



L. Barbee Ponder IV
General Counsel & Vice President Regulatory Affairs

October 24, 2014

Via Electronic Filing

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street SW
Washington, DC 20554

Re: Iridium Constellation LLC Petition for Rulemaking – RM-11697
Written Ex Parte

Dear Ms. Dortch:

Iridium Constellation LLC (“Iridium”) has proposed to appropriate a portion of Globalstar’s MSS spectrum at 1610-1618.725 MHz. Globalstar opposes Iridium’s efforts, including its “revised proposal.”¹ Iridium fails to justify revisiting the Commission’s 2007 allocation of the Lower Big LEO band between Iridium and Globalstar. Globalstar has relied on the Commission’s allocation and launched a \$1 billion, second-generation Mobile Satellite Service (“MSS”) constellation specifically designed to operate over the spectrum Iridium seeks. Adopting Iridium’s proposal would materially degrade Globalstar’s mobile satellite service over its second-generation network, to the detriment of its customers. Having completed the comment cycle and held extensive meetings with all parties involved, the Commission should now reject Iridium’s petition as nothing more than a blatant attempt to use the Commission’s regulatory process to stifle its closest and fastest growing competitor, Globalstar.

After a four-year long proceeding, the Commission “re-balanced” the Lower Big LEO band (1610-1626.5 MHz) in 2007, by re-assigning more than three megahertz of Globalstar’s spectrum to Iridium.² Under the Commission’s order, Globalstar’s MSS

¹ See Petition for Rulemaking of Iridium Constellation LLC (Feb. 11, 2013); Supplemental Comments of Iridium Constellation, RM-11697 (May 5, 2014); Opposition of Globalstar, Inc. to Petition for Rulemaking, RM-11697 (Dec. 2, 2013) (“December Opposition”).

² *Application of Loral/Qualcomm Partnership, L.P. for Authority to Construct, Launch, and Operate Globalstar, a Low Earth Orbit Satellite System to Provide Mobile Satellite Services in the 1610-1626.5 MHz/2483.5-2500 MHz Bands*, Order and Authorization, 10 FCC Rcd 2333 (IB 1995); see also *Spectrum and Service Rules for Ancillary Terrestrial Components in the 1.6/2.4 GHz Big LEO Bands; Review of the*

system has an exclusive assignment of 7.775 megahertz of Lower Big LEO spectrum in the United States at 1610-1617.775 MHz, Iridium has an exclusive assignment of 7.775 megahertz at 1618.725-1626.5 MHz, and the two companies share a small segment, 0.95 megahertz, at 1617.775 MHz-1618.725 MHz.³

The Commission found that its band plan would improve spectrum efficiency, provide an equitable distribution of the spectrum between the two MSS licensees in the band,⁴ and “provide long-term certainty and stability in the Big LEO market.”⁵ In limiting sharing to less than one megahertz, the Commission pointed to the impracticability of sharing spectrum in the Lower Big LEO band, noting that its “own experience of satellite interference issues reinforces the decision the Commission made in 1994 to restrict TDMA and CDMA systems to different parts of the L-band, a decision based on the conclusion that fully-loaded TDMA and CDMA systems cannot share spectrum in a co-frequency, co-coverage manner without generally undesirable operational limitations.”⁶

As Globalstar detailed in its December Opposition, the loss of additional spectrum in the Lower Big LEO band would harm Globalstar and its customers. Globalstar uses its licensed spectrum at 1610-1618.725 MHz for the “return” link between its customers’ mobile terminals and its satellites. The U.S. frequency and channel plan for this Lower Big LEO spectrum is shown below in Figure 1. Globalstar’s duplex mobile terminals transmit on 1.23 MHz channels between 1610 MHz and 1618.725 MHz, numbered from Channel 1 to Channel 7. Globalstar’s simplex terminals, including the SPOT family of devices, transmit on three 2.5 MHz channels, identified as channels A, B, and C (as shown in Figure 1). Globalstar uses simplex channel C outside North America and within North America when simplex terminals are located near Radio Astronomy sites, but otherwise uses simplex channel A in North America.

Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, Second Order on Reconsideration, Second Report and Order, and Notice of Proposed Rulemaking, 22 FCC Rcd 19733 (2007) (“2007 Big LEO Spectrum Order”).

