

BEFORE THE
Federal Communications Commission
WASHINGTON, D.C. 20554

In the Matter of)	
)	
Amendment of the Commission’s Rules)	ET Docket No. 95-183
Regarding the 37.0-38.6 GHz and)	RM-8553
38.6-40.0 GHz Bands)	
)	
Implementation of Section 309(j) of the)	PP Docket No. 93-253
Communications Act – Competitive)	
Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz)	
Bands)	

To: The Commission

EX PARTE SUBMISSION OF
NORTHROP GRUMMAN SPACE & MISSION SYSTEMS CORPORATION

Northrop Grumman Space & Mission Systems Corporation, by its attorneys and through its Northrop Grumman Space Technology sector (“NGST”), hereby submits this *ex parte* pleading into the record of the above-captioned proceeding. For the reasons provided below, NGST urges the Commission to take the views it offers in this submission into consideration as the Commission endeavors to determine what steps it should take next in response to the comments and reply comments it has received from fixed service representatives earlier in this rulemaking proceeding dedicated to the establishment of service rules for the fixed-service users of the 37.0-38.6 GHz and 42-42.5 GHz bands (the “37/42 GHz bands”).

NGST is in a unique position to offer meaningful views into the record. Since 1997, NGST has been an applicant for authority to establish a satellite system that will offer space-to-Earth links in the fixed-satellite service (“FSS”) from both geostationary satellite orbit (“GSO”) and non-geostationary satellite orbit (“non-GSO”) spacecraft in the 37.5-42.0 GHz band. Since March 2004, NGST has been the sole FSS applicant for such authority. In 2001, NGST became a licensee of wireless services, having successfully acquired at auction from the Commission 100 fixed

microwave service licenses in 11 Economic Areas in the band 38.6-40 GHz (“39 GHz band”).¹

NGST was instrumental in working with the Commission and fixed service interests to establish the conditions under which spectrum in the 39 GHz band could be used by FSS earth stations in a manner consistent with the primary domestic allocations the Commission has made to the fixed, point-to-point microwave service in the same band.²

No other entity has had as long and as active a role as NGST in the development – both domestically and internationally – of the power flux-density limitations and associated regulations that establish the conditions under which FSS satellites (both GSO and non-GSO) will be able successfully to operate in the space-to-Earth direction in the co-primary fixed-service allocations at 37.5-40 GHz that were made in the Commission’s Second Report and Order in IB Docket No. 97-95 in 2003.³ The Commission’s *38/48 GHz Report and Order* followed closely on the heels of the 2003 World Radiocommunication Conference (“WRC-03”), where seven years of intense debate culminated in the adoption of global power limitations on FSS systems and networks for the protection of fixed service systems. The results of WRC-03 on this subject, and the Commission’s subsequent implementation thereof domestically, bring, in the Commission’s words, “certainty to systems operating in the 37.0-40.0 GHz portion of the spectrum and codify the concept

¹ The Commission tentatively concluded that it should divide the 37/42 GHz bands into the same 175 Economic Areas for geographic licensing purposes as it utilized for the 39 GHz band back in 2000. *See Amendment of the Commission’s Rules Regarding the 37.0-38.6 GHz and 38.6-40 GHz Bands, Third Notice of Proposed Rule Making*, 19 FCC Rcd 8232, 8240 (2004) (“*Third Notice of Proposed Rule Making*”).

² *See* Public Notice, DA 01-800 (released March 29, 2001) (announcing grant of the 100 39 GHz band licenses in 11 Economic Areas for which NGST’s predecessor in interest was the high bidder at the Commission’s Auction No. 30). *See also Amendment of the Commission’s Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands, Report and Order and Second Notice of Proposed Rule Making*, ET Docket No. 95-183, 12 FCC Rcd 18,600 (1997), *on reconsideration, Memorandum Opinion and Order*, 14 FCC Rcd 12428 (1999).

³ *Amendment and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Band; 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*, 18 FCC Rcd 25428 (2003) (“*38/48 GHz Report and Order*”).

of ‘soft segmentation,’ and allow ubiquitous deployment of fixed service and fixed satellite service operations to commence in the V-band.”⁴

In its *Third Notice of Proposed Rule Making* in the instant proceeding, the Commission proposes to establish service and auction rules for the fixed, point-to-point microwave services it designated as primary in the 2003 *38/48 GHz Report and Order*.⁵ The rules it proposes for the fixed service in the 37-38.6 GHz band are “substantially the same as those applicable to the 39 GHz proceeding, and ... consistent with the allocation and designation in the [*38/48 GHz Report and Order*].⁶

