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Before the
FEDERAL COMMUNICATIONS COMMISSION Federal Communications Commission
Washington, D.C. 20554 Office of Secretary

In the Matter of the Applications of)
)
Celsat, Inc.) File Nos. 26/27/28-DSS-P/LA-97
) 88-SAT-AMEND-98
)
The Boeing Company) File Nos. 178-SAT-P/LA-97(16)
) 90-SAT-AMEND-98
)
Mobile Communications Holdings, Inc.) File No. 180-SAT-P/LA-97(26)
)
Globalstar, L.P.) File Nos. 182-SAT-P/LA-97(64) and
) 183 through 186-SAT-P/LA-97
)
Iridium, L.L.C.) File No. 187-SAT-P/LA-97(96)
)
ICO Services Limited) File No. 188-SAT-LOI-97
)
Personal Communications) File No. 24/25-DSS-P/LA-97
Satellite Corporation)
)
TMI Communications and Company, L.P.) File No. 189-SAT-LOI-997
)
INMARSAT Horizons) File No. 190-SAT-LOI-97
)
For Authority to Launch and Operate)
Mobile Satellite Service Systems in the)
2 GHz Bands)

COMMENTS
OF
CONSTELLATION COMMUNICATIONS, INC.

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Dated: May 4, 1998

Executive Summary

Constellation Communications, Inc. ("CCI"), by counsel, hereby files its comments in the above-captioned license proceedings. In these comments CCI reviews the numerous legal and technical issues that are raised by the different applications submitted to the Commission seeking to use the 2 GHz bands assigned to the Mobile Satellite Service ("MSS"). Specifically, CCI urges the Commission to promptly establish a regulatory framework that will facilitate resolution of the pending applications. This should include a decision that provides the MSS access to the entire 70 MHz of spectrum allocated by the Commission in the 1990-2025 MHz and 2165-2200 MHz bands allocated in 1997 to the MSS for service within the United States as well as access by non-geostationary orbit ("NGSO") MSS systems to adjacent 2 GHz allocations in the ITU Table of Allocations. Relatedly, CCI submits that the Commission should not require the MSS to bear the burden of funding the broadcasters' migration to digital electronic news gathering equipment. Most importantly, the Commission should take whatever action is necessary to avoid auctioning licenses for global mobile satellite service systems. In this regard, the Commission should adopt technical rules which the applicants could use as a framework to develop a sharing proposal for using the allocated spectrum and at the same time encourage the applicants to begin negotiating a settlement agreement. Finally, CCI comments on some of the issues raised by the individual 2 GHz applications presently on file with the Commission.

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I. INTRODUCTION

CCI was established in 1991 to pursue mobile satellite service opportunities and currently holds a license to construct, launch and operate a NGSO MSS Above 1 GHz (or "Big LEO") MSS system. Since 1991 CCI has assembled a team of investors and domestic and strategic partners that are now implementing the CCI system.¹ On September 26, 1997, CCI submitted to the Commission its application to expand its currently authorized Big LEO system with the launch and operation of

¹ Today CCI and Orbital Sciences Corporation issued press releases announcing that Orbital Sciences Corporation has been selected to manufacture and launch the first phase of the CCI satellite system. Orbital will also provide up to \$150 million in equity capital and vendor financing.

46 additional satellites operating in the 2 GHz MSS bands. Although these "Constellation II" satellites will be compatible with and similar in design to CCI's satellites operating in the 1.6/2.4 GHz bands, they will be designed to offer additional services which will not be available using the Constellation I satellites. The primary services to be offered over these Constellation II satellites will be high speed digital transmission services at rates of up to 28.8 Kbps, including high speed file transfer, Group 3 facsimile, Internet access and multimedia services. These services will all be in addition to the high quality voice services also to be offered by the Constellation II satellites.

Currently, the FCC has licensed four NGSO systems and one GSO system in MSS bands above 1 GHz. The NGSO systems, including the one being implemented by CCI, are capable of providing global, inexpensive mobile satellite services to areas not served by conventional wireline or cellular systems. The explosive demand for wireless services, as represented by the Big LEO systems currently being implemented, has been fueled by new technologies and requirements. Today, the MSS industry is on the brink of providing truly global access to wireless telecommunications services. The United States has been the world's leader in satellite technology and services, and the Commission, through its prompt resolution of this proceeding and assignment of 2 GHz spectrum, can once again provide the appropriate impetus to ensure that the United States maintains this leadership position.

The Commission's Order allocating an additional 70 MHz of spectrum for MSS at 2 GHz noted that projections call for insufficient MSS capacity in the near future.² Grant of the pending 2 GHz applications will provide an opportunity for a robust market to develop in the provision of

²

See First Report and Order and Further Notice of Proposed Rulemaking, 12 FCC Rcd 7388 (1997) ("*First Report and Order*").

a variety of mobile satellite services. Unfortunately, the large variance in system design, spectrum requirements and market focus among the applicants creates a difficult environment for obtaining the common ground necessary to resolve this proceeding. For instance, there are proposals for both GSO MSS (AMSC, Celsat, PCSC, TMI and Inmarsat) and NGSO (Boeing, CCI, Globalstar, ICO, Iridium and MCHI) systems, and one of these applicants (Globalstar) proposes to use both. The Commission and the applicants must wrestle with the question of whether these two types of orbital architectures can be compatible. This is an issue that the Commission confronted and successfully resolved in the Big LEO and Ka-band proceedings. Likewise, the applicants propose two distinctively different multiple access techniques (TDMA and CDMA), in some cases on the same system. The compatibility of different access techniques was one of the most difficult issues to resolve in the Big LEO proceeding. Until it is determined how different access techniques can be accommodated in the 2 GHz MSS bands, it will be impossible to resolve the pending applications.

