

Before the  
Federal Communications Commission  
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of )  
)  
FWCC Request for Declaratory Ruling on )  
Partial-Band Licensing of Earth )  
Stations in the Fixed-Satellite Service )  
that Share Terrestrial Spectrum )  
)  
FWCC Petition for Rulemaking to Set )  
Loading Standards for Earth Stations )  
in the Fixed-Satellite Service that )  
Share Terrestrial Spectrum )  
)  
Onsat Petition for Declaratory Order that )  
Blanket Licensing Pursuant to Rule 25.115(c) )  
is Available for Very Small Aperture )  
Terminal Satellite Network Operations at C- )  
Band )  
)  
Onsat Petition for Waiver of Rule 25.212(d) )  
to the Extent Necessary to Permit Routine )  
Licensing of 3.7 Meter Transmit and Receive )  
Stations at C-Band )  
)  
*Ex parte* Letter Concerning Deployment of )  
Geostationary Orbit FSS Earth Stations in the )  
Shared Portion of the Ka-band )

IB Docket No. 00-203  
RM-9649

SAT-PDR-19990910-00091

COMMENTS

Lockheed Martin Global Telecommunications, Inc. ("LMGT") herein submits its  
Comments in response to the Commission's Notice of Proposed Rulemaking ("NPRM")  
in the above-captioned proceedings.

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In its NPRM, the Commission proposes a rule to ensure that an FSS licensee uses the spectrum within a reasonable amount of time after receiving its license, particularly when an FS applicant proposes to use the same spectrum. Specifically, the Commission proposes to require that when spectrum is requested by a potential FS user and coordination is denied, an FSS earth station that is licensed in the Ku- or C-bands for 24 or more months must demonstrate past, present, or imminent future usage of the requested spectrum. If the FSS licensee does not make this demonstration during the coordination, the FS station would be successfully coordinated with the FSS earth station, and the FSS earth station would be barred from causing unacceptable interference into the FS station on that spectrum in the future. In addition, the Commission requests comments on a C-band licensing plan proposed by Onsat and on a Hughes proposal related to the deployment of GSO/FSS earth stations in the shared portion of the Ka-band without individual site-by-site licensing.

**1. LMGT supports the Commission's decision to deny the FWCC request to limit the amount of spectrum the Commission would license to FCC earth stations.**

LMGT agrees with and fully supports the Commission's decision to deny FWCC's request to amend section 25.130 of the Commission's Rules to limit the amount of spectrum the Commission would license to FSS earth stations to no more than twice the amount of spectrum for which the licensee has demonstrated "actual need".<sup>1</sup> The Commission recognizes that its own full-band licensing policy "provides all earth station operators the ability to conform to the constraints placed on the satellite operators and the

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<sup>1</sup> See NPRM at ¶ 40.

flexibility to change channels to access available transponder capacity within a satellite network and available capacity on other satellite networks."<sup>2</sup> If FSS earth station and satellite operators were limited to the spectrum suggested in the FWCC request, the result would be to stifle growth in satellite services and limit the FSS operators' ability to compete with other radio and wireless services. This simply would be inconsistent with the public interest.

**2. The Commission's proposal requiring FSS operators to demonstrate "imminent" plans to use FS requested spectrum is an impractical and unrealistic burden to place upon FSS operators.**

The Commission proposes to amend Section 25.203 to require that when spectrum is requested by a potential FS user and coordination is denied, an FSS earth station licensed in the Ku- or C-bands for 24 or more months must demonstrate past, present, or imminent future use of the requested spectrum. If the FSS licensee does not make this demonstration during the coordination, the FS station would be successfully coordinated with the FSS earth station, and the FSS earth station would be barred from causing unacceptable interference into the FS station on that spectrum in the future.

The Commission's proposal for FSS operators to show past or present usage would place a very heavy burden upon the earth station operator who would then be required to track usage, and divulge sensitive business information to third parties. An earth station operator cannot be expected to carry such a burden and operate a profitable business.

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<sup>2</sup> See *id.* at ¶ 40.

LMGT also believes that the requirement to show "imminent plans" to use any specific frequency is an impractical and unrealistic burden to place upon FSS operators. Most earth station operators in the INTELSAT system, for example, do not know specific service frequency assignments until 90 days prior to the start of service date.<sup>3</sup> Further, satellite operators routinely reassign traffic due to changing customer requirements and to maximize transponder bandwidth for new services. An earth station operator's frequencies can be changed several times prior to service activation. In view of the foregoing, an FSS operator cannot realistically be expected to show "imminent use" of a particular frequency.