NGST is satisfied with both the 39 GHz rules it helped craft and the actions in the *38/48 GHz Report and Order*. As a result, and given that the instant proceeding is dedicated to the development of service rules for the fixed service in the 37/42 GHz bands, NGST chose to refrain from intervening at the initial stage of the proceeding in response to the *Third Notice of Proposed Rule Making*. After reviewing the comments and reply comments filed to date – exclusively by members of the fixed service community – NGST believes the record would benefit from the opinions of the satellite community’s most directly interested party. Thus, NGST makes its views known for the record here, and urges the Commission to consider the same as it decides where to go next. NGST limits its comments to two discrete matters: (i) the emerging consensus among the three fixed service commenters to call upon the Commission not to adopt licensing and auction rules for the 37-38.6 GHz and 42-42.5 GHz band commercial wireless services at this time; and (ii) the misplaced effort on the part of some of the commenters to use their comments on the *Third*

⁴ *Id.* at 25429 (¶ 1).

⁵ *Third Notice of Proposed Rule Making*, 19 FCC Rcd at 8233-34 (¶ 2) (2004).

⁶ *Id.* at 8237 (¶ 9).

Notice of Proposed Rule Making to revisit the Commission's now-final determination on power flux-density limits for satellite systems and networks.

In its comments, First Avenue Networks, Inc. ("First Avenue") argues that it is not in the public interest to allocate and license additional millimeter wave spectrum to the fixed service at this time.⁷ It provides evidence of what it later terms the "chronic excess supply"⁸ of spectrum, and predicts that an auction of the spectrum would net revenues that did not even cover the cost of holding the auction.⁹ First Avenue urges the Commission "to defer indefinitely any allocation or licensing of spectrum for terrestrial point-to-point or point-to-multipoint use in the 37/42 GHz band."¹⁰ The other two commenters supported the First Avenue view on the timing of licensing of 37 GHz spectrum to terrestrial users.¹¹

The commenters from the fixed service community are in the best position to assess the wisdom of issuing licenses for the 37/42 GHz bands at this time. NGST's only thoughts here are to emphasize that the fixed service is not the only service interested in using the bands, and that the public interest would be disserved by an indefinite warehousing of more than 2 GHz of spectrum until such time as the fixed wireless industry generates enough business to deplete the chronic excess supply of spectrum that the commenters cite.

Contrary to First Avenue's urgings, the Commission cannot defer the allocation to the fixed service, as that allocation was finalized in 2003's *38/48 GHz Report and Order*. Only

⁷ Comments of First Avenue Networks, Inc. ("First Avenue"), ET Docket No. 95-183, et al., at 3 (filed December 3, 2004).

⁸ Reply Comments of First Avenue Networks, Inc., ET Docket No. 95-183, et al., at 1 (filed January 3, 2005).

⁹ First Avenue Comments at 5.

¹⁰ *Id.* at 9.

¹¹ Reply Comments of Winstar Communications, LLC ("Winstar"), ET Docket No. 95-183, et al., at 4 (filed January 3, 2005) ("Winstar Reply Comments"); Reply Comments of Fixed Wireless Communications Coalition ("FWCC"), ET Docket No. 95-183, et al., at 2 (filed January 3, 2005) ("FWCC Reply Comments").

licensing rules are at issue here. As to the timing of licensing, if the Commission determines that the principle of what is sought by the commenters is consistent with the public interest and longstanding Commission policies against the warehousing of spectrum, NGST has no objection to even an open-ended deferral. Of course, the Commission would have to proceed with the establishment of rules and policies that permit the operation of earth stations in the 37.5-38.6 GHz portion of the 37/42 GHz bands, and provide for the fact that if licensing of the fixed service is eventually to occur in these bands, future fixed service licensees will have to protect the earth stations that are operating or proposed to operate in the band. Any other course of action would cause extreme prejudice and injustice to NGST and its pending application for a GSO/non-GSO FSS satellite system in the 37.5-42 GHz band.¹²

To ensure that a proper balance and perspective is maintained, NGST would support an outcome whereby the Commission establishes Economic Area-based service rules for the fixed service in the 37/42 GHz bands, as it proposes in the *Third Notice of Proposed Rule Making*, and allows each V-band FSS satellite system operator to establish (under Part 25 of the Commission's Rules) gateway earth stations across the nation at locations that are not within the 10 most populous Economic Areas.¹³ This would preserve the practical elements of the opinions in Winstar's comments¹⁴ in that it would ensure that fixed service operators would not face the prospect of having to accommodate or protect FSS earth stations in the more densely-populated areas of the

¹² NGST, as noted above, has had space station applications pending for the 37.5-38.6 GHz band portion of the 37/42 GHz bands since 1997. NGST filed comprehensive amendments to its applications in March 2004, in response to a Commission public notice directing V-band applicants to comply with the Commission's final decision in the *38/48 GHz Report and Order*. See Applications of Northrop Grumman Space & Mission Systems Corp., File Nos. SAT-AMD-20040312-00030, et. seq. (filed March 12, 2004).

