

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

In the Matter of)
)
Review of the Spectrum Sharing Plan Among) IB Docket No. 02-364
Non-Geostationary Satellite Orbit Mobile)
Satellite Service Systems in the 1.6/2.4 GHz)
Bands)

To: The Commission

COMMENTS OF LOCKHEED MARTIN CORPORATION

Lockheed Martin Corporation (“Lockheed Martin”) hereby responds to the Commission’s February 10, 2003 *Notice of Proposed Rulemaking* seeking comment on proposals for reassigning or reallocating a portion of spectrum in the Big LEO MSS frequency bands.¹ Specifically, the Commission requested comment on the possibility of making spectrum in the Big LEO CDMA service bands available to the federal government to support military MSS use.² As explained herein, Lockheed Martin believes that enabling a portion of Big LEO CDMA spectrum to be available to the U.S. government to support such an MSS system would facilitate efficient use of existing MSS CDMA spectrum, serve the public interest and be consistent with the desire of the Department of Defense (“DoD”) to become less dependent on proprietary technology to meet the U.S. military’s increasing spectrum-based needs.

¹ *Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands*, Notice of Proposed Rulemaking, 18 FCC Rcd 1962 (2003) (“*Notice of Proposed Rulemaking*”).

² *Id.* at ¶ 271.

I. INTRODUCTION

Lockheed Martin is participating in this proceeding as a global enterprise engaged in the research, design, development, manufacture and integration of advanced-technology systems, products and services for the U.S. military. The company has extensive experience and technology leadership in providing command, control communications, computers and intelligence reconnaissance and surveillance systems (C4ISR).

Lockheed Martin is a leading, global manufacturer of space systems for national defense/homeland security applications, with over 45 years of experience launching more than 860 spacecraft that have accumulated over 1,600 years of service on orbit. These advanced technologies offer a full range of services, including ground systems, remote sensing satellites, advanced space observatories, interplanetary spacecraft and missile defense systems. Lockheed Martin is also a leading supplier of government and commercial communication satellites offering a variety of platforms – geostationary and non-geostationary – and supporting a wide range of services including fixed satellite, direct broadcast, mobile, multimedia, radio-navigation, Internet, and broadband.

II. PERMITTING GOVERNMENT USE OF BIG LEO CDMA SPECTRUM WILL FACILITATE EFFICIENT USE OF THE MSS CDMA SPECTRUM, SERVE THE PUBLIC INTEREST AND ADDRESS THE INTEREST OF THE DEPARTMENT OF DEFENSE IN USING OFF THE SHELF TECHNOLOGY TO ADDRESS SOME OF ITS SPECTRUM-BASED NEEDS

In providing spectrum across several bands for MSS --- L-band, Big LEO and 2 GHz --- the Commission anticipated multiple MSS systems in each band would be deployed to support a strong commercial demand for these services; unfortunately, these commercial demands have not (yet) been

sufficient to support multiple, independent commercial systems in each of the allocated bands. As the Commission noted in its *Notice of Proposed Rulemaking*, three of the original five Big LEO licensees have lost their licenses;³ the remaining two have been through or are about to emerge from bankruptcy;⁴ and, two of the L-band licensees have merged their operations.⁵

In light of these developments and the resulting availability of CDMA spectrum, Lockheed Martin believes the Commission can and should allow a Federal government system, if the Federal government determines it is meaningful, to have MSS operations in the Big LEO CDMA spectrum. Much of the spectrum-based technology being used or planned for use by the military during the last several years has been CDMA, and this trend is expected to continue.⁶ Further, frequency bands allocated for and used by the Federal government, principally the DoD, have been recently identified

³ *Constellation Communications Holdings, Inc.*, 17 F.C.C.R. 22584 (IB 2002), *petition for recon. pending*; *Mobile Communications Holdings, Inc.*, 16 F.C.C.R. 11766 (IB 2001), *petition for recon. denied*, Memorandum Opinion and Order, 17 F.C.C.R. 11898 (IB 2002), *app. for review denied*, FCC 03-122, released June 4, 2003; *Public Notice*, Report No. SPB-114, File Nos. 65-SAT-P/LA-98; SAT-LOA-19971222-00230 at 3 (Jan. 15, 1998) (reporting letter from counsel for TRW, Inc. to Secretary of the Commission surrendering Big LEO authorization).

⁴ *Space Station System licensee, Inc., Assignor and Iridium Constellation LLC, Assignee*, 17 F.C.C.R. 2271 (IB 2002); *ICO Saves Competitor Globalstar from Bankruptcy with Investment*, Comm. Daily, Apr. 29, 2003 (ICO to acquire control of Globalstar for \$55 million).

⁵ *Motient Services Inc. and TMI Communications and Company, LP*, 16 F.C.C.R. 20469 (IB 2001).

