

FCC MAIL SECTION

Federal Communications Commission

FCC 97-85

MAR 26 4 13 PM '97

DISPATCHED

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
)	
Allocation and Designation of Spectrum)	IB Docket No. 97-95
for Fixed-Satellite Services)	
in the 37.5-38.5 GHz, 40.5-41.5 GHz,)	RM-8811
and 48.2-50.2 GHz Frequency Bands;)	
Allocation of Spectrum to Upgrade Fixed)	
and Mobile Allocations in the 40.5-42.5 GHz)	
Frequency Band, Allocation of Spectrum)	
in the 46.9-47.0 GHz Frequency Band for)	
Wireless Services; and Allocation of)	
Spectrum in the 37.0-38.0 GHz and)	
40.0-40.5 GHz for Government Operations.)	

NOTICE OF PROPOSED RULEMAKING

Adopted: March 13, 1997

Released: March 24, 1997

Comment Date: 30 days after date of publication in the Federal Register

Reply Comment Date: 45 days after date of publication in the Federal Register

By the Commission:

TABLE OF CONTENTS

<u>Subject</u>	<u>Para.</u>
I. INTRODUCTION.....	1
II. BACKGROUND.....	2-8
III. DISCUSSION.....	9-36
A. Proposed Band Plan	9-20
B. Proposed FSS Allocations.....	21-24

C. Proposed Changes to Allocation Tables	25-36
IV. PROCEDURAL MATTERS.....	37-43
A. Ex Parte Rules.....	46-42
B. Initial Regulatory Flexibility Analysis.....	37
C. Initial Paperwork Reduction Act of 1995 Analysis.....	39
D. Comment Dates.....	38
E. Further Information.....	43
V. ORDERING CLAUSES	44-46
VI. APPENDIX A -- Initial Regulatory Flexibility Analysis	
VII. APPENDIX B -- Proposed Rules	
VIII. APPENDIX C -- Charts	

I. INTRODUCTION

1. In this *Notice*, we propose to designate 4 gigahertz of spectrum predominantly for Fixed-Satellite Services ("FSS"). These proposals are for the 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz bands. We also propose changes in the U.S. domestic table of allocations to accommodate these and related proposals affecting the 37.0-38.0 GHz, 40.0-40.5 GHz, 40.5-42.5 GHz and 46.9-47.0 GHz bands. The Commission will consider in other proceedings service and licensing rules for neighboring bands. We also solicit comment on sharing with Government users in the bands proposed primarily for satellite services. In addition, to place today's proposals in context and because some parties have submitted proposals that cross some of these bands, we set forth below a broad plan for the 36-51.4 GHz bands, on which we also seek comment.

II. BACKGROUND

2. By this *Notice*, we continue our efforts to make available, for commercial use, spectrum above 30 GHz.¹ Most of the 36-51.4 GHz spectrum is allocated internationally and

¹ Spectrum between 30 and 300 GHz is known as the millimeter wave band. The term millimeter wave connotes the wavelength of radio signals which, for this band, is between 1 and 10 millimeters.

domestically on a co-primary basis to the fixed, mobile, FSS, and mobile-satellite services ("MSS"). Domestically, with a few exceptions, the spectrum is allocated to both Government and non-Government operations.

3. Prior to 1994, most millimeter wave technology had been funded by the Government for military and scientific applications. In response to growing interest in commercial terrestrial applications for spectrum above 40 GHz, including PCS support services and vehicular radar systems, we initiated a rulemaking proceeding, in 1994, to open 18 gigahertz of spectrum between 40.5 GHz and 153 GHz for commercial use on a shared basis with existing and future Government operations ("Millimeter Wave" proceeding).² In that proceeding, we proposed to designate spectrum for both licensed and unlicensed commercial terrestrial facilities, with specific spectrum set aside for unlicensed uses, including vehicular radar systems. Specifically, we proposed to designate 6.3 gigahertz of spectrum to licensed services, including the 40.5-42.5 GHz and 47.4-48.2 GHz frequency bands. We also proposed a total of 8.5 gigahertz of spectrum in eight bands for general unlicensed operations, and an additional 3.2 gigahertz in four bands for unlicensed vehicular radar operations. Our proposal for unlicensed vehicular radar systems included the 47.2-47.4 GHz frequency band segment.

4. In December 1995, we adopted a *Report and Order and Second Notice of Proposed Rule Making* in the Millimeter Wave proceeding. Among other things, we proposed to establish rules for unlicensed vehicular operations below 80 GHz and general unlicensed operations between 59-64 GHz.³ In the *Report and Order*, we made available for vehicular radar operations the 46.7-46.9 GHz band, instead of the proposed 47.2-47.4 GHz band. We reasoned that this change, which had been suggested by the Telecommunications Industry Association ("TIA") and was unopposed, would provide additional flexibility in our decisions regarding licensed operations. We deferred issues related to licensed services, vehicular radar operations above 80 GHz, and operations in other bands to future proceedings.

5. Also, in December 1995, we adopted a *Notice of Proposed Rulemaking and Order* that proposed to provide additional spectrum between 37.0-38.6 GHz for terrestrial point-to-point operations ("39 GHz Notice").⁴ We also proposed to modify existing rules governing fixed point-to-point operations at 38.6-40.0 GHz to permit competitive wireless

² See In the Matter of Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *Notice of Proposed Rulemaking*, 9 FCC Rcd 7078 (1994).

³ See In the Matter of Amendment of Parts 2, 15 and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *First Report and Order and Second Notice of Proposed Rulemaking*, 11 FCC Rcd 4481 (1995).

⁴ See In the Matter of Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands -- Implementation of Section 309(j) of the Communications Act, *Notice of Proposed Rulemaking and Order*, 11 FCC Rcd 5930 (1995).

operations. This rulemaking was initiated by a petition from TIA, which sought additional spectrum around 37 GHz for point-to-point operations to ensure, among other things, adequate spectrum to support broadband PCS operations. In our *39 GHz Notice*, we requested comment on whether a wider array of fixed services should be accommodated and whether, and to what extent, mobile operations should be permitted in these bands.

6. Since the *Millimeter Wave* and *39 GHz Notices* were adopted, technological developments have sparked new applications for the frequencies between 36-51.4 GHz that were not contemplated in our prior proposals. These new applications include the stratospheric telecommunications system proposed by Sky Station International, Inc. and the NGSO/FSS system proposed by Motorola Satellite Systems, Inc. ("M-Star" system). Sky Station proposes to use platforms located in the stratosphere that would operate in the 47.2-47.5 GHz and 47.9-48.2 GHz frequency bands, or in other comparable bands, to offer domestic and global broadband fixed, mobile, and portable digital switched services in areas of significant population densities.⁵ Sky Station states that it will provide access to the Internet and picturephone services from small, handheld units or laptop computer devices. Motorola's proposed 72-satellite M-Star system seeks to use the 37.5-40.5 GHz (space-to-Earth) and 47.2-50.2 GHz (Earth-to-space) bands to provide broadband satellite services on a global basis.⁶ Motorola's M-Star system is designed to provide cellular and PCS backhaul services, wireless local loop backhaul services, corporate private data distribution service, interexchange transport service, private line networks, and backup and disaster recovery.