¹³ NGST emphasizes that none of the 11 Economic Areas in which it holds 39 GHz licenses are among the 10 most populous of the nation's 175 Economic Areas.

¹⁴ See Winstar Comments at 6. There are, in NGST's opinion, a number of elements of Winstar's comments that are neither practical nor rational (e.g., Winstar's proposal to require FSS providers to purchase all corresponding terrestrial licenses that are impacted by a satellite beam). With the approach urged by NGST here, most of these elements become overtaken by events.

country, and would provide regulatory certainty not only for the fixed service for the foreseeable future, but also for the FSS. The Commission's proposal to move to a coordination trigger for the fixed service (with an FSS earth station) that is based on a power flux-density of -125 dBW/m²/MHz at the boundary of the Economic Area within which the earth station is located, rather than on a flat distance of 16 km from the boundary of the Economic Area within which the earth station is located, is acceptable to NGST (as evidenced by NGST's silence during the comment phase of this proceeding). This would reduce the number of coordinations, without materially diminishing the protection to which an FSS earth station is entitled. If and when the fixed service is licensed in the 37/42 GHz bands, individual systems would have to meet these obligations with respect to authorized or proposed FSS earth stations.

Perhaps one way to address the licensing and auction concern that First Avenue and the others have raised, while not forestalling new entry by all telecommunications services into the bands and geographic areas the fixed service commenters seek to protect, is for the Commission to approach licensing in the 37/42 GHz bands in a manner based on what it recently did in establishing licensing rules for services at 70, 80, and 90 GHz.¹⁵ Instead of using area licenses awarded at auction, the Commission could award non-exclusive Economic Area-wide licenses (as opposed to nationwide licenses). Rights to use specific links or groups of links would be tied to the date and time of registration. The earth station limits from the 38.6-40 GHz band (i.e., gateway stations only) could be imposed in the 37.5-38.6 GHz band, and there could be, as suggested above, a restriction against locating earth stations in the ten most populous Economic Areas.¹⁶ The

¹⁵ See *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz, and 92-95 GHz Bands, Report and Order*, 18 FCC Rcd 23318 (2003) ("*70/80/90 GHz Report and Order*"). NGST observes that the fundamental propagation and directionality considerations in the 70, 80, and 90 GHz bands are similar to those in the 37/42 GHz bands.

¹⁶ A wrinkle here could be to auction spectrum in the 10 most populous economic areas and use a non-exclusive licensing scheme based loosely on the *70/80/90 GHz Report and Order* in all other areas. This would allow revenue to be generated from auctions in more crowded areas while maintaining maximum flexibility for the delivery of broadband telecommunications services to rural areas. A true win-win outcome thus could be achieved.

Commission's proposed pfd-based coordination trigger would come into play under this scheme as a prerequisite to link registration by later entrants of either service.¹⁷

Either of the approaches identified above would, to NGST, advance the public interest. NGST simply does not wish to see an open-ended delay on the licensing of fixed service primary spectrum in the 37.5-38.6 GHz band negatively impact the regulatory certainty of the use of the band by FSS gateway earth stations (including, at a minimum, those that would operate with V-band FSS systems such as the GSO/non-GSO FSS system proposed by NGST).

NGST's second point has to do with some misplaced support on the part of fixed service licensees for a tightening of power flux-density limits in the 37.5-38.6 GHz and even the 38.6-40 GHz band. Winstar makes this request directly, and another commenter supports the proposal on reply.¹⁸ Both want to take the Commission back to the spring of 2000, and a proposal the U.S. made in an unsuccessful attempt to secure an agreement within CITEL on a regional position to take to the 2000 World Radiocommunication Conference in Istanbul. The U.S. and the world moved on and determined – tentatively in 2000 and finally at WRC-03 – that the fixed service in the 37.5-40 GHz band would be adequately protected if limitations on the power flux-density from GSO and non-GSO satellites were set at different levels from those now re-urged by Winstar. There is no going back.

NGST does not look backward here, it looks forward. In December 2003, the Commission put the power flux-density limit question for the 37.5-38.6 and 38.6-40 GHz bands to rest with its adoption of the *38/48 GHz Report and Order*. There, after years of domestic and

¹⁷ NGST does not object to the idea of allowing some future mobile services in the 37/42 GHz band, as the nature of the propagation characteristics in this frequency range makes any mobile service inherently short range. Nevertheless, NGST believes that any mobile use here should be limited to land and maritime mobile service; aeronautical mobile service, even if practical, has an unacceptable potential to cause significant interference to NGST's FSS receive earth stations.

