BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Allocation and Designation of Spectrum for	)	
Fixed-Satellite Services in the 37.5-38.5 GHz,	)	IB Docket No. 97-95
40.5-41.5 GHz and 48.2-50.2 GHz Frequency	)	
Bands; Allocation of Spectrum to Upgrade Fixed	)	RM-8811
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	)	

To: The Commission

REPLY COMMENTS OF TRW Inc.

TRW Inc.

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SUMMARY

TRW Inc. ("TRW") observes that the comments filed in response to the Further Notice of Proposed Rule Making ("FNPRM"), despite the divergent interests of the commenters, generally support implementation of the "soft segmentation" of spectrum between satellite and wireless users in the 36.0-51.4 GHz band ("V-band"). Where the views expressed in the comments do vary, these differences are best resolved through the adoption of proposals that track the global sharing arrangements reached by WRC-2000, as modified in the manner TRW proposes in its comments.

There is strong, broad-based support for the Commission's proposal to allocate new spectrum to the non-government fixed-satellite service ("FSS") at 37.5-37.6 GHz and 41.0-42.0 GHz. There is also ample support for the Commission's proposed swap of non-government wireless and high-density FSS ("HDFSS") satellite designations at 41.0-42.0 GHz and 37.6-38.6 GHz. As these proposals would advance the WRC-2000 soft segmentation plan, TRW urges the Commission to adopt them.

In contrast, there is very little support for the proposed allocation of spectrum at 40.5-41.0 GHz for government mobile-satellite service use. The majority of commenters oppose the proposal and correctly recognize that its adoption would compromise the utility of the two gigahertz of contiguous FSS spectrum at 40.0-42.0 GHz that is necessary for soft segmentation. Most commenters also oppose the protections proposed for the Radio Astronomy Service ("RA") as overly broad and unnecessary. TRW concurs, especially with those commenters who oppose the RA proposals as too stringent and inapplicable to observations conducted at most of the RA sites. The majority of commenters also join TRW in supporting the addition of non-government fixed service and mobile service allocations to the 42.5-43.5 GHz band, and the return of the

47.2-48.2 GHz band to its original government and non-government allocation.

The comments responding to the Commission's proposed PFD limits on satellite operations split along wireless and satellite industry lines. Wireless interests support adoption of the CITEL power-control methodology, but fail to reconcile this stance with the fact that it would mark a retreat to a previously abandoned U.S. position, and would exacerbate existing international resentment to the clear-sky elements of the soft segmentation plan. As such, the Commission should reject the CITEL "bottom up" PFD approach and instead adopt the PFD approach taken by WRC-2000 in Article S.21 of the international Radio Regulations. The Commission should also adopt TRW's proposal to eliminate the requirement for clear-sky PFD restrictions in the 37.5-38.6 GHz band for the reasons TRW identified in its Comments.

No commenter offered a precise method of determining the amount of time that a satellite operator should be allowed to exceed PFD limits in the 37.5-40.0 GHz band, and the proposals that were made in some of the comments should be rejected as either unnecessary or inappropriate. Instead, the Commission should adopt the workable approach proffered by TRW in its comments. Finally, the Commission should reject the proposals of the Wireless Communications Association that would inequitably favor Part 101 terrestrial licensees over Part 101 satellite licensees.

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Operations	)	

To: The Commission

REPLY COMMENTS OF TRW Inc.

TRW Inc. ("TRW"), by its attorneys and pursuant to Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415 and 1.419, hereby replies to the comments filed regarding the Commission's Further Notice of Proposed Rule Making ("FNPRM") in the above-captioned proceeding.[1]

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[1] Allocation 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 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, *Further Notice of Proposed Rulemaking*, IB Docket No. 97-95; RM-8811 (released May 31, 2001). These Reply Comments are being filed thirty days after the deadline for filing comments, as anticipated by the FNPRM (comments due 60 days from *Federal Register* publication; reply comments due 90 days from *Federal Register* publication). It appears, however, that the actual comment deadline provided for in the *Federal Register* was *61* days from the date of publication, due to the occurrence of the Labor Day holiday on the 60th day following publication. The actual reply deadline established, ninety days from the publication date, was therefore only 29 days after the comment date, October 3. These reply comments are being filed on October 4, and TRW therefore requests such leave as may be necessary to permit acceptance of this filing one day late. Because it is being submitted at the end of the pleading cycle and is being filed electronically, little more than fourteen hours after the actual filing deadline, no prejudice will result to any party, and the Commission will not be hindered in any way in its deliberations. TRW has been an (continued….)