³ *2007 Big LEO Spectrum Order* ¶ 8; *aff’d sub nom. Globalstar, Inc. v. FCC*, 564 F.3d 476 (D.C. Cir. 2009).

⁴ *2007 Big LEO Spectrum Order* ¶ 1.

⁵ *Id.* ¶ 17.

⁶ *Id.* ¶ 16.

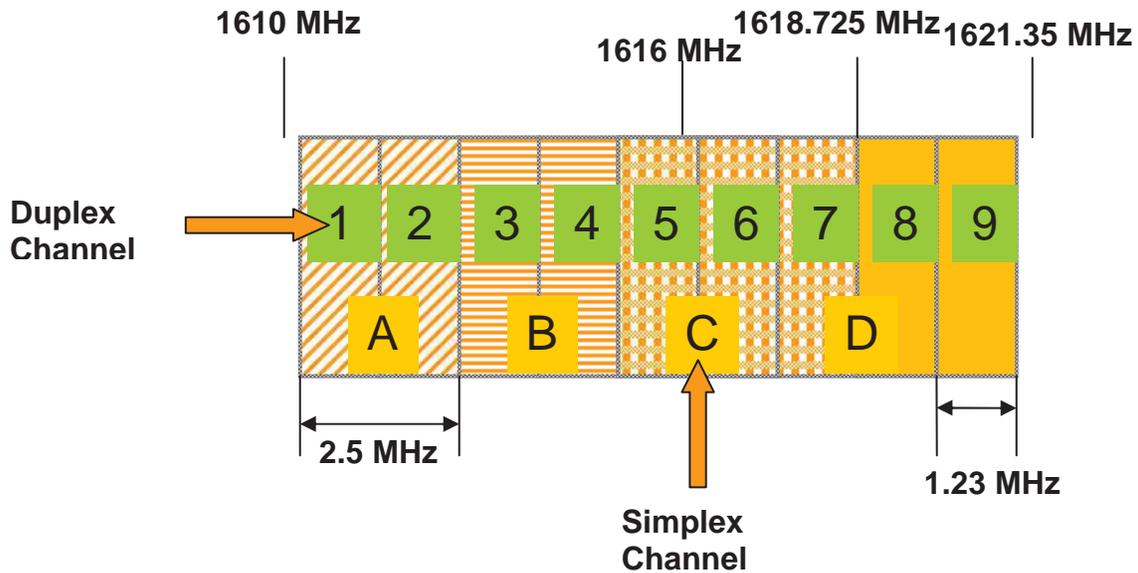


Figure 1 – Globalstar L-band Return Link Frequency Plan

Material Degradation of Globalstar’s MSS, Generally

Under Iridium’s “revised proposal,” Globalstar’s duplex Channel 7 at 1617.5-1618.725 MHz would be reassigned to Iridium.⁷ The loss of Channel 7 would materially degrade Globalstar’s MSS offerings in the United States as the traffic on its network increases. Globalstar uses Channel 7 extensively in the United States and throughout the world, and will rely on this channel even more heavily with the roll-out of its second-generation ground infrastructure. The loss of Channel 7 would harm consumers, public safety personnel, and other customers located in rural and remote areas outside terrestrial network coverage.

Since the deployment of its second-generation MSS constellation, Globalstar has experienced a substantial increase in demand for its offerings and is the fastest growing MSS provider today. Globalstar is enjoying accelerated growth across two-way and simplex business lines, with greater minutes of use, increased subscriber additions, and expanding equipment sales. Globalstar has contracted with Hughes Network Systems and Ericsson Inc. to deliver next-generation ground network equipment, software upgrades, and satellite handset chipsets, and expects this new ground segment to be

⁷ In the 2013 version of its proposal, Iridium asked the Commission to reassign all of Globalstar’s spectrum above 1616 MHz to Iridium. Globalstar explained in its December Opposition how granting that proposal would create substantial gaps in Globalstar’s global service footprint, degrade the quality of its services in the United States and elsewhere, compromise the management of its satellite constellation, and stunt its development and future growth.

operational by 2016. Its new constellation and ground systems will enable Globalstar to provide customers with new service features including advanced (and affordable) voice, two-way data, and multi-media messaging services, with uplink and downlink data speeds of up to 256 kbps for mobile service. Globalstar expects that these higher-speed data services will result in more intensive use of its spectrum and capacity and, as always, its peak usage will be after disasters, when terrestrial networks are rendered unavailable.

