

IRIDIUM

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February 2, 1998

COPY

VIA HAND DELIVERY

Magalie Salas, Esquire
Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Re: Iridium LLC
Application for authority to launch and operate
the MACROCELL MSS satellite system
File No. 187-SAT-P/LA-97

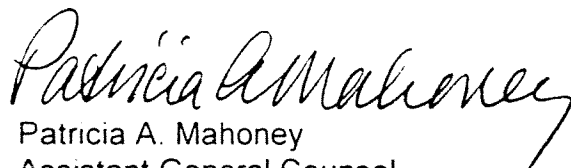
Dear Ms. Salas:

Transmitted herewith are the original and four copies of the Consolidated Opposition and Response of Iridium LLC in connection with the above-referenced application.

Should any questions arise concerning this matter, please communicate directly with the undersigned.

Very truly yours,

IRIDIUM LLC



Patricia A. Mahoney
Assistant General Counsel
Regulatory and Trade Policy

Enclosure

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**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

FEB - 2 1998

In re Application of)
)
IRIDIUM LLC)
)
For Authority to Launch and Operate)
The MACROCELL Mobile Satellite System)
In the 2 GHz Band)

**Federal Communications Commission
Office of Secretary**

File No. 187-SAT-P/LA-97

To: Chief, Satellite and Radiocommunication Division
International Bureau

CONSOLIDATED OPPOSITION AND RESPONSE

SUMMARY

Iridium LLC ("ILLC") herein opposes the Petition to Deny filed by Hughes Communications Galaxy, Inc. ("Hughes") (herein referred to as "Petition" or "Hughes Petition") and responds to comments filed by CellularVision USA, Inc. ("CVUS"), KaStar Satellite Communications Corp. ("KaStar"), Lockheed Martin Corporation ("Lockheed"), and the Fixed Point-to-Point Communications Section, Wireless Communications Division, of the Telecommunications Industry Association ("FS-TIA") (herein collectively referred to as "Comments") in connection with ILLC's proposal to use frequencies in the Ka Band for its feeder links, as specified in ILLC's above-captioned application for authority to launch and operate the MACROCELL System, a low earth orbit mobile satellite service ("MSS") system proposed to be operated in the 2 GHz band (the "Application").

As is demonstrated herein, the concerns raised by the Petition and Comments regarding the ability of the MACROCELL system to share frequencies in the Ka-band with

terrestrial fixed service ("FS") operators, geostationary orbit ("GSO") fixed satellite service ("FSS") systems, and Local Multipoint Distribution Service ("LMDS") facilities are exaggerated and do not provide any basis for denying the ILLC application or concluding that ILLC is not technically qualified.

In its Application, ILLC proposes to operate its feeder links at frequencies that have been allocated globally and domestically for NGSO MSS feeder links. Thus, FS-TIA's Comments, which seek to prevent ILLC's feeder down link operations in the 19.3-19.7 GHz band, are entirely without merit.

ILLC committed in its Application to meet its coordination responsibilities and to comply with the Commission's rules, including the rules establishing coordination procedures for antenna site location. Thus, the assurances CVUS seeks are contained in ILLC's Application.

Finally, ILLC's request for waiver of Section 25.258(c) of the rules and its proposed operation of feeder uplinks in the 29.25 to 29.5 GHz band do not require that its Application be denied (as Hughes requests) or that it be precluded from operation in the band (as Lockheed urges). As ILLC demonstrates herein, ILLC has justified its request for waiver; but, whether or not a waiver is granted, ILLC will protect the operations of the GSO FSS systems operating in this band.

There is, therefore, no reason whatsoever for denying, dismissing, or deferring action on ILLC's Application.

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In the 2 GHz Band)

To: Chief, Satellite and Radiocommunication Division
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CONSOLIDATED OPPOSITION AND RESPONSE

Iridium LLC ("ILLC") hereby respectfully opposes the Petition to Deny filed by Hughes Communications Galaxy, Inc. ("Hughes") (herein referred to as "Petition" or "Hughes Petition") and responds to comments filed by CellularVision USA, Inc. ("CVUS"), KaStar Satellite Communications Corp. ("KaStar"), Lockheed Martin Corporation ("Lockheed"), and the Fixed Point-to-Point Communications Section, Wireless Communications Division, of the Telecommunications Industry Association ("FS-TIA") (herein collectively referred to as "Comments") in connection with ILLC's proposal to use frequencies in the Ka Band for its feeder links,¹ as specified in ILLC's above-captioned application for authority to launch and operate the MACROCELL System, a low earth orbit mobile satellite service ("MSS") system proposed to be operated in the 2 GHz band (the "Application");²

¹ By Public Notice, Report No. SPB-106 (released October 15, 1997, the Commission established a cut-off date for filing comments or petitions to deny regarding ILLC's proposal in its Application to use feeder downlink frequencies in the 19.3-19.7 GHz band and feeder uplink frequencies in the 29.1-29.5 GHz band.