Some applicants are seeking to establish new systems (Celsat and ICO) to serve the United States while others are seeking to expand the capabilities of currently licensed systems (CCI, Globalstar, Inmarsat, Iridium, MCHI, PCSC and TMI). One of the applicants (Inmarsat) is an Intergovernmental Organization ("IGO") that has the inherent market advantages associated with such organizations. Finally, different systems have different service requirements. Most of the applicants are seeking to offer a broad array of mobile satellite services primarily to complement personal and multimedia services. However, Boeing, Inmarsat and Iridium are seeking to offer Aeronautical Mobile Satellite (R) Service (AMS(R)S) or to participate in the Global Maritime Distress and Safety System ("GMDSS"). In light of the inherent priorities associated with such service, before this proceeding can be resolved, it must be determined whether it is feasible or

appropriate to assign 2 GHz MSS frequencies to systems claiming treaty associated safety of life obligations, such as AMS(R)S and GMDSS. Only by reconciling the different technologies, requirements and goals of the pending applicants can this proceeding be resolved and new services be offered to the public.

Finally, given the differences between Region 2 and worldwide 2 GHz allocations, the Commission must determine how to most efficiently use the available spectrum. Currently, only the 1980-2010 MHz and 2170-2200 MHz bands are available on a worldwide basis. In Region 2 the 2010-2025 MHz and 2165-2170 MHz bands may also be used for the MSS. Moreover, the 1980-1990 MHz band is unavailable in the United States. These different allocations present a challenge to spectrum managers, system designers and applicants to match a particular applicant's needs with the appropriate spectrum.

II. THE COMMISSION SHOULD DEVELOP POLICIES THAT WILL FACILITATE PROMPT RESOLUTION OF THIS PROCEEDING SO THAT THE PUBLIC CAN EXPEDITIOUSLY OBTAIN THE BENEFITS OF NEW MOBILE SATELLITE SERVICES.

A. The Commission must make available the full 70 MHz to the MSS.

In 1997, the Commission, in its *First Report and Order* in ET Docket No. 95-18,³ found that it would serve the public interest to allocate the 1990-2025 MHz and the 2165-2200 MHz bands to the MSS. The Commission concluded that this spectrum would "provide another option for mobile communications, and would provide communications to underserved areas, such as rural and remote

³ *Id.*

areas where PCS and cellular, and other mobile services are less feasible."⁴ The Commission further concluded that the public interest would be served by allocating the 70 MHz to the MSS because such an allocation will "allow the United States to participate in global MSS systems and realize the benefits to consumers of such systems."⁵ If the amount of spectrum allocated to the MSS is reduced in any manner, it will significantly decrease the ability of the applicants or the Commission to successfully resolve this proceeding. More importantly, it will deprive the public of all the benefits to be derived from MSS. Unfortunately, since the 70 MHz was allocated by the Commission in March 1997, Congress passed legislation that required the FCC to identify 15 MHz to be auctioned from within the 1990-2110 MHz frequency band.⁶ If 15 MHz of spectrum is no longer available for MSS uplinks, it would have significant repercussions on this proceeding. CCI urges the Commission to take whatever steps are necessary to insure that the full 70 MHz remains available to the MSS. Otherwise, as discussed below, this proceeding will be much less likely to be resolved and the promise of new MSS services will be left in doubt.

First, failure to make the entire 70 MHz available to the MSS will increase the likelihood that this proceeding will result in mutual exclusivity. The 2 GHz proceeding presents difficult sharing and compatibility issues. Elimination of almost 50% of the uplink spectrum would make it nearly impossible to accommodate the ten pending MSS applications in the remaining spectrum. Denying or scaling back proposals of qualified applicants will deprive the public of the maximum benefit to be offered by this new technology.

⁴ *Id.* at paras. 13-15.

⁵ *Id.* at para. 14.

⁶ *See* Balanced Budget Act of 1997, Pub.L. No. 105-33, § 3002(c)(1)(E), 111 Stat 251, 261.

Second, if mutual exclusivity cannot be avoided, the Commission may be forced to auction the spectrum. As a practical matter, it is difficult to see how an auction would benefit the public interest. Based on the different multiple access techniques and service requirements of the various applicants, it is unlikely that an auction would maximize the compatibilities of the systems or the use of the spectrum. Instead, an auction would promote inefficiency by potentially placing the most incompatible systems in the same or adjacent spectrum. Auctions also may force applicants to redesign their systems in an inefficient manner to conform to the structure of the auction. For instance, an auction may present a particularly vexing problem for CDMA systems since they will need access to wide bandwidth that can be shared among multiple applicants. As the Commission is well aware, there are significant international repercussions associated with the auctioning of global satellite systems. The record in every MSS proceeding considered by the Commission during the last ten years is replete with reasons not to auction global satellite licenses. This is not the time or place to initiate auctions for mobile satellite services.

