration with the

Federal range limitation, because it launches from a private site in West Texas that is not an FAA-licensed launch site and is not co-located with a Federal range. NTIA has requested that non-Federal use of the 2200-2290 MHz band be limited to use during space launches and pre-launch testing at Federal ranges and FAA-licensed launch sites.

22. The Commission will not restrict the locations where the new non-Federal allocation for the 2200-2290 MHz band may be used. The Commission recognizes that as the commercial space industry continues to develop, launches will likely not be limited to Federal ranges, and, consequently, the Commission does not believe it would be in the public interest to limit future non-Federal space launch operations to Federal ranges. The Commission also will not adopt the alternative suggested by NTIA and some commenters that the Commission limit use of this non-Federal allocation to FAA-licensed launch sites. As the FAA does not require that all launches be conducted at locations where it has issued a launch site license, restricting use of the allocation to launches at FAA-licensed launch sites would prevent some launch providers from obtaining a license for this spectrum band. Regardless of where a launch occurs, the Commission will require coordination with NTIA. However, because of the expense involved in constructing a launch site and the need to conduct launches at remote locations because of safety concerns, the Commission expects the number of locations where launches will occur to remain small. Consequently, our decision should not significantly increase the burden on NTIA and Federal agency coordinators.

23. *420-430 MHz and 5650-5925 MHz Bands.* The *NPRM* also proposed new non-Federal allocations for the 420-430 MHz and 5650-5925 MHz bands. However, in recent *ex parte* submissions, several commercial space launch providers have indicated that they do not use either of these bands for their operations. The Commission has never granted an STA for the 420-430 MHz band for space launches. In the past several years only one operator has obtained STAs for a small number of launches for the 5650-5925 MHz band. Given the limited current use of these bands during space launches, the Commission is not convinced that there is need for new allocations for either band. Instead, the Commission seeks further comment on these proposed allocations in the accompanying *FNPRM* to determine the current need for these allocations.

24. *Non-Federal Launch Definition*. The *NPRM* recognized that there can be confusion when trying to determine whether launch activity spectrum access requires authorization from NTIA or a license from the Commission. Under the Communications Act, the Commission has authority to issue licenses for radio stations except those "belonging to and operated by the United States." The *NPRM* sought comment on how to determine whether a given launch is non-Federal or Federal for licensing purposes. It asked whether factors such as the nature of the payload, the location of the launch, the provider of the launch vehicle, and FAA classification of the launch as commercial should be considered in making this determination.

25. All commenters addressing this issue urge the Commission to consider all launches licensed by the FAA to be non-Federal. SpaceX claims that none of the factors listed in the *NPRM* are conclusive and that relying on FAA licensing provides the most predictable standard. Boeing and the Satellite Industry Association both point out the similarity between language in the NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management (NTIA Manual or Redbook), focusing on who has "effective control" of the radio equipment, and the Commercial Space Launch Act's definition of a commercial launch provider, which focuses on who has "primary control" of the launch. The Aerospace Industries Association goes further by suggesting that the Commission not require any additional licensing for launches not licensed by the FAA.

26. A threshold issue for deciding whether a Commission license is required is the Communications Act's provision excluding radio stations "belonging to and operated by the United States" from the Commission's jurisdiction. If radio equipment used during a launch both belongs to and is operated by the United States Government, no Commission license is necessary. Otherwise, a Commission license is required. While launches that require FAA licensing might be expected to involve operation of non-Federal stations and require a Commission license, our jurisdiction is defined in the Communications Act. The key determination under the Communications Act is whether the radio equipment at issue belongs to and is operated by the United States Government. Consistent with the Communications Act, all radio equipment supporting space launches require a Commission license or authorization prior to transmitting, unless such equipment "belong[s] to and [is] operated by the United States [Government]."