I. Introduction

What is clear throughout ILLC's Application, and ignored in the Petition and the Comments, is that ILLC is committed to complying with the Commission's rules and policies, to coordinating with all services and systems with which it is required to coordinate, and to amending its application, including its feeder link proposal, where and if necessary to comply with the Commission's rules and requirements. Thus, there is absolutely no basis for denying, dismissing, or deferring processing of the ILLC Application. It is also clear from the Application that ILLC has proposed that its feeder links be operated in frequencies that have been allocated for this purpose.

As is demonstrated below, the concerns raised by the Petition and Comments regarding the ability of the MACROCELL system to share frequencies in the Ka-band with terrestrial fixed service ("FS") operators, geostationary orbit ("GSO") fixed satellite service ("FSS") systems, and Local Multipoint Distribution Service ("LMDS") facilities are exaggerated and do not provide any basis for denying the ILLC application or concluding that ILLC is not technically qualified.

²ICO Services Limited ("ICO") also filed comments indicating that it reserves the right to comment on the ILLC Application (not its feeder link proposal) when the Application is placed on Public Notice along with other 2 GHz MSS applications. ICO has not raised any issue concerning ILLC's proposed feeder links; thus, ILLC sees no need to respond to the ICO Comments, other than to note that, if ICO intends to submit any future comments or petition directed to the ILLC application, such petition or comments cannot address the ILLC feeder link proposal that appeared on Public Notice.

II. ILLC's Proposed Use of the 19.3-19.7 GHz Band for its Feeder Downlinks Does Not Render ILLC "Technically Unqualified" or its Application "Premature"

There is no explaining or understanding the FS-TIA Comments. FS-TIA contends that ILLC is technically unqualified for reasons that have nothing to do with ILLC's Application other than the fact that the Application proposes that ILLC's feeder links will be in frequencies that FS-TIA believes should never have been allocated for NGSO MSS feeder links. FS-TIA begins by acknowledging in its summary that NGSO MSS feeder links are co-primary with FS in the band 19.3-19.7 GHz. Nevertheless, FS-TIA alleges that:

"[L]icensing Iridium, to the extent that it would allow operation of MSS feeder downlinks in the 18 GHz Band, is prima facie inconsistent with the public interest. Thus...grant of the Application is premature and the Commission must defer any final decision until either Iridium proves that its proposed operation would not harm FS users or until appropriate criteria are developed through studies conducted by such groups as the JWG."

Contrary to these assertions, operation of MSS feeder downlinks in the 18 GHz band³ is obviously not prima facie inconsistent with the public interest. Sharing is permitted.

This spectrum has been allocated for NGSO MSS feeder links domestically and internationally. Indeed, as FS-TIA acknowledges, FS and NGSO MSS have co-primary status in the band.

Moreover, the IRIDIUM® system, a NGSO MSS system with feeder downlinks in

³ FS-TIA has referred to the frequency bands 18.35-18.60 GHz and 19.3-20.2 GHz collectively as the 18 GHz band, and ILLC will refer to them similarly herein.

the 19.3-19.7 GHz Band, has already been licensed by the Commission and has been successfully coordinated with FS licensees. There is therefore no reason to conclude, or even to allege as FS-TIA does, that “[S]ubstantial and material questions ... exist with respect to Iridium’s technical qualifications.”

FS-TIA also curiously contends that ILLC is not technically qualified because “The 18 GHz Band Must Be Preserved For Valuable Existing and Future FS Operations.” Not surprisingly, FS-TIA never explains how the future spectrum needs and desires of the FS render ILLC technically unqualified.