Third, the reduced spectrum will cause an imbalance between uplink and downlink 2 GHz MSS allocations which will severely handicap the U.S. MSS industry as it competes in the world marketplace. These competitive implications are particularly troublesome, in light of the lack of alignment between U.S. allocations and international allocations.

Fourth, from the Commission's perspective, an environment that leads to mutual exclusivity will result in significant administrative burdens. Throughout the debate on auctions of global satellite systems, no one has been able to articulate an alternate mechanism that would fairly resolve mutually exclusive global satellite applications. Fortunately for the FCC, the applicants, and the public, mutual exclusivity has been avoided. CCI believes that this proceeding can be resolved even

with the complexity and variety of the various 2 GHz proposals, if 70 MHz remains available for the MSS. As was the case in the Ka-band and the recently concluded Little LEO second processing round, this can be done on a voluntary basis. However, if the uplink spectrum is reduced by almost 50%, the Commission most likely will be faced with an intractable proceeding that will tax the Commission's already limited administrative resources. Thus, the Commission must quickly resolve this frequency issue in order to provide the basis for cooperation. Inaction on these frequency issues will delay consideration of sharing solutions by the applicants and the Commission and delay provision of service to the public.

B. The Commission should review the terrestrial relocation issues being examined in ET Docket No. 95-18.

The Commission, in the *First Report and Order*, adopted policies that will have a devastating impact on the 2 GHz MSS industry. Specifically, the Commission required 2 GHz MSS operators to assume the costs of relocating broadcast auxiliary services in the MSS uplink band at 1990-2025 MHz and fixed services in the MSS downlink band at 2165-2200 MHz. This requirement could cripple the nascent 2 GHz MSS industry. The necessity for requiring relocation and the methodology for the relocation have been questioned during the last year. CCI urges the Commission to expeditiously revisit its relocation decision and adopt a reasoned policy that allows the 2 GHz MSS industry, broadcasters and fixed service users to meet their business requirements. CCI believes that this can be accomplished without a significant economic penalty being imposed on MSS, broadcast or fixed service operations.

C. The Commission Should Develop Policies That Insure The Prompt Licensing Of 2 GHz MSS Systems.

As an initial matter, the Commission must establish the basic criteria under which the licensing of 2 GHz MSS systems is to proceed. This will involve various issues that can be divided into two general categories. The first category involves technical rules which must be developed for multiple GSO and NGSO MSS systems to be licensed and coordinated within the allocated 2 GHz MSS bands. The second category includes the application procedures and service rules under which licenses (or the equivalent for Letter of Intent ("LOI") applicants) will be issued.

CCI is of the opinion that the Commission should establish only the minimum technical and legal criteria needed to grant these applications and avoid the need for auctions. In so doing, the Commission should maximize the opportunity for the growth of currently operating or licensed systems as well as the opportunity for initial entry into the MSS market. A flexible approach will foster technical and service innovation and maximize competition as new services are developed using the 2 GHz bands.

1. Sharing Issues.

Based on its initial review of the pending 2 GHz MSS applications, CCI believes that mutual exclusivity among applicants can be avoided if appropriate technical and sharing rules are adopted by the Commission. The development of such technical criteria is likely to require some adjustment to the proposed technical and operating characteristics of each system to maximize access to the available 2 GHz MSS spectrum and orbit resource. However, such adjustments are not unusual in the coordination process, and the Commission should use its existing 2 GHz proceeding to establish the technical principles needed to guide the development of a settlement among the applicants and

the detailed technical coordination agreements required before systems can be implemented. These general principles are identified below.

a. GSO 2 GHz MSS Systems Should Be Assigned the Portion Of The 2 GHz Bands Allocated Only In Region 2

As noted above, there is a substantial difference between the Region 2 MSS allocations at 2 GHz and the 2 GHz MSS allocations in Regions 1 and 3. There is even a difference between the 2 GHz MSS frequencies available in the United States and those available throughout the rest of Region 2. Because GSO and NGSO MSS satellites have different coverage requirements, CCI believes that the Commission should exploit these differences to maximize the number of MSS systems accommodated in the 2 GHz bands.

Several applicants propose 2 GHz GSO satellites that provide coverage of only the United States and, perhaps, adjacent countries in ITU Region 2. Since GSO MSS satellites are inherently limited to national or regional coverage, restricting GSO systems to operations in spectrum only available in Region 2 will not limit their operations in any fashion. NGSO systems, on the other hand, are designed to provide service on a global basis should initially be assigned spectrum in the 1990-2010 and 2170-2200 MHz band which is allocated to the MSS in all 3 Regions. If requirements dictate, NGSO systems should also be assigned Region 2 spectrum. Additionally, the 1980-1990 MHz band should be made available for global NGSO systems outside the United States. CCI believes that these differences in 2 GHz MSS allocations should be exploited to maximize the number of systems licensed by the Commission.

b. Aeronautical Systems And Other Treaty Related Safety Of Life Services Should Be Required To Operate In Bands Currently Designated By The ITU For Such Use

The 2 GHz MSS bands were allocated by WARC-92 with the view of providing the satellite component of third generation cellular/personal communications network services. Although such systems may be used for emergency or safety messages, they were not intended to replace other systems contemplated for aeronautical safety of life (AMS(R)S), or maritime safety of life (GMDSS) that are protected by treaty requirements.

