

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
The Establishment of Policies)	IB Docket No. 99-81
and Service Rules for the Mobile)	RM-9328
Satellite Service in the 2 GHz Band)	

**REPLY COMMENTS OF
THE BOEING COMPANY**

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The Boeing Company (“Boeing”), by its attorneys and pursuant to Section 1.415 of the Commission’s Rules, 47 C.F.R. § 1.415, hereby submits its reply comments in response to the above-captioned Notice of Proposed Rulemaking (“*NPRM*”).

I. INTRODUCTORY SUMMARY

Boeing is encouraged by the support expressed in the comments filed in this proceeding for Boeing’s proposed aeronautical communication and navigation services. Boeing seeks to operate a mobile satellite service (“MSS”) network in the 2 GHz MSS band in order to provide a number of communications, navigation and surveillance (“CNS”) air traffic management (“ATM”) services (“CNS/ATM”) that are needed by the global aviation industry to increase safety communication and navigational accuracy and, with it, air space safety, capacity and efficiency.

Boeing can operate its aeronautical communication and navigation services in a safe and reliable manner without encumbering the operations and growth of other 2 GHz MSS systems. Recognizing this, several 2 GHz MSS applicants expressed support for

Boeing's proposal, indicating that they have no objection to the issuance of a license to Boeing as long as it is able to operate its network without requiring special interference protection measures such as inter-network priority and preemption.

In light of the support expressed for Boeing's proposal and the undisputed need for the services that Boeing will provide, the Commission should grant Boeing's application. The Commission should also authorize Boeing to provide its traffic information service within the CDMA-based spectrum assigned to its 2 GHz MSS system. Additionally, the Commission should grant authority to Boeing to provide a Navigation Augmentation Service in the GPS L-1 band. Boeing can provide its Navigation Augmentation Service without causing interference into government users of Radionavigation Satellite spectrum.

The Commission should also permit Boeing to operate feeder links for its 2 GHz MSS network in the Ku-band on a shared basis with existing satellite-based and terrestrial users of the band. Boeing's proposed feeder links can operate on a near transparent basis to other spectrum users, including non-geostationary ("NGSO") satellite networks that have been proposed to operate in the fixed satellite service ("FSS").

Boeing believes that the Commission should authorize each qualified 2 GHz MSS applicant to initially operate in 3.75 MHz of paired spectrum in order to maximize the technical capabilities of each 2 GHz MSS system. Authorizations should be issued utilizing a traditional band sharing approach, or, if it will expedite the issuance of licenses in this proceeding, a flexible band sharing arrangement.

The Commission should also strictly enforce implementation milestones for 2 GHz MSS systems, providing no special exceptions for Big LEO MSS incumbents.

The Commission should also maintain its existing practice, however, of starting the clock on milestones only after feeder link authorizations have been granted.

The Commission should also reconsider its tentative decision to refrain from adopting financial qualification rules for 2 GHz MSS systems. Such rules can prevent spectrum from remaining fallow, while discouraging speculators from raising costs for financially qualified operators and consumers.

II. IN LIGHT OF THE SUPPORT EXPRESSED FOR BOEING'S AERONAUTICAL COMMUNICATION AND NAVIGATION SERVICES, THE COMMISSION SHOULD ENDORSE THE PROVISION OF AMS(R)S IN THE 2 GHz MSS BAND.

As Boeing has previously indicated in this proceeding, Boeing can provide safe and reliable Aeronautical Mobile Satellite Route Service (“AMS(R)S”) in the 2 GHz MSS band without encumbering the operations and growth of other 2 GHz MSS systems. Boeing designed its 2 GHz MSS system with intra-network priority and preemptive capabilities, along with sufficient interference protection margins to preclude the need for special interference protection from 2 GHz MSS systems operating in adjacent frequencies.

Since filing its application, Boeing has been working with the domestic and international aviation industry and regulatory organizations to solidify consensus behind Boeing's proposal. Boeing believes that safe and dependable AMS(R)S can be ensured in the 2 GHz MSS band using FAA, RTCA and ICAO standards and/or regulations that mandate intra-network priority and preemptive capabilities, the existing regulatory

provisions of Articles S44 and S45 of the ITU Radio Regulations,¹ binding contractual commitments between Boeing and its customers, and a technical design for Boeing's MSS network that ensures that aviation industry and ITU requirements are met.

In light of the measures that are already available to protect AMS(R)S communications, Boeing believes that no additional regulatory measures – such as footnotes in the domestic and international Tables of Frequency Allocations – are needed to ensure the safety and dependability of Boeing's aeronautical communication services. In this regard, Boeing is encouraged by the comments of the National Telecommunications and Information Administration ("NTIA"), which indicated that it sees no need for additional regulatory provisions for AMS(R)S in the 2 GHz MSS band.²

Boeing is also encouraged by the support expressed by other applicants in the 2 GHz MSS proceeding. For example, Globalstar indicated that it has "no objection to permitting Boeing to provide AMS(R)S in these bands as long as it seeks no extraordinary protection for the service within the intrasystem [sic] coordination

¹ Articles S44 and S45 of the Radio Regulations mandate that a satellite operator carrying aeronautical communications must provide intra-network priorities for AMSS safety and distress communications. In carrying out this requirement, Article S45.4 envisions that a network operator may need to preempt low-priority transmissions to make capacity available for priority communications.

