

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

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In re Applications of)
MOTOROLA SATELLITE)
COMMUNICATIONS, INC.)
ELLIPSAT CORPORATION)
For Authority to Construct, Launch)
and Operate a Low Earth Orbit)
Satellite System in the)
1610-1626.5 MHz and/or)
2483.5-2500 MHz Bands)

File No. 9-DSS-P-91(87)
CSS-91-010

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File No. 11-DSS-P-91(6)

FACILITIES DIV
SATELLITE RADIO BRANC

To: The Commission

RESPONSE OF TRW INC.

TRW Inc. ("TRW"), by its attorneys and pursuant to the Commission's April 1, 1991 Public Notice, Report No. DS-1068, 6 FCC Rcd 2083 (1991), hereby responds to the reply comments and oppositions that were filed in connection with the applications of Motorola Satellite Communications, Inc. ("Motorola") for a low Earth orbit system of 77 satellites ("Iridium") and of Ellipsat Corporation ("Ellipsat") for a low Earth orbit system consisting of six satellites ("Ellipso I").^{1/}

^{1/} Reply comments or oppositions were filed by TRW; Motorola; Ellipsat; Hughes Aircraft Company ("Hughes"); Constellation Communications, Inc. ("Constellation"); American Mobile Satellite Corporation ("AMSC"); and Aeronautical Radio, Inc. ("ARINC").

DISCUSSION

I. The Fact That Several Parties Have Applied To Provide RDSS Services In The 1610-1626.5 MHz and 2483.5-2500 MHz Bands Requires The Denial Of Requests To Reallocate These Bands For Other Uses.

With respect first to the reply comments filed by AMSC and Hughes, TRW reiterates that the pendency of five applications to provide true radiodetermination ("RDSS") services in the 1610-1626.5 MHz and/or 2483.5-2500 MHz bands means that the public interest benefits the Commission has identified with RDSS services are still attainable -- now more than ever. The Commission should not prematurely turn its back on its findings in the RDSS spectrum allocation and system licensing proceedings by reallocating the RDSS bands for use by non-RDSS compatible generic mobile satellite service applicants such as AMSC.^{2/} Indeed, the Commission has already allocated

^{2/} Like Constellation (see Constellation Reply Comments at 7-8), TRW wishes to correct those applicants who might assume that AMSC has some sort of monopoly in the provision of generic mobile satellite services. See, e.g., Motorola Opposition and Reply at iii, 18 & nn.37-38. AMSC once held an authorization to establish a domestic satellite system in 28 MHz of L-Band spectrum. It neither had the exclusive right to use the subject frequencies, nor the exclusive right to provide mobile satellite services in the United States. See Amendment of Parts 2, 22, and 25 of the Commission's Rules to Allocate Spectrum for and to Establish Other Rules and Policies Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service for the Provision of Various Common Carrier Services, 4 FCC Rcd 6043 (1989), vacated in pertinent part sub nom. Aeronautical Radio, Inc. v. FCC, 928 F.2d 428 (D.C. Cir. 1991). AMSC is not now, and never was authorized to be, a monopoly provider of domestic generic mobile satellite services.

large segments of spectrum (28 MHz of L-Band frequencies on a primary or co-primary basis) for the provision of domestic generic mobile satellite services, and has pending a rulemaking proceeding to allocate additional frequencies to the service. In these times where spectrum is scarce and any expansion would leave other applicants and technologies without access to frequency bands of their own, the requests of AMSC and its shareholder Hughes in this proceeding for the allocation of even more spectrum to the generic mobile satellite service argue strongly for the proposition that it is no longer in the public interest for the Commission to license the spectrum inefficient system AMSC has applied for (and keeps seeking to expand).

In addition, AMSC incorrectly characterizes the other members of the June 3 "processing group" when it states that "[a]ll of the proposed systems are designed primarily to provide mobile voice services only and to provide position location services on a secondary basis." See AMSC Reply Comments at 6. TRW is committed to providing RDSS services via its proposed Odyssey system, and will provide code division multiple access ("CDMA") spread spectrum mobile voice and data services in a manner that is compatible with its provision of RDSS services. Odyssey Application at 25-26, 34.^{3/} What TRW's

^{3/} AMSC also incorrectly states that "all of the proposed systems would operate at power levels that substantially exceed the Commission's limits for RDSS systems." Id.

(Footnote continued on next page)

Odyssey system does is enhance the efficient use of the RDSS bands by integrating additional services in a manner that does not detract from or degrade the currently-required use of the bands, and that does not prevent achievement of the Commission's policy objectives for the RDSS service.

II. TRW's Petition For Rule Making Will Allow The Commission To Answer The Calls Of Those Parties Who Want To Expedite The Provision of RDSS Services To The Public.

