Description of Operations and Public Interest Statement

Lockheed Martin Corporation ("Lockheed Martin") requests special temporary authority ("STA") to operate its Carpentersville, New Jersey fixed earth station (*see* File No. SES-LIC-20081103-01443, as amended; Call Sign 7541) to provide tracking, telemetry and control ("TT&C") functions during the post-launch and early orbit phases ("LEOP") of operation for the Ekspress AMU-1 (aka Eutelsat 36C) satellite ("AMU-1"). AMU-1 is destined for operation at the nominal 36° East longitude orbital location (36° E.L.), and is currently scheduled for launch on December 24, 2015 aboard a Proton Breeze-M launch vehicle from the Baikonur Cosmodrome in Kazakhstan. Accordingly, Lockheed Martin requests to begin test transmissions on December 21, 2015 in preparation for the scheduled launch.[1]

1. Requested STA Operations

Lockheed Martin specifically seeks authority to transmit signals at the center frequencies 17301.5 MHz and 17303.0 MHz for in transit telecommand communications (Earth-to-space). It will receive telemetry signals from the satellite (space-to-Earth) at the center frequencies 11700.2 MHz and 11702.5 MHz, frequencies that are covered by its existing authorization. These frequencies are appropriate for TT&C operations as they are near the band edges, as required by the FCC's Rules. *See* 47 C.F.R. § 25.202(g). A Frequency Coordination and Interference Analysis Report prepared by Comsearch is a separate attachment to this STA request.

Lockheed Martin's proposed transmissions will use total input power and emissions for Ku-band telecommand that will fall below the highest input power, EIRP, EIRP density, and bandwidth prescribed for the telecommand carriers in its FCC license. Additional technical parameters for the STA operation are set forth in the table that comprises the final two pages of this attachment. When no commands are being sent, a CW carrier that is within the emission of Lockheed Martin's currently authorized operation would be present. *See, e.g.,* File No. SES-AMD-20081219-01664, at Schedule B. All of Lockheed Martin's proposed TT&C transmit operations in support of the AMU-1 launch will be on a strictly non-harmful interference, non-protected basis. *See* 47 C.F.R. § 25.282. Lockheed Martin notes that it is possible that during an unexpected emergency with the satellite, the authorized power levels for the earth station may need to be exceeded to help recover the satellite. Under these extremely unlikely circumstances, Lockheed Martin will make every effort to coordinate such operations with affected users, and will take all reasonable steps to swiftly eliminate any harmful interference caused, consistent with the non-harmful interference, non-protected status of the temporary operations proposed.

[1] The test transmissions that would begin on or about December 21st would occur over a period of approximately 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.

Lockheed Martin is requesting that the duration of this STA be a total of thirty (30) days commencing December 21, 2015 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 approximately fifteen (15) days after the AMU-1 satellite is launched. Lockheed Martin designates Michael Usarzewicz as the contact person that will be available whenever transmission to, or reception from, AMU-1 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 AMU-1 satellite are required in the public interest. AMU-1 will be a state-of-the-art high-capacity satellite with up to 70 Ku- and Ka-band transponders. It will provide coverage for broadcast satellite services in the European part of the Russian Federation, and will also ensure service continuity and growth for broadcast markets developed by Eutelsat in sub-Saharan Africa.

Lockheed Martin's Carpentersville earth station will be part of a global network of control facilities that will be used solely to position the satellite as it progresses from transfer orbit to its final geosynchronous orbital location. No end user service will be provided within the United States at any time. The safe and orderly use of the geostationary orbital resource and protection of the satellites licensed by the U.S. and other countries that operate there depends in on ensuring that the AMU-1 satellite is controlled while over North America *en route* to its final position; Lockheed Martin's earth station thus will serve a vital function.

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As outlined above, Lockheed Martin requests authority to operate its Carpentersville, NJ earth station antenna to provide critical TT&C services during the launch and early operations phase of the AMU-1 satellite, for a term of 30 days commencing December 21, 2015.

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

SITE NAME (or identifier):	**Carpentersville, NJ – Call Sign E7541**

Antenna location

Longitude (deg, min, sec- *NAD 83*)	75 ° 11 ' 27.8 " W
Latitude (deg, min, sec- *NAD 83*)	40 ° 38 ' 39.1 " N
Antenna Height (in meters):	19.2
Ground Elevation (AMSL)	85.7 m

Antenna Characteristics (size & gain)

Size	14.2m
TX Gain	65.0 dBi @ 17.0 GHz
RX Gain	63.12 dBi @ 11.7 GHz
Antenna Model	14.2 KFPA
Antenna Manufacturer	TIW (GD SATCOM)
Maximum HPA Power	2 kW
Satellites Arc to Coordinate:	4° W.L. to 139° W.L.
Satellites Desired:	AMU-1 LEOP

RF Characteristics

Downlink	**FTX1 = 11700.2 MHZ LHCP & RHCP**
	FTX2 = 11702.5 MHZ RHCP & LHCP
Uplink	**CMR1 = 17301.5 MHZ RHCP & LHCP**
	CMR2 = 17303.0 MHz LHCP & RHCP

Telemetry (Downlink) Sub-Carriers

Modulation	PM
Frequency	65536 Hz
Data Type	BP-L PCM/BPSK
Data Rate	8192 bps Viterbi-Inverted

Telecommand (Uplink) Carrier Parameters

Type of Service (Broadcast Data TTC)	TTC
Occupied Bandwidth	800 kHz
Emission Designators	800KFXD
Deviation	6400 kHz
Frequency	8 kHz
Data Type	BPSK/NRZ-L
Data Rate(S):	1000 bps
Modulation:	FM
Polarization:	LHCP and RHCP

Forward Error Coding Rate: None

Ranging

Method	ESA-like 7 tone (MCC configured) with 27.77 kHz major tone for either.
Modes Supported	Range with either, both or none of the telemetry sub-carriers active.