² See *Comments of the National Telecommunications and Information Administration*, IB Docket No. 99-81, at 18 (June 24, 1999). In contrast, NTIA indicated in its comments that it believes that existing regulatory provisions for AMS(R)S need to be strengthened in the 1.5/1.6 GHz band. Consultation with NTIA staff indicates that the different treatment between the 2 GHz MSS band and the 1.5/1.6 GHz band is warranted because portions of the 1.5/1.6 GHz band had previously been allocated exclusively to AMS(R)S and need to remain available for AMS(R)S services. Boeing concurs with this position.

requirements that are adopted for the spectrum it shares with other licensees.”³

Globalstar went on to argue that

[I]n keeping with a market-based approach to 2 GHz satellite services, each system should have the flexibility to provide the services it deems marketable as long as the parameters of the intrasystem [sic] coordination process apply equally to all and give no one system any particular advantage to accommodate a specialized service.⁴

Boeing believes that Globalstar’s support is particularly relevant in light of Globalstar’s significant experience in the international spectrum coordination process.

Support for Boeing’s service was also expressed by TMI Communications, which indicated that “if a service provider proposes to offer an aeronautical service within its allotment in the 2 GHz band, TMI would not object, provided that service carried no priority status over other operators’ allocations.”⁵

Other 2 GHz MSS applicants made comparable comments. For example, while Constellation objected to Boeing’s proposal, it based its concern on the possibility that Boeing’s AMS(R)S service would need “special protection” that would force 2 GHz MSS systems in adjacent frequencies to “substantially reduce” their capacity.⁶ Since the Boeing system will not require special interference measures from other 2 GHz MSS systems, Constellation’s concern has been accommodated by the Boeing design.

³ *Comments of Globalstar, L.P.*, IB Docket No. 99-81, at 6 (June 24, 1999).

⁴ *Id.*

⁵ *See Comments of TMI Communications of Company*, IB Docket No. 99-81, at 3 (June 24, 1999).

⁶ *Comments of Constellation Communications, Inc.*, IB Docket No. 99-81, at 4, 5 (June 24, 1999).

A few 2 GHz MSS applicants suggested that Boeing's proposal for AMS(R)S is inconsistent with the underlying intent of the current proceeding.⁷ Such remarks ignore the fact that AMS(R)S is simply a type of MSS and can be provided in generic MSS spectrum.⁸ Furthermore, Boeing's aeronautical communication services will directly advance the Commission's goals of serving rural and unserved areas,⁹ along with providing infrastructure for public safety communications.¹⁰ Residents in rural and remote areas depend heavily on the aviation industry for commerce and transportation. Air traffic facilities in these remote areas will be a major beneficiary of the advanced aeronautical communication and navigation services that Boeing will provide. Boeing's system will also create an infrastructure for emergency aeronautical communications that will provide not only "nationwide public safety coverage,"¹¹ but will also provide these services on a global basis. The Commission should therefore conclude that Boeing's proposal is fully consistent with, and furthers directly, the public interest goals in this proceeding.

⁷ See *Comments of Celsat America, Inc.*, IB Docket No. 99-81, at 27 (June 24, 1999); *Comments of Iridium LLC*, IB Docket No. 99-81, at 10-11 (June 24, 1999); *Comments of Inmarsat Ltd.*, IB Docket No. 99-81, at 13-14 (June 24, 1999) (arguing that there is a shortage of MSS spectrum for generic services).

⁸ See *NPRM*, ¶ 21 (indicating the Commission's view that "the absence of a specific AMS(R)S allocation does not bar the provision of AMS(R)S in MSS bands").

⁹ *Id.*, ¶ 95.

¹⁰ *Id.*, ¶ 93.

¹¹ *Allocation of Spectrum at 2 GHz for Use by the Mobile-Satellite Service*, Notice of Proposed Rule Making, 10 FCC Rcd 3230, 3231 (1995) ("2 GHz MSS Allocation *NPRM*").

Despite the undisputed need for Boeing’s aeronautical services, two parties made objections to Boeing’s proposal that seem to reflect the opinions of potential competitors for aeronautical communication services rather than those of concerned parties. For example, Inmarsat argued against allowing AMS(R)S in the 2 GHz MSS band, possibly because Inmarsat controls the global use of the vast majority of 1.5/1.6 GHz MSS spectrum, including almost all of the bands currently used for AMS(R)S.

Inmarsat argued that existing terrestrial services in the 2 GHz MSS band might make the provision of AMS(R)S “undesirable.”¹² The FCC has long recognized, however, that terrestrial relocation may be necessary in the band. Boeing believes that the scope of this relocation will not be increased as a result of Boeing’s provision of AMS(R)S.

Iridium also argued against Boeing’s AMS(R)S proposal, claiming that Boeing’s application is defective because the 2 GHz MSS band does not contain footnote language for AMS(R)S, “particularly with regard to intra-network priority and preemptive access.”¹³ Iridium argued further that without such a footnote, implementing priority and preemptive capabilities on a global basis would be extremely difficult.¹⁴

Iridium’s concern seems disingenuous, however, since Iridium’s proposal to use its Big LEO system to provide AMS(R)S involves spectrum that also lacks footnote language providing for intra-network priority and preemptive access. The footnote for Iridium’s Big LEO spectrum says simply that the band is also allocated for AMS(R)S and

¹² *Iridium Comments* at 13.

¹³ *Id.* at 9.