If the Commission were to reassign Channel 7 to Iridium, it would significantly increase the likelihood of harmful interference and service outages on the Globalstar system.⁸ With its current traffic, Globalstar can only re-use channels twice in adjacent gateways.⁹ Without Channel 7, Globalstar would have severely limited capacity in Channels 5 and 6 due to greater re-use of those frequencies, requiring it to assign additional channels (Channels 1-4) to its six North American gateways. With the loss of Channel 7, Globalstar would have limited growth potential in 2016 and beyond when it rolls out its second-generation ground network and associated products and services.

Without its assigned Channel 7 spectrum, Globalstar's network capacity would be significantly constrained, with a reduced ability to support its planned high-speed satellite services in the United States. Because Globalstar uses CDMA, the uplink band is interference limited and mobile terminals in this spectrum are subject to EIRP restrictions, the number of high data rate satellite users per Globalstar channel is limited. By reducing the number of Globalstar's Lower Big LEO channels in the United States, the Commission would be limiting the number of high data rate users on Globalstar's MSS network and limiting Globalstar's overall capacity (regardless of data rate). Limited to lower data rates, the ability of Globalstar's U.S. MSS customers to uplink bandwidth-intensive material would be impaired. Globalstar's substantial investment in its global ground network would be compromised, and consumers, particularly those in rural and remote areas, would be harmed.

The loss of Channel 7 would also affect the performance of Globalstar's MSS network during periods of peak usage, such as after natural or manmade disasters when terrestrial networks are unavailable. Generally, when the number of users within a satellite beam is large enough, additional users are unable to connect to Globalstar's MSS network (receiving a busy signal) and the likelihood of dropped calls increases. If Globalstar lost one of its seven Lower Big LEO band channels, its ability to reduce congestion and improve service quality by reallocating channels to affected areas would be diminished. Following disasters such as Hurricanes Katrina and Sandy, when

⁸ In contrast to its "forward" link in the Upper Big LEO band, Globalstar's return link at 1610-1618.725 MHz relies on interference sharing, meaning each customer who uses the same frequency interferes with every other customer using that frequency.

⁹ Like other MSS and wireless networks (including Iridium's), Globalstar's system cannot use all of its assigned frequencies at all times across all geographic areas. Each system has to have a frequency re-use method, and Globalstar's MSS system re-uses its assigned frequencies gateway by gateway.

Globalstar's usage spikes, Globalstar's MSS service would be impaired – just when consumers and public safety need it the most.

The loss of Channel 7 would also degrade Globalstar's SPOT and simplex services. If Globalstar were forced to shift duplex traffic from Channel 7 to Channels 1-6, the noise level in SPOT Channels A and C (used for SPOT in the United States) would increase. In addition, "sharing" of the 1616-1617.5 MHz band with Iridium (discussed further below) could further raise the noise level in Channel C. With these higher noise levels, Globalstar's SPOT and simplex services in the United States would be degraded, and customers in need would face failed and dropped connections.

Harm to Globalstar MSS and Customers Related to RAS, GLONASS Restrictions

Not all spectrum in the Lower Big LEO band has equal value. The Commission and other national administrations restrict the use of the frequencies below 1616 MHz, primarily to protect the Radio Astronomy Service ("RAS") at 1610.6-1613.8 MHz, and the GPS and GLONASS systems below 1610 MHz. For example, Section 25.213 of the Commission's rules prohibit Globalstar from operating co-channel with RAS at 1610.6-1613.8 MHz within 160 kilometers of several geographic "protection zones," and Globalstar devices operating in those zones must use the non-overlapping Channels 5-7. Additionally, Globalstar cannot operate co-channel with RAS within 50 kilometers of a number of other RAS sites in the United States.¹⁰

Globalstar has designed its global MSS network to work around the various RAS and GLONASS-related restrictions. It makes the most efficient possible use of its spectrum given the options available under the Big LEO band plans in the United States and elsewhere. If Iridium were reassigned Globalstar's "clean" Channel 7 spectrum (1617.5-1618.725 MHz), it would be much more difficult for Globalstar to overcome these encumbrances in the lower half of the Lower Big LEO band. As a result, the quality of Globalstar's MSS offerings would be significantly degraded and its MSS capacity would be reduced significantly in the United States. RAS protection zones comprise almost 16% of the continental United States and include many rural and remote areas beyond terrestrial coverage.