7. Parties representing the FSS and terrestrial services communities interested in the 36-51.4 GHz frequency range recently met in the Ad Hoc Millimeter Wave ("AHMW") group of the Commission's 1997 World Radio Conference ("WRC-97") Advisory Committee. The agenda for WRC-97 includes a provision for considering the identification of spectrum above 30 GHz for high-density fixed service applications.⁷ In order that the United States address that agenda item properly at WRC-97, the Commission has charged the AHMW group

⁵ See Sky Station Request to Establish New GSTS Service, Additional Comments and Petition for Rulemaking, ET Docket No. 94-124, RM-8784, and Application of Sky Station International, Inc. for Authority to Construct, Deploy and Operate a Global Stratospheric Telecommunications System, File No. 96-SAT-P/LA-96 (both filed, March 20, 1996) and Further Comments of Sky Station International, Inc., (filed, December 24, 1996).

⁶ See Motorola Satellite Systems, Inc.'s Application to Construct, Launch and Operate the M-Star System, File No. 157-SAT-P/LA-96(72) (filed, September 4, 1996). We also note that Motorola Satellite Communications, Inc. has filed a Petition for Rulemaking seeking allocation of 37.5-38.6 GHz to FSS (space-to-Earth) on a co-primary basis. See Motorola Petition for Rulemaking, RM-8811 (filed, March 4, 1996). We placed the Motorola Petition on public notice, and oppositions and replies were due on June 20, 1996 and July 5, 1996, respectively. Motorola's Petition is granted to the extent it proposes allocations consistent with our proposals discussed in this *Notice*.

⁷ Generally, "high density applications" refer to services in which the user population (or terminal population) is very high for a particular area.

with recommending U.S. proposals to WRC-97 that consider both the requirements of competing services in spectrum above 30 GHz and our goal of obtaining common worldwide allocations for various services.

8. In that regard, the AHMW group has discussed, among other things, the possibility of satellite and fixed terrestrial, and other terrestrial services operating from alternative delivery platforms sharing spectrum in this band. Motorola contends that sharing is possible between its NGSO FSS system and point-to-point fixed services in the 37.5-40.5 GHz band if the fixed service operators use specified peak effective isotropically radiated power ("EIRP") density limits and automatic transmission power control ("ATPC").⁸ In the AHMW group, representatives for the terrestrial fixed services argue that Motorola's proposed peak EIRP density limit would prevent, absent severe geographic restrictions on both services, the possibility of either a viable, ubiquitous NGSO FSS or a viable, ubiquitous high-density fixed service. Moreover, they maintain that ATPC to the degree specified by Motorola is not available, is not technically feasible, and is not applicable to high-density equipment currently in manufacturers' production pipelines. This group will continue to meet and will monitor the domestic situation.

III. DISCUSSION

A. Proposed Band Plan

9. In light of the competing proposals involving frequencies between 36 and 51 GHz, the two ongoing rulemakings involving frequencies in this range and the comments received therein, the difficulty in sharing between ubiquitous terrestrial and satellite licensees in the same bands, and the AHMW Group's consideration of this spectrum as a whole, we believe it useful to describe an initial overall policy and framework that we intend to follow in developing services using this spectrum. We believe that presenting the plan for the entire band will help clarify the relationship among individual proceedings, assist in planning for WRC-97, and assure that all proposed uses are given due consideration. Providing the public with an overview of our overall band plan will foster better business planning and expedite the commercial development of the 36-51.4 GHz spectrum. Furthermore, we suggest the associated changes that would be necessary in the domestic and international allocations were we to adopt the band plan. Service and licensing rules for specific subbands in the 36-51.4 GHz band, and specific designations for terrestrial services, are the subject of separate

⁸ Motorola recommends a maximum clear air EIRP density of -22 dBW/MHz and incorporation of ATPC to exceed the clear air EIRP limit during increases in atmospheric losses due to precipitation. In the 47.2-50.2 GHz, Motorola asserts that sharing is possible between the two services with coordination and an EIRP density rule applied to fixed service transmitters. Motorola also indicates that in order to share, fixed service antennas must meet the reference radiation pattern of ITU-R F.699-2.

ongoing and future proceedings.⁹

10. In developing the framework for the 36-51.4 GHz spectrum, we considered a wide range of factors. First, we considered the requirements of existing licensees and the effect of their outstanding authorizations on potential uses of the bands. We also considered requirements for both fixed and satellite services as expressed in applications now pending before us. These include a number of fixed terrestrial services, the Sky Station proposal, and the M-Star application. We also took into account other expressions of interest in providing services in these bands, including expressions made in domestic proceedings, as well as interest in international fora and by other administrations. Furthermore, noting that many of the bands under consideration are also allocated on a co-primary basis for Government use, we have attempted to make reasonable provision for anticipated Government requirements in these bands.

11. Consistent with our mandate to make available to the public rapid and efficient radiocommunications services, we seek to manage spectrum in a manner that promotes open entry, appropriate flexibility, technical innovation, and seamless satellite and terrestrial networks. Seamless global networks are facilitated by global allocation of spectrum for the same or similar services. This not only supports a compatible technical environment and minimizes potential harmful interference, but creates economies of scale for equipment manufacturers and ease of use for consumers. We recognize, however, that there is inherent tension between flexible use of spectrum and the promotion of seamless networks through global allocations since worldwide allocations can restrict the manner in which spectrum may be used in a particular country. Our overall plan for the 36-51.4 GHz spectrum, therefore, attempts to balance our goal of encouraging seamless communications with our goal of affording service providers appropriate flexibility to meet their customers' needs. Finally, since the current domestic and international allocation tables already provide, on a shared co-primary basis, significant spectrum for accommodating the services, we attempt to accomplish our objectives with minimal changes to those tables.¹⁰

12. Segmentation. Given the ubiquitous nature of some of the services proposed, it is not likely that satellite and terrestrial systems will be able to share the same spectrum without significant technical constraints on the operations of one or the other, or both, types

⁹ In addition, we will address spectrum outside the 36-51.4 GHz frequency range in separate proceedings. As such, issues related to licensed millimeter wave services, vehicular radar operations above 80 GHz, and unlicensed operations in bands outside 36-51.4 GHz will be addressed in our ongoing Millimeter Wave proceeding.

¹⁰ "Co-primary" services have equal rights to operate in particular frequencies. Stations operating in primary services are protected against interference from stations of "secondary" services. Moreover, stations operating in secondary services cannot claim protection from harmful interference from stations of primary service. See 47 C.F.R. §§ 2.104(d)(4) and 2.105(c).

of systems.¹¹ Indeed, frequency sharing is an issue of some contention. Consequently, we believe a band plan, with frequencies designated for different types of high-density services, would provide the various proposed systems with the best opportunity to succeed. While we anticipate that frequencies will be designated for a predominant use in a band (e.g., FSS), we will consider licensing a second, co-primary service, where possible.