¹⁴ *Id.* at 9; *see also Inmarsat Comments* at 13.

coordination of such services should be conducted under S9.21 of the ITU Radio Regulations.¹⁵

Boeing is confident that with the assistance of the FCC, Boeing can also utilize S9.21 of the Radio Regulations to coordinate on a worldwide basis sufficient spectrum for its 2 GHz MSS system. The absence of special regulatory provisions for AMS(R)S in the 2 GHz MSS band will not pose a significant hindrance to the global coordination and operation of Boeing's 2 GHz MSS network. Furthermore, Boeing can provide intra-network priority and preemptive access through contractual commitments with its customers.

Iridium also claimed that Boeing's AMS(R)S service might reduce "overall spectrum efficiency" in the 2 GHz MSS band because Boeing may not want to share spectrum with other CDMA-based systems.¹⁶ This is a particularly novel argument coming from a MSS applicant that has consistently promoted TDMA-based systems that are incapable of sharing spectrum with other MSS networks. It would appear that Iridium would view its own system as spectrally inefficient.

Iridium further argued that Boeing's application should be denied because Section 87.187 of the Commission's rules does not yet authorize the use of Aircraft Earth Stations in the 2 GHz MSS band.¹⁷ While Boeing acknowledges the need to amend Part 87, Boeing does not believe that this poses an insurmountable obstacle to its service. Moreover, Boeing observes that Iridium has also failed to petition to amend Section

¹⁵ ITU Radio Regulations S5.367.

¹⁶ *Iridium Comments* at 9.

¹⁷ *Id.* at 10.

87.187 of the Commission's rules, even though the rule does not permit the operation of Aircraft Earth Stations in Iridium's Big LEO spectrum. Iridium may want to consider filing jointly with Boeing to amend Part 87 of the Commission's rules, if Iridium is still planning to provide aeronautical communication services.¹⁸

Finally, Boeing acknowledges the support for its proposal indicated by Aeronautical Radio, Inc. ("ARINC"). ARINC expressed interest in "the potential improvement to aeronautical communication that may be possible through" the use of MSS.¹⁹ ARINC also indicated that to aid Boeing in providing its service, an exclusive AMS(R)S allocation should be adopted in the 2 GHz MSS band in the domestic and international Tables of Frequency Allocations.²⁰

While Boeing appreciates ARINC's support, Boeing does not believe that its system requires an exclusive spectrum allocation for the provision of AMS(R)S in generic MSS spectrum.²¹ Nor does Boeing concur with ARINC's suggestion that an

¹⁸ See Emma Kelly, *Iridium Looks for Avionics Supplier as AlliedSignal Quits*, Flight International (May 5, 1999) (indicating that AlliedSignal, the exclusive manufacturer of avionics and aeronautical services for the Iridium system, dropped its plans to develop multi-channel aeronautical terminals for the Iridium system because the necessary satellite link technology was not ready and Iridium had no schedule in place for its development); see also *Flt Tech Economics* at 7-8 (June 17, 1999).

¹⁹ *Comments of Aeronautical Radio, Inc.*, IB Docket No. 99-81, at 1 (June 24, 1999) ("ARINC Comments").

²⁰ See *id.* at 2.

²¹ Boeing also believes that ICO is incorrect in suggesting that ITU action is necessary to consider the provision of AMS(R)S in generic MSS spectrum. See *Comment of ICO Services Limited*, IB Docket No. 99-81, at 5 (June 24, 1999); see also *Comments of BT North America Inc. et al.*, IB Docket No. 99-81, at 6 n.18 (June 24, 1999) (repeating ICO's comments).

exclusive allocation will be needed to convince aviation authorities and airlines to invest in new avionics communications equipment.²²

As Boeing detailed in its initial comments in this proceeding, the safety and reliability of Boeing's AMS(R)S transmissions can be fully ensured through FAA, RTCA and ICAO technical standards and/or regulations, existing ITU Radio Regulations, contractual commitments between Boeing and its customers to provide AMS(R)S in a safe and reliable manner using intra-network priority and preemptive capabilities, and a technical design for Boeing's system that will meet each of the standards and regulatory requirements.

Furthermore, Boeing believes that an exclusive allocation would not be a significant factor in convincing airlines and aviation authorities to purchase new avionics equipment. The international aviation community will invest in avionics for Boeing's AMS(R)S services only after it becomes confident that Boeing has dedicated the same commitment to its 2 GHz MSS system that it has long devoted to constructing the world's largest fleet of commercial, private and government owned aircraft. Confidence in the aviation industry is built on safety, dependability and a commitment to quality. It is these factors that Boeing is relying on to promote its aeronautical communication and navigation services.

²² See *ARINC Comments* at 4-5. Additionally, Boeing desires to correct the suggestion of ARINC that Boeing's equipment would replace existing services. Boeing has never suggested that its 2 GHz MSS system was designed as a replacement for existing aeronautical communication systems. Boeing's system will compliment existing terrestrial and spaced-based systems by providing added capabilities, improved technology, greatly enhanced availability and coverage, and redundant backup capability.

Boeing acknowledges that additional work must be accomplished in order to solidify the aviation community's support for Boeing's aeronautical communication and navigation services. This is hardly surprising in light of the international scope of Boeing's proposal and the enviably high standards that the aviation industry places on aeronautical safety and reliability.