I. INTRODUCTION

Despite the divergent interests represented by the commenters, TRW notes that the comments generally offer support for the broad outlines of the proposals made by the Commission in the FNPRM. Significantly, most commenters concur with TRW that the benefits associated with the adoption of the "soft segmentation" of spectrum between satellite and wireless users will provide each of these services with greater certainty about their operations in the 36.0-51.4 GHz band ("V-band").[2] Where the views expressed in the comments do vary, it is largely in regard to the specifics of how much spectrum should be allocated or designated for satellite and wireless operations, and on the level of power flux density ("PFD") limits on satellite operations necessary in the bands below 40 GHz. The Boeing Company ("Boeing") and Hughes Communications, Inc. ("Hughes"), in particular, urge the Commission to redress the perceived inequitable distribution of spectrum by reallocating and redesignating additional blocks of the V-band to satellite service providers.[3] To a lesser extent, the commenters also depart on the issue of how much protection to provide the Radio Astronomy service ("RA") in the 42.5-43.5 GHz band, and on how to apply the Part 101 coordination rules to satellite earth stations.

(Continued from previous page)
active participant in this proceeding from the beginning, and full consideration of its views in response to other parties will ensure a complete record for Commission consideration, consistent with the public interest.

[2] See, e.g., Comments of Winstar Communications, Inc., IB Docket No. 97-95; RM-8811, at 2 (filed Sept. 4, 2001) ("Winstar Comments"); Comments of the Wireless Communications Association International, Inc., IB Docket No. 97-95; RM-8811, at 1 (filed Sept. 4, 2001) ("WCA Comments"); Comments of DMC Stratex Networks Inc., IB Docket No. 97-95; RM-8811, at 1 (filed Sept. 4, 2001) ("DMC Stratex Comments"); Comments of Spectrum Astro, Inc. on Further Notice of Proposed Rule Making, IB Docket No. 97-95; RM-8811, at 2 (filed Sept. 4, 2001) ("Spectrum Astro Comments"); Letter to Magalie R. Salas, Secretary, Federal Communications Commission from Richard DalBello, Executive Director, Satellite Industry Association (Sept. 4, 2001) at 1 ("SIA Letter"); Comments of Astrolink International LLC, IB Docket No. 97-95; RM-8811, at 1 (filed Sept. 4, 2001) (fully supporting the SIA Letter) ("AstrolinkComments").

[3] Comments of The Boeing Company, IB Docket No. 97-95; RM-8811, at 4 (filed Sept. 4, 2001) ("Boeing Comments"); Comments of Hughes Communications, Inc., IB Docket No. 97-95; RM-8811, at 4 (filed Sept. 4, 2001) ("Hughes Comments").

Resolution of the differing viewpoints represented in the comments will require the Commission to craft compromises that equitably promote commercial satellite and terrestrial operations without encumbering legitimate governmental interests in the V-band. Fortunately, much of this work has already been completed in the form of the global sharing arrangements adopted by the 2000 World Radiocommunications Conference ("WRC-2000" or "Conference"). WRC-2000 fairly considered the complicated sharing issues that form the crux of the FNPRM, and in the end reached agreements that strike a careful balance between the needs of the satellite, terrestrial and governmental interests. In recognition of these agreements, the U.S. has formally embraced the results of the Conference in its post-WRC-2000 ITU meetings addressing V-band issues, despite the fact that the WRC-2000 Final Acts differed significantly from several key U.S.-backed proposals formulated prior to the Conference.

In view of the strong support for the soft segmentation approach exhibited by the commenters in the instant proceeding and by the United States since Istanbul, TRW urges the immediate adoption of only those modifications to the Commission's V-band plan that comport with the determinations reached at WRC-2000 and with the modifications/enhancements thereto that TRW proposed in its comments on the FNPRM.[4] In turn, proposals made in the FNPRM – or in the comments filed in response to it – that would depart from or undermine these determinations or the spirit of the soft segmentation compromise should be rejected. As TRW indicated in its comments, by acting consistent with the results of WRC-2000, the Commission will "provide the best opportunity possible for the introduction of beneficial and economical global broadband satellite service in [the V-band]."[5]

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[4] See Comments of TRW Inc., IB Docket No. 97-95, RM-8811 (filed Sept. 4, 2001) ("TRW Comments").

[5] See id. at 6.

II. THE MAJORITY OF COMMENTERS GENERALLY SUPPORT THE SPECTRUM ALLOCATIONS AND DESIGNATIONS PROPOSED BY THE COMMISSION.

A. Commenters Strongly Favor The Proposed Allocation And Designation Of Spectrum For Non-Government FSS, But Some Raise Concerns Regarding The Proposed Government FSS Allocation.