27. *Orbital Debris Mitigation*. Two commenters addressed the issue of orbital debris mitigation. XCOR maintains that orbital debris mitigation associated with launch and reentry operations is the responsibility of the Secretary of Transportation, and that this responsibility has been delegated to the FAA. SpaceX also encourages the Commission to defer to the FAA regarding orbital debris matters for commercial space transportation activities when it develops service rules following this rulemaking. In light of the Commission's ongoing proceeding regarding orbital debris, the Commission will not address orbital debris mitigation in this proceeding, but any rules adopted in that context may be applicable to space launch operations.

28. *Regulatory Flexibility Analysis*. The Regulatory Flexibility Act of 1980, as amended (RFA) requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities." As required by the Regulatory Flexibility Act of 1980, as amended (RFA), an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Notice of Proposed Rulemaking* (*NPRM*) released in May 2013. The Commission sought written public comment on the proposals in the *NPRM*, including comments on the IRFA. No comments were filed addressing the IRFA. A Final Regulatory Flexibility Analysis (FRFA) that conforms to the RFA was prepared and included in Appendix B of the *Report and Order*.

29. *Paperwork Reduction Act Analysis*. This *Report and Order* does not contain 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).

30. The Commission has determined, and the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, concurs that this rule is non-major under the Congressional Review Act, 5 U.S.C. 804(2). The Commission will send a copy of this Report & Order to Congress and the Government Accountability Office pursuant to 5 U.S.C. 801(a)(1)(A).

31. Accordingly, IT IS ORDERED that, pursuant to sections 1, 2, 4(i), 5(c), 301, 303(c), 303(f), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. 151, 152, 154(i), 155(c),

301, 303(c), 303(f), and 303(r), and section 1.411 of the Commission's rules, 47 CFR 1.411, this *Report and Order and Further Notice of Proposed Rulemaking* IS HEREBY ADOPTED.

32. IT IS FURTHER ORDERED that the amendments of Part 2 of the Commission's rules, as set forth in Appendix A, ARE ADOPTED, effective thirty (30) days after publication in the *Federal Register*.

33. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Report and Order and Further Notice of Proposed Rulemaking*, including the Final and Initial Regulatory Flexibility Analyses, to the Chief Counsel for Advocacy of the Small Business Administration.

34. IT IS FURTHER ORDERED that the Commission SHALL SEND a copy of this *Report and Order* in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. 801(a)(1)(A).

List of Subjects in 47 CFR Parts 2

Communications equipment, Radio, Telecommunications.

FEDERAL COMMUNICATIONS COMMISSION

Marlene Dortch,

Secretary.

Final Rules

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

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

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

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

2. Amend § 2.106, the Table of Frequency Allocations, as follows:

a. Revise page 37.

b. In the list of United States (US) Footnotes, add footnote US96 in numerical order.

The revision and addition read as follows:

§ 2.106 Table of Frequency Allocations.

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International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
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) Wireless Communications (27)
2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392			2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) US96 EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED (line-of-sight only) MOBILE (line-of-sight only including aeronautical telemetry, but excluding flight testing of manned aircraft) 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392 US303	2200-2290 US96 US303	
2290-2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)			2290-2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)	2290-2300 SPACE RESEARCH (deep space) (space-to-Earth)	
2300-2450 FIXED MOBILE 5.384A Amateur Radiolocation	2300-2450 FIXED MOBILE 5.384A RADIOLOCATION Amateur		2300-2305 G122	2300-2305 Amateur	Amateur Radio (97)
			2305-2310 US97 G122	2305-2310 FIXED MOBILE except aeronautical mobile RADIOLOCATION Amateur US97	Wireless Communications (27) Amateur Radio (97)

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UNITED STATES (US) FOOTNOTES

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US96 The band 2200-2290 MHz is allocated to the space operation service (space-to-Earth) on a secondary basis for non-Federal use subject to the following conditions. Non-Federal stations shall be:

(a) Restricted to transmissions from the launch vehicle in the sub-bands 2208.5-2213.5 MHz, 2212.5-2217.5 MHz, 2270-2275 MHz, and 2285-2290 MHz (necessary bandwidth shall be contained within these ranges);

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

(c) Subject to coordination with NTIA prior to each launch.

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