Boeing is confident, however, that it can continue to work successfully with the international civil aviation community to finalize an approach that will advocate Boeing's plan to use its 2 GHz MSS system to provide AMS(R)S. Boeing's proposed aeronautical communication and navigation services have the potential to provide tremendous public interest benefits through increased safety, efficiency and reliability in international air transport. In light of these public interest benefits, and recognizing the ongoing efforts of the aeronautical community, Boeing urges the Commission to endorse the provision of AMS(R)S in the 2 GHz MSS band.

III. THE COMMISSION SHOULD AUTHORIZE BOEING'S RADIONAVIGATION SATELLITE SERVICE CONDITIONED ON THE COMPLETION OF INTERFERENCE COORDINATION WITH THE DEPARTMENT OF DEFENSE AND THE FEDERAL AVIATION ADMINISTRATION.

In the *NPRM*, the Commission requested comment on Boeing's proposed use of the 1565.42-1585.42 MHz band ("GPS L1 band") to provide Navigation Augmentation Services.²³ In response, the NTIA indicated that Boeing must continue discussions that it has already initiated with the Department of Defense and the FAA in order to ensure the

²³ See *NPRM*, ¶ 68.

protection of the Global Positioning System (“GPS”).²⁴ Boeing has been working with the DoD and FAA to assure government users of the band that Boeing’s service is fully compatible with existing and planned systems.²⁵ Boeing has provided analyses to the GPS Joint Program Office indicating that Boeing’s proposed satellite system would comply with the technical specifications included in ICD GPS 200, its subsidiary documents, and any subsequent revisions to those requirements. Boeing has also assured the United States Air Force in writing that Boeing will tailor its satellite operations so that the total number of signals radiated by Boeing in the GPS L1 band will not reduce the carrier-to-noise per bit ratio (C/No) in a GPS tracking receiver below that necessary to acquire and track the satellites.

In light of the extensive work that has already taken place between Boeing and the United States Government, the Commission should authorize Boeing’s Navigation Augmentation Service conditioned on the continued agreement of U.S. government users of the band.

IV. THE COMMISSION SHOULD AUTHORIZE BOEING’S TRAFFIC INFORMATION SERVICE AS A PART OF BOEING’S OVERALL CDMA-BASED SYSTEM.

The Commission should authorize Boeing’s traffic information service (“TIS”) in part because no party has provided a reason why Boeing should not be permitted to provide this service. In the *NPRM*, the Commission noted that Boeing’s TIS was

²⁴ See *NTIA Comments* at 17-18.

²⁵ In light of the fact that Boeing can operate its service without interfering with GPS, the Commission should disregard the Comments of Iridium, which indicated that it would oppose the operation of any navigation service that would compromise the accuracy of GPS. See *Iridium Comments* at 30.

designed as a one-way TDMA-based signal. As indicated in its initial comments, Boeing can convert TIS from a TDMA modulation scheme to a CMDA-based scheme and provide the service within the overall capacity of the CDMA-based spectrum assigned to its MSS network. Thus, no reason exists to refrain from authorizing Boeing's TIS.

V. THE COMMISSION SHOULD AUTHORIZE BOEING'S REQUEST FOR NGSO FEEDER LINK SPECTRUM FOR ITS 2 GHz MSS NETWORK.

As the Commission noted in the *NPRM*, Boeing is seeking authority to operate feeder links for its 2 GHz MSS system in the Ku-band.²⁶ Boeing can operate its feeder links without causing unacceptable interference to geostationary ("GSO") satellites and terrestrial networks in the band. Boeing filed a complete interference analysis for its Ku-band NGSO feeder links with the Commission on January 8, 1999. The analysis, along with subsequent submissions by Boeing, demonstrated the interference protection capabilities of the Boeing system and, as a result, should be adequate to satisfy the concerns of co-frequency GSO operators and terrestrial networks.

Furthermore, the Commission is considering authorizing NGSO operations on a primary basis in the Ku-band, subject to the interference protection limits under consideration in the NGSO FSS proceeding. Thus, the Commission should disregard suggestions by PanAmSat that NGSO networks will operate on a "secondary" basis in the Ku-band and thus would not be appropriate for use as feeder link spectrum for Boeing's proposed aeronautical communication system.²⁷

²⁶ See *NPRM*, ¶ 61. Boeing requested in its application 109 MHz of paired spectrum at 14.391-14.5 GHz and 11.591-11.7 GHz.

²⁷ *Comments of PanAmSat Corporation*, IB Docket No. 99-81, at 5 (June 24, 1999).

Boeing can also operate feeder links for its 2 GHz MSS system in the Ku-band without reducing the total number of NGSO FSS systems that can be accommodated on a co-frequency basis. Boeing's narrow band feeder links will operate using a small number of Gateway earth stations and steerable narrow beams that can be coordinated around the signals of NGSO FSS constellations and, as a result, avoid encumbering the services that they provide. Through the use of satellite diversity, Boeing's NGSO feeder links will be able to effectively operate in the Ku-band in a near transparent manner. The Commission should therefore authorize Boeing to utilize the Ku-band to provide feeder links for its 2 GHz MSS network.

VI. EACH QUALIFIED 2 GHz MSS APPLICANT SHOULD BE AUTHORIZED TO INITIALLY OPERATE IN AT LEAST 3.75 MHz OF PAIRED SPECTRUM.

Boeing continues to believe that the Commission can maximize the likelihood of success for 2 GHz MSS licensees by authorizing each applicant to initially operate in 3.75 MHz of paired spectrum. Access to 3.75 MHz of paired spectrum will enable applicants to utilize technical designs that can provide greater capacity and, equally important, better transmission quality than may be available using only 2.5 MHz of paired spectrum.