Accommodating all of the proposed 2 GHz MSS systems in the available spectrum will undoubtedly require coordination criteria that allow interference at levels higher than those currently specified for safety of life services, especially for AMS(R)S applications. In addition, the preemptive priority access provisions established in the 1.5/1.6 GHz MSS bands for maritime and aeronautical safety of life GSO systems may not be feasible in bands where NGSO MSS systems are sharing the band. Preemptive, priority access techniques are difficult between GSO systems using narrow-band SCPC/FDMA transmissions. However, the constantly changing geometry of NGSO MSS systems and the use of TDMA and CDMA multiple access techniques will greatly complicate the design and operation of any preemptive priority access scheme.

The Commission should not complicate the resolution of this proceeding by designating certain systems as providing safety of life services and then requiring the other applicants to demonstrate that their systems can satisfy the stringent interference criteria and priority preemptive requirements needed to protect such safety of life systems. If applicants insist on seeking designation of their proposed systems as safety of life systems, the Commission should begin a separate

der the accommodation of such applicants in the 1.5/1.6 GHz MSS bands where established the regulatory provisions for such systems.

c. The Commission Must Carefully Examine The Technical And Operational Issues Raised By The Applicants Proposing To Use Both TDMA And CDMA Techniques In Their 2 GHz MSS Systems.

of establishing the rules for Big LEO systems in the 1.6/2.4 GHz bands, the ed with the issue of accommodating both TDMA and CDMA methods of iques. The Commission eventually partitioned the 1610-1626.5 MHz band, d CDMA systems to distinct, non-overlapping subbands.

g LEO proceeding where each applicant proposed either TDMA or CDMA he pending 2 GHz applicants propose to use both TDMA and CDMA in their se applicants do not provide any detail on how both of these techniques would tems. In particular, they do not indicate if TDMA and CDMA signals would ate portions of the band, or if TDMA and CDMA signals would occupy a

e pending MSS system applications propose use of small, essentially s for subscriber terminals, two systems cannot use the same carrier frequency ound for narrowband TDMA transmissions. Two or more CDMA systems, use the same frequencies in the same area on the ground by properly ower density levels. Wideband CDMA signals and narrowband TDMA re the same occupied frequency band if the processing gain of the CDMA igh to overcome the higher power density of a limited number of TDMA idth.

In the course of the 1.6/2.4 proceeding, analyses was submitted to show that TDMA and CDMA signals can exist in the same bandwidth under certain conditions. Indeed, it was the ability of a CDMA signal to be received in the presence of a narrow band jammer that led to the development of CDMA technology in the first place.⁷ However, the applicants proposing to use both type of multiple access techniques have not been explicit on how TDMA and CDMA operations would both be used in their systems.

CCI does not object per se to the use of both types of multiple access techniques in a system. Nor has CCI taken a position whether the band splitting approach adopted in the 1610-1626.5 MHz band to accommodate both TDMA and CDMA operations should also be applied to the 2 GHz MSS bands. But CCI is concerned over the lack of detail on how the use of both TDMA and CDMA on the same system would affect inter-system coordination and the Commission's frequency assignment process.

If the Commission were to partition the band into TDMA and CDMA segments and permit systems to use both types of multiple access, CCI is concerned with the complications of coordinating and operating two different multiple access techniques with all of the applicants in two different portions of the band. If TDMA and CDMA signals are operated in the same occupied bandwidth, CCI is concerned with how the occupied bandwidth would be assigned to different systems and how systems assigned the same occupied bandwidth would coordinate aggregate TDMA/CDMA power levels and non-overlapping TDMA carrier frequencies.

⁷ In the initial Little LEO proceeding, a sharing arrangement was adopted that provided for the STARSYS wideband CDMA system to share downlinks with the ORBCOMM narrowband FDMA system. *See* Report of the Below 1 GHz LEO Negotiated Rulemaking Committee, dated Sept. 16, 1992.

Thus, if 2 GHz MSS systems are to be permitted to use both types of multiple access techniques in their systems, the Commission should carefully review the advantages and disadvantages of splitting the band between TDMA and CDMA techniques or allowing TDMA and CDMA to coexist in separate bands assigned to different systems or groups of systems. The Commission will also need to consider requiring system operators to establish different operating protocols and coordination arrangements for the TDMA and CDMA portion of the bands; splitting the band between different MSS operators or groups of operators; and requiring the system operators to establish operating protocols and coordination agreements for TDMA and CDMA in the portion of the band assigned to their systems. At a minimum, if the Commission ultimately adopts rules to allow use of both TDMA and CDMA in these systems, all applicants should be offered the same option to adopt this novel approach.

d. Flexibility Should Be Provided To File Amendments Proposing Different Feeder Link Bands.