A majority of the commenters participating in this proceeding either support, or express no opinion on, the Commission's proposals to allocate new spectrum to the non-government fixed-satellite service ("FSS").[6] Several of the supporting commenters, in addressing the proposed allocation of non-government FSS spectrum at 41.0-42.0 GHz, correctly observe that the success of the soft segmentation approach hinges on setting aside two gigahertz of contiguous spectrum for FSS use,[7] while others accurately note the feasibility of operating non-ubiquitously deployed FSS earth stations co-frequency with high-density fixed service ("HDFS") applications at 37.5-37.6 GHz.[8] There is also ample support among the commenters for the Commission's proposed swap of non-government wireless and ubiquitous or high-density FSS ("HDFSS") satellite designations at 41.0-42.0 GHz and 37.6-38.6 GHz.[9] TRW agrees that the proposed non-government FSS allocations and designations are necessary components of the WRC-2000 soft segmentation plan and, accordingly, urges the Commission to adopt these proposals promptly.

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6 See, e.g., Comments of Intelsat Global Service Corporation, IB Docket No. 97-95; RM-8811, at 3, 5 (filed Sept. 6, 2001) ("Intelsat Comments"); Winstar Comments at 5; Boeing Comments at 17; Hughes Comments at 8; SIA Letter at 2.

7 See e.g., Boeing Comments at 17; SIA Letter at 2.

8 See, e.g., Spectrum Astro Comments at 3.

9 See, e.g., Winstar Comments at 3; Intelsat Comments at 2.

With respect to the proposals of Boeing and Hughes for the allocation of additional spectrum for FSS downlink use, TRW is sympathetic to the views expressed. As a principal architect and proponent of the soft segmentation concept, however, TRW has determined for itself that two gigahertz of "clean," globally-available downlink spectrum for user links (HDFSS), and access to the remaining downlink spectrum for non-ubiquitously deployed terminals that would not require protection from fixed service ("FS") transmitters, is an acceptable compromise. As TRW emphasized in its comments, the need for HDFSS downlink spectrum beyond 40.0-42.0 GHz depends on the resolution of issues regarding government satellite use that were raised in the FNPRM. If HDFSS cannot be assured of having meaningful access to two full gigahertz of downlink spectrum because of allocations to the government or the mobile-satellite service ("MSS"), or because of PFD restrictions, then the additional spectrum for satellite operations proposed by Boeing and Hughes would be necessary.[10]

In contrast to the near universal support for the proposed non-government FSS allocations and designations, a few commenters either oppose outright, or express concern regarding, the Commission's proposal to allocate the 40.5-41.0 GHz band for *government* FSS. Hughes believes that this proposal, first advanced by the National Telecommunications and Information Administration ("NTIA") early this year, would unfairly place the burden of coordinating government systems solely on commercial satellite interests.[11] Intelsat Global Service Corporation ("Intelsat") asserts that the proposed allocation might result in non-

[10] In its V-band application, TRW requested three gigahertz of uplink and downlink spectrum. Although the need for this amount of spectrum remains, TRW has agreed that it can share one gigahertz of spectrum with terrestrial users for its feeder links.

[11] See Hughes Comments at 7.

government FSS users competing against government FSS applications for spectrum.[12] Boeing agrees, and proposes that any government FSS allocation at 41.0-42.0 GHz be on a secondary basis only.[13]

TRW shares the concern that an allocation of spectrum for unconstrained government FSS operations at 41.0-42.0 GHz will have a negative impact on the commercial viability of non-government FSS operations in that band. TRW nevertheless believes that, with the imposition of sensible limits on government FSS operations, a place can be found in the band for government FSS systems to meet their objectives in a way that does not jeopardize the commercial viability and business objectives of non-government FSS systems.[14]

B. The Comments Evince Little Support For The Commission's Proposal To Allocate Spectrum For Primary Government MSS At 40.5-41.0 GHz.

TRW observes that there is very little support among the commenters for the Commission's proposal, offered in response to concerns raised by NTIA, to allocate spectrum at 40.5-41.0 GHz on a primary basis for government MSS use. Indeed, other than NTIA itself, only Winstar Communications, Inc. ("Winstar"), a fixed service licensee that is motivated solely by a desire to remove the MSS use from the 39.5-40.0 GHz HDFS band, exhibits any degree of support for this proposal.[15] In contrast, several commenters strongly oppose the proposal, recognizing, *inter alia,* that the primary MSS allocation would compromise the utility of the two gigahertz of contiguous FSS spectrum for ubiquitously-deployed HDFSS use at 40.0-42.0 GHz

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12 See Intelsat Comments at 5.

13 See Boeing Comments at 16.

14 TRW offers one such possibility in its Comments. See TRW Comments at 14.

15 See Letter to Bruce Franca, Acting Chief, Office of Engineering and Technology, Federal Communications Commission from William T. Hatch, Associate Administrator, National Telecommunications and Information Administration (Aug. 31, 2001) at 1 ("NTIA Letter"); Winstar Comments at 4.

that is necessary for soft segmentation.[16] TRW, in its comments, raises this same concern regarding the co-primary allocation of the 40.5-41.0 band to governmental MSS, and also explains that the allocation is: (1) contrary to the WRC-2000 decision to allocate MSS on a secondary basis at 40.5-41.0 GHz; and (2) technically infeasible given the incompatibility between the MSS and FSS services.[17]

In short, the preponderance of opinion and evidence overwhelmingly weighs against acceding to the prospective spectrum needs of the NTIA at 40.5-41.0 GHz. Accordingly, the Commission should reject both the belated and counterproductive request of the NTIA and its own consequent proposal to shift a primary government MSS allocation to this portion of the spectrum.