13. Based upon rulemakings we have already completed for spectrum between 36 and 51.4 GHz and those that are currently underway or being planned, we believe that there is sufficient spectrum to accommodate the current and proposed commercial and Government applications. The Commission has been considering how we might segment this spectrum to meet these needs, and we think it will be helpful to those interested in the spectrum to understand our proposed band plan. This framework is, of course, subject to change and development as we proceed to consider licensing specific segments in further rulemakings.

14. Specifically, we propose to designate 4 gigahertz of spectrum for FSS and 4.6 gigahertz of spectrum for domestic wireless services. The satellite allocations and designations on which we seek comment in this Notice are part of this comprehensive plan for the 36-51.4 GHz spectrum, which will be implemented in this and other proceedings. As discussed in paragraph 22, we also request comment on the extent to which other flexible uses can be accommodated in the proposed FSS bands. Our overall framework for the 36-51.4 GHz spectrum is depicted in the following chart:

Frequencies	Proposed Commercial Designations	Other Permissible Operations
36.0-37.0 GHz	No Change	Current and Proposed Government Earth Exploration-Satellite/Space Research, Fixed, and Mobile
37.0-37.5 GHz	Wireless Services	Proposed addition of Government co-primary Space Research allocation to the 37.0-38.0 GHz band. ¹²
37.5-38.5 GHz	FSS (NGSO) and possible Wireless Underlay	Proposed addition of Government co-primary Space Research allocation to the 37.0-38.0 GHz band.
38.5-38.6 GHz	Wireless Services	
38.6-40.0 GHz ¹³	Wireless Services	

¹¹ Some FSS applications and fixed terrestrial services have been able to share spectrum in instances where there have been few earth terminals and primarily fixed, point-to-point terrestrial operations. In these instances, coordination of specific sites and facilities is required to obtain interference-free operations by both services.

¹² Specific proposals for Government allocations at 37.0-38.0 GHz and 40.0-40.5 GHz will be addressed later in this document.

40.0-40.5 GHz	Wireless Services	Proposed addition of Government co-primary Space Research and Earth Exploration-Satellite allocation to 40.0-40.5 GHz.
40.5-41.5 GHz	FSS (GSO) and possible Wireless Underlay	
41.5-42.5 GHz ¹⁴	Wireless Services	
42.5-43.5 GHz	No Change	Current Government Radioastronomy
43.5-45.5 GHz	No Non-Government Allocation	Current Government FSS (Military)
45.5-46.7 GHz	No Change	Future Government Mobile, MSS, and Radionavigation-Satellite
46.7-46.9 GHz ¹⁵	No Change	Current Unlicensed Commercial Vehicular Radar and Government Radionavigation-Satellite
46.9-47.0 GHz	Wireless Services	
47.0-47.2 GHz	No Change	Amateur
47.2-48.2 GHz ¹⁶	Wireless Services	
48.2-49.2 GHz	FSS (NGSO) and possible Wireless Underlay	
49.2-50.2 GHz	FSS (GSO) and possible Wireless Underlay	
50.2-50.4 GHz	No Change	Government Passive Earth-Exploration Service

¹³ We have already received comment on our proposal on this band segment and will take action in our 39 GHz proceeding. *See In the Matter of Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands -- Implementation of Section 309(j) of the Communications Act, Notice of Proposed Rulemaking and Order*, 11 FCC Rcd 5930 (1995).

¹⁴ As discussed above, we proposed this band, for licensed commercial use, in our Millimeter Wave NPRM and will address this proposal in a separate proceeding. *See In the Matter of Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, Notice of Proposed Rule Making*, 9 FCC Rcd 7078 (1994).

¹⁵ This segment of the band has already been designated to vehicular radar systems as part of our Millimeter Wave proceeding. *See In the Matter of Amendment of Parts 2, 15, and 97 of the Commission's rules to Permit Frequencies Above 40 GHz for New Radio Applications*, 11 FCC Rcd 4481 (1995).

¹⁶ We have already received comment on our proposal on this band segment and will take action in our Millimeter Wave proceeding. *See In the Matter of Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, Notice of Proposed Rulemaking*, 9 FCC Rcd 7078 (1994) and *First Report and Order and Second Notice of Proposed Rulemaking*, 11 FCC Rcd 4481 (1995).

50.4-51.4 GHz

Wireless Services

15. We seek comment on the proposed band plan. Specifically, we request comment on our proposed designations and whether a more efficient allocation of the spectrum could be achieved. Parties will also have an opportunity to comment on specific band segments in future rulemakings. Parties may request that we open additional bands for commercial operations.

16. We develop this bandplan against a backdrop of several existing rulemakings regarding sub-bands between 36-51.4 GHz.¹⁷ Procedurally, we are at different stages in designating and licensing specific sub-bands and services. Some of our existing rulemakings are consistent with our bandplan, while others are not. To the extent that an outstanding proposal is inconsistent with this band plan, the item provides the public with notice of our proposals to designate a particular sub-band for a different use.¹⁸ To the extent that an outstanding rulemaking is consistent with our band plan, we will reserve the right to move forward to the Report and Order stage of that rulemaking, independent of this proceeding. To defer action on other rulemakings, pending the outcome of this proceeding, would cause unnecessary delay in licensing commercial operations throughout the 36-51.4 GHz band. For example, we have already sought comment regarding commercial operations located between 38.6-40.0 GHz. By moving forward with our licensing proposals for this band, operators will be able to deploy their services at an earlier date.¹⁹ In addition, we see no reason to delay our action in the 41.5-42.5 GHz and 47.2-48.2 GHz bands established as part of our Millimeter Wave proceeding.²⁰ Postponing action on these bands could cause unnecessary delay in introducing new services to the telecommunications market.

¹⁷ See In the Matter of Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *Notice of Proposed Rulemaking*, 9 FCC Rcd 7078 (1994); In the Matter of Amendment of Parts 2, 15 and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *First Report and Order and Second Notice of Proposed Rulemaking*, 11 FCC Rcd 4481 (1995); and In the Matter of Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands -- Implementation of Section 309(j) of the Communications Act, *Notice of Proposed Rulemaking and Order*, 11 FCC Rcd 5930 (1995).

¹⁸ For example, in our *39 GHz Notice*, we proposed to license point-to-point microwave operations between 37.5-38.5 GHz. See In the Matter of Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands -- Implementation of Section 309(j) of the Communications Act, *Notice of Proposed Rulemaking and Order*, 11 FCC Rcd 5930 (1995). After reviewing the various competing proposals for the 36-51.4 GHz, we now propose to designate 37.5-38.5 GHz for predominantly fixed-satellite services.

¹⁹ We anticipate adopting service and licensing rules for this sub-band in the near future.

²⁰ See In the Matter of Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *NPRM and First Report and Order and Second NPRM*, note 13, *supra*.