In arguing in favor of a 3.75 MHz spectrum assignment, Boeing has supported a traditional band sharing approach for 2 GHz MSS systems. The traditional approach outlined in the *NPRM* enables the licensing of all proposed 2 GHz MSS systems, while providing certainty for each applicant with respect to the specific spectrum available and the interference conditions to be addressed in the design of each system.

While Boeing continues to support the traditional band sharing approach, Boeing remains committed to studying other spectrum sharing options that have been put forth by the Commission and other 2 GHz MSS applicants. Boeing also remains aware that the Commission is attempting to license 2 GHz MSS systems on an expeditious basis. In this light, Boeing observes that four applicants expressed general support for the Commission's flexible band sharing approach.²⁸ Recognizing this support, Boeing would be willing to support for the flexible approach if it would further the Commission's goal of granting 2 GHz MSS licenses on an expedited basis.

If the Commission does adopt a flexible band sharing approach, however, Boeing urges the Commission to also endorse implementation procedures that will permit 2 GHz MSS operators to gain access to expansion spectrum without having to complete burdensome administrative procedures to demonstrate need. For example, 2 GHz MSS operators should be permitted access to expansion spectrum without being forced to go through a notice and comment application procedure. Instead, the Commission should grant access to expansion spectrum based simply on a written demonstration of need by a 2 GHz MSS licensee.

Once access to expansion spectrum has been granted, any party would then be free to object to the licensee's statement of need in a process that should be collateral to the basic application process. In this way, 2 GHz MSS licensees would be able to operate in expansion spectrum without facing delay during adversarial proceedings that may be initiated by potential competitors for MSS services. At the same time, the Commission

²⁸ Celsat, MCHI, Inmarsat and TMI expressed support for the flexible band sharing approach.

would be able to review the validity of a licensee’s statement of need in a process that could be conducted concurrently with the licensee’s initial use of expansion spectrum.

VII. IN ADOPTING A BAND SHARING APPROACH FOR 2 GHz MSS LICENSEES, THE COMMISSION SHOULD REQUIRE GEOSTATIONARY SATELLITE NETWORKS TO OPERATE IN NON-CONTIGUOUS PORTIONS OF THE 2 GHz MSS BAND.

In the *NPRM*, the Commission concludes that it should permit both NGSO and GSO MSS networks to operate in the 2 GHz MSS band. The Commission argues that permitting both types of satellites is appropriate because of the different advantages that each technical design is capable of providing.²⁹ In permitting GSO networks in the 2 GHz MSS band, however, the Commission proposes band sharing approaches that authorize GSO networks only in the non-contiguous portions of the spectrum.³⁰ The Commission appears to have proposed this arrangement because of a recognition that a GSO satellite “operates from a fixed point relative to the Earth and consequently the coverage from a single GSO satellite, while continuous, allows for regional service at most.”³¹

Despite this recognition, Inmarsat argued in its comments that GSO networks should not be required to operate only in the non-contiguous portions of the band. Inmarsat indicated that if such a requirement were enforced, Inmarsat would need to

²⁹ See *NPRM*, ¶ 17.

³⁰ Specifically, the two band sharing approaches that included specific spectrum assignments – the traditional and the flexible approaches – each assign GSO networks to portions of the 2165-2170 MHz and 2010-2025 MHz bands.

³¹ *NPRM*, ¶ 17.

design its satellites to operate throughout the spectrum band, or else “tailor each of its satellites separately” to match different allocations in different parts of the world.³²

What Inmarsat overlooks is the fact that the option of tailoring specific satellites to match regional spectrum assignments is an advantage, rather than an inconvenience, that is unavailable to NGSO networks. NGSO operators have no choice but to design each satellite to operate over the entire range of frequencies that might be available in each region. Thus, what Inmarsat describes as a “burden”³³ for GSO networks is actually an advantage. Accordingly, the Commission should not entertain Inmarsat’s proposal to permit GSO networks to operate in the contiguous portions of the 2 GHz MSS spectrum.

VIII. THE COMMISSION SHOULD PROMOTE INTERNATIONALLY COMPATIBLE BAND PLANS FOR 2 GHz MSS AND SHOULD CONDITION 2 GHz MSS AUTHORIZATIONS ON COOPERATION IN INTERNATIONAL SPECTRUM COORDINATION.

The Commission should continue its policy of promoting internationally compatible band plans in the 2 GHz MSS proceeding. As Boeing pointed out in its initial comments, pursuing an internationally compatible band plan for the 2 GHz MSS service is important because this is the Commission’s first satellite application processing round in which non-U.S. licensed systems have been permitted to participate using letters of intent. Further, several applicants in this proceeding appear to have already begun spectrum coordination with the support of foreign administrations. These applicants will be under no obligation to cooperate with the development of an internationally compatible band plan unless the Commission makes such cooperation a condition of their

³² *Inmarsat Comments* at 7-8.

³³ *Id.* at 8.