Feeder links for 2 GHz MSS systems raise two areas of concern for CCI: (1) priority for currently licensed systems and (2) possible new feeder link bands.

CCI specified in its Big LEO application⁸ that it planned to use the 6825-7025 MHz and 5050-5250 MHz bands for feeder links. The FCC subsequently assigned this spectrum to CCI for its feeder links.⁹ CCI's license is conditioned on its demonstrating "that it can feasibly share spectrum with all other persons or organizations with full or conditional authority to use any part of

⁸ Amendment to Application of Constellation Communications, Inc., File No. 10-SAT-AMEND-94, November 16, 1994.

⁹ Constellation Communications, Inc., 12 FCC Rcd 9651 (1997).

[the spectrum] for feeder link transmission to gateway earth stations in the United States."¹⁰ CCI believes that it will be able to satisfy the Commission with respect to this condition. However, as long as the Commission has not made a definitive determination on this feeder link compatibility issue, CCI is concerned that other feeder link options may be exhausted by the pending 2 GHz applicants. CCI has a priority right to us to this spectrum vis-a-vis any new 2 GHz system. Thus, the feeder link requirements of any new 2 GHz system should only be accommodated in this spectrum after CCI and other Big LEO licensees feeder links have been successfully accommodated, and all 2 GHz licensees assigned C-band feeder link spectrum should be conditioned on demonstrating the ability to share with CCI, Globalstar and MCHI. Additionally, CCI must be provided with the ability to seek feeder links in other portions of the C or Ku-bands if the Commission finds that CCI cannot share C-band feeder links. CCI's flexibility to find appropriate feeder link bands for its licensed Big LEO system should not be hampered by subsequently licenses 2 GHz MSS systems.

2. Licensing Issues.

During the last eight years, the Commission has confronted numerous administrative problems in resolving satellite proceedings. The Big LEO, Ka-band and two Little LEO proceedings presented some vexing challenges to the Commission. Generally, these proceedings were considered successful because the parties, through prodding by the Commission, fully vetted all legal and technical issues presented by the particular processing group. This vetting process allowed the issues to be narrowed and subsequently resolved. The 2 GHz proceeding should be no different. The Commission should take an active role in resolving this proceeding.

¹⁰ *Id.* at para 20.

- a. The Commission should encourage the applicants to develop an agreement on how to share the allocated frequency.

In the Ka-band rulemaking, the two Little LEO proceedings, and the Big LEO negotiated rulemaking, the Commission actively worked with the applicants to develop a frequency sharing plan. The Commission provided technical and legal support towards this endeavor, and it was only through the efforts of the International Bureau staff that these proceedings were resolved. CCI urges the Commission to promptly convene a meeting of all 2 GHz applicants to initiate a similar process as soon as the 2 GHz allocation issues are resolved. Given the limited and highly undesirable regulatory options available to the Commission, it certainly is in the applicants' and the public's interest to seek a voluntary resolution of this proceeding.

- b. The Commission should propose rules that will establish a framework for a sharing agreement.

The Commission can provide additional impetus for settlement of the proceeding if it proposes technical and licensing rules for 2 GHz MSS systems. The Commission deferred consideration of technical and licensing issues until after it accepted applications for 2 GHz MSS systems. Now that a cut-off notice has been issued, applications have been submitted and pleadings have been filed, the Commission has sufficient information to propose specific rules and policies to settle this proceeding. CCI, in its comments herein, has made several suggestions as to the framework for these rules and policies. Just as was the case in the recently conducted Little LEO proceeding, the issuance of a Notice of Proposed Rulemaking here can be a stimulus for resolving this proceeding. Thus, CCI encourages the Commission to review the comments submitted on the pending 2 GHz applications and proceed promptly toward the issuance of a Notice of Proposed Rulemaking to develop appropriate technical and licensing rules.

- c. Applicants should be allowed to amend their applications in order to conform to any new technical rules and to update their system characteristics.

During the last ten years, the Commission has witnessed a dramatic change in satellite technology. In 1988 there was only the GSO fixed satellite service industry and the prospect of a GSO mobile satellite service serving relatively large commercially oriented ground terminals. Direct satellite service to consumers is now technologically and economically feasible. In the last decade, the number and types of various satellite suppliers has dramatically increased. This industry has migrated from the seemingly simple 12 transponder Westar satellites that were launched in the mid-1970's, to the NGSO mobile satellite systems proposed in the early 1990's by CCI and others, to the broadband multimedia satellites now being proposed by Teledesic, Skybridge and Motorola. Each of these new systems has been marked by rapid advances in technology. The problem of obsolescence is particularly acute for satellite technology, given the long lead time for implementation, likely regulatory delays between the filing of applications and grant of licenses, and the inability to upgrade technology once the satellite is placed into earth orbit. As the Commission considers the 2 GHz applications, it must carefully balance its need to establish a stable regulatory environment with the business requirements of the applicants to upgrade to new technology. In order to meet this goal, CCI urges the Commission to establish a flexible regulatory environment based on the following elements. First, the Commission should provide all applicants the opportunity to amend their applications to conform to any new technical rules. Second, applicants should be allowed to upgrade technology, system design and proposed transmission parameters. Third, the applicants should be allowed to make technical changes to their system architecture and satellite

design, including combination of replenishment payloads and new 2 GHz payloads, subject to not adversely affecting the agreed upon interference environment.