17. Many of the frequencies we have designated or are planning to designate for terrestrial wireless services are consistent with our prior proposals regarding fixed terrestrial services in these bands, as well as proposed operations, such as Sky Station.²¹ For example, we have already issued licenses for fixed operations throughout the 38.6-40.0 GHz band and have proposed to continue to license these services in that band.²² These wireless broadband point-to-point systems provide local access and backhaul services in primarily industrial areas, with more multimedia applications anticipated for the future. Sky Station requested use of 300 MHz of spectrum at 47.2-47.5 GHz and 300 MHz at 47.9-48.2 GHz for its stratospheric radio relay repeater system. As a radio relay repeater, we consider Sky Station's proposed system to be a terrestrial service. Accordingly, Sky Station's proposal will be considered in the pending Millimeter Wave proceeding, concerning predominantly terrestrial operations above 40 GHz.

18. Government and Non-Government Sharing. In devising a band segmentation plan, we recognize that much of the 36-51.4 GHz spectrum is allocated, in the United States, to both Government and non-Government operations, on a shared co-primary basis.²³ It appears that Government operations, particularly FSS operations, and commercial FSS may be better sharing candidates than commercial wireless and Government operations, in part, because of technical considerations. In either case, open-ended spectrum sharing with co-primary Government users would create uncertainty about the amount of spectrum within a licensed block that would be available for future commercial use. This uncertainty may adversely affect licensees' ability to raise the capital needed to deploy their services. However, in the FSS bands, it may be possible to fashion technical sharing rules that would allow sharing between Government and commercial licensees without significantly reducing the amount of spectrum available for commercial use. Such rules may be less feasible in terrestrial bands where a wider range of commercial systems and services may be permitted.

19. NTIA will be the co-arbiter with the Commission on deciding how spectrum sharing will be implemented. Commission staff has begun discussions with NTIA to

²¹ We have on several occasions considered additional services at these frequencies beyond these licensed point-to-point operations. For example, in our 39 GHz Rulemaking we sought comment on whether, and to what extent, we would permit a wider array of fixed services, such as point-to-multipoint operations.

²² See In the Matter of Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands -- Implementation of Section 309(j) of the Communications Act, *Notice of Proposed Rulemaking and Order*, 11 FCC Rcd 5930 (1995). Issues regarding licensing in other bands designated for wireless services will be addressed in separate proceedings. All comments regarding service, auction, and other licensing proposals in the wireless bands should be directed to those proceedings.

²³ Current and proposed Government operations in this spectrum include radio navigation, radio astronomy, space research, earth exploration satellite, vehicular radar services, and satellite operations.

determine how best to balance the needs of Government and commercial users in this spectrum. Those discussions have centered on three approaches. One approach is to allocate parts of this spectrum for exclusive non-Government use and other parts for exclusive Government use. For example, the Government already has a range of services, including earth-exploration satellite and space research services in the 36-37 GHz band. Under this approach, one option may be to designate that band, and other, similar bands to exclusive Government use. In exchange, other bands would be designated for exclusive commercial use. Another approach we are exploring with NTIA is that of geographic exclusivity. In some cases, for example, around military installations, Government use is confined to a definable geographic area. In any wireless band where such operations exist, those areas can be identified and carved out of licensed, non-Government markets. In this case, after licensing wireless services, future Government spectrum requirements would be met in bands that have predominantly Government use. A further approach would be to grant the non-Government licensee exclusive rights for non-Government use in a certain band and geographic area. However, current Government operations and requests by the Government for future frequency assignments would be handled as they are now. However, this approach could reduce the amount of spectrum that will be available for future use in a block licensed to a non-Government entity and cause problems with planning and financing of buildout and with the auctioning of licenses.

20. To assist us in our continuing discussions with NTIA, we request comment on the possibilities for sharing between Government and non-Government users in the bands proposed herein for predominantly satellite use.²⁴ We also invite parties to provide their views on how Government and non-Government access to these bands is best balanced. For example, private agreements may be negotiated between commercial and Government users that could result in protected Government use of frequencies under a commercial operator's control, or in Government operational requirements being met through commercial operators.²⁵ Conversely, there may be agreements where non-Government use can be accommodated in exclusive Government-use zones.

B. Proposed FSS Bands.

21. We propose to allocate the 37.5-38.5 GHz (space-to-Earth) band for predominantly NGSO/FSS operations. This band was allocated internationally to FSS at WARC-79. However, the Commission has not yet implemented that allocation domestically.

²⁴ Commenters should direct discussion regarding Government sharing in other frequency bands to the proceeding addressing licensing and service rules for that particular band.

²⁵ Regardless of how Government and commercial spectrum access is balanced in these bands, it is likely that some commercial operators who have successfully bid on spectrum may be required to share that spectrum with Government users. Future rulemakings that address service and licensing rules will define the rights, vis-a-vis Government users, granted to wireless operators who have obtained spectrum access through auctions

We propose to pair that NGSO/FSS downlink band with an NGSO/FSS uplink at 48.2-49.2 GHz (Earth-to-space). The proposed uplink is part of the 47.2-50.2 GHz band that is already allocated to FSS, among other services, both domestically and internationally. While we do not have a GSO proposal before us, we envision use of spectrum at 40 GHz for both GSO and NGSO operations. We propose to allocate the 40.5-41.5 GHz (space-to-Earth) band for predominantly GSO operations. The 40.5-41.5 GHz band is part of the existing worldwide broadcasting-satellite service ("BSS") allocation at 40.5-42.5 GHz. Since GSO/FSS and BSS operations often have similar technical characteristics, it may be feasible to accommodate FSS downlinks in this band. We propose to pair the 40.5-41.5 GHz GSO downlink with an uplink at 49.2-50.2 GHz (Earth-to-space). Again, the proposed uplink is part of the 47.2-50.2 GHz band that is already allocated to FSS. As discussed below, our proposals would require a modification of the ITU and United States Tables of Allocations to permit FSS operations in several of these bands.

22. As in other satellite services, we seek to maximize entry, since multiple systems facilitate wider service options and better prices for consumers. Following the release of this *Notice*, we will place Motorola's M-Star application on Public Notice and will establish a cut-off period for both GSO/FSS and NGSO/FSS applications to be considered concurrently with Motorola's application. In this Public Notice, we may require Motorola to amend its application to ensure consistency with recent Commission decisions. At this point, we would accept applications for systems in acceptable frequency bands proposed by Motorola, as well as the 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz frequency bands proposed for FSS in this *Notice*. All applicants will have an opportunity to amend their applications to bring them into compliance with our band plan or other spectrum assignments, and any technical or service rules we adopt for FSS systems in the 36-51.4 GHz frequency range. Parties are advised, however, that the requirements contained in Part 25 of our rules relating to fixed-satellites, in general, will apply to FSS systems in the bands we designate for FSS operations in this proceeding.²⁶ Accordingly, we propose to amend Section 25.202(a)(1) of our rules, 47 C.F.R. § 25.202(a)(1), to add the 37.5-38.5 GHz (space-to-Earth), 40.5-41.5 GHz (space-to-Earth), and 48.2-50.2 GHz (Earth-to-space) to the listed FSS frequencies.²⁷

23. Underlay Licenses in FSS Bands. We also request comment on whether we should consider issuing "underlay" licenses in bands where we have designated FSS as the primary use, but where that use does not exhaust the potential uses of the spectrum. We use the term "underlay" service to describe a concept which would explore the possibility of licensing second service in the FSS bands, in a manner that would not interfere with the predominant use. An underlay service would be a type of service that fits within existing or subsequently modified spectrum allocations, but is not our designated predominant use of a particular frequency band. For example, in its M-Star application, Motorola indicates that

²⁶ As such, applicants are required to meet full frequency reuse requirements and power flux density limits, as well as licensee qualification requirements.

