

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

In the Matter of

Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems

ET Docket No. 00-258

The Establishment of Policies and Service Rules for the Mobile-Satellite Service in the 2 GHz Band

IB Docket No. 99-81

Amendment of the U.S. Table of Frequency Allocations to Designate the 2500-2520/2670-2690 MHz Frequency Bands for the Mobile-Satellite Service

RM-9911

Petition for Rule Making of the Wireless Information Networks Forum Concerning the Unlicensed Personal Communications Service

RM-9498

Petition for Rule Making of UTStarcom, Inc. Concerning the Unlicensed Personal Communications Service

RM-10024

REPLY COMMENTS OF MOTOROLA, INC.

Motorola, Inc. ("Motorola") hereby submits these reply comments on the *Third Notice of Proposed Rulemaking* ("*Third NPRM*") in the above-captioned proceeding.¹ Motorola strongly supports the Commission's efforts to ensure that sufficient additional spectrum is made available to support new and innovative advanced wireless services ("AWS").

¹ Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems, ET Docket No. 00-258, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, FCC 03-16 (rel. Feb. 10, 2003) ("*Third R&O*" and "*Third NPRM*").

I. THE RECORD REFLECTS WIDESPREAD SUPPORT FOR THE SPECTRUM DESIGNATIONS ADVOCATED BY MOTOROLA, PARTICULARLY ITS RECOMMENDATION TO DESIGNATE THE 2155-2180 MHZ BAND FOR AWS

The comments submitted in response to the *Third NPRM* show that there is considerable support for the spectrum recommendations stated in Motorola's initial comments. Many commenters support re-designation of the 1910-1915 MHz and 1990-1995 MHz bands for Personal Communications Services ("PCS") and auctioning of this 2x5 MHz spectrum pair as a PCS "G" Block, subject to the Commission's existing Part 24 rules.² Furthermore, as the Cellular Telecommunications & Internet Association ("CTIA") notes, this spectrum "should have designated mobile and base transmit bands consistent with the existing operations in adjacent PCS bands."³ Requiring "G" Block licenses to comply with Part 24 technical rules and the conventional duplex orientation would help ensure compatibility with existing PCS systems.⁴

The record also firmly supports Motorola's recommendation that the 1915-1930 MHz band should be retained for Unlicensed PCS ("UPCS") operations.⁵ High power operations in this band would invariably lead to interference to PCS licensees,⁶ as well as UPCS users. The creation of a "G" Block would require re-designation of the 1910-1915 MHz band, reducing the

² See Comments of the Cellular Telecommunications & Internet Association, ET Docket No. 00-258, Apr. 14, 2003, at 2 ("CTIA Comments"); Comments of Ericsson, Inc., ET Docket No. 00-258, Apr. 14, 2003, at 3-5 ("Ericsson Comments"); Comments of Verizon Wireless, ET Docket No. 00-258, Apr. 14, 2003, at 5 ("Verizon Wireless Comments").

³ CTIA Comments at 2.

⁴ The record also includes support for Motorola's recommendation that the Commission should not designate any high power operations in the 1995-2000 MHz band and instead should allow this spectrum to serve as a guard band between PCS and MSS/ATC operations. See Motorola Comments at 12; CTIA Comments at 5.

⁵ See, e.g., CTIA Comments at 5; Ericsson Comments at 5; Comments of UTAM, Inc., ET Docket No. 00-258, Apr. 14, 2003, at 5 ("UTAM Comments"); Verizon Wireless Comments at 5; see also Letter from Ari Q. Fitzgerald, counsel for NEC America, Inc., to Marlene H. Dortch, ET Docket No. 00-258, Jan. 14, 2003, Attachment at 2 ("NEC January 14 ex parte").