The loss of Channel 7 would also degrade Globalstar's duplex MSS offering well beyond RAS protection zones. A duplex mobile terminal's initial "access" transmission connects a user with Globalstar's MSS network,¹¹ and Globalstar has only limited information about the location of the terminal until the call is received by Globalstar's gateway earth station. As a result, in most areas, Globalstar has no practical way to

¹⁰ 47 C.F.R. § 25.213(a)(1)(i), (ii). Section 25.213 also limits the power flux density that Globalstar mobile terminals can produce within the 1610.6-1613.8 MHz RAS band at the RAS sites identified in this rule, and imposes certain separation requirements for Globalstar's airborne mobile terminals.

¹¹ See also December Opposition at 17-18.

distinguish between “access” calls made within or near a U.S. RAS-protected zone, and those originating sufficiently far from an RAS protection zone. Thus, to ensure compliance with the RAS rules, all initial access calls on Globalstar’s network in North America occur on duplex Channels 5-7.

Globalstar’s capacity for access calls would be reduced with the loss of duplex Channel 7, and this reduced capacity would significantly constrain Globalstar with the roll-out of its second-generation ground infrastructure. Globalstar’s first- and second-generation ground systems will interference share with one another, and, therefore, Globalstar will have to allot separate access channels to first- and second-generation user equipment. These separate first- and second-generation access channels will of course have to avoid interfering with RAS, and thus would be possible only on Channels 5 and 6 with a loss of Channel 7. Having only Channels 5 and 6 available for access calls would be inadequate where Globalstar’s satellite beams and the overlapping gateway coverage limit frequency re-use.¹² Iridium’s spectrum grab would thus severely limit Globalstar’s access capacity as well as its overall MSS capacity.¹³

Harm to Globalstar and Customers Related to Competitive Aviation Services

Iridium and Globalstar have each announced plans to compete in aviation services. Apparently as a way to address this competitive threat, Iridium asks the Commission to reassign to it the very spectrum Globalstar will use to compete with Iridium’s aviation services.

Aeronautical MSS (“AMSS”) is subject to particularly rigorous restrictions on channel usage in the Lower Big LEO band. Globalstar’s aviation equipment must be built to meet standards set by the Federal Aviation Administration (“FAA”) and RTCA, Inc., to protect RAS at 1610.6-1613.8 MHz and GPS and GLONASS at 1574-1610 MHz. To meet these FAA/RTCA standards and be commercially marketable in terms of size, weight, and cost, Globalstar’s aviation terminals can only operate above 1616 MHz on

¹² This access channel constraint could become more difficult for Globalstar with the continuing growth of its Machine to Machine (“M2M”) services. The access capacity used on each five-second M2M data burst is the same as required for a voice call.

¹³ In an October 21, 2014 *ex parte* letter, the National Radio Astronomy Observatory (“NRAO”) noted that it has benefitted from Globalstar’s strict compliance with the Commission’s RAS-related restrictions in the Lower Big LEO band and the interference-free environment for RAS at 1610-1613.8 MHz. NRAO stated its concern that “the obligation to protect radio astronomy might have to be relaxed in order to maintain Globalstar’s commercial viability were it to lose the use of the spectrum requested by Iridium.” Letter from Harvey Liszt, NRAO, RM-11697, at 1 (Oct. 21, 2014). NRAO further indicated that the expansion of Iridium operations down to 1616.0 MHz would greatly increase the potential for interference into RAS below 1613.8 MHz. *Id.*

Channels 5-7.¹⁴ Unlike other MSS terminals, aviation terminals cannot use Channels 1-4 even when far from RAS protection zones, due to the filtering required to protect RAS when aircraft carrying these terminals enter or approach RAS protection zones.

If the Commission left Globalstar with only Channels 5 and 6 for its aviation services, it would severely limit Globalstar's aviation capacity and jeopardize the viability of its domestic AMSS. Three of Globalstar's North American gateways would have to use either Channel 5 or Channel 6 as its access channel (and once Globalstar rolls out its second-generation system, all six Gateways would be required to use Channel 5 and Channel 6). This loss of capacity would also threaten Globalstar's innovative ADS-B Link Augmentation System ("ALAS"), a space-based air traffic management solution, since ALAS equipment only uses Globalstar's channels above 1616 MHz.¹⁵ Globalstar, its technology partner ADS-B Technologies, LLC, the commercial airlines, airline passengers, and public safety would all suffer as a result. The only beneficiary of this action would be Iridium, which in 2013 announced an agreement to deploy an alternative ADS-B satellite delivery system that will compete directly with ALAS.¹⁶