C. Most Commenters Conclude That The Commission's Radio Astronomy Proposals Are An Unnecessary Or Premature Concession To Unsubstantiated Interference Concerns.

A clear majority of commenters who weighed in on the issue oppose the Commission's proposals to adopt restrictions on FSS and broadcasting satellite service ("BSS") operations in the bands adjacent to the RA band at 42.5-43.5 GHz. In general, these commenters object to the proposed restrictions on the same grounds that were raised by TRW in its comments – namely, that footnote USXXX is an unnecessary and premature limitation that severely encumbers satellite operations,[18] and that a decision not to allocate the 42.0-42.5 GHz band to the FSS and

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[16] See SIA Letter at 3; Intelsat Comments at 4; Boeing Comments at 16; Hughes Comments at 7. Hughes, on the other hand, does support the proposed *designation* of spectrum at 40.5-41.0 GHz for non-government MSS, in order to further the "maximum flexibility satellite operators need to implement their systems." Hughes Comments at 9. TRW opposes Hughes on this point because the proposed MSS designation would be technically infeasible, given the inherent incompatibility of MSS and FSS services, and contrary to the results reached at WRC-2000. See TRW Comments at 20.

[17] See TRW Comments at 9-10.

[18] See, e.g., Boeing Comments at 19 (urging the Commission to put off protecting RA until the results of ITU-R studies can reconcile conflicting study data); Intelsat Comments at 7 (proposing that the Commission defer (continued….)

BSS would run counter to the agreements reached at WRC-2000.[19] The only commenters that back the Commission's RA proposals, the National Academy of Sciences' Committee on Radio Frequencies ("CORF") and NTIA, offer little substantive evidence to support these overly restrictive proposals.[20]

On the issue of RA protection, TRW particularly endorses the comments of Astrolink International LLC ("Astrolink"). In its comments, Astrolink describes the one-sided nature of the Commission's RA proposals, noting the lack of credible evidence provided by the RA community that justifies the need for the proposed limitations on FSS in the first instance, as well as the lack of any independent support for the proposals.[21] Astrolink also maintains, correctly, that the proposed "one-size-fits-all" PFD limits are far too stringent given the various types of receivers at issue and the small number of sites where RA observations are actually conducted.[22]

In this regard, TRW notes that in the United States, there are 13 RA receivers that intend to operate in the 42.5-43.5 GHz band. However, of these sites, 11 operate with Very Long Baseline Interferometry ("VLBI") antenna arrays, which under the applicable ITU recommendation, have a detrimental interference threshold of –173 dB(W/m^2/Hz). Only two RA

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a decision on the domestic allocation or designation of the 42.0-42.5 GHz band until the completion of the work by ITU-R); SIA Letter at 4 (asserting that it is "unreasonable" to accept without question the protection criteria set forth by the RA community).

19 See, e.g., Intelsat Comments at 7;

20 See Comments of the National Academy of Sciences' Committee on Radio Frequencies, IB Docket No. 97-95, RM-8811 (filed Sept. 4, 2001) ("CORF Comments"); NTIA Letter at 3. The CORF comments largely explain the importance of RA observations and propose even more stringent emission and siting restrictions. TRW does not doubt the many scientific benefits that are derived from RA observations; however, the proposed protections that CORF advocates are unnecessary to ensure interference-free operations. For this reason, the Commission should promptly reject the more stringent proposals that CORF offers.

21 See Astrolink Comments at 4.

22 See id. at 4-5.

receiver sites – Socorro, New Mexico and Green Bank, West Virginia – operate with single dish telescopes that may have more stringent interference thresholds of –210 to –227 dB ($W/m^2/Hz$), depending on the observations being conducted.[23] But even at these two sites, interference into RA observations is unlikely for two reasons. First, there exists a sufficiently large 500 megahertz buffer between the HDFSS and RA bands. Second, satellite operators can, in cooperation with the RA, orient their frequency plans to minimize use of the highest frequency end of the band near these three most susceptible sites.