⁶ See CTIA Comments at 3; Verizon Wireless Comments at 5.

existing 20 MHz duplex gap between the PCS mobile and base transmit bands to 15 MHz. Motorola's initial comments noted that "advances in manufacturing and improvements in filtering performance appear to make feasible a reduction in the duplex gap of 5-6 MHz over the next several years."⁷ These advances would support the designation of a 2x5 MHz "G" Block, but not any additional allocation of licensed spectrum in the 1910-1930 MHz band. Indeed, Motorola noted that technology to enable a 10 MHz duplex gap does not appear to be achievable in the foreseeable future.⁸

The record supports Motorola's assessment that the Commission should not rely on future advances in duplexer technology to accommodate high power licensed services in the 1915-1930 MHz band. CTIA states that "reducing the gap between PCS mobile transmit and base transmit bands to 10 MHz is also not feasible. Mobile handsets operating between 1915-1920 MHz would not be able to meet the generally accepted TIA standards for out-of-band emissions into the PCS base transmit band, and PCS service would be substantially degraded as a result."⁹ Verizon Wireless observes that mobile handset duplexers "cannot be designed to operate effectively without at least 15 MHz of frequency separation between the mobile transmit and mobile receive bands."¹⁰ Ericsson supports retaining "a minimum 15 MHz duplex gap between the uplink and downlink bands for PCS service."¹¹ None of the comments submitted in this proceeding provide any evidence that a duplex gap of less than 14-15 MHz will be

⁷ Comments of Motorola, Inc., ET Docket No. 00-258, Apr. 14, 2003, at 4 ("Motorola Comments").

⁸ See Motorola Comments at 5.

⁹ CTIA Comments at 3-4.

¹⁰ Verizon Wireless Comments at 5-6.

¹¹ Ericsson Comments at 5.

feasible.¹² Accordingly, the record supports retaining the 1915-1930 MHz band for unlicensed operations.

Most striking of all, the comments in this proceeding provide undivided support for designating most, if not all, of the 2155-2180 MHz band for AWS.¹³ In the *Third NPRM*, the Commission tentatively concluded that the 2155-2180 MHz band should be made available for AWS.¹⁴ The record now clearly supports re-designation of this band for AWS. Most of the commenters that addressed this aspect of the *Third NPRM* support re-designation of the entire 2155-2180 MHz band for AWS.¹⁵ Even those commenters that propose an alternative use for a small portion of the band adjacent to the 2180-2200 MHz Mobile Satellite Service (“MSS”)/ancillary terrestrial component (“ATC”) band recognize that the Commission should allocate most of the 2155-2180 MHz spectrum for AWS.¹⁶

¹² See Comments of Cingular Wireless LLC, ET Docket No. 00-258, Apr. 14, 2003, at 8 (stating that “14 MHz separation is the least amount necessary to minimize the possibility of mobile-to-mobile and base-to-base interference in the PCS bands”) (“Cingular Comments”); UTAM Comments at 4 (“There is no record evidence that reduction of the transmit/receive separation by 10 MHz is feasible and, in fact, there is evidence to the contrary.”).

¹³ In addition, commenters support extending the Part 24 rules that govern Broadband PCS to this band. See Ericsson Comments at 7; WCA Comments at ii. There is no support in the record for application of Part 27 rules to this spectrum.

¹⁴ See *Third NPRM* ¶ 68.

¹⁵ See Comments of Ad Hoc MDS Alliance, ET Docket No. 00-258, Apr. 14, 2003, at 5 (“Ad Hoc Comments”); CTIA Comments at 6; Verizon Wireless Comments at 7; Comments of the Wireless Communications Association International, Inc., ET Docket No. 00-258, Apr. 14, 2003, at ii, 27 (“WCA Comments”); see also Cingular Comments at 6, 9 (recommending designation of the 2155-2170 MHz segment for AWS and proposing that one option for the remaining 2170-2180 MHz segment is to designate it for AWS use).

¹⁶ See Cingular Comments at 6, 9 (recommending designation of the 2155-2170 MHz segment for AWS and proposing that some or all of the remaining 2170-2180 MHz segment could be designated for AWS use); Ericsson Comments at 7-8 (supporting AWS use in most of the band but proposing that the 2175-2180 MHz segment should be re-designated for MDS use).

