Description of Operations and Public Interest Statement

Lockheed Martin Corporation ("Lockheed Martin") requests special temporary authority ("STA") to operate its Carpentersville, New Jersey Ku-band fixed earth station (*see* File No. SES-LIC-20081103-01443, as amended)[1] to provide telemetry, tracking and control ("TT&C") functions during the post-launch and early orbit phases ("LEOP") of operation for the ABS-2 satellite. ABS-2 is destined for operation at the 75° East longitude orbital location (75° E.L.), and is currently scheduled for launch on January 23, 2014 aboard an Ariane 5 launch vehicle from Kourou, French Guiana.[2] Accordingly, Lockheed Martin would likely need to begin test transmissions in preparation for the launch on or about January 21, 2013.[3]

1. Requested STA Operations

Lockheed Martin specifically seeks authority to transmit telecommand signals at the center frequencies 5844 MHz and 5846 MHz MHz for in transit communications, and to receive telemetry signals from the satellite on the 4183.25 MHz and 4184.25 MHz frequencies. Additional technical parameters for the STA operation are set forth in the chart on pages 5-6 of this narrative. Lockheed Martin is requesting the duration of this STA to be a total of thirty (30) days from January 21, 2014 to cover any slippage in the anticipated dates of the various phases of operation; it nonetheless expects that all Carpentersville operations in support of the launch will be completed within ten (10) days after the ABS-2 satellite is launched.

Lockheed Martin's proposed transmissions will use total input power and emissions for telecommand that will fall below the highest input power, EIRP, EIRP density, and bandwidth prescribed for the telecommand carriers in its former FCC license. When no commands are being sent, a CW carrier that is within the emission of Lockheed Martin's E7541 operation would be present. *See, e.g.*, File No. SES-AMD-20081219-01664, at Schedule B. The information in the Schedule B portion of Lockheed Martin's pending application in File No. SES-LIC-20081130-01443, as amended, is hereby incorporated by reference. All of Lockheed

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[1] The pending application in File No. SES-LIC-20081103-01443, under Call Sign E7541, was filed on a provisional basis to replace Lockheed Martin's license for a 14.2 meter Ku-band antenna at the Carpentersville, NJ site under Call Sign E920702, for which it inadvertently did not file a timely renewal application. Lockheed Martin's petition to reinstate the license for Call Sign E920702, as well as the "replacement" application it filed in the alternative under File No. SES-LIC-20081103-01443 and Call Sign E7541, both remain pending.

[2] *See, e.g.*, Space Systems Loral/Asia Broadcast Satellite Joint Press Release, "SSL Delivers ABS-2 Satellite to Launch Base in Kourou," dated Dec. 9, 2013 (available at http://www.absatellite.net/wp-content/uploads/2013/12/ABS-2-Shipped-FINAL-9-Dec-2013.pdf, last visited 1/02/2014).

[3] The test transmissions that would begin on or about January 21st would occur over a period of approximately two to three days. During these tests, the earth station would not be communicating with any satellite; instead, the transmissions will be made with the antenna at zenith to verify RF functionality.

Martin's proposed TT&C operations in support of the ABS-2 launch will be on a strictly non-harmful interference, non-protected basis.

The antenna to be used for this STA is already built. It is the same antenna that was authorized under Call Sign E7541 and that is now the subject of the pending request described in Note 1 above, and has been used during the pendency of that request on an STA-basis to support many other satellite launches. *See, e.g.*, Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of SES-8, SES-STA-20131101-00922 (granted Nov. 18, 2013)*;* Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of Eutelsat 25B, SES-STA-20130809-00708 (granted Aug. 26, 2013); Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of Amazonas-3, File No. SES-STA-20130122-00078 (granted Feb. 4, 2013). For this reason, Lockheed Martin does not provide a new analysis of non-ionizing radiation for the antenna, or any of the detailed transmission/reception parameters for the signals. Instead, Lockheed Martin incorporates by reference the radiation hazard study and Schedule B information that were included with the November 2008 modification application in File No. SES-LIC-20081103-01443, as amended.