- d. Existing MSS licensees should be allowed to adjust milestones to enable phasing in of new technology.

All of the existing Big LEO licensees have submitted applications in this proceeding. Each has articulated a need for additional spectrum to meet growing market demand for MSS services as well as a means to provide a greater variety of services than can be offered on the existing Big LEO systems. Given the disparity in the dates of licensing among the existing Big LEO licensees, Globalstar and Iridium will be implementing their systems before CCI and MCHI. Thus, the practical implications for introducing 2 GHz systems will be different for different licensees.

CCI urges the Commission to provide each of the existing Big LEO licensees the flexibility to introduce 2 GHz service at the most opportune time from a business perspective. For example, the 5-7 year life time of Big LEO MSS satellites is comparable to the 6 year implementation schedule for new 2 GHz NGSO MSS systems. Depending on the timing of the Commission's action, a combined 1.6/2.4 GHz and 2 GHz MSS satellite may make economic sense, as suggested in the Globalstar application. However, business and cash flow considerations may require an implementation schedule that differs from an arbitrary milestone schedule based on the date of Commission action on the applications. Thus, the Commission when developing its milestone policies for 2 GHz MSS systems licensed to the current MSS licenses should provide sufficient flexibility to the licensees to insure that 2 GHz systems are introduced in a reasoned and prudent manner.

- e. All applicants must provide a minimum level of technical information as required by FCC rules.

The cut-off Notice for this proceeding stated:

Each conforming amendment, new application, or letter of intent must include a concrete, comprehensive proposal for its proposed system, describing in detail all pertinent technical, operational and ownership aspects of the system and its ability to proceed expeditiously with construction and launch. This should include the information specified in Section 25.114 of the Commission's Rules, 47 C.F.R. § 25.114 as amended by the Commission's Part 25 Streamlining Order, including appropriate information relating to any feeder link and telemetry, tracking and control requirements Second, where international coordination for non-U.S. satellite systems has been completed through the International Telecommunication Union ("ITU"), and the network has been notified to the ITU, applicants need not file technical information specified in Section 25.114(c)(5) through 25.114(c)(12), unless the technical characteristics of the proposed system differ from the characteristics established in the ITU coordination process.¹¹

A review of the pending 2 GHz MSS applicants reveals a wide variance in the depth of information submitted with the applications. Some applicants provide all the information required under Section 25.114 while others provide only a skeleton description of their proposed systems. In particular, CCI does not believe that any of the systems have completed the ITU coordination requirements and thus all systems are required to submit the information specified in Section 25.114(c)(5)-(12) of the Commission's rules.¹² If there is not a uniform level of information submitted by all the applicants it will be extremely difficult to resolve this proceeding. Given that the information requirements were specified in the Public Notice, CCI urges the Commission to

¹¹ See Clarification and Corrections to Public Notices Report Nos. SPB-88 and SPB-89, Report No. SPB-95, August 13, 1997 at 2.

¹² 47 C.F.R. § 25.114(c)(5)-(12) (1997).

immediately dismiss any application that is blatantly deficient in providing the requisite level of information.

III. COMMENTS ON INDIVIDUAL APPLICATIONS

In developing rules to govern the licensing of 2 GHz MSS systems, CCI offers the following comments relating to specific applications. In addition to these specific comments, some of the general issues raised in Section II above apply to certain applications even if not specifically mentioned in this section.

A. Boeing.

CCI's major concern with the Boeing application is its request for designation as an AMS(R)S system. The Commission has already made provisions for such systems in the 1.5/1.6 GHz MSS bands. Boeing has not demonstrated a compelling demand for AMS(R)S service by the international airline community that cannot be met in the 1.5/1.6 GHz MSS bands.

As indicated above, CCI believes that the technical constraints that will be needed to accommodate the proposed applications in the 2 GHz MSS bands will make it impractical to offer the priority preemptive access that a safety of life system will require. If Boeing is granted a license for a 2 GHz MSS system, that system should not be designated as a safety of life system and should have no higher priority for spectrum access than the other systems operating in the 2 GHz MSS bands. If Boeing insists on constructing and operating an AMS(R)S system, then the Commission should begin a proceeding to determine how to accommodate such a system in the 1.5/1.6 GHz bands already allocated for AMS(R)S systems.

B. Celsat.

Celsat's application raises two basic concerns. The first concern is that Celsat's request for an assignment of 25 MHz for 3 GSO satellites on an exclusive basis is excessive. Celsat has provided no rationale for such an assignment which would preclude grant of most of the other pending applications. In this regard, the Commission should not consider Celsat's plans for a second and third operational satellite before Celsat has begun any service. CCI's other concern is Celsat's request to use both senses of circular polarization in its Earth-to-space service link. Polarization discrimination is an important element in maximizing the number of systems that can be accommodated in the available spectrum, especially for CDMA operations. For this reason, user terminals should have a reasonable amount of cross-polarization isolation which would preclude Celsat's proposed diversity approach. The poor cross-polarization isolation implied by Celsat's proposed polarization diversity reception is inconsistent with efficient spectrum utilization.