In its reply comments, Constellation urges the Commission to act quickly to bring RDSS and mobile voice and data services to the public. Constellation Reply Comments at 2-4. TRW concurs with this request. It notes that the regulatory mechanisms it proposed in its July 8, 1991 Petition for Rule Making and Request for Pioneer's Preference -- namely (1) the revision of Sections 2.106 and 25.141 of the Commission's rules to enable the provision of spread spectrum

(Footnote continued from previous page)

3/ (footnote omitted). While all of the applicants proposing use of the 2483.5-2500 MHz S-Band segment will minimally exceed existing power flux density limits in that band, TRW has shown that the limits can be relaxed to the modest extent necessary to accommodate TRW's Odyssey system without causing harmful interference to existing terrestrial users in that band. See TRW Petition for Rule Making and Request for Pioneer's Preference at 12-13, and Attachment (filed July 8, 1991). See also Odyssey Application at Appendix C, as clarified (waiver of S-Band power flux density limit requested for Odyssey downlink operations). AMSC's generic mobile satellite system, of course, is incompatible with RDSS systems and with the uses of the RDSS bands that were proposed by the other members of the June 3, 1991 "processing group," including TRW.

mobile voice and data services in the RDSS bands and the relaxation of current power flux density limitations at S-Band; and (2) the retention of the remainder of the current RDSS licensing rules and policies to cover the applicants in the June 3, 1991 "processing group" -- are capable of extremely rapid implementation.

The Commission thus has before it a blueprint for bringing RDSS and spread spectrum mobile voice and data services expeditiously to the public. TRW urges the Commission to act in the manner suggested by TRW in its Petition for Rule Making, and take the steps necessary to ensure the timely inauguration of mobile-enhanced RDSS services in this country.

III. Motorola's Opposition And Reply Leaves Unanswered Many Of The Questions Raised In The Comments and Petitions.

A. Motorola's Asserted Sharing Analysis.

Motorola states that its proposed Iridium system is capable of sharing the 1610-1626.5 MHz band with what it terms "compliant" RDSS systems. Motorola Opposition and Reply at 4, 20-27, 29-32. It asserts, however, that the only "compliant" system is the now-defunct -- and therefore nonexistent -- RDSS system proposed by Geostar Positioning Corporation. Motorola's argument that it need only demonstrate compatibility between Iridium and so-called "compliant" systems is not consistent with the

Commission's RDSS Licensing Order.^{4/} The Commission will have to engage in a comparison of all proposals in order to determine which system design or designs are in the public interest.

There are six applicants in the June 3 "processing group" who seek access to the RDSS bands. Assuming, arguendo, that Motorola and one or more of the other members of the June 3 "processing group" are basically (i.e., legally, financially, and technically) qualified to be Commission licensees, the ability of one or more of these applicants' systems to share these frequency bands will have to be addressed.^{5/} The system or systems that can share the band with other existing or planned systems will clearly advance the public interest, while systems unable to engage in such intraband sharing will not. Thus, the ability of any of the applicants to share spectrum with an entity whose proposed system will never be built (Geostar) is irrelevant to the comparison among competing qualified applicants to determine which system or systems are most consistent with the Commission's policy favoring competitive multiple entry.

Motorola states that it stands prepared to justify the licensing of its system on a non-competitive basis by

^{4/} Amendment to the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to, a Radiodetermination Satellite Service, 104 F.C.C.2d 650 (1986) ("RDSS Licensing Order").

^{5/} See RDSS Licensing Order, 104 F.C.C.2d at 654 (system design that permits only one system to operate in a frequency band must be "unquestionably superior" to justify departure from Commission policy favoring competitive entry by multiple independently-licensed systems).

demonstrating the "unquestionable superiority" of the Iridium system over the other five applicants. Motorola Opposition and Reply at 28-29. TRW and others have emphasized that Motorola's proposal to operate bi-directionally in the 1610-1626.5 MHz band, combined with its use of time division multiple access and frequency division multiple access techniques, will hinder or preclude sharing of the RDSS bands between Iridium and systems employing spread spectrum CDMA transmission techniques. See TRW Petition at 4.