²⁷ These proposed changes are outlined in Appendix C of this *Notice*.

sharing between its proposed NGSO FSS system and point-to-point terrestrial operations is possible. Specifically, as we described previously, Motorola contends that with certain technical limitations on these terrestrial operations, such as appropriate power limits and automatic power control, sharing with a ubiquitous NGSO FSS service is possible.

24. With this in mind, we seek to identify service types within existing allocations and technical parameters for "underlay" facilities, recognizing the underlay operations may need to be restricted so that they do not substantially impact the predominant use designated for a particular band. We seek comment on the types of technical parameters and protection mechanisms that would facilitate this "underlay" concept. For example, commenters may choose to distinguish an underlay license from a secondary license.²⁸ The underlay license could be auctioned in the event mutually exclusive applications are received and if we found that the principal use of the spectrum would be for subscription-based services, even if the predominant use service is not auctioned.

C. Proposed Changes to the Table of Allocations

25. The Band plan proposes to segment the 36.0-51.4 GHz band in a way that minimizes changes to the domestic and the international allocation tables. We believe that our band segmentation plan best balances the various interests. We note that the current domestic and international allocation tables were established long before the new, higher deployment density services were developed or even feasible. Because we seek to give both terrestrial and satellite high-density services a genuine opportunity to develop, we consider it preferable to make adjustments to the domestic and international frequency allocation tables rather than to force potentially unworkable sharing situations on these services. We believe our plan will work to the overall benefit of high density terrestrial fixed services, high density fixed-satellite services and high density services operating from alternative platforms. Our proposed allocation table changes follow.

26. Domestic Allocations. Consistent with our band segmentation plan, we are proposing several changes to the U.S Table of Frequency Allocations as set forth in Section 2.106 of the Commission's Rules. These changes are related primarily to FSS. First, we are proposing to implement the Region 2 FSS downlink allocation at 37.5-38.5 GHz by adding it to the domestic table in Part 2.106 of our Rules. This Region 2 allocation was a result of international agreement between the United States and other administrations at past ITU world radio conferences. The Commission periodically adopts international allocations to which it has agreed either by initiating general WARC/WRC implementation rulemakings, or by initiating rulemakings that implement such allocations when a domestic requirement is identified. The latter case applies here. Currently, this spectrum is allocated on a shared (Government and non-Government), co-primary basis to the fixed and mobile services.

²⁸ Secondary licensees cannot cause harmful interference to primary services in a particular band and cannot claim protection from those primary services. See 47 C.F.R. § 2.105(c)(3).

Although we have not licensed any terrestrial services in the 37.5-38.5 GHz frequency band, we are not proposing to delete the existing fixed and mobile allocations. This proposal would give us the flexibility of permitting "underlay" licenses, as described earlier, in this band if that proposed use is feasible.

27. Second, we are proposing to adopt an allocation for FSS downlinks at 40.5-41.5 GHz. This spectrum is part of the existing 40.5-42.5 GHz worldwide broadcasting-satellite service ("BSS") allocation.²⁹ This added FSS allocation would promote our goal of allowing high-density FSS and high-density fixed service to develop independent of mutual sharing constraints. The reason for extending the existing 38.6-40.5 GHz FSS allocation into the BSS allocation is that point-to-point and high-density fixed service operations are already being licensed and implemented in the 38.6-40 GHz frequency band that we proposed to designate for such use. We believe this would cause a shortfall in available FSS spectrum, given our desire to make a sufficient amount of both NGSO and GSO FSS spectrum available in the 36-51.4 GHz range. Because GSO FSS and BSS operations often have similar technical characteristics, and noting that there are no current 40 GHz BSS operations and also that the 40.2-42.5 GHz BSS band is not part of the ITU's "planned" BSS bands, we believe it is feasible and appropriate to place FSS downlinks in the 40.5-41.5 GHz segment of the BSS band. Our two FSS allocation proposals would make available 2 gigahertz of downlink spectrum (37.5-38.5 GHz and 40.5-41.5 GHz) and 2 gigahertz of uplink spectrum (48.2-50.2 GHz) for FSS. This should be sufficient for a combination of GSO and global NGSO FSS services. We invite comment on these allocation proposals.

28. There is also a secondary allocation for fixed and mobile services in the 40.5-42.5 GHz frequency band. This spectrum could be used for wireless services and possible underlay licenses as described above. If such use is practical and is needed, we would like to afford these wireless operations greater protection than a secondary status affords. Therefore, we propose to upgrade the status of the fixed and mobile services in the 40.5-42.5 GHz frequency band to primary.³⁰ We seek comment on this proposal. Commenting parties should note that this proposal would provide for primary fixed and mobile wireless services throughout the 40.5-42.5 GHz frequency band. Our proposal designates the 41.5-42.5 GHz band for predominantly wireless services. Our proposal also envisions possible "underlay" wireless services in the 40.5-41.5 GHz band designated for predominantly FSS operations. That would encompass our proposed FSS allocation addition at 40.5-41.5 GHz and the existing BSS allocation that would remain throughout the 40.5-42.5 GHz frequency band.

29. Our FSS allocation proposals and our outstanding proposal regarding the 38.6-

²⁹ A change in the International Table of Allocations would permit U.S. FSS systems to receive interference protection from other Region 2 BSS systems.

³⁰ In the WRC-95 Final Acts, the allocation of services on a permitted basis was suppressed, and all permitted services were given primary status. Domestically, the broadcasting service at 40.5-42.5 GHz is currently allocated on a permitted basis. We propose to conform with the Region 2 allocation plan and change its allocations status from permitted to primary.

40.0 GHz band leaves a 100 MHz segment from 38.5-38.6 GHz unaccounted for. We believe this spectrum could also be used for wireless services. For example, there may be one-way applications that could make use of the 38.5-38.6 GHz band. Alternatively, this segment could be paired with another 100 MHz segment in the 36-51.4 GHz range. Based on our recent discussions with NTIA regarding Government use of the 36-51.4 GHz spectrum, we have reason to believe that the 46.9-47.0 GHz band, currently allocated on a shared, co-primary basis to the mobile, mobile-satellite, radionavigation and radionavigation-satellite services is very lightly used.³¹ This spectrum could be paired with the 38.5-38.6 GHz band to yield two 100 MHz blocks of spectrum for two-way wireless operations. To enable this possibility, we are herein proposing to add a fixed service allocation to the 46.9-47.0 GHz band. Specific use of the 38.5-38.6 and 46.9-47.0 GHz bands will be addressed separately or collectively in future rulemakings.