As a general proposition, propagation impairments are severe in the 40 GHz band, and RA receivers are understood to be not generally able to operate during rainy conditions, even during periods of light rain. In addition, it is TRW's understanding, from discussions with RA experts (at the National Science Foundation and elsewhere), that most RA sites operating in the 42.5-43.5 GHz band only operate occasionally – in a range of from 10 to 20 percent of the time. As a result, in the 40 GHz band, the calculation of unwanted emission levels into, as well as the actual protection requirements for RA receiver sites operating in, the 42.5-43.5 GHz band should generally be based on clear-sky conditions.[24]

TRW further observes that the unwanted emissions of 40.5-42.5 GHz FSS systems would meet the interference criterion, -173 dB ($W/m^2/Hz$) or –113 dB ($W/m^2/MHz$), of RA sites operating with VLBI antennas. Eleven out of thirteen U.S. RA receiver sites operate with VLBI

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[23] Single-dish telescopes at Goldstone, California, Kitts Peak, Arizona, and Mauna Kea, Hawaii, are not presently used for 42.5-43.5 GHz observations, and there is substantial doubt as to whether they will ever be used for such observations in the future. It is unclear to TRW whether a single-dish telescope is used for 42.5-43.5 GHz band observations at the Haystack Observatory in Westford, Massachusetts.

[24] This determination is based on a U.S. contribution to the on-going meeting of ITU-R Working Party 4A, Doc. 4A/279, "Potential Impact on FSS and BSS Systems Planning to Operate in the 40.5-42.5 GHz Band of Meeting the Detrimental Interference Threshold Criteria of Recommendation ITU-R Rec. RA-769-1 for Radio Astronomy Receivers Operating in the 42.5 –43.5 GHz Band."

antennas. While the unwanted emissions of satellite systems operating in this band, particularly at the band edge 42.0-42.5 GHz, will not be able to meet the provisional PFD level -167 dB ($W/m^2/MHz$) – which is based on the most stringent criteria for single-dish telescopes of –227 dB ($W/m^2/Hz$) in footnote S5.551G – several mitigation techniques, such as geographical isolation, better RA antenna roll-off, etc., are under study within ITU-R Working Parties (particularly Working Party 4A and Task Group 1/7).

In short, the Commission should reject its proposal to adopt USXXX because:

- The interference threshold level of most U.S. RA receiver sites (11 out of 13 sites) operating in the 42.5-43.5 GHz band is -173 dB ($W/m^2/Hz$) or –113 dB ($W/m^2/MHz$), which is 54 dB higher than the provisional PFD level, -167 dB ($W/m^2/MHz$), in footnote S5.551G.

- A 500 MHz buffer between the upper edge of the HDFSS band (42.0 GHz) and the start of the RA band at 42.5 GHz is sufficiently large.

- The provisional power flux density level, -167 dB (W/m2/MHz), shown in footnote S5.551G is the worst-case, most stringent interference threshold criterion for one type of RA observation. In addition, this stringent interference criterion is only applied to RA receivers operating with a single dish telescopes during continuum observations (based on Recommendation ITU-R RA 769-1, the interference threshold level of these two RA sites is - 150 dB (W/m2/MHz) for spectral line observations at 42.5-43.5 GHz). In the United States, there are only two out of 13 RAS sites operating with a single dish telescopes;

- The derived worst-case interference threshold level, -167 dB ($W/m^2/MHz$), was based on a RA antenna gain of 0 dBi at 19 degrees off-axis angle, which is too conservative (the actual RA antenna gain at a 19 degree off-axis angle is significantly lower than 0 dBi).

- RAS receivers operating in the 42.5-43.5 GHz band will not be able to operate during rainy conditions, even during periods of light rain. The unwanted emissions from FSS and BSS systems falling into the 42.5-43.5 GHz RAS band should thus be based on clear sky conditions, which apply for 90 to 95 percent of the time, instead of on the maximum pfd limit.

- Satellite operates can, in cooperation with the RA, orient their frequency plans to minimize use of the highest frequency end of the band near the two most susceptible RA sites.

The comments of Astrolink, as well as those filed by the majority of other parties to this proceeding, evidence a well-justified reluctance to accept at face value the protection criteria sought by the RA community.[25] Accordingly, TRW again urges the Commission to take a long and critical look at the proposed protection criteria to determine whether they are unduly conservative.[26] In addition, the Commission should, consistent with WRC-2000, allocate spectrum to the FSS and BSS at 42.0-42.5 GHz.

D. Many Commenters Support The Restoration Of The 47.2-48.2 GHz Band To FSS Use And The Addition Of FS And MS Allocations At 42.5-43.5.

In its comments, TRW supports the Commission's proposal to add non-government FS and mobile service ("MS") allocations to the 42.5-43.5 GHz band, and expresses its preference to see this band and the 47.2-48.2 GHz band returned to their original government and non-government allocations to make such allocations possible.[27] TRW conditions its support, however, on the understanding that the 47.2-48.2 GHz band would be restored to FSS use.[28] Many commenters advance comparable positions. DMC Stratex Networks Inc. ("DMC Stratex") and Boeing, for example, support the proposed FS allocation at 42.5-43.5 GHz,[29] while Spectrum

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[25] In this connection, TRW observes that ITU-R Working Party 7D, the group principally responsible for RA matters in the ITU-R, has indicated in a liaison statement to Task Group 1/7 that the additional 15 dB reduction in emission levels into the 42.5-43.5 GHz band – i.e., levels beyond even those in Tables 1 and 2 of the already too-stringent Recommendation ITU-R RA.769-1, are not required.