U.S. operating authority. Boeing therefore urges the Commission to condition the authorizations of all 2 GHz MSS systems on cooperating with international spectrum coordination efforts and refraining from using preexisting spectrum coordination agreements to inhibit the ability of other 2 GHz MSS systems to participate on an equal footing in international markets.³⁴

Boeing is also concerned that the Commission does not appear to have identified the steps that it is prepared to take to address the significant problem of access to European 2 GHz MSS spectrum that stems from inconsistencies in global MSS spectrum allocations and the scarcity of global MSS uplink spectrum.³⁵ Iridium observes that:

[t]he consequence of the European 2 GHz Band Plan is that only two entities, Inmarsat and ICO have assurance of access to 2 GHz MSS spectrum in Europe until at least 2005. Thus, the European 2 GHz Band Plan currently does not include any of the applicants that are seeking U.S. space segment licenses for global MSS systems in this processing round, which may be operational after 2001 but before 2005. This inconsistency between the domestic MSS allocation and the global MSS allocation thus constrains the Commission's ability to authorize multiple 2 GHz MSS systems that can operate on a global basis.³⁶

Boeing agrees that all 2 GHz MSS operators authorized to serve the United States must have prompt access to 2 GHz MSS spectrum in Europe. As Iridium argued, "failure by the Commission to resolve these problems will preclude the authorization of multiple global MSS systems in the 2 GHz bands to the detriment of competition and will

³⁴ See *Comments of Mobile Communications Holdings, Inc.*, IB Docket No. 99-81, at 19 (June 24, 1999) ("*MCHI Comments*") (also requesting that authorizations be conditioned on cooperation in international spectrum coordination efforts).

³⁵ See *Iridium Comments* at 57.

³⁶ *Id.* at 60.

compromise the public interest.”³⁷ Accordingly, the Commission should initiate a formal process with Europe and other countries to ensure that all MSS providers have equitable access to spectrum.³⁸

IX. THE COMMISSION SHOULD EXTEND ITS PROHIBITION ON EXCLUSIVE ARRANGEMENTS.

No party in this proceeding has provided any reason why the Commission should not continue its policy of prohibiting exclusive arrangements for traffic between the United States and foreign countries. Furthermore, the Commission should apply its prohibition on both *de jure* and *de facto* exclusive arrangements. This should be done by, *inter alia*, extending the Commission’s prohibition to spectrum coordination agreements that provide a limited number of MSS operators exclusive, or near exclusive use of 2 GHz MSS spectrum in certain markets.

As discussed in the previous section, such a prohibition is warranted because this is the first FCC proceeding in which the Commission has permitted non-U.S. licensees to participate in an application processing round. Once authorizations are issued, the FCC may be unable to regulate non-U.S. licensees unless the Commission has rules in place that expressly prohibit anti-competitive activities both in the U.S. and in global markets.

³⁷ *Id.*

³⁸ Boeing also agrees with Iridium that this activity must include “obtaining a commitment from CEPT to adopt procedures that ensure U.S. 2 GHz MSS licensees will have access to appropriate spectrum in the CEPT countries after 2001, or before 2005. [Further,] [t]he U.S. must also work with countries outside Europe to see that a U.S. band plan is accepted around the world.” *Iridium Comments* at 61.

X. THE COMMISSION SHOULD ADOPT ITS PROPOSED MILESTONES FOR 2 GHz MSS LICENSEES, WITH NO EXCEPTION FOR BIG LEO INCUMBENTS.

In the *NPRM*, the Commission proposes to adopt implementation milestones for 2 GHz MSS licensees that are substantially similar to those adopted for Big LEO licensees.³⁹ As Boeing indicated in its initial comments, Boeing supports the Commission's basic proposal. Boeing does not believe, however, that the Commission should not abandon its prior practice of delaying the start of milestones until after feeder link spectrum is assigned for each system. Satellite licensees do not have significant control over the pace at which the Commission makes feeder link assignments. Thus, initiating milestones prior to the issuance of feeder links would penalize licensees without providing significant corresponding public interest benefits.

The Commission should also reject suggestions that it should change its milestone rules for incumbent Big LEO licensees. For example, Constellation Communications requested a special exception for Big LEO incumbents that would permit Constellation to warehouse its 2 GHz MSS spectrum until 2011, a full twelve years into the future and about twice as long as the milestones for other MSS licensees.

Constellation indicated that it wants this unprecedented milestone extension so that it can include its proposed 2 GHz MSS payload on a second generation of its Big LEO MSS satellites.⁴⁰ According to a report filed recently with the FCC, however, Constellation has started construction on only two of its 46 first generation Big LEO

³⁹ See *NPRM*, ¶ 85-90.

⁴⁰ See *Constellation Comments* at 25-26.

satellites.⁴¹ Thus, if Constellation really wants to include both payloads on the same satellites, Constellation should redesign its first generation Big LEO constellation to include a payload for 2 GHz MSS services. After all, the Commission is likely to issue licenses for 2 GHz MSS systems well before Constellation is ready to place its first generation Big LEO system into service.

XI. STRICT ENFORCEMENT OF IMPLEMENTATION MILESTONES IS NOT A SUBSTITUTE FOR IMPOSING STRICT FINANCIAL QUALIFICATION REQUIREMENTS.

Boeing continues to believe that requiring stringent financial qualification requirements in the 2 GHz processing round is necessary to deter the kinds of abuses that often result – *i.e.*, “green-mail” like practices, delay in the provision of services, warehousing by unqualified entities and those with speculative proposals, etc. -- when such requirements are not imposed. In Boeing’s view, it simply is not practical to accept the position of some parties, like MCHI, who argue that financial qualification requirements should not be imposed under any circumstances.⁴² As BellSouth points out, for example, various MSS proponents have argued repeatedly that they should not have the obligation of reimbursing Broadcast Auxiliary Service and FS licensees for their cost

⁴¹ See Letter from Albert Shuldiner, Counsel to Constellation Communications, Inc., to Magalie Roman Salas, Secretary, Federal Communications Commission, at 2 (June 30, 1999).