In its initial comments, Motorola recommended two possible courses of action with regard to the timing of re-designation of the 2155-2180 MHz band for AWS: (1) maintaining the band in reserve for later designation (either in a symmetrical pairing with a yet-to-be-determined band or as an asymmetrical pairing with the 1710-1755 MHz or 2110-2155 MHz AWS bands); or (2) auctioning this spectrum at the same time as the 1710-1755 MHz and 2110-2155 MHz bands, creating asymmetric downlinks.¹⁷ The record shows that there is support for each of these options. Most commenters support auctioning the 2155-2180 MHz spectrum along with the 90 MHz previously allocated for AWS in the 1710-1755 MHz and 2110-2155 MHz bands.¹⁸ Other commenters support the alternative of reserving some or all of the 2155-2180 MHz spectrum for future pairing options.¹⁹

Ericsson has proposed that the 2175-2180 MHz segment could be paired with the 2020-2025 MHz band and re-designated for Multipoint Distribution Service (“MDS”) use, with the 2175-2180 MHz segment designated as the downlink (base transmit) band. Motorola notes that, from a technical perspective, this proposal is feasible, provided that the Commission designates the 2155-2175 MHz band as AWS downlink spectrum. The permitted base transmit operations at 2175-2180 MHz would be compatible with base transmit operations in the adjacent 2180-2200 MHz MSS/ATC band and the proposed 2155-2175 MHz AWS band. This compatibility is also found in the lower band since the mobile transmit band at 2020-2025 MHz would be

¹⁷ See Motorola Comments at 14.

¹⁸ See CTIA Comments at 6-7; Ericsson Comments at 7; Verizon Wireless Comments at 7; WCA Comments at ii, 27-28.

¹⁹ See Ad Hoc Comments at 5 (supporting reservation of the 2165-2180 MHz segment); Cingular Comments at 6, 9.

immediately adjacent to the MSS/ATC mobile transmit band at 2000-2020 MHz. Therefore, there would be little prospect of interference to or from the 2020-2025/2175-2180 MHz band, and guard bands would not be necessary to protect users in adjacent bands. Ericsson's proposal thus presents a technically feasible option for a 2x5 MHz band pair for FDD use.²⁰

II. THE COMMISSION SHOULD NOT PERMIT HIGH POWER OPERATIONS IN THE 1915-1930 MHZ BAND

As noted above, Motorola opposes allowing any high power operations in the 1915-1930 MHz band and numerous comments submitted in response to the *Third NPRM* support this position.²¹ Any such high power operations would likely interfere with isochronous devices currently operating in the 1920-1930 MHz band and would potentially cause interference into PCS operations, particularly the mobile receive band above 1930 MHz.²² Motorola opposes any proposal that would hinder existing UPCS operations in the 1920-1930 MHz band and therefore recommends that the Commission carefully consider potential interference scenarios before permitting any high power operations in the unlicensed 1915-1930 MHz band.

UTStarcom, Inc. ("UTStarcom") and the PHS MoU Group ("PHS MoU") have proposed that Personal Handyphone ("PHS") devices should be permitted to operate in the 1910-1920 MHz band (or in the 1915-1920 MHz band if the Commission designates the 1910-1915 MHz

²⁰ In the past, Motorola has repeatedly noted that TDD MDS operations in the 2155-2180 MHz would not be feasible because a significant guard band would be needed between AWS and MDS spectrum. This assessment, however, is based upon the existing TDD MDS operations in the 2150-2160 MHz band.

²¹ See, e.g., CTIA Comments at 5; Ericsson Comments at 5; NEC January 14 ex parte, Attachment at 2; UTAM Comments at 5; Verizon Wireless Comments at 5.

²² See CTIA Comments at 5; Verizon Wireless Comments at 5.

band as parts of a PCS "G" Block).²³ This proposal would allow higher power unlicensed PHS devices to operate across the entire 1915-1920 MHz band, without any guard band between spectrum designated for PHS use and the 1920-1930 MHz isochronous UPCS band.²⁴ Motorola strongly opposes this proposal as it would cause harmful interference to isochronous devices operating in the 1920-1922 MHz band and effectively preclude use of this segment of the 1920-1930 MHz band for such UPCS devices. Given that the present allocation of 10 MHz of spectrum is proving to be a constraint on further deployment of isochronous applications in some areas, the Commission should act to increase the amount of spectrum available to such devices,²⁵ not decrease it, as the UTStarcom and PHS MoU proposals would.