LMGT further believes that the Commission's proposal requiring FSS operators to show "imminent use" at the time of coordination is equivalent to the Commission's rescinding its full-band licensing policy for FSS earth stations.<sup>4</sup> The Commission notes that its full-band licensing policy promotes important operational objectives in the FSS, in particular by providing earth station licensees the needed flexibility to change transponders or satellites on short notice, and without having to be re-licensed by the Commission, to meet changing operational requirements. LMGT believes that the objectives of the Commission's FSS full-band licensing policy would be lost or severely curtailed if the Commission were now to require that FSS operators show "imminent use" upon coordination. As noted above, an FSS operator may not know when or what

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<sup>3</sup> Imminent plans to use any specific radio frequency may be difficult or impossible to quantify, particularly at time of coordination. Even though INTELSAT Global Traffic Meetings and Operational Planning meetings are used in part to identify and assign available frequencies, specific, customer assigned frequencies are only sent out about 90 days (on average) prior to the start of service date.

<sup>4</sup> See NPRM at ¶ 40. ("Our full-band licensing policy promotes important operational objectives in the FSS, in particular by providing earth station licensees the needed flexibility to change transponders or satellites on short notice, and without having to be re-licensed by the Commission, to meet changing operational requirements.").

particular frequency may be assigned for future services or for the relocation of existing services, if required. Therefore, if the Commission's "imminent use" proposal were implemented, essential (prior coordinated and licensed) FSS spectrum would be "forfeited" to the proposed FS service. Finally, requiring the FSS operator to show past, present, or "imminent use" would add another layer of unnecessary coordination and cost, and, as a result, could severely impact a customer's decision to use satellite services, if competing technologies are available.

### **3. Auctioning of geographic areas to FS services could deter implementation and growth of FSS services.**

In its NPRM, the Commission requests comment on whether geographic licensing of FS facilities by means of auction leads to conflict with the current licensing of C-band earth stations, or with the proposed licensing of CSATs.<sup>5</sup>

LMGT believes that the auctioning of geographic areas to FS systems in C-band could infer some priority of use to the licensed terrestrial services in the shared spectrum. FS operators would likely demand unconstrained usage of the spectrum in any coordination, severely restricting the ability of FSS earth station operators to plan for growth or the expansion of existing carriers. Auctioning of geographic areas to FS services could deter the implementation of new FSS earth stations due to the perceived problem of coordinating with the "licensed" terrestrial services.

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<sup>5</sup> See *id.* at ¶ 30.

**4. It is premature to impose rule changes suggested in the Commission's NPRM for the shared FSS and FS services in the C and Ku-band spectrums to the Ka-band.**

The Commission seeks comment on whether the rule changes proposed in its NPRM concerning coordination and sharing between FSS earth stations and FS stations would apply in bands other than in the C- and Ku-bands.<sup>6</sup> In response, we note that the C and Ku-bands are the two major bands used by the FSS, and are near to capacity. Adoption of the new procedures in the subject NPRM would change the operational flexibility of the earth station operator and could severely upset the status quo. Moreover, the types of services and earth station configurations for the Ka-band are still under development. LMGT believes that it would not be in the public interest to impose these rule changes on the yet undefined Ka-band systems.

**5. The Commission's frequency coordination proposals/amendments are unnecessary, will lead to endless disputes, and slow down an already time-consuming frequency coordination process.**

The Commission raises several questions with regard to how prior interference coordination between the FS and FSS services should affect the conduct of subsequent coordination.<sup>7</sup> Specifically, the Commission proposes to amend Section 25.203 so that if an earth station licensee accepts a particular interference analysis model employing

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<sup>6</sup> See *id.* at ¶ 31, and ¶ 55.