⁴² See *MCHI Comments* at 22. The Commission should observe that most commenters still recognize the practical value of financial requirements. For example, ICO states that it “continues to believe that financial requirements serve the important purpose of ensuring that valuable spectrum is assigned to systems that are able to use it to benefit consumers.” See *ICO Comments* at 5; see also *Comments of BellSouth*, IB Docket No. 99-81, at 6 (June 24, 1999) (submission of financial qualifications demonstrates that each entity can construct, launch, and operate its system for at least one year).

of relocating out of the 2 GHz MSS spectrum, which, according to BellSouth, suggests “that at least some of the domestic and international entities expressing interest in MSS assignments may not have the wherewithal to meet their relocation obligations.”⁴³

Further, in Boeing’s view, it is not enough that some applicants would support financial qualification requirements only in the event that the 2 GHz MSS band cannot accommodate all nine of the proposed systems without mutual interference.⁴⁴ This position assumes that band sharing will avoid mutual exclusivity, but as the Commission has noted, “many of the 2 GHz MSS system proponents request use of the entire available 2 GHz MSS spectrum allocation,” and there is, therefore, “insufficient spectrum to accommodate all systems as proposed without causing mutual interference.”⁴⁵

Furthermore, no matter how thinly the spectrum is sliced in the United States, global mutual exclusivity will undoubtedly occur as a result of international spectrum coordination with regional MSS systems in other parts of the world.

Since it appears inevitable that some form of mutual exclusivity will exist, the Commission should resolve the competing claims for spectrum through financial

⁴³ *BellSouth Comments* at 6.

⁴⁴ *See Constellation Comments* at 3-4 (argues that if financial qualifications are required, because all systems cannot be accommodated, the Commission will have to modify the provisions of Section 25.243(b)(3) “to reflect the realities of financing multi-billion dollar satellite systems under the then current market conditions.”); *ICO Comments* at 5-6 (“ICO also agrees that in the event that the Commission concludes that not all proposed 2 GHz systems can be accommodated within the available spectrum, the financial qualifications previously adopted for Big LEO and domestic fixed-satellite systems should be imposed upon 2 GHz MSS operators.”); *Inmarsat Comments* at 15-16 (“Inmarsat urges the Commission to require a financial showing of the type proposed in the NPRM prior to licensing in the event that any spectrum limitations are placed on the applicants.”).

⁴⁵ *See NPRM*, ¶ 8.

qualification requirements. If financial qualification requirements are adopted now, enforcement of the rules will likely winnow the field of applicants and expedite the initiation of new services.

Further, Boeing disagrees with the insistence of commenters who argue that the existence of milestones would be sufficient to deter the warehousing of 2 GHz MSS spectrum by underfinanced and unqualified applicants.⁴⁶ The use of financial requirements serves as a necessary complement to milestones, not as a substitute for them, particularly in situations where the scarcity of valuable spectrum could facilitate abuses by some entities. These abuses can include not only the “warehousing” of spectrum (which the Commission assumes it will be able to deter with milestones), but also engaging in “greenmail-like” practices of selling a bare license and privately profiting from the regulatory process. As the Commission is well aware from its experience with broadcasting and wireless telephony licenses, “greenmail-like” practices do occur, and cannot be deterred without the imposition of financial requirements at the outset.

Boeing strongly believes that it is imperative that the Commission implement financial qualification requirements now so as not to jeopardize the public interest in ensuring the near-term availability of 2 GHz MSS services and the efficient use of the spectrum allocated to this service. Further, imposing financial qualification requirements now could assist the Commission in deciding on a band sharing plan that could accommodate all those applicants who are financially and technically capable of

⁴⁶ See, e.g., *Celsat Comments* at 20-23; *ICO Comments* at 5; *Inmarsat Comments* at 15-16.

constructing, launching, and operating an MSS system. As Boeing pointed out in its initial comments, the lack of financial qualifications is likely to introduce additional parties for international coordination, which could tie up spectrum utilization for years by “paper” systems. The Commission should impose financial requirements now to prevent potential abuses and delay in the availability of MSS service capable of furthering the public interest.

XII. THE COMMISSION SHOULD NOT IMPOSE SPECIAL PROVISIONS TO INDUCE SERVICE IN UNSERVED COMMUNITIES.

Boeing disagrees with the comments of some parties who argue that the Commission should impose regulatory preferences for those applicants who provide telecommunications services to “unserved communities.”⁴⁷ Boeing believes that imposing special provisions to encourage service to underserved communities will only encourage abuse and unwarranted preferential treatment. Further, as Constellation points out, special provisions are not imperative because many systems, including Boeing’s, already are designed to provide services to areas not covered by terrestrial facilities.⁴⁸ Additionally, it is unclear how an “unserved community” would be defined and the types of telecommunications services that would qualify for special treatment.

While aviation activities were not specifically mentioned in the *NPRM*, they truly qualify as areas that are not, and often cannot be, well-served by terrestrial

⁴⁷ See, e.g., *Celsat Comments* at 28-29; *Iridium Comments* at 48-51.