⁶ Within the last year or so, representatives of the Defense Department's newly created office for spectrum management have indicated DOD will look at possible applications of CDMA "as part of its work with the private sector" to address the "increasing demands . . . prompted by the war on terrorism and the push for homeland security.: See Sharon Weinberger, "War on Terrorism Raises Concerns Over Spectrum, DOD Official Says," *Aerospace Daily*, (Feb. 5, 2002); see also Testimony of Stephen Price, Deputy Assistant Secretary for Spectrum and C-3 Policy, Office of the Secretary of Defense, April 23, 2002 before The House Government Reform National Security Subcommittee ("A fourth core Department of Defense principle is that we commit to continue to investing in research and development for new spectrum efficient technology. DOD has been a major contributor to the birth of CDMA . . . and we are reaching out to collaborate with my former colleagues in the private sector to expedite such efforts.").

for use by commercial services (*e.g.*, 1700 MHz) and, as a result, the amount of spectrum available for government satellite use is being decreased; however, the US government's need for space segment capacity, especially DoD's, has increased substantially since the events of September 11, 2001.

It is important to note that allowing Federal government access to Big LEO CDMA spectrum will not foreclose opportunities for future, commercial MSS CDMA operators. In fact, Federal government use of CDMA technology in the Big LEO CDMA spectrum bands would both (i) minimize disruptions to currently operating systems (including eliminating the risk of harmful interference); and (ii) allow the government to take advantage of the significant development work that has already occurred in producing CDMA-based equipment to operate in these bands. Moreover, the Commission should provide flexibility by enabling either GSO or NGSO MSS CDMA deployment. With respect to the CDMA downlink band, a GSO system employing CDMA can share with a NGSO system employing CDMA just as well as two NGSO systems can share. With respect to the uplink band, Lockheed Martin acknowledges that NGSO MSS sharing with a GSO MSS may be more difficult, but Lockheed Martin believes that the appropriate technical regime can be developed to enable such sharing.

III. LOCKHEED MARTIN SUPPORTS THE RETENTION OF CDMA SPECTRUM IN THE BIG LEO BANDS

Lockheed Martin believes that the original spectrum-sharing plan -- the split of the uplink band between CDMA and TDMA and the entire downlink band designated for CDMA - - was a valid compromise and should not be overturned at this time. Based on the record to date, Lockheed Martin does not believe that additional Big LEO spectrum should be allocated for TDMA use.

Because new CDMA MSS systems can share across the frequency band with Globalstar based on the flexibility of CDMA technology, the current split leads to the potential for the

beneficial introduction of new entrants into the CDMA frequency bands without necessitating any significant changes to the operation of any existing systems. On the other hand, the spectrum that has been allocated for bi-directional TDMA use does not easily support entry for future new entrants -- hard band-segmentation may be the only option for sharing between such systems. Therefore, absent a compelling showing that TDMA-based systems need more spectrum, the Commission should not reconsider the existing spectrum sharing plan at this point in time.

IV. ADDITIONAL ISSUES IMPACTING THE UTILITY OF BIG LEO CDMA SPECTRUM

Lockheed Martin urges the Commission to avoid narrow channelization of the CDMA spectrum; too narrow a channelization would risk compromising the utility of that CDMA spectrum. Furthermore, CDMA-based satellite systems should have access to most, if not all, of the available uplink and downlink spectrum. With respect to the Commission's question on unlicensed operations in portions of the band, Lockheed Martin believes that such uses would likely decrease the utility of this spectrum. The proliferation of unlicensed devices will have the potential, on an aggregated basis, to cause harmful interference to the mobile receivers of future satellite systems. Therefore, the introduction of unlicensed devices could place both current and future satellite operations at risk. This is problematic for both commercial and federal MSS operations.

Finally, Lockheed Martin believes it is imperative for the Commission to carefully consider all of the ramifications of ATC operations in those portions of the Big LEO CDMA spectrum implicated by the *Notice of Proposed Rulemaking* before the Commission adopts rules implementing ATC in this

band.⁷ Lockheed Martin believes preliminarily that introducing ATC into the Big LEO CDMA MSS spectrum could unduly complicate sharing of the spectrum with other MSS licensees. Specifically, ATC requires detailed, real-time coordination of the frequencies used for the terrestrial component with the frequencies used for the satellite system. Although such coordination may be possible when both the terrestrial and satellite components are under the control of a single operator, sharing between the terrestrial (ATC) component of one operator and either the terrestrial (ATC) or satellite components of another operator would be virtually impossible for purposes of co-frequency operations. Therefore, allowing ATC into the CDMA portion of the Big-LEO band would result in having to effectively band-segment that spectrum between different operators, thereby losing the many advantages the current wideband CDMA allocation currently provides in terms of flexibility.

CONCLUSION

Lockheed Martin believes that enabling the US Government to access a portion of the Big LEO CDMA spectrum to support deployment of a federal MSS system will facilitate efficient use of existing MSS spectrum, will not disrupt current (or future) CDMA operations in the bands subject to the *Notice of Proposed Rulemaking*, and will enable the DoD to successfully continue its efforts to implement CDMA technology. Further, there are a number of technical issues the Commission needs to carefully consider when implementing operational rules for the CDMA MSS bands discussed

⁷ See *Notice of Proposed Rulemaking* at ¶ 192 wherein the Commission notes that “it would be premature to adopt rules to implement ATC in those portions of the Big LEO bands implicated” by the *Notice of Proposed Rulemaking*.