<sup>7</sup> See *id.* at ¶ 77.

certain mitigating factors, it must accept that same model in subsequent coordinations in order to coordinate successfully with a terrestrial fixed station.<sup>8</sup>

Additionally, if an earth station applicant accepts a level of interference recognized to be below accepted interference objectives along a set of azimuths and elevation angles on part of the spectrum for which it is applying, the earth station licensee would not be entitled to protection from interference from future terrestrial fixed applicants on those same frequencies within that same set of azimuths and elevation angles.<sup>9</sup>

LMGT believes that in general, if "identical" coordination situations existed, similar interference physical factors or models could be used. However, such identical coordination situations are rare. Interference levels will most assuredly vary depending on factors such as frequency, the type of traffic carried at a given frequency, the modulation technique employed, the azimuth and horizon elevation, earth station antenna size and noise temperature, performance objectives, terrain, along with many other factors.

An earth station applicant should not be expected to accept from all future terrestrial applicants interference along a set of azimuths and elevation angles (and frequencies) for the sole reason that the earth station applicant accepted a (below objective) level of interference from one terrestrial applicant. Earth station service objectives and priorities can change from the initial coordination and the initial (below objective) frequency interference level can potentially become acceptable. However, if the Commission's proposal is enacted, there may be no way for the earth station to

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<sup>8</sup> See *id.* Appendix C at ¶ 115.

<sup>9</sup> See *id.* Appendix C at ¶ 115, 3700-4200 MHz, 5925-6425 MHz, 6525-6875 MHz, 10.7-11.7 GHz.

overcome the compounded effect of future multiple FS interference levels within the given spectrum.

The Commission's frequency coordination proposals/amendments are unnecessary and will lead to endless numbers of disputed cases that the Commission will have to resolve. The Commission's proposals will slow down an already time-consuming frequency coordination process.

**6. A spectrum efficiency standard is not needed for FSS earth stations.**

In its NPRM, the Commission seeks comment on whether there should be a spectrum efficiency standard for FSS earth stations.<sup>10</sup> LMGT is keenly aware of the benefits derived from efficient spectrum utilization and yet firmly believes that a spectrum efficiency standard is not required. Our customers currently benefit through diligent application of new satellite transmission techniques (such as TCM 8-PSK and 16-QAM) which increases the number of transmitted information bits per unit bandwidth as compared to traditional QPSK.

Given the scarcity of unused FSS allocated spectrum, FSS service providers must employ spectrally efficient satellite services which also result in lower wholesale space segment costs for their customers. Lower wholesale space segment costs stirs competition and promotes opportunity to entrepreneurs who might otherwise have not been able to assemble a viable business case due to the high recurring costs of satellite space segment.

However, it is not always possible to implement spectrally efficient services since the feasibility of using such technology is inherently tied to many variable satellite network parameters. These parameters include the satellite flight model, transponder gain

configuration and final power amplifier technology, geographic beam pattern advantage, quality of service, and earth station aperture size.

Further, a spectrum efficiency standard is not required since satellites must use the limited amount of spectrum that is available for FSS usage in order to be commercially successful in a highly competitive marketplace. Current INTELSAT satellite designs, for example, re-use the C-band spectrum as much as seven times through polarization and spatial isolation of its beams, with Ku-band re-use as much as four times. Satellite operators are already forced to compromise spectrum usage through satellite-to-satellite sharing constraints, two-degree GSO spacing, and strict earth station antenna radiation patterns. An additional spectrum efficiency standard is unnecessary and would neither serve the public interest nor enhance the competitive nature of the FSS industry.

#### **7. LMGT endorses the Commission's CSAT licensing proposal.**

LMGT supports the Commission's proposal to amend Part 25 of its rules to allow the licensing, under a single authorization and with prior coordination, of C-band small aperture terminal earth station networks, or CSATs.<sup>11</sup> LMGT believes that the Commission's proposal could ease the coordination process and help accelerate deployment of economically viable and advanced telecommunication services.

However, LMGT believes that CSAT networks should not be limited to 20 MHz operations. The Commission's proposed 20 MHz C-band spectrum allotment restriction<sup>12</sup> for CSAT networks is not sufficiently wide to support current broadband CSAT network

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<sup>10</sup> See *id.* at ¶¶ 59-61.

<sup>11</sup> See *id.* at ¶ 13, ¶ 82.

services offered by LMGT. LMGT deploys CSAT networks using state-of-the-art multi-frequency TDMA technology and agile L-band satellite modems capable of satellite transponder hopping over 500 MHz<sup>13</sup>. LMGT suggests that the proposed 20 MHz CSAT spectrum restriction be increased to no less than a 72 MHz allotment in any direction. A 72 MHz allotment allows access to one nominally sized transponder on an INTELSAT satellite. Other typical INTELSAT transponder bandwidths are 36 MHz, 72/77 MHz, and 150 MHz.