Harm to Globalstar and Consumers from "Sharing" of 1616-1617.5 MHz

Globalstar agrees with the Commission that "fully-loaded TDMA and CDMA systems cannot share spectrum in a co-frequency, co-coverage manner without generally undesirable operational limitations"¹⁷ and opposes Iridium's proposal to "share" Globalstar's assigned spectrum in the 1616-1617.5 MHz segment of the Lower Big LEO band. Were the Commission to change course and allow Iridium to load this band segment with its TDMA traffic, there would be widespread harmful interference to Globalstar's CDMA operations in that spectrum.¹⁸ With the full loading Iridium says it

¹⁴ See also December Opposition at 21-23.

¹⁵ During a recent 7000 mile test flight, an aircraft's location data was transmitted every second via Globalstar's satellite system, tracking that aircraft in real time during the flight. Letter from L. Barbee Ponder IV, General Counsel & Vice President Regulatory Affairs, Globalstar, Inc., to Marlene Dortch, Secretary, FCC, RM-11697, at 4 (Oct. 6, 2014).

¹⁶ In April 2013, Aieron LLC, a joint venture between Iridium and NAV CANADA, announced an agreement to launch and integrate its ADS-B payloads on Iridium's next-generation satellites. Iridium Press Release, *Iridium Joint Venture, Aireon, Signs Long-Term Data Services Contract with NAV CANADA* (Apr. 29, 2013), <http://investor.iridium.com/releasedetail.cfm?ReleaseID=760199>.

¹⁷ 2007 Big LEO Spectrum Order ¶ 16.

¹⁸ Globalstar and Iridium currently share the 1617.775-1618.725 MHz band segment (which includes a portion of Globalstar's Channel 7). To date, Globalstar has detected little to no Iridium use of this shared frequency in North America, and has not experienced any quality of service issues due to this sharing.

Marlene H. Dortch

October 24, 2014

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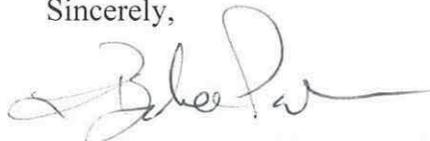
plans to do, Globalstar and its customers would lose access to all of its licensed Lower Big LEO spectrum above 1616 MHz.

Globalstar has explained in detail that losing its spectrum above 1616 MHz (duplex Channels 5-7 and simplex Channel C) would have a disastrous effect on its global MSS business and its public safety and other customers in North America and around the world.¹⁹ The loss of this spectrum would create substantial gaps in Globalstar's global service footprint, degrade the quality of its services, compromise the management of its satellite constellation, and stunt its development and future growth just as Globalstar has restored its full MSS capabilities. Globalstar would lack the spectrum necessary to operate a competitive, viable MSS network. Accordingly, the Commission should reaffirm its prior views on Big LEO sharing and deny Iridium's proposal for "sharing" at 1616-1617.5 MHz.

* * *

Is Iridium growing beyond its spectrum holdings? If so, that would be news to its investors. In any case, Iridium should look elsewhere for a solution to its alleged problems, rather than try to grab the spectrum of its fastest-growing competitor. Giving Globalstar's spectrum to Iridium would harm Globalstar and its customers. Globalstar relied on the Commission's allocation – which the Commission itself emphasized would "provide long-term certainty and stability in the Big LEO market"²⁰ – to build and launch a \$1 billion second generation MSS constellation. The Commission should not tolerate Iridium's anti-competitive tactics and should expeditiously deny Iridium's Petition for Rulemaking.

Sincerely,



L. Barbee Ponder IV, General Counsel
and Vice President Regulatory Affairs

¹⁹ December Opposition at 12-28.

²⁰ *2007 Big LEO Spectrum Order* ¶ 17.

Declaration

I hereby certify under penalty of perjury that the engineering statements made in the foregoing written *ex parte* of Globalstar, Inc. are true and correct to the best of my knowledge.

Dated: October 24, 2014

A handwritten signature in black ink, appearing to read "Paul Monte", written in a cursive style.

Paul A. Monte
Vice President
Engineering & Operations
Globalstar, Inc.