Finally, FS-TIA contends that ILLC is not technically qualified because there could be interference between MSS earth station receivers and FS transmitters. However, it is clear that in this argument, too, FS-TIA is not really concerned with ILLC’s Application or technical proposal but with all satellite earth station receivers in the 18 GHz band. For example, FS-TIA states:

“It is anticipated that satellite applicants, such as Iridium, will deploy, in the aggregate, a significant number of 18 GHz Band earth station receivers, especially in urban areas. Once this deployment rolls out, if sharing is permitted, FS users would have to coordinate their transmitters with throngs of FSS and other satellite earth station receivers to protect them against harmful interference. Given MSS earth station feeder downlink receiver characteristics...such coordination would limit FS expansion potential significantly.”

Again, the concern FS-TIA has is not interference with existing FS but the potential for interference between numerous satellite earth stations (not just ILLC’s feeder link earth stations) and **future** FS services. This is no reason for contending that ILLC is not

technically qualified.⁴

There is similarly no reason or need to withhold or defer action on ILLC's Application while a TIA committee considers 18 GHz sharing issues, as FS-TIA proposes.⁵ Contrary to FS-TIA's contentions, ILLC's Application is not premature. Although ILLC had no obligation to do so, ILLC participated in the first meeting of TIA-JWG and may participate in future meetings. Nevertheless, the IRIDIUM system was coordinated successfully without any activity of TIA's JWG. ILLC has committed in its Application to ensure that the MACROCELL system will comply with FCC rules regarding sharing and coordination in these frequency bands. ILLC has also described the experience it has learned from the coordination of the IRIDIUM system with FS in these bands. ILLC does not anticipate any difficulty coordinating the MACROCELL Application without action by TIA's JWG or other "such groups," as requested by FS-TIA. There is certainly no reason for the Commission to allow or require its processes to be governed by TIA's activities.

III. ILLC's Proposed Use of the 29.1-29.25 GHz Band Will Not Interfere With LMDS Operations

In its comments, CVUS does not oppose grant of ILLC's application, but "seeks Commission confirmation that the proposed MACROCELL system will comply with the Commission's special requirements for feeder link operations in the 29.1-29.25 GHz band,"

⁴ It should be pointed out that the IRIDIUM system will commence operations with only one gateway earth station in the continental United States.

⁵ In fact, ILLC understands that the charter of the TIA JWG does not even include the

as set forth in Sections 25.257 and 101.103(h) of the Commission's rules. As CVUS acknowledges, ILLC has committed that "the MACROCELL system will comply with FCC rules regarding sharing and coordination in these frequency bands "includ[ing] following established coordination procedures for antenna site location." ILLC's feeder link earth station locations will comply in all respects with applicable Commission requirements. It should be noted, however, that ILLC's Ka band feeder link earth stations are not restricted to the eight locations specified by Motorola in its letter of October 6, 1997, which was filed jointly with TRW Inc. ("TRW"). ILLC could also locate its Ka band feeder link earth stations at either or both of the two locations previously specified by TRW in the October 6, 1997 letter, pursuant to Section 25.257 of the Commission's rules, or at other locations in accordance with Section 101.103(h)(3) of the rules.

**IV. ILLC's Proposed Use of the 29.25-29.5 GHz Band
is Consistent with the Commission's Rules and
Will Not Interfere with GSO FSS Operations**

In their respective filings, Hughes, Lockheed and KaStar raise various concerns regarding the ability of the MACROCELL system's proposed feeder uplinks to share spectrum in the 29.25-29.5 GHz band with GSO FSS facilities. In KaStar's judgment, a workable sharing plan is achievable and, "with proper coordination and mitigation techniques, such as satellite diversity and geographic separation of ground stations, the potential for interference could be eliminated." Clearly KaStar has correctly assessed the feasibility of sharing in the 29.25-29.5 GHz band between the MACROCELL

NGSO MSS bands.

system's feeder uplinks and GSO FSS licensees. KaStar seeks assurance that ILLC will coordinate with KaStar to minimize or avoid harmful interference. The commitments in ILLC's Application and this filing contain such assurances.