Motorola claims in the text of its Opposition and Reply that all of the applicants proposing CDMA spread spectrum techniques are in violation of the Commission's rules because they do not "spread their transmissions over the entire 1.65 MHz RDSS wide [sic] band as required by the rules." Motorola Opposition and Reply at 39 n.95 (citing RDSS Licensing Order, 104 F.C.C.2d at 660). See also id. at 23 n.51. Contrary to this assertion, neither the RDSS Licensing Order nor the Commission's rules contain any requirement that RDSS systems spread their systems' signals over the entire 16.5 MHz band.^{6/}

^{6/} In the RDSS Licensing Order, the Commission rejected a proposal from a non-spread spectrum applicant for what now are the RDSS bands to split the bands between spread spectrum RDSS services and non-spread spectrum mobile satellite services. The Commission did not impose a technical requirement that applicants spread their systems' signals across the entire band. Instead, it "conclude[d] that spread spectrum systems should operate using the entire bandwidth allocated for RDSS, and reject[ed] Omninet's 'band splitting' proposal." RDSS Licensing Order, 104 F.C.C.2d at 660. The Commission did, however, state that it "will not mandate specific system parameters or coding schemes" Id. at 662.

While all of the applicants in the June 3 "processing group" that propose CDMA transmission techniques in the S-Band (2483.5-2500 MHz) will require some relaxation of the power flux density limitations, all have requested waivers of the restrictions to the extent necessary. See, e.g., TRW Odyssey Application at Appendix C, as clarified. Moreover, TRW has petitioned the Commission to relax the limitation, noting that easing the limits by 9 dB (i.e., to -135 dBW/m²-4 kHz) would double the potential user base for spread spectrum RDSS systems operating in the S-Band without causing harmful interference to terrestrial systems. TRW Petition for Rule Making and Request for Pioneer's Preference at 12-13 and Attachment (filed July 8, 1991).^{7/}

TRW does not agree with Motorola's comments on spread spectrum technology. See Motorola Opposition and Reply at 32-34. TRW expects to have an opportunity to address specific comments about its Odyssey system and the CDMA spread spectrum transmission techniques incorporated therein once the

^{7/} Motorola observes that "there are no [power flux density] limits specified in the space-to-Earth direction of the 1.6 GHz band that IRIDIUM proposes to use for such transmissions." Motorola Opposition and Reply at 36. The only reason no power flux density limitations exist in this band is that until Motorola filed its Iridium application, there had been no requests for downlink operations in that band (since existing rules do not permit them). Now that such a request has been made and will be discussed as a possible secondary allocation at the upcoming World Administrative Radio Conference, it is reasonable to anticipate that the International Telecommunication Union will place downlink power flux limits in this band.

Commission places the Odyssey application on public notice. TRW will defer further comment until that time.

B. Motorola's Opposition And Reply Leaves Many Technical Questions Concerning Iridium Unanswered.

Motorola did not completely respond to challenges to specific aspects of its technical proposal for the Iridium system. For example, whereas AMSC leveled a series of very specific challenges to the technical feasibility of the Iridium system, Motorola replied only to several (see, e.g., Motorola Opposition and Reply at 37, 38), and dismissed the balance.

Given the gravity of the questions raised by AMSC and others in their comments and petitions, a response is warranted. Left unaddressed in Motorola's Opposition and Reply are charges that only a small portion of the Iridium system's communications capability can be used at any one time; that all 77 Iridium satellites must be in place for the system to work; and that it is inherently inefficient for the Iridium system to provide uniform coverage of populated and unpopulated areas. See, e.g., Hughes Comments at 6-8.

C. Motorola's Call For Processing Guidelines For The Applicants In The June 3 "Processing Group" Is Premature.

In its Opposition and Reply, Motorola suggests a series of processing guidelines that it feels should be applied post haste to the members of the June 3 "processing group." Specifically, Motorola: (a) urges the dismissal of all

applications not basically qualified; (b) urges the dismissal of all applications not proposing RDSS services; and (c) recommends the conditioning of all licenses on strict adherence to milestone schedules (subject to revocation for non-compliance). Motorola Opposition and Reply at 39.

TRW approves in concept of all three of Motorola's recommendations. Nevertheless, TRW remains concerned that summary dismissal of any applicant before placement on public notice could lead to protracted litigation and ultimately serve to delay the initiation of service to the public.

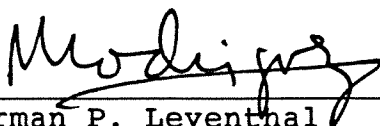
IV. Conclusion

TRW urges the Commission to consider the matters discussed above in the course of its processing of the Motorola and Ellipsat applications, and as it develops rules and policies to govern the processing of the other applicants in the June 3 "processing group."

Respectfully submitted,

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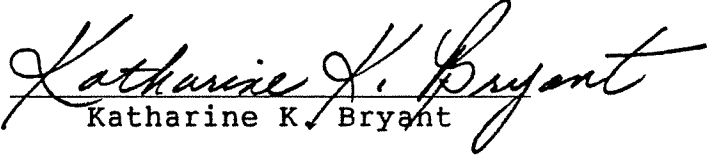
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