Notably, this latest proposal from UTStarcom and PHS MoU represents a significant departure from the joint proposal submitted by UTAM, Inc. ("UTAM") and UTStarcom in August 2002, which provided for a 2 MHz guard band at 1918-1920 MHz to protect isochronous operations in the 1920-1930 MHz band.²⁶ UTStarcom's comments acknowledge that its new proposal to allow PHS operations in the 1915-1920 MHz band would "eliminate the 2 MHz 'guard band' between a PHS based community wireless service and the 1920 MHz to 1930 MHz isochronous UPCS band," and that the resulting "impact of this is that capacity of UPCS systems operating in proximity to PHS systems could be reduced due to interference between systems."²⁷ This impact on isochronous devices would be considerably more harmful

²³ See Comments of PHS MoU Group, ET Docket No. 00-258, Apr. 11, 2003, at 1-2 ("PHS MoU Comments"); Comments of UTStarcom, Inc., ET Docket No. 00-258, Apr. 14, 2003, at 2-3 ("UTStarcom Comments").

²⁴ See UTStarcom Comments at 3.

²⁵ See Motorola Comments at 7-10; UTAM Comments at 5.

²⁶ See Letter from Eric W. DeSilva to Marlene H. Dortch, ET Docket No. 00-258, Aug. 8, 2002, Attachment.

²⁷ UTStarcom Comments at 3.

than UTStarcom suggests—it would effectively preclude isochronous operations in the 1920-1922 MHz band in areas where isochronous applications are in greatest demand.²⁸ This is unacceptable for UPCS operations in the 1920-1930 MHz band, which are already starved of spectrum in some high-density areas, and thus should be rejected by the Commission.

If, however, the Commission were to allow PHS devices to operate in the 1915-1920 MHz band, it should implement a 2 MHz guard band at 1918-1920 MHz.²⁹ This guard band would be necessary to ensure that PHS operations do not cause interference to existing isochronous UPCS operations that provide valuable services to hundreds of thousands of users.³⁰ The better course of action—one that would allow more efficient use of the 1915-1920 MHz spectrum—would be to encourage existing low power UPCS operations in this band by allowing the cross-over of isochronous devices into the 1915-1920 MHz band. Again, the record supports this approach.³¹

²⁸ Motorola notes that UTAM’s initial comments on the *Third NPRM* assert the need to retain the 2 MHz guard band at 1918-1920 MHz: “If the FCC were to limit the reallocation of UPCS spectrum to 1910-1915 MHz, however, UTStarCom could still operate on a subset of the 1915-1920 MHz band while retaining a guardband between such operations and the frequencies used by UPCS devices.” UTAM Comments at 5.

²⁹ See UTAM Comments at 5.

³⁰ See *id.* In the past, Motorola has stated its reserved support for UTStarcom’s proposal to deploy PHS systems in rural and underserved areas. See Reply Comments of Motorola, Inc., ET Docket No. 00-258, Nov. 8, 2001, at 13 n.48. However, Motorola expressly noted that its support is subject to the condition that PHS entities “bear the burden of demonstrating, prior to deployment of operations, that they will not cause interference with UPCS uses” and “agree to shut off operations in the event of interference with UPCS operations.” *Id.*; see also UTAM Comments at 5 (stating that PHS systems would need to operate “on a non-interference basis to UPCS devices”).

³¹ See Ericsson Comments at 5; Motorola Comments at 7-10; UTAM Comments at 2; Verizon Wireless Comments at 6.

III. CONCLUSION

The record in this proceeding provides support for the spectrum designation recommendations advocated by Motorola in its initial comments. Of particular note, the record reflects undivided support for re-designation of most, if not all, of the 2155-2180 MHz band for AWS. Furthermore, Motorola opposes allowing any high power operations in the 1915-1930 MHz band and recommends that the Commission carefully evaluate potential interference issues permitting any such use.

Respectfully submitted,

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