30. Government Allocations. We also make proposals for the Government column of the domestic table of frequency allocations. NTIA has requested that Space Research (space-to-Earth) be added on a primary basis to the domestic allocation table in the Government column of the 37.0-38.0 GHz band. NTIA requests the addition of a primary Space Research and Earth Exploration-Satellite (Earth-to-space) allocation to the Government allocation at 40.0-40.5 GHz.³² NTIA also requests the addition of a secondary Earth Exploration-Satellite (space-to-Earth) allocation at 40.0-40.5 GHz. This spectrum has already been allocated worldwide at WARC-92 due, in large part, to the success of proposals from the United States. NTIA requests that we now implement this allocation domestically.

31. NTIA has stated to us that the National Aeronautics and Space Administration ("NASA"), who would operate space research and earth exploration stations in the United States, indicates that use of this spectrum is planned for a specific number of sites. Specifically, we understand that NASA has plans to implement stations at the following sites: (a) Goldstone, California; (b) Greenbank, West Virginia; and (c) Socorro, New Mexico.

32. NASA intends to use part of the 37.0-38.0 GHz band for planetary exploration downlinks (space-to-Earth) and part of the band for downlinking data from spaceborne very long baseline interferometry ("VLBI").³³ NASA would use the 40.0-40.5 GHz band for

³¹ The 46.9-47.0 GHz band is part of the 45.5-47.0 GHz band that is allocated to the services referenced earlier in this document. However, we have already allocated the 46.7-46.9 GHz segment for vehicular radars. See Footnote 16, *supra*. A 1.1 gigahertz segment from the 45.5-46.7 frequency band remains allocated to the referenced services. Currently we have no proposal to use this spectrum for commercial services.

³² See Memorandum to William Torak, FCC Representative to Interdepartment Radio Advisory Committee ("IRAC") from William Gamble, IRAC Chairman (March 21, 1995).

³³ Interferometry is a measurement technique that uses the phenomenon of interference of light waves to measure light wavelengths, small distances and optical phenomenon. VLBI is a technique where a large array of many radiofrequency receiving antennas are used as an interferometer to give spectral line observation resolutions equivalent to that of large optical

planetary exploration uplinks (Earth-to-space).

33. We note that the locations listed are well-known deep-space and radioastronomy observatory sites and are few in number. For the most part, they are already protected from interference from other Government and commercial radio services and are located away from population centers. On this basis, we propose to implement the U.S.-initiated WARC-92 results by adding the Space Research and Earth Exploration-Satellite services to the 40.0-40.5 GHz band and the space research service to the 37.0-38.0 GHz band in the Government column of the domestic table of frequency allocations. We invite comment on this proposal. Parties should note that in future Commission rulemaking items we intend to develop rules for implementing commercial services in these bands. We invite comment on what impact the space services proposed here might have on the future use of the bands for commercial services. Those who comment may wish to provide information on the sharing potential between commercial services they envision and space science use of the band and also what limitations protection of space science services might place on commercial service. Parties are also invited to comment on how possible requests for additional space science observation sites in the 37.0-38.0 GHz and 40.0-40.5 GHz bands, beyond the three sites listed, should be handled.

34. International Allocation. To ensure international protection of global and domestic FSS operations that may be implemented if we adopt our proposed FSS allocation table changes, it is desirable to obtain consistent international allocations. If we do adopt our proposals domestically, we anticipate advocating proposals at ITU World Radiocommunication Conferences to extend these changes to a regional or global basis. The next opportunity to consider changes to the international table of spectrum allocations is WRC-97, that convenes in the fall of this year. Although the approved WRC-97 agenda does not provide for consideration of FSS allocation issues explicitly, it does provide for considering identification of spectrum above 30 GHz for high-density fixed service applications. For the reasons we provide in this document, designating spectrum for one service may affect the availability of that spectrum for other services to which it is allocated. Consequently, we believe that proposals that address other above 30 GHz services, such as FSS should also be entertained at WRC-97. The alternative would be to advocate at WRC-97, a WRC-99 agenda item that would address explicitly FSS, above 30 GHz. These matters will be discussed in the Commission's WRC-97 preparation process that includes the WRC-97 Advisory Committee.³⁴

35. Additionally, we recognize that proposed domestic "underlay" licenses in the 40.5-41.5 GHz band, as well as most commercial wireless uses that we contemplate domestically in the 41.5-42.5 GHz band, would not be afforded international protection if

telescopes. In this case, spaceborne interferometers collect data that must be downloaded to earth stations and correlated with data collected simultaneously with terrestrial radioastronomy observations.

³⁴ Interested parties may comment on these proposals through the Commission's Advisory Committee for WRC-97 preparation.

fixed and mobile services remain secondary in the International Table of Allocations. Thus, we will also discuss in the WRC preparation process whether to seek an upgrade for worldwide fixed and mobile allocations in the 40.5-42.5 GHz frequency band.

36. Finally, were we to proceed with a pairing of the 38.5-38.6 GHz frequency band with 46.9-47.0 GHz, we would desire to seek international protection of wireless services in those band segments. This would require addition of a fixed services allocation at 46.9-47.0 GHz. Again, this will be addressed in the WRC-97 preparation process based on the progress of domestic considerations.

PROCEDURAL MATTERS

37. As required by Section 603 of the Regulatory Flexibility Act, the Commission has prepared an Initial Regulatory Flexibility Analysis ("IRFA") of the expected impact on small entities of the proposals set forth in this document. See, Appendix A. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines as the comment period established for this Notice, but must have a separate and distinct heading designating them as responses to the Initial Regulatory Flexibility Analysis. The Secretary shall send a copy of this Notice of Proposed Rulemaking, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administrations in accordance with paragraph 203(a) of the Regulatory Flexibility Act, Pub. L. No. 96-354, 94 Stat. 1164, 5 U.S.C. § 601 *et seq* (1981).

38. Pursuant to applicable procedures set forth in Sections 1.415 and 1.419 of the Commission's Rules, 47 C.F.R. §§ 1.415 and 1.419, interested parties may file comments on or before 30 days after publication in the Federal Register, and reply comments on or before 45 days after publication in the Federal Register. To file formally in this proceeding, you must file an original and four copies of all comments, reply comments and supporting comments to the Office of the Secretary, Federal Communications Commission, Washington, D.C. 20554. If you want each Commissioner to receive a personal copy of your comments, you should file four additional copies. Comments and reply comments will be available for public inspection during regular business hours in the Federal Communications Commission, Reference Center, Room 239, 1919 M Street, N.W. Washington, D.C. 20554.

39. This *Notice* contains no proposal for modified information collection and does not impact the requirements of the Paperwork Reduction Act of 1995, Pub. L. No. 104-13.