[26] See TRW Comments at 17.

[27] See TRW Comments at 13-14.

[28] See id.

[29] See DMC Stratex Comments at 2; Boeing Comments at 9. Boeing maintains that the Commission should limit wireless designations to the 38.6-40.0 GHz band, but if a need for additional wireless spectrum is demonstration in the future, the Commission should "target" the 42.5-43.5 GHz band.

Astro, Inc. ("Spectrum Astro"), Intelsat, Hughes and Boeing agree with TRW's proposal that the FSS designation should be restored in the 47.2-48.2 GHz band.[30]

The only contrary voices raised in this regard belong to CORF, which opposes an FS or MS allocation at 42.5-43.5 GHz out of a concern over the effect such terrestrial operations would have on adjacent RA operations,[31] and NTIA, which requests that the current allocation of the 42.5-43.5 and 47.2-48.2 GHz bands be maintained.[32] TRW urges the Commission to reject the unsubstantiated views of CORF and NTIA, as well as the unnecessary series of measures proposed by CORF intended to protect RA observations.

III. WIRELESS COMMENTERS FAIL TO ADEQUATELY SUPPORT THE NEED FOR THE CITEL PFD APPROACH AND TIME LIMITS ON POWER INCREASES UNDER FADING CONDITIONS.

The comments responding to the Commission's proposed PFD limits on satellite operations below 40 GHz predictably split along wireless and satellite industry lines. Although the commenters in general support the adoption of PFD limits as agreed to by WRC-2000, they disagree on the critical issue of the conditions under which the WRC-2000 power limits should be applied. The commenters also split on the extent to which satellite power may be increased to account for such conditions.

A. Commenters Representing Wireless Interests Ignore The Incentives Favoring Reduced Satellite Power Limits And The International Consequences Of Adopting The CITEL Approach.

Winstar, DMC Stratex, and the Wireless Communications Association International, Inc. ("WCA") each support adoption of the power-control methodology agreed to prior to WRC-2000

30 See Spectrum Astro Comments at 8; Intelsat Comments at 6; Hughes Comments at 8; Boeing Comments at 5.

31 See CORF Comments at 6-7.

32 See NTIA Letter at 2.

by the Inter-American Telecommunication Commission ("CITEL"), which would allow for more restrictive PFD limits on satellite operations under clear-sky conditions and increases in PFD of up to 12 dB to overcome fading conditions.[33] Only Winstar, however, addresses the alleged consequences of adopting the WRC-2000 approach, which would allow satellites to operate up to the maximum Article S21 levels under fading conditions but which contemplates a reduction in PFD of up to 12 dB under clear-sky conditions. Winstar asserts, unconvincingly, that the WRC-2000 methodology would place the burden on HDFS operators to "police" FSS operators to ensure compliance with the power-control limits.[34] Contrary to Winstar's assertion, however, there would no need to so monitor satellite operations under the WRC-2000 approach because, as even DMC Stratex recognizes, satellite operators have an economic incentive not to operate using any more power than is necessary.[35]

Commenters in support of the CITEL "bottom up" approach also do not consider the consequences of adopting the method of power control that WRC-2000 flatly rejected. As TRW notes in its comments, and as others also observe, adoption of the CITEL approach would not

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[33] See Winstar Comments at 7; DMC Stratex Comments at 2; WCA Comments at 4.

[34] See Winstar at 7.

[35] See DMC Stratex Comments at 2 ("The ITU method defines the maximum power, but in reality in order to conserve power, the satellite should normally operate at the lower value, and only increase power to the S21 value under faded conditions."). See also Hughes Comments at 10. To the extent Winstar provides some data on rain statistics, see Winstar Comments at Attachment 2, this material does not aid the Commission's analysis. The data provided by Winstar is for isolated events of heavy rain in small cells. This data cannot be generalized (as the U.S. recognizes in contributions to ITU-R Working Party 4-9S), and ignores the fact that light rain with very large coverage areas is perhaps more significant to the assessment of fading conditions on the satellite-to-FS receiver path in a satellite beam. As TRW notes, satellite operators have every incentive to minimize the amount of time during which they operate at maximum PFD, and TRW's studies show that the additional impact on FS receivers within a satellite beam due to fade compensation is exceedingly small.

only mark a significant retreat to a previously abandoned approach, it would exacerbate existing international resentment to the clear-sky elements of the soft segmentation plan.[36]

For all these reasons, TRW urges the Commission to adopt the PFD approach taken at WRC-2000, and to specify that the clear-sky PFD limitation of 12 dB applies only to FSS satellites serving the United States.[37]