By contrast, both Lockheed and Hughes allege that ILLC's 29.25-29.5 GHz feeder link proposal is specifically prohibited by Section 25.258(c) of the Commission's rules, 47 C.F.R. § 25.258(c). Lockheed urges the Commission to restrict MACROCELL system feeder uplink operations to the 29.1-29.25 GHz band; and Hughes petitions the Commission to deny ILLC's application in its entirety, apparently not for technical reasons but for punitive ones--"because it threatens the delicate compromise embodied in the Commission's 28 GHz Band Plan" adopted in CC Docket No. 92-297.⁶

As both companies acknowledge, however, ILLC has requested a waiver of Section 25.258(c). The ILLC waiver request incorporates by reference a pending Petition for Partial Reconsideration filed by Motorola Satellite Communications, Inc. ("Motorola Petition") seeking deletion of this requirement.⁷ Both the ILLC waiver request and the Motorola Petition demonstrate that the maintenance of constant successive sub-satellite ground tracks, as required by Section 25.258(c), is but one possible method of avoiding interference with FSS earth stations and by far the least

⁶See Rulemaking to Amend Parts 1, 2, 21 and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, 11 FCC Rcd 19005 (1996).

⁷Application, Exhibit D; Motorola's Petition for Partial Reconsideration of First Report and Order and Fourth Notice of Proposed Rulemaking in CC Docket No. 92-257, filed September 27, 1996.

effective. Application of the rule would impose unnecessary technical constraints on NGSO MSS operations without ensuring that the objective of the rule--sharing with GSO FSS systems in the 29.25-29.50 GHz band—could be achieved.⁸

Lockheed's assertion that ILLC has provided no legal justification for grant of a waiver, and Hughes's exaggerated claim that ILLC's waiver request "threatens to undermine the carefully crafted compromise ... in the 28 GHz Band Plan," are both without merit.⁹ ILLC has shown that good cause exists for grant of its requested rule waiver. Moreover, as both Lockheed and Hughes neglect to mention, in its Application ILLC has stated that, in the event the Commission denies reconsideration of the adoption of Section 25.258(c), ILLC "will take such steps as are necessary to ensure compliance of ... [the] MACROCELL system with this section of the rules, including possible demonstration that **the intent of the rule is satisfied by other technical means.**" Thus, the interests of Hughes and Lockheed as licensees of GSO FSS systems operating in this band are and will be fully protected.

⁸ In fact, developments subsequent to the filing of ILLC's Application have underscored ILLC's and Motorola's concerns. The only NGSO MSS system licensee that alleged that it could employ repeating ground tracks, TRW, has abandoned its proposed system.

⁹In the Petition, Hughes also claims that ILLC's waiver request should be denied because, *inter alia*, (i) Hughes' Spaceway system has been authorized pursuant to a final order; (ii) Hughes is proceeding with its Spaceway system design in reliance on Section 25.258; and (iii) ILLC did not seek a stay of the effectiveness of Section 25.258 when it could have done so. These points are irrelevant to the question of whether grant of ILLC's waiver request would serve the public interest. More importantly, nowhere in its filing does Hughes dispute ILLC's position that other effective solutions to spectrum sharing between NGSO MSS and GSO FSS systems exist that do not suffer from the shortcomings of Section 25.258(c).

The contention by Lockheed and Hughes that ILLC has failed to demonstrate that its feeder links can share spectrum in the 29.25-29.5 GHz band with GSO FSS licensees is equally unfounded. As ILLC has shown in the Application, sharing studies within the ITU-R have concluded that sharing between NGSO feeder links and GSO networks is feasible with appropriate mitigation. ILLC has outlined the three most effective mitigation techniques cited in the Conference Preparatory Meeting-97 Report, *i.e.*, geographic separation of earth stations, adaptive uplink power control, and large antennas (with high directivity). See ILLC Application, pp. A-38 through A-40. While Hughes claims that ILLC's showing impermissibly attempts to place the burden of interference mitigation on currently licensed GSO FSS systems, such solutions are entirely appropriate under Section 25.258(a) of the rules; which accords to NGSO MSS feeder link earth stations and GSO earth stations in the 29.25-29.5 GHz band co-primary status, with mutual responsibility to "cooperate fully in order to coordinate their systems."

Lockheed and Hughes also allege that the interference techniques that ILLC proposes will not work. In this connection, Lockheed contrasts ILLC's application with the Odyssey™ NGSO MSS system of TRW Inc. ("TRW"). Lockheed claims that it is "already engaged in detailed coordination with TRW concerning the shared use of this band and is confident that coordination of Odyssey™ feeder link earth stations and Astrolink™ gateway earth stations can be achieved." Of course, at the time Lockheed made this statement, TRW had already publicly announced that it was abandoning its

Odyssey project.¹⁰ No doubt TRW found it easy to address Lockheed's concerns in their coordination discussions.