40. This is a non-restricted notice and comment rulemaking proceeding. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in the Commission's rules. See generally 47 C.F.R. §§ 1.1202, 1.1203, and 1.1206(a). The Sunshine Agenda period is the period of time that commences with the release of public notice that a matter has been placed on the Sunshine Agenda and terminates when the Commission (1) releases the text of a decision or order in the matter; (2) issues a public notice stating that the matter has been deleted from the Sunshine Agenda; or (3) issues

a public notice stating that the matter has been returned to the staff for further considerations, whichever occurs first. 47 C.F.R. § 1.1202(f). During the Sunshine Agenda period, no presentations, *ex parte* or otherwise, are permitted unless specifically exempted. See 47 C.F.R. § 1.1203.

41. In general, an *ex parte* presentation is any communications directed to the merits or outcome of the proceeding made to decision-making personnel that (1) if written, is not served on the parties to the proceeding, or (2) if oral, is made without advance notice to the parties to the proceeding and without opportunity for them to be present. 47 C.F.R. § 1.1202(b). Any person who makes or submits a written *ex parte* presentation shall provide on the same day it is submitted, two copies of the same under separate cover to the Commission's Secretary for inclusion in the public record. The presentation, as well as any transmittal letter, must clearly indicate on its face the docket number of the particular proceeding and the fact that two copies of it have been submitted to the Secretary, and must be labeled or captioned as *ex parte* presentation. 47 C.F.R. § 1.1206(a).

42. Any person making an oral *ex parte* presentation including data or arguments not already reflected in the person's written comments, memoranda, or other previous filings in that proceeding shall provide on the same day of the oral presentation and original and one copy of a written memorandum to the Secretary (with a copy to the Commissioner or staff member involved) that summarizes the data and arguments. The memorandum (as well as any transmittal letter) must clearly indicate on its face the docket number of the particular proceeding and the fact that an original and one copy of it have been submitted to the Secretary, and must be labeled or captioned as an *ex parte* presentation. 47 C.F.R. § 1.1206(a)(2).

43. For further information concerning this rulemaking, contact Virginia Marshall (202) 418-0778 of the International Bureau, Federal Communications Commission, Washington, D.C. 20554.

ORDERING CLAUSES

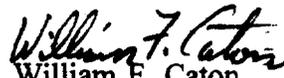
44. Accordingly, IT IS ORDERED that pursuant to the authority contained in Sections 1, 4(i), 4(j), 301, and 303 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 154(j), 301, and 303, NOTICE IS HEREBY GIVEN of our intent to adopt the policies set forth in this Notice and that COMMENT IS SOUGHT on all proposals in this Notice.

45. IT IS ORDERED THAT, the Petition for Rule Making, filed by Motorola Satellite Communications, Inc. IS GRANTED to the extent it is consistent with our proposals.

46. IT IS FURTHER ORDERED that the Secretary shall send a copy of this Notice of Proposed Rulemaking, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with paragraph 603(a) of the Regulatory Flexibility Act, Pub. L. No. 96-354, 94 Stat. 1164, 5

U.S.C. §§ 601 et seq (1981).

FEDERAL COMMUNICATIONS COMMISSION


William F. Caton
Acting Secretary

Appendix A**Initial Regulatory Flexibility Analysis**

As required by Section 603 of the Regulatory Flexibility Act, the Commission has prepared an Initial Regulatory Flexibility Analysis ("IRFA") of the expected significant economic impact on small entities by the policies proposed in this Notice of Proposed Rulemaking. Written and public comments are requested by the IRFA and must be filed by the deadlines for comments on this Notice.

A. Reason for Action

This rulemaking proceeding is being initiated to obtain comment and develop a record on certain proposals in the 36-51.4 GHz frequency band. Specifically, this Notice proposes to designate spectrum for fixed-satellite services, both geostationary and non-geostationary satellite orbit, systems at 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz. In addition, this Notice seeks comment on a proposal to achieve sharing between Government and non-Government operations in these bands. Finally, this Notice outlines and seeks comment on the domestic allocations necessary to accommodate both terrestrial and satellite services as discussed in the item.

B. Objectives

The Commission seeks to allocate spectrum for predominantly fixed satellite uses, in a manner that minimizes disruption to existing services. The proposed band plan will promote the technological developments in the millimeter wave bands (30-300 GHz), encourage effective competition, and provide customers with additional satellite service providers.

C. Legal Basis

The proposed action is authorized under the Administrative Procedure Act, 5 U.S.C. § 553; and Sections 1, 4(i), 4(j), 301 and 303 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 154(j), 301, and 303.

D. Description and Estimate of Small Entities Subject to the Rules

The Commission has not developed a definition of small entities applicable to geostationary or non-geostationary orbit fixed-satellite service licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to Communications services, Not Elsewhere Classified. This definition provides that a small entity is one with \$11.0 million in annual receipts.³⁵ According to

³⁵

13 C.F.R. § 121.201, Standard Industrial Classification (SIC) Code 4899.

Census Bureau data., there are 848 firms that fall under the category of Communications Services, Not Elsewhere Classified. Of those, approximately 775 reported annual receipts of \$11 million or less and qualify as small entities.³⁶ However, since this is a new service, we are unable, at this time, to provide a reasonable estimate of how many of these entities will be providing these services.

E. Reporting, Recordkeeping, and Other Compliance Requirements

The proposal under consideration in this Notice, involve no reporting requirements at this time. Final service and licensing rules will be proposed at a later date.

F. Any Significant Alternatives Considered

This Notice solicits comment on other alternatives such as other mechanisms of Government/non-Government sharing in these bands proposed primarily for FSS uses. The Notice also requests comment on whether a sufficient amount of spectrum has been designed for terrestrial and satellite services or whether a different split would be better.

The proposed fixed-satellite designations would apply to both geostationary orbit and nongeostationary orbit fixed-satellite systems. Furthermore, the proposed Government sharing mechanisms would apply to those bands proposed primarily for FSS uses. This item should positively impact both large and small businesses by providing additional spectrum in which to provide services. Our proposals would not displace incumbent operators. We will be able to address small business concerns regarding specific sub-bands as we proceed to establishing licensing and service rules for those bands.

G. Federal rules that Overlap, Duplicate or Conflict with These Proposed Requirements

None.

³⁶ U.S. Bureau of the Census, U.S. Department of Commerce, 1992 Census of Transportation, Communications, and Utilities, UC92-S-1, Subject Series, Establishment and Firm Size, Table 2D, Employment Size of Firms, 1992, SIC Code 4899 (issued May 1995).

Appendix B: Proposed Rules

Parts 2 and 25 of title 47 of the Code of Federal Regulations are proposed to be amended 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: Sections 4, 302, 303, and 307 of the Communications Act of 1934, as amended, 47 U.S.C. sections 154, 302, 303 and 307, unless otherwise noted.