B. The Comments Suggest The Lack Of A Credible Opposition To Clear-Sky PFD Limits At 37.5-38.6 GHz.

No arguments made in the comments supporting the Commission's CITEL power limit proposal offer credible opposition to the proposal of TRW to eliminate any clear-sky PFD limit in the 37.5-38.6 GHz band.[38] Winstar, WCA and DMC Stratex expressly support the CITEL approach for one overarching reason – namely, the protection that it would afford ubiquitous terrestrial services.[39] This form of protection, however, would not be necessary at 37.5-38.6 GHz because, as TRW explains in its comments, no extremely sensitive HDFS systems are currently deployed there, and future HDFS systems that may be so deployed in the future are capable of being designed to operate in the higher PFD environment.[40] Even Winstar limits its area of

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36 See TRW Comments at 22; SIA Letter at 3; Boeing Comments at 17.

37 See TRW Comments at 21-22. TRW also supports the immediate adoption of workable PFD limits, as doing so would assist satellite operators plan and construct their systems. See id. at 21. Thus, TRW disagrees with those commenters who would put off adopting PDF limits until after WRC-2003. See, e.g., Boeing Comments at 17.

38 See TRW Comments at 25-26.

39 See DMC Stratex Comments at 2; Winstar Comments at 3; WCA Comments at 2.

40 See TRW Comments at 25-26. See also SIA Letter at 3 (urging the Commission to adopt the WRC-2000 PFD values for the 37.5-38.6 GHz band without restrictive power controls because the band is not currently identified for fixed service in the United States). TRW reiterates its position that it would not seek HDFSS at 37.5-38.6 GHz unless meaningful access for user terminals to the band 40.0-41.0 GHz is withheld as a result of proposals for government MSS and FSS use that were advanced by NTIA. See TRW Comments at 26.

concern to the 38.6-40.0 GHz band, noting that "[t]here are significant FS impediments in the 38.6-40 GHz band."[41]

C. Commenters Do Not Propose Appropriate Methods Of Establishing The Time By Which Satellite Licensees May Exceed The Proposed PFD Limits During Fading Conditions.

None of the commenters representing wireless interests propose a precise percentage of time for which satellite operations would be permitted to exceed PFD limits in the 37.5-40.0 GHz band. Instead, Winstar and WCA curiously propose that the time limit be set by private negotiation between the fixed wireless and satellite providers modeled after the Commission's Secondary Market policy.[42] DMC Stratex asserts that any such figure should be determined by the results of studies being conducted by ITU Study Group 9 and WP 4-9S.[43] The Commission should reject both approaches.

The Secondary Market proposal of Winstar and WCA is both impracticable and misplaced. Given the dozens of individual FS licensees serving the U.S. in the 39 GHz band, requiring satellite operators to negotiate a percentage time limit is logistically unfeasible, and would serve only to delay the implementation of service.[44] In addition, the applicability of the Secondary Market negotiation standards (at least to TRW) is difficult to discern because that

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41 Winstar Comments at 5.

42 See Winstar Comments at 8; WCA Comments at 5.

43 See DMC Stratex Comments at 2.

44 Requiring TRW to negotiate with FS operators would also impose an unfair burden on the company. Winstar's desire for low PFDs in the 39 GHz band are based on hypothetical future technologies and deployment configurations that would apply only to the highest density urban areas – areas that TRW is deliberately avoiding in its feeder link design. TRW should not be penalized for taking steps to minimize interference.

proceeding concerned itself with easing restrictions on the transfer of spectrum usage rights.[45] Yet, as Winstar and WCA well know, TRW most definitely is an *existing* rights-holder, having purchased one hundred 39 GHz licenses in 11 economic areas ("EAs") at last year's auction.[46] Under Commission policy, TRW will be able to use this spectrum for satellite services, subject to receipt of satellite authorizations under Part 25 of the Commission's rules. Thus, the negotiation approach advanced by Winstar and WCA is clearly inapplicable to TRW, which should not be relegated to the status of a "potential new entrant" as would be the case under the Secondary Market model.[47]

Regarding DMC Stratex's proposal, there is no need to delay a decision determining the amount of allowable time for PFD increases precisely because no such limit is necessary in the first place. As noted above, FSS service providers operating in bands with PFD limitations have practical reasons not to run at full power any longer than necessary, or as Hughes put it, "[s]atellite operators have every incentive to reduce power when it is not needed to overcome fade conditions."[48] Thus, the need for further study cited by DMC Stratex is plainly beside the point.

In lieu of the inapplicable proposals of Winstar, WCA and DMC Stratex, the Commission should adopt the two-part PFD time limit standard TRW offered in its comments. Under this approach, satellite systems would be required: (1) not to increase power for longer

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45 See Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, *Notice of Proposed Rulemaking*, 15 FCC Rcd 24203, 24207 (2000) ("Secondary Market NPRM").