C. Globalstar.

Globalstar's 2 GHz MSS application presents several novel aspects. For example, its proposed option of including 1.6/2.4 GHz and 2 GHz MSS payloads on the same spacecraft can create significant economies and is an option that should be afforded to current 1.6/2.4 GHz MSS licenses. However, several other aspects of Globalstar's application, such as use of both TDMA and CDMA, use of both GSO and NGSO satellites, and proposed feeder link assignments raise technical issues which require careful analysis by the Commission.

CCI has previously expressed its concerns regarding the need for careful analyses and planning of the use of both TDMA and CDMA on the same satellites. A similar type of concern arises by use of both GSO and NGSO satellites in the same system. Globalstar has provided no

technical details on how its proposed GSO and NGSO satellites would share the same spectrum. CCI's concern is that such a 2 GHz MSS system architecture will require an amount of spectrum equivalent to that needed for two systems. The Commission should not allow such an excessive assignment of spectrum in the initial round of 2 GHz MSS system licenses. Before Globalstar is authorized to operate both GSO and NGSO satellites in the 2 GHz MSS bands, it should be required to demonstrate that such a system architecture uses no more spectrum than a 2 GHz MSS system using only NGSO satellites.

CCI notes that Globalstar is requesting feeder link frequencies for its 2 GHz MSS satellites that differ from the specific 5/6/7 GHz frequencies used in Globalstar's currently licensed Big LEO system. However, no showing is made that its current feeder link frequency assignments are inadequate for its proposed 2 GHz MSS system, or that its proposed 2 GHz system could not share the same 5/6/7 GHz bands as its Big LEO system, if separate satellites are used for the two systems. Several systems will be required to share each of the available feeder link frequency bands, including the 5 GHz and 6/7 GHz bands, if all of the pending applications are to be granted. Globalstar should be required to demonstrate that any assignment of new feeder link bands will not preclude sharing with other systems, especially currently licensed Big LEO systems such as CCI.

D. ICO.

In its LOI, ICO requests the Commission to limit its consideration to 2 GHz MSS systems intended to be brought into operation within five years of the September 26, 1997 cut-off date. This proposal is self-serving and should be rejected. ICO's proposal would place non-U.S. systems in an advantageous position vis-a-vis most United States applicants who are proposing to place their 2 GHz MSS systems into operation within six years of Commission grant of their application.

In addition, ICO proposes to use the same feeder link frequency bands for its 2 GHz MSS system that are currently licensed to CCI for its 1.6/2.4 GHz MSS system. In light of CCI's priority to the C-Band feeder link spectrum vis-a-vis ICO, any authorization to ICO to serve the United States should be conditioned on achieving successful coordination of feeder link spectrum with the currently licensed CCI system.

E. Inmarsat Horizons.

Inmarsat's LOI does not satisfy the Commission's requirements for completeness and should therefore be dismissed. For example, Inmarsat does not include FCC Form 312 (or Form 430) nor does it provide any of the technical information required by §25.114 of the Commission's rules. Indeed, the application is not even definite as to whether the Inmarsat Horizons satellite will use the 2 GHz MSS bands. Given the lack of specificity in the application, it appears that Inmarsat is treating its LOI in a frivolous manner. Inmarsat should be well versed on the regulatory process in the United States and presumably should have read the July 22, 1997 cut-off Notice,¹³ the July 30, 1997 erratum to the July 22, 1997 Public Notice,¹⁴ the August 13, 1997 Public Notice,¹⁵ the September 4, 1997 Public Notice,¹⁶ and the September 8, 1997 Public Notice.¹⁷ There is no excuse

¹³ FCC Public Notice, Report No. SPB-88, DA 97-1550, July 22, 1997.

¹⁴ Erratum to Public Notice, Report No. SPB-88 DA 97-1550, Report No. SPB-92, July 30, 1997.

¹⁵ FCC Public Notice, Report No. SPB-95, DA 97-1773, August 13, 1997.

¹⁶ FCC Public Notice, Report No. SPB-99, September 4, 1997.

¹⁷ FCC Public Notice, Report No. SPB-101, MMEO 76393, September 8, 1997.

for its failure to comply with the requirements specified in these Public Notices and its application should therefore be dismissed.¹⁸

Even if the Commission were to allow Inmarsat to correct these blatant deficiencies, other issues remain. To the extent that Inmarsat's LOI contemplates use of the 2 GHz MSS bands, it also raises more fundamental issues with regard to its provision of GMDSS and AMS(R)S safety of life services in the 1.5/1.6 GHz bands. As noted in previous sections, CCI does not believe that 2 GHz MSS systems should be designated as safety of life systems. Nowhere in Inmarsat's submission does it address how it will continue to maintain its established role in this regard, including maintaining service to the large installed base of maritime and aeronautical terminals that currently rely on Inmarsat for safety of life communications. With Inmarsat's current ownership interest in ICO, and the current debate over Inmarsat privatization, it is not clear what Inmarsat's role should be. Given these issues and the incompleteness of its filing, the Commission should dismiss its LOI.