⁴⁸ See *Constellation Comments* at 28.

communications systems.⁴⁹ In Boeing's view, the public interest justifications for using MSS spectrum to fulfill the underserved needs of the aviation industry, as Boeing intends to do, are substantial. Therefore, the Commission is justified in concluding that the launch and operation of Boeing's 2 GHz MSS system is both consistent with, and in furtherance of, the public policy goals of service to "unserved communities."

XIII. MANY COMMENTERS, INCLUDING MOST MSS APPLICANTS, AGREE THAT 2 GHz SYSTEMS SHOULD NOT BE REQUIRED TO IMPLEMENT ENHANCED 9-1-1 CAPABILITIES.

Boeing agrees with many other MSS applicants that MSS systems should not be subject to Enhanced 9-1-1 ("E-911") service requirements.⁵⁰ Boeing recognizes the fine intentions of APCO and the U.S. Coast who encourage the Commission to impose E-911 requirements on MSS systems; however, such requirements are just not practicable at this time or are not applicable to MSS systems that are not intended to provide traditional telephony service.⁵¹ Boeing notes that APCO offers no solution to the technical impracticalities involved in implementing E-911. On the other hand, while the U.S.

⁴⁹ As Boeing pointed out in its initial comments, the use of satellite services for airports is analogous to the use of such services to a police force in a remote location. In the *NPRM*, the Commission provides the following as an example of what it envisages as use of satellite service in unserved areas that furthers its public policy goals: "We note that American Mobile Satellite Corporation, a GSO MSS licensee, is providing service to a police force in the Navajo Nation and to the remote community of Tortilla Flat, Arizona." *NPRM*, ¶ 95 n.210.

⁵⁰ See, e.g., *Globalstar Comments* at 41-44; *Iridium Comments* at 45-48; *ICO Comments* at 19; *TMI Comments* at 10-11; *Constellation Comments* at 26-27; see also *Comments of the Satellite Industry Association*, IB Docket No. 99-81, at 2 (June 24, 1999). Cf. *Celsat Comments* at 28-30 (stating its willingness to comply with E-911 requirements).

⁵¹ See *Comments of APCO*, IB Docket No. 99-81, at 2 (June 24, 1999); see also *BellSouth Comments* at 8 (argues in favor of imposing E-911 requirements on MSS systems, but does not address the technical obstacles that must be overcome).

Coast Guard hopes that E-911 capability becomes available, it at least recognizes the technical limitations of MSS systems.⁵²

Boeing's system, for one, is not designed to provide traditional telephony services like Big LEO systems and other MSS systems, and, therefore, it would be inappropriate to impose E-911 capabilities on Boeing's proposed system. As explained in its initial comments, Boeing's MSS system will use the 2 GHz band to provide a number of communications, navigation and surveillance ("CNS") air traffic management ("ATM") services ("CNS/ATM") that are needed by the global aviation industry to increase safety communication and navigational accuracy and, with it, air space safety, capacity and efficiency.

Moreover, in Boeing's view, imposing E-911 requirements on the other 2 GHz MSS systems would also be inappropriate since such technically challenging requirements (and Boeing questions the feasibility of providing a seamless network capable of providing E-911) will only serve to delay unnecessarily the deployment of MSS systems,

⁵² See *U.S. Coast Guard Comments* at 9 ("Users of existing satellite communications systems, such as Inmarsat land mobile systems, have no means of contacting a PSAP, even by dialing 911, except by going through a service provider operator at the land earth station. If the provider's land earth station were automated and an operator were not available on a 24 hour basis, such users would have no means of reaching a PSAP in an emergency. We suspect this problem may also exist with operational or planned satellite systems.").

which is contrary to the public interest.⁵³ The Commission must also be mindful that MSS systems are already facing more technological and international hurdles than terrestrial carriers, which are themselves having difficulty implementing the Commission's E-911 requirements. For the foregoing reasons, Boeing urges the Commission to refrain from imposing E-911 requirements.

XIV. CONCLUSION

For the reasons stated herein, Boeing urges the Commission to promptly grant its authorization to launch and operate its 2 GHz MSS network. The Commission is also urged to adopt rules and policies in this proceeding that will facilitate the expeditious

⁵³ Several Commenters point out the limitations inherent in the provision of E-911 through MSS systems. *See, e.g., Constellation Comments* at 26-27 (“Unlike a cellular system in which E911 capabilities can be applied on a cell-by-cell or local jurisdictional basis, Constellation’s MSS system will cover the entire country, including large unpopulated areas where there may not be a designated agency to respond to emergency calls.”); *Globalstar Comments* at 42 (“[T]he model of the terrestrial wireline or wireless emergency call service is inconsistent with the operation of MSS systems. Emergency 911 calls require rapid identification of the public safety answering point (“PSAP”) nearest to the caller and a local response. However, NGSO MSS systems are inherently global in service area; Globalstar plans to have only about three or four gateway earth stations serving the United States to which incoming calls would be routed.”); *ICO Comments* at 19 (points out that E-911 requirements “were not imposed on Big LEO systems with which 2 GHz operators will compete, and imposing those requirements on 2 GHz operators now (when system design for ICO’s service, in particular, already is completed and launch is imminent) would require costly system re-design and place 2 GHz operators at a disadvantage in competing with Big LEO incumbents.”).

licensing of 2 GHz MSS networks and will otherwise benefit consumers of satellite services.

Respectfully submitted,

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