Lockheed Martin designates Michael Usarzewicz to be the contact person that will be available whenever transmission to, or reception from, ABS-2 is to occur through the subject earth station. Mr. Usarzewicz can be reached at the following cell phone number: (609)-865-2658 and/or station number: (908) 859-4050.

2. Grant of the Requested Authority Will Serve the Public Interest

Lockheed Martin believes that the limited operations it proposes in support of the launch of the ABS-2 satellite are required in the public interest. Operations will be coordinated in advance with any and all potentially affected entities that operate communications systems in compliance with the Table of Frequency Allocations during the limited period of use.[4] ABS-2 will be located in geostationary orbit at 75˚E.L. and fitted with up to 89 active C, Ku, and Ka-band transponders for the provision of direct TV broadcast, multimedia applications, telecommunications and data transmission services for the Asia Pacific, African, Middle Eastern, European and Russian/CIS markets. Lockheed Martin's Carpentersville earth station will be part of a global network of control facilities that will be used to position the satellite as it progresses from transfer orbit to its final location. The safe and orderly use of the entire geostationary orbital resource and protection of the hundreds of satellites licensed by the U.S. and other countries that operate there depends in no small part on ensuring that the ABS-2 satellite is controlled while over North America; Lockheed Martin's earth station thus will serve a vital function.

[4] The spacecraft will be controlled throughout the launch and transfer orbit phases by Space Systems/Loral, which is the manager of the LEOP portion of the mission.

3. Request for Limited Waiver of the Commission's Rules

The requested telecommand transmit frequencies at 5844 MHz and 5846 MHz are part of the band allocated in the U.S. Frequency Table to the Federal Radiolocation service on a primary basis and to non-government users operating in the Amateur and Amateur-satellite (space-to-Earth) on a secondary basis. Accordingly, Lockheed Martin seeks a waiver of the U.S. Table of Frequency Allocations to the extent necessary to allow the limited STA satellite TT&C uplink operations described herein.[5]

Under the Commission's rules and established polices, a waiver of the Commission's Rules is appropriate when good cause is shown.[6] In general, a waiver of the Commission's rules is appropriate if circumstances warrant a deviation from the rule and such deviation will better serve the public interest than would strict adherence to the rule.[7] This is just such a case.

Good cause exists for allowing Lockheed Martin to conduct LEOP operations for the ABS-2 satellite using the 5844 MHz and 5846 MHz frequencies. As described above, ABS-2 is destined for permanent operation at the 75° E.L. for service to locations that lie entirely outside the U.S. and predominantly within ITU Region 1, where the spectrum band 5830-5850, in which the requested TT&C frequencies lie, is allocated to the Fixed-Satellite Service ("FSS") (Earth-to-space) on a primary basis. ABS-2 therefore was designed to meet the requirements for operation within this band in ITU Region 1, and there is no alternative to using these TT&C channels during the brief period that the satellite passes over ITU Region 2, including the United States. In order to safely guide and communicate with the spacecraft during this period, Lockheed Martin and other similarly situated LEOP service providers must have access to these frequencies on a temporary basis.

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[5] Lockheed Martin notes that no waiver of the Commission's application rules with respect to non-U.S. satellites (*see* 47 C.F.R. §§ 25.114 and 25.137) is required in this instance, as the requested operations will not "serve the United States" market, but are instead intended only to assist in the launch and transfer orbit phases for deployment of a new satellite, which incidentally will also serve only points that lie outside the U.S. Under such circumstances, the Commission has not required any submission pursuant to the application rules governing non-U.S. satellites, nor otherwise required any waiver showing. *See, e.g,* Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of Amazonas-3, File No. SES-STA-20130122-00078 (granted Feb. 4, 2013); *cf. EchoStar Satellite Operating Company*, 28 FCC Rcd 4229, 4233 (¶ 12) (IB 2013) ("ESOC will operate feeder links and TT&C earth stations within the United States, but we do not interpret these very limited technical operations, under STA, as constituting "DBS service" to the United States").

[6] *See* 47 C.F.R. § 1.3. *See also WAIT Radio. v. FCC*, 459 F.2d 1203 (1972).