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

- a. Remove the existing entries for 36-51.4 GHz.
- b. Add entries in numerical order for 36-51.4 GHz.
- c. In the International Footnotes under heading I., add footnotes S5.340, S5.552, S5.553, S5.554, and S5.555 in numerical order.
- d. In the International Footnotes under heading II., remove footnotes 898, 899, 900, and 901.
- e. Add footnote US342.

The revisions and additions read as follows:

§ 2.106 Table of Frequency Allocations.

* * * * *

International table			United States table			FCC use designators	
Region 1 - allocation GHz	Region 2 - allocation GHz	Region 3 - allocation GHz	Government	Non-Government	Rule part(s)	Special-use frequencies	
(1)	(2)	(3)	Allocation GHz (4)	Allocation GHz (5)	(6)	(7)	
36 - 37 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) S5.149	36 - 37 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) S5.149	36 - 37 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) S5.149	36 - 37 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) US283 US342	36 - 37 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) US263 US342			
37 - 37.5 FIXED MOBILE SPACE RESEARCH (space-to-Earth)	37 - 37.5 FIXED MOBILE SPACE RESEARCH (space-to-Earth)	37 - 37.5 FIXED MOBILE SPACE RESEARCH (space-to-Earth)	37 - 37.5 FIXED MOBILE SPACE RESEARCH (space-to-Earth)	37 - 37.5 FIXED MOBILE	FIXED MICROWAVE SERVICES (101)		
37.5 - 38 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (space-to-Earth) Earth Exploration-Satellite (space-to-Earth)	37.5 - 38 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (space-to-Earth) Earth Exploration-Satellite (space-to-Earth)	37.5 - 38 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (space-to-Earth) Earth Exploration-Satellite (space-to-Earth)	37.5 - 38 FIXED MOBILE SPACE RESEARCH (space-to-Earth)	37.5 - 38 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	FIXED MICROWAVE SERVICES (101) SATELLITE COMMUNICATIONS (25)		
38 - 38.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth Exploration-Satellite (space-to-Earth)	38 - 38.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth Exploration-Satellite (space-to-Earth)	38 - 38.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth Exploration-Satellite (space-to-Earth)	38 - 38.5 FIXED MOBILE	38 - 38.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE	FIXED MICROWAVE SERVICES (101) SATELLITE COMMUNICATIONS (25)		

International table			United States table		FCC use designators	
Region 1 - allocation GHz	Region 2 - allocation GHz	Region 3 - allocation GHz	Government	Non-Government	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	Allocation GHz (4)	Allocation GHz (5)	(6)	(7)
38.5 - 38.6 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth Exploration-Satellite (space-to-Earth)	38.5 - 38.6 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth Exploration-Satellite (space-to-Earth)	38.5 - 38.6 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth Exploration-Satellite (space-to-Earth)	38.5 - 38.6 FIXED MOBILE	38.5 - 38.6 FIXED MOBILE	FIXED MICROWAVE SERVICES (101)	(7)
38.6 - 39.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth Exploration-Satellite (space-to-Earth)	38.6 - 39.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth Exploration-Satellite (space-to-Earth)	38.6 - 39.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Earth Exploration-Satellite (space-to-Earth)	38.6 - 39.5 US291	38.6 - 39.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE US291	FIXED MICROWAVE SERVICES (101) Auxiliary Broadcasting (74)	
39.5 - 40 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite (space-to-Earth)	39.5 - 40 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite (space-to-Earth)	39.5 - 40 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) Earth Exploration-Satellite (space-to-Earth)	39.5 - 40 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US291 G117	39.5 - 40 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) US291	FIXED MICROWAVE SERVICES (101) Auxiliary Broadcasting (74)	
40 - 40.5 EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth Exploration-Satellite (space-to-Earth)	40 - 40.5 EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth Exploration-Satellite (space-to-Earth)	40 - 40.5 EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth Exploration-Satellite (space-to-Earth)	40 - 40.5 EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth Exploration-Satellite (space-to-Earth) G117	40 - 40.5 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth)		

International table			United States table			FCC use designators	
Region 1 -- allocation GHz	Region 2 -- allocation GHz	Region 3 -- allocation GHz	Government	Non-Government	Rule part(s)	Special use frequencies	
(1)	(2)	(3)	Allocation GHz (4)	Allocation GHz (5)	(6)	(7)	
40.5 - 41.5 BROADCASTING-SATELLITE BROADCASTING Fixed Mobile	40.5 - 41.5 BROADCASTING-SATELLITE BROADCASTING Fixed Mobile	40.5 - 41.5 BROADCASTING-SATELLITE BROADCASTING Fixed Mobile	40.5 - 41.5	40.5 - 41.5 BROADCASTING-SATELLITE BROADCASTING FIXED-SATELLITE (space-to-Earth) FIXED MOBILE	SATELLITE COMMUNICATIONS (25)	(7)	
41.5 - 42.5 BROADCASTING-SATELLITE BROADCASTING Fixed Mobile	41.5 - 42.5 BROADCASTING-SATELLITE BROADCASTING Fixed Mobile	41.5 - 42.5 BROADCASTING-SATELLITE BROADCASTING Fixed Mobile	US211 41.5 - 42.5	US211 41.5 - 42.5 BROADCASTING-SATELLITE BROADCASTING FIXED MOBILE			
42.5 - 43.5 FIXED FIXED-SATELLITE (Earth-to-space) S5 552 MOBILE except aeronautical mobile RADIO ASTRONOMY S5 149	42.5 - 43.5 FIXED FIXED-SATELLITE (Earth-to-space) S5 552 MOBILE except aeronautical mobile RADIO ASTRONOMY S5 149	42.5 - 43.5 FIXED FIXED-SATELLITE (Earth-to-space) S5 552 MOBILE except aeronautical mobile RADIO ASTRONOMY S5 149	US211 42.5 - 43.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile RADIO ASTRONOMY US342	42.5 - 43.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile RADIO ASTRONOMY US342			
43.5 - 45.5 MOBILE S5 553 MOBILE-SATELLITE RADIO NAVIGATION-SATELLITE S5 554	43.5 - 45.5 MOBILE S5 553 MOBILE-SATELLITE RADIO NAVIGATION-SATELLITE S5 554	43.5 - 45.5 MOBILE S5 553 MOBILE-SATELLITE RADIO NAVIGATION-SATELLITE S5 554	43.5 - 45.5 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) G117	43.5 - 45.5			
45.5 - 46.9 MOBILE S5 553 MOBILE-SATELLITE RADIO NAVIGATION-SATELLITE S5 554	45.5 - 46.9 MOBILE S5 553 MOBILE-SATELLITE RADIO NAVIGATION-SATELLITE S5 554	45.5 - 46.9 MOBILE S5 553 MOBILE-SATELLITE RADIO NAVIGATION-SATELLITE S5 554	45.5 - 46.9 MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO NAVIGATION-SATELLITE S5 554	45.5 - 46.9 MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO NAVIGATION-SATELLITE S5 554	RADIO FREQUENCY DEVICES (15)		