46 See Public Notice DA 01-800 (released March 29, 2001).

47 See Secondary Market NPRM at 24207.

48 Hughes Comments at 10.

than necessary to overcome fading; and (2) to increase power by only the amount needed to close the link (up to 12 dB).[49] TRW believes that this straight-forward approach would serve as a workable check on satellite PFD emissions.

IV. THE COMMISSION SHOULD REJECT WCA'S PROPOSALS THAT FAVOR PART 101 TERRESTRIAL LICENSEES OVER PART 101 SATELLITE LICENSEES.

WCA is the only commenter that takes exception to the Commission's proposal to treat Part 101 terrestrial and satellite licensees on equal terms.[50] WCA contends that this proposal imposes "inequitable technical and economic burdens" on wireless licensees at 39 GHz in large part because the fixed wireless EA licensees paid for their spectrum at auction, unlike the "vast majority of FSS providers who intend to operate in the 39 GHz band."[51]

WCA's reasoning is faulty. First, WCA overlooks the fundamental tenet of the soft segmentation plan that allocates spectrum to both the FS and the FSS on a co-primary basis throughout the 37.5-42.5 GHz band. Because these two services are co-primary throughout the allocated spectrum, they should receive comparable treatment under the coordination standards of Part 101. Second, WCA ignores the fact that TRW, for one, paid nearly $2.5 million for one hundred 39 GHz licenses. Although certainly aware of this fact, WCA offers no solution as to how TRW should be treated vis-à-vis satellite operators who did not or will not pay for licenses at auction. In addition, WCA's myopic focus on auction dollars overlooks the substantial

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49 See TRW Comments at 25. This measure would only apply to service in the United States.

50 Although in support of its position WCA claims to rely on "the reasons set forth in Winstar's comments," in fact the comments of Winstar do not address the application of the Part 101 rules to satellite operations. See WCA Comments at 6. Thus, the Commission should not be misled into believing that there is more support for WCA's position than actually exists.

51 Id.

resources that satellite service proponents have invested to secure the soft segmentation consensus at WRC-2000, as Boeing correctly notes.[52]

To effect its brand of "equitable" licensing, WCA proposed that the Commission (1) require that FSS systems give neighboring broadband wireless systems "adequate prior notice" of their intent to construct gateway stations in the 37.0-40.0 GHz band, "so as to facilitate private negotiations as to the appropriate means of sharing the spectrum;" and (2) limit the number of gateway stations in the 37.0-40.0 GHz band that may be constructed by a single FSS operator.[53] Both proposals should be rejected. The first is misplaced because the applicable frequency coordination procedures contained in Part 101 are not dependent upon "private negotiations." The second is unnecessary because the Commission has previously endorsed the deployment of FSS gateways below 40 GHz without imposing (as it certainly could have) a strict limit on the number of such gateways.[54]

Finally, WCA asserts that it is "premature" and "excessive" to impose a 16 kilometer "zone of protection" around the licensed service areas of Part 101 satellite earth station licensees given the alleged lack of agreement within the engineering community regarding the extent of

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[52] See Boeing Comments at 19.

[53] See WCA Comments at 7.

[54] See FNPRM at ¶ 21 (recognizing that a "small" but not specifically limited number of FSS gateways creates a "promising sharing environment for FS operators"). Although in its comments TRW observes that a prohibition on ubiquitous earth stations in the 39 GHz band is a necessary concession to further the soft segmentation division of spectrum, it notes that several commenters disagree and would not impose (or would reduce) restrictions on satellite earth stations. See Boeing Comments at 19 (global PFD limits facilitate predominate use of the band by wireless services, thus achieving the goal of promoting wireless services without the need for additional restrictions on earth station function or usage); Hughes Comments at 12 (gateway-only restriction should not apply to the 37.6-38.6 GHz band); Intelsat Comments at 9 (only gateway-type earth stations should receive proposed protection under Part 101 of the Commission's rules while other user earth stations should be permitted on a non-protected basis).

protection that is necessary.[55] This claim is clearly irrelevant. While TRW intends to use its EA licenses for satellite services, the company is authorized to operate any permissible service, including FS, MS and FSS, within those borders. Thus, TRW should not be subjected to a coordination standard more rigorous than that imposed on any other Part 101 licensee. Moreover, because TRW believes that sharing is possible between the 39 GHz services, it has the right to expect the same level of protection accorded to any other Part 101 licensee. Finally, WCA did not provide any technical study to determine whether an EA licensee could be protected if the protection zone is less than 16 kilometers.

V. CONCLUSION

For the foregoing reasons, TRW urges the Commission to adopt its own proposals, as well as those of TRW and others, that promote the soft segmentation of the V-band, and to reject any proposal that would undermine that goal.

Respectfully submitted,

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[55] See WCA Comments at 6.