Antenna configurations and bandwidth requirements in CSAT networks will vary, as will communication technologies and satellite access techniques used within these networks. A 72 MHz allotment affords greater flexibility (than 20 MHz) and access to electronic commerce and data through Internet and other high-speed networks, while still satisfying the Commission's proposal of "limiting" CSAT spectrum usage.<sup>14</sup>

The Commission also raises the question whether its rules should limit CSAT service to rural areas, or alternatively, to wherever frequency coordination allows earth station installation.<sup>15</sup> LMGT believes that CSAT service should not be limited to rural areas, but should instead be authorized wherever earth stations can be sited and can successfully coordinate frequency usage with FS operations.

Limiting CSAT (FSS) service to "rural" areas will not necessarily afford better frequency protection to or from FS services, particularly with the expansion of "suburban" areas into areas previously considered rural. Therefore, limiting CSAT

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<sup>12</sup> See *id.* at ¶ 14.

<sup>13</sup> 500 MHz for uplinks and up to 800 MHz for downlinks.

<sup>14</sup> See *id.* at ¶ 14.

<sup>15</sup> See *id.*

services to rural areas is not in the public interest, and CSAT service should be authorized wherever frequency coordination allows.

**8. LMG T supports the Commission's proposal to exempt FSS earth stations licensed for 40 MHz or less of bandwidth from demonstrating usage.**

In its NPRM, the Commission seeks comment on its proposal to exempt FSS earth stations licensed for 40 MHz or less of bandwidth in any direction from demonstrating use in order to retain protection for that spectrum.<sup>16</sup> LMG T supports this proposal; earth stations licensed for limited or narrow bandwidths should not be required to demonstrate usage. Moreover, this exemption should include CSAT services,<sup>17</sup> and LMG T believes that the minimum bandwidth exemption should be 72 MHz in any direction for reasons discussed in the section above regarding CSAT networks.

**9. Administrative procedures associated with coordination and licensing should be left to the FSS and FS operators to maintain for future reference.**

The Commission seeks comment on how the procedural aspects of its proposals contained in this NPRM could be recorded for future reference; if frequency coordinators should maintain such results; and if the results should be reported to the Commission.<sup>18</sup> The Commission gives as an example the case where a terrestrial FS station has been successfully coordinated using spectrum not currently used by the FSS earth station.

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<sup>16</sup> See *id.* at ¶ 56.

<sup>17</sup> See *id.*

<sup>18</sup> See *id.* at ¶ 57.

LMGT believes that the recording of coordination information should be left as it is presently to the FSS and FS operators to maintain for future reference. There is no public interest reason to make a change in this regard.

**10. LMGT supports Hughes' Ka-band licensing proposal.**

Hughes urges the Commission to allow, under "blanket" licensing, the deployment of GSO FSS earth stations to receive signals in the 18 GHz band with the option of registering for interference protection on a site by site basis in accordance with Section 25 coordination procedures.<sup>19</sup> Hughes also suggests that any registration fees be "consumer tolerant." The Commission seeks comment on whether such deployment in both the 29.25-29.5 GHz and 18.3-18.58 bands would be practicable.

LMGT supports the Hughes proposal, as it would effectively enable the FCC to expedite and simplify its licensing approach for ubiquitous deployment of broadband FSS earth terminals. In addition, LMGT supports the concept of a consumer tolerant "batch" fee for the registration of large numbers of earth terminals. Both of these proposals would redound to the benefit of consumers by facilitating the timely and more cost-efficient distribution of these broadband terminals.

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<sup>19</sup> See *id.* at ¶¶ 98-99.

Respectfully submitted,

By 

Robert A. Mansbach  
Assistant General Counsel  
Lockheed Martin Global Telecommunications  
6560 Rock Spring Drive  
Bethesda, Maryland 20817  
301-214-3459

Gerald Musarra  
Vice President  
Government and Regulatory Affairs  
Lockheed Martin Global Telecommunications  
Crystal Square 2, Suite 403  
Jefferson Davis Highway  
Arlington, Virginia 22202  
703-413-5791

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