¹⁸ Winstar Comments at 6-7; FWCC Reply Comments at 5 (arguing incorrectly that "any power increase that may be permitted for the space station to overcome the effects of rain attenuation will be detrimental to fixed service operations").

international debate to which Winstar and its predecessors in interest were a party, the Commission adopted rules codifying the power flux-density levels that had been unanimously and finally agreed at WRC-03.¹⁹ The Commission's decision on the power flux-density levels is final, and Winstar did not seek reconsideration or review of that action.²⁰ The Commission cannot permit Winstar or anyone else to use the guise of proceedings dedicated to the establishment of licensing rules for the fixed service at 37/42 GHz to belatedly raise ancient arguments that have been soundly and permanently rejected by the Commission and the world.²¹

In sum, NGST has no objection to the proposals advanced in the *Third Notice of Proposed Rule Making* to harmonize the licensing conditions of the 37.5-38.6 GHz portion of the 37/42 GHz bands with those it established previously in the 39 GHz band. As explained above, NGST could also support accommodation of the fixed service commenters' desire to defer fixed service licensing of the 37/42 GHz bands as long as the ability to establish FSS earth stations for gateway applications is reasonably accommodated in the short term as well. NGST outlines some

¹⁹ *38/48 GHz Report and Order*, 18 FCC Rcd at 25439-4147 C.F.R. § 25.208. See also ITU Radio Regulations, Article 21, Table 21-4 (WRC-03).

²⁰ To the extent that Winstar includes some technical materials in its comments, NGST observes that there are major problems with the analysis. In Attachment D to Winstar's comments, which is entitled, "Impact of Downlink Power Control on FS Stations Taking into Account Differential Fading," Winstar only addresses the subject of differential rain attenuation between two locations. It does not address the essential question of what is the additional percentage of fixed service receivers where the interference levels from an FSS satellite may exceed the fixed service interference criteria when the FSS satellite transmitters increase their downlink power flux density to overcome fading conditions. Moreover, Winstar does not take satellite antenna roll-off into account in its analysis. Although NGST can go into great detail about why Winstar's analysis is flawed – and has repeatedly made such showings over the years in the context of U.S. preparations for ITU-R Working Party 4-9S, suffice it to say that Winstar's analysis is not an appropriate simplification.

²¹ To the extent that Winstar focuses on the question of satellites' use of fade compensation techniques to increase power flux-density at the Earth's surface by up to 12 dB above clear-sky levels (but to levels no greater than the maximum values permitted in the respective limits), see Winstar Comments at 6-7, the Commission addressed this topic in the *38/48 GHz Report and Order*. The Commission determined that any request by a satellite system to exceed the diminished clear-sky power flux-density levels would be addressed on a case-by-case basis and subject to review and coordination of both the International Bureau and the Wireless Telecommunications Bureau to ensure that the proper sharing conditions exist between the satellite and terrestrial stations. *38/48 GHz Report and Order*, 18 FCC Rcd at 25440 (¶ 29). This was an interim measure, put in place pending the establishment of a future Commission rulemaking proceeding that would address a number of outstanding points regarding satellite use of the space-to-Earth bands at 37.5-42 GHz. *Id.* There is no question that the Third Notice of Proposed Rule Making in the instant proceeding on fixed service licensing in the 37-38.6 GHz and 42-42.5 GHz bands was not the future proceeding on outstanding satellite operations in the 37.5-42 GHz band that the Commission had in mind.

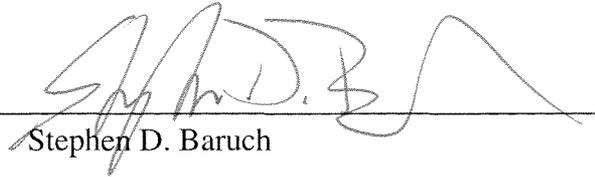
ways in which this dual accommodation could be achieved. The instant proceeding, however, is not the place for a revisitation of the power flux-density limits on GSO and non-GSO FSS space-to-Earth satellites that were finalized in 2003 by both the Commission and WRC-03. The limits are set and a procedure for addressing potential issues associated with the use of downlink fade compensation techniques by satellite networks and systems has been put into place.

NGST respectfully urges the Commission to take its views, as a representative of the satellite community, into account as it decides where next to go from here.²²

Respectfully submitted,

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²² Although not required to do so under the Commission's Rules, NGST is today providing copies of this *ex parte* submission, by mail, to the fixed service industry representatives that filed comments and reply comments in response to the *Third Notice of Proposed Rule Making*.