F. Iridium.

Iridium's proposal to be characterized as AMS(R)S and as a component of GMDSS raises the same issues as the Boeing application. If Iridium intends to characterize its system as providing safety of life functions, it should do so in the 1.5/1.6 GHz bands.

Iridium is one of the 2 GHz MSS applicants who is proposing to use both TDMA and CDMA in its system, but provides no details on how this would be accomplished. As discussed above, the technical and operating conditions under which both TDMA and CDMA access techniques are used

¹⁸

See Leosat Corporation v FCC, 8 FCC Rcd 668 (1993). In the Leosat decision, the FCC dismissed the Little LEO application of Leosat even though it was filed prior to the cut-off date because Leosat failed to submit Form 155 as required in the Little LEO cut-off notice. Here, like Leosat, Inmarsat had adequate notice of the requirement to submit Form 312 and the requisite information specified in Part 25 of the Commission's Rules.

in the same system requires careful consideration to insure that such operations do not complicate the inter-system coordination process.

G. Mobile Communications Holdings, Inc.

MCHI is a current Big LEO MSS licensee that is proposing a 2 GHz MSS system to provide future growth capacity and new services. Unlike Globalstar, MCHI is proposing to use the same feeder link bands for its 2 GHz MSS system that are licensed for its Big LEO system. However, MCHI's request for 300 MHz of Ku-band Earth-to-space feeder link bandwidth requires an expanded domestic and international allocation since only 200 MHz is currently allocated for NGSO MSS feeder links. In addition, while MCHI claims that its combined Big LEO and 2 GHz satellites will be phased in to avoid any beam couplings within its own system, the increased number of satellites will require further analysis and coordination with respect to other systems, and, in particular, with respect to CCI's 1.6/2.4 GHz system. MCHI's proposal for its Concordia satellites will have highly overlapping coverage of the equatorial belt by several satellites. However, MCHI does not address how it will manage traffic in the equatorial design with respect to establishing aggregate power flux density and areal equivalent isotropically radiated power density levels for sharing the bands with other CDMA systems. As is the case with Globalstar's proposed use of GSO and NGSO satellites, CCI believes that MCHI's proposed Concordia satellites should not be permitted to use more of the spectrum resource than a single NGSO MSS system.

H. Personal Communications Satellite Corporation.

Personal Communication Satellite Corporation ("PSCS") filed its application in 1994 and did not update it in response to the current cut-off notice. PSCS is a wholly owned subsidiary of the American Mobile Satellite Corporation, which was established to hold the sole 1.5/1.6 GHz GSO MSS (including AMS(R)S service) license for service in the United States. Although AMSC has launched one MSS satellite, it recently leased it for service over Africa and combined its service with that of TMI on a single satellite.¹⁹

In light of these significant developments since the PCSC 2 GHz MSS application was filed, it is incumbent on AMSC to clearly explain its plans with respect to this proposed 2 GHz MSS system as well as its plans for its currently licensed 1.5/1.6 GHz MSS system. Before granting AMSC, through PSCS, a 2 GHz MSS license, the Commission should carefully review AMSC's plans for the continuation and second generation upgrading of its 1.5/1.6 GHz system, especially with respect to the provision of AMS(R)S services. Given AMSC's unique role as the only domestic licensee in the 1.5/1.6 GHz bands, the Commission should ensure that effective use is being made of that spectrum resource by AMSC before assigning it additional spectrum.

In addition, the Commission should carefully review the relationship between AMSC/PSCS and TMI with respect to their 2 GHz MSS plans. AMSC and TMI have had a long and close relationship, as illustrated by the recent combination of their traffic on a single satellite. Given this relationship, the Commission should carefully examine the PSCS application and the TMI LOI to determine whether or not the two proposals amount to a joint operation. If this is the case, the two

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See AMSC Subsidiary Corporation, DA 98-493, (released March 13, 1998).

proposals should be treated as a single system with respect to the assignment of any 2 GHz MSS spectrum.

I. TMI.

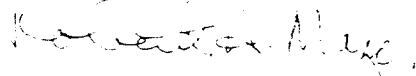
The TMI LOI does not include all of the information required by the Commission to be included in the LOI filing. TMI should have been aware of the information requirements articulated in the Public Notices regarding the 2 GHz processing round. Like Inmarsat, TMI's failure to conform to these requirements should result in its LOI being dismissed. TMI should be treated like any U.S. applicant that failed to provide the requisite information.

The TMI LOI request also raises similar issues to those raised by the PSCS application. TMI and AMSC have had a special relationship as the respective designated United States and Canadian MSS system licensees in the 1.5/1.6 GHz MSS bands. As long as they hold such a position, it is incumbent on the Commission to insure that their next generation systems make as efficient use of these currently licensed bands as will be achieved by the new 2 GHz MSS systems. Moreover, given the close relationship in the past between TMI and AMSC, it may be appropriate to consider the PSCS application and TMI LOI as a single system for spectrum assignment purposes.

IV. CONCLUSION

CCI urges the Commission to promptly develop the rules and policies as described in these comments so that new 2 GHz MSS licenses can expeditiously be issued and new MSS services can be offered to the public.

Respectfully submitted,



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Dated: May 4, 1998

CERTIFICATE OF SERVICE

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