Lockheed also alleges that a joint TRW/Motorola submission to ITU Working Party 4A supports the proposition that "a ... combination of Odyssey™ and MACROCELL [system] feeder link operations in the 29.25-29.5 GHz band would prohibit GSO FSS operations in substantial portions of the continental United States...." This concern should now be moot, as there is no longer any Odyssey system or any potential of such combined operation.¹¹

Lockheed also criticizes ILLC's Application because it does not designate the number and precise location of its feeder link stations. The Commission's rules, however, do not require MSS applicants to provide such detailed information at this time. Upon grant of the Application, ILLC stands ready to engage in "detailed coordination" discussions with all then existing GSO FSS licensees and fully cooperate with them to coordinate shared use of the 29.25-29.5 GHz band. Lockheed's assertion that lack of details regarding ILLC's earth station locations will effectively eliminate the possibility of geographic separation as a viable technique for sharing with the Astrolink™ system's gateway stations is, in short, conjectural at best. Moreover, Lockheed's claim that ILLC will have virtually precluded sharing with GSO FSS

¹⁰Communications Daily, December 18, 1997, "ICO and Odyssey End Patent Dispute; TRW Gets \$150 Million Stake."

¹¹On January 7, 1998, TRW advised the Commission that it would no longer pursue its Odyssey system and requested that its authorization for the system be canceled. Report No. SPB-114, rel. January 15, 1998.

operations is without basis as Lockheed has failed to show that geographic separation is the sole workable sharing technique.

Hughes's Petition contains similar groundless allegations.¹² While Hughes poses interference scenarios, Hughes has failed to demonstrate that these scenarios render ineffective the interference mitigation techniques described in the Conference Preparatory Report submitted by the ITU-R to WRC-97, mentioned above. Contrary to the plain language of Section 25.258 of the rules, Hughes also appears to suggest that its right to the 29.25-29.5 GHz band is exclusive, and that its authority to deploy "ubiquitously deployed earth stations" in its SPACEWAY™ system gives it priority over MSS systems. There is no justification for excluding NGSO MSS systems from using this band for feeder links if they can coordinate with GSO FSS systems. In its application, ILLC demonstrated knowledge, experience, and commitment to effect such coordination on a national and global scale.

Finally, ILLC has committed to amend its feeder link frequency proposal, if necessary to comply with applicable Commission requirements.¹³ Hughes's demand that ILLC's application to operate a global MSS system in the 2 GHz band be denied on the basis of ILLC's proposal to use 250 MHz of feeder link spectrum in the 28 GHz band is thus unreasonably extreme and obviously unjustified.

¹² Citing its own internal studies, Hughes likewise claims that, in the 29.25-29.5 GHz band, MACROCELL system feeder uplinks will cause harmful interference into Hughes' SPACEWAY uplinks, and Hughes' SPACEWAY uplinks will preclude MACROCELL system uplink operations.

¹³ In the Application, ILLC has also indicated that it may amend its Application to seek

V. Conclusion

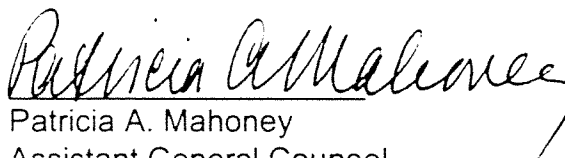
In its Application, ILLC requested for its proposed feeder links frequencies that have been allocated globally and domestically for NGSO MSS feeder links. ILLC recognized and committed to meet its coordination responsibilities and its obligation to comply with the Commission's rules. As the foregoing demonstrates, there is no justification whatsoever for denying, dismissing, or deferring action on ILLC's Application.

WHEREFORE, for the foregoing reasons, the Commission should deny the Petition, reject the Comments in accordance with the discussion above, and grant Iridium a license authorizing use of the 29.1-29.5 GHz band for the MACROCELL system's feeder uplink operations and the 19.3-19.7 GHz band for the MACROCELL system's feeder downlink operations.

Respectfully submitted,

IRIDIUM LLC

By:



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February 2, 1998

feeder link spectrum in additional frequency bands if necessary.

CERTIFICATE OF SERVICE

I, Helena Falla, an employee of Iridium LLC, do hereby certify that on this 2nd day of February, 1998, a copy of the foregoing Consolidated Opposition and Response was served upon the following via U.S. First Class Mail, postage prepaid:

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*Via Hand Delivery



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