[7] *See Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990), *citing WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

Moreover, Lockheed Martin's short-term use of the 5844 MHz and 5846 MHz frequencies will not harm incumbent operations. The FSS is co-primary with the Federal Radiolocation service in the adjacent 5850-5925 MHz band, and operations are regularly coordinated in this band between these types of users. Other users of the band are secondary and are therefore accustomed to accepting some level of occasional interference. Any additional interference that may occur to these secondary operations during the brief duration of the LEOP mission would be transient, if it occurs at all, and unlikely to cause any material disruption of these operations. Accordingly, for the reasons outlined here and in the foregoing public interest showing, the Commission should grant the requested waiver for the ten-day period required for Lockheed Martin's limited STA operations.

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As outlined above, Lockheed Martin requests authority to operate its Carpentersville, NJ Ku-band earth station antenna to provide critical TT&C services during the launch and early operations phase of the ABS-2 satellite, for a term of 30 days commencing January 21, 2014.

Operating Parameters for Proposed Carpentersville, NJ C-Band TT&C LEOP STA

Parameter	Performance
Orbit-Raising Operations and Contingency Operations (Telemetry)	
Antenna coverage	+130° to -90° from +Z and +70° to -30° from –Z
Antenna polarization	Left-Hand Circular Polarization (LHCP)
Antenna configuration	Four antennas
	Two +Z elements
	Two -Z elements
On-Station Normal Operations (Telemetry)	
Antenna coverage	C-band East/West Hemi Horn communications transmit pattern
Antenna polarization	Linear Vertical and Linear Horizontal Polarization (V-Pol and H-Pol)
Antenna configuration	C-band East/ West Hemi communications antenna
Orbit-Raising Operations and Contingency Operations (Command)	
Antenna coverage	+130° to -90° from +Z and +70° to -30° from -Z
Antenna polarization	Left-Hand Circular Polarization (LHCP)
Antenna configuration	Four antennas
	Two +Z elements
	Two –Z elements
On-Station Normal Operations (Command)	
Antenna coverage	C-band East/ West Hemi Horn communications receive coverage
Antenna polarization	Linear Vertical Polarization (V-Pol)
Antenna configuration	C-band East/ West Hemi communications antenna
Telemetry	
Frequency	4183.25 MHz
	4184.25 MHz
EIRP	
Wide-angle antenna	>0 dBW at edge of coverage (min)
	15 dBW (max)
C-Band East/West Hemi communication antenna	>0 dBW at edge of coverage (min)
	18 dBW (max)

Parameter	Performance
Telemetry (cont'd)	
Modulation	Phase modulation telemetry and/or ranging
Subcarrier Frequencies	128 kHz Normal + Dwell
Output data	
Normal/Dwell telemetry	BPSK on 128-kHz subcarrier
Data Rate	16,000 bps
Data modulation	Bi-phase L
Ranging	27.777-kHz 7 tones ESA ranging subcarrier
Modulation Index	
One Subcarrier	1.0 ±0.1 radian
Two Subcarriers	0.7 ±0.1 radian
Three Subcarriers	0.58 ±0.1 radian (three subcarriers)
Command	
Frequency	5.844 GHz, 5.846 GHz
Flux density (min)	
Transfer orbit and contingency on-station	–90 dBW/m^2
Normal on-station	≥ -95 dBW/m^2
Modulation	
Type	FM
Deviation	±400 kHz
Bit rate	1000 bps
Baseband encoding	Non-return to Zero-Level (NRZ-L) Binary Phase-Shift Keyed (BPSK)
Data modulation	Binary Phase-Shift Keyed (BPSK) on 16-kHz subcarrier, coherent
Ranging	
Baseband	Ranging tones 7-tone-27.7 kHz ESA-like (on-station) or Intelsat tone burst ranging scheme
Modulation	
Uplink	FM, ±400-kHz carrier deviation
Downlink	PM, 1.0 ±0.2 radian, 0.7 ±0.2 radian, or 0.58 ±0.2radian
Ranging accuracy	±30 m