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**APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY**

**APPLICANT INFORMATION**

Enter a description of this application to identify it on the main menu:  
Carpentersville TT&C 180-Day LEOP STA for ABS-3A - January 2015

|   |   |
|---|---|
| <b>1. Applicant</b>   |   |
| Name: Lockheed Martin Corporation   | Phone Number: 703-413-5970                          |
| DBA Name:   | Fax Number: 703-413-5908                            |
| Street: 2121 Crystal Drive<br>Suite 100   | E-Mail: Jennifer.Warren@lmco.com                    |
| City: Arlington   | State: VA   |
| Country: USA  | Zipcode: 22202 -                                    |
| Attention: Ms Jennifer Warren   |   |
| <b>2. Contact</b>   |   |
| Name: David S. Keir   | Phone Number: (202) 429-8970                        |
| Company: Lerman Senter PLLC   | Fax Number: (202) 293-7783                          |
| Street: 2000 K Street, NW<br>Suite 600  | E-Mail: dkeir@lermansenter.com                      |
| City: Washington  | State: DC   |
| Country: USA  | Zipcode: 20006 -1809                                |
| Attention:  | Relationship: Legal Counsel                         |
| (If your application is related to an application filed with the Commission, enter either the file number or the IB Submission ID of the related application. Please enter only one.) |   |
| <b>3. Reference File Number or Submission ID</b>  |   |
| <b>4a. Is a fee submitted with this application?</b>  |   |
| <input checked="" type="radio"/> If Yes, complete and attach FCC Form 159.  |   |
| If No, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114).  |   |
| <input type="radio"/> Governmental Entity <input type="radio"/> Noncommercial educational licensee  |   |
| <input type="radio"/> Other (please explain):   |   |
| <b>4b. Fee Classification CGX - Fixed Satellite Transmit/Receive Earth Station</b>  |   |
| <b>5. Type Request</b>  |   |
| <input type="radio"/> Use Prior to Grant <input type="radio"/> Change Station Location <input checked="" type="radio"/> Other   |   |
| <b>6. Requested Use Prior Date</b><br>02/09/2015  |   |
| <b>7. City</b> Carpentersville  | <b>8. Latitude</b><br>(dd mm ss.s h) 40 38 39.1 N   |
| <b>9. State</b> NJ  | <b>10. Longitude</b><br>(dd mm ss.s h) 75 11 27.8 W |

|  |                         |   |
|--|-------------------------|---|
| 11. Please supply any need attachments.  |                         |   |
| Attachment 1: Coordination Report  | Attachment 2: Narrative | Attachment 3:   |
| 12. Description. Lockheed Martin Corporation requests Special Temporary Authority for a 180-day period, commencing February 9, 2015, to use the C-band antenna at its Carpentersville, NJ earth station (Call Sign E7541) to support post-launch/early-orbit operations TT&C for the ABS-3A satellite, which is expected to be launched on or about February 16, 2015. See Attachment.   |                         |   |
| 13. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. <i>See 47 CFR 1.2002(b) for the meaning of "party to the application" for these purposes.</i> |                         |   |
| 14. Name of Person Signing<br>Jennifer Warren  |                         | 15. Title of Person Signing<br>Vice President, Technology Policy & Regulation |
| <input checked="" type="radio"/> Yes <input type="radio"/> No  |                         |   |
| <b>WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).</b>   |                         |   |

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THE FOREGOING NOTICE IS REQUIRED BY THE PAPERWORK REDUCTION ACT OF 1995, PUBLIC LAW 104-13, OCTOBER 1, 1995, 44 U.S.C. SECTION 3507.

## Description of Operations and Public Interest Statement

Lockheed Martin Corporation (“Lockheed Martin”) hereby requests special temporary authority (“STA”) to operate its Carpentersville, New Jersey C/Ku-band fixed earth station (FCC Call Sign E7541) to provide telemetry, tracking and control (“TT&C”) functions during the post-launch and early orbit phases (“LEOP”) of operation for the ABS-3A satellite. ABS-3A is a Boeing Model 702SP satellite using all-electric propulsion and licensed by Papua New Guinea for operation at the 3° West longitude orbital location (3° W.L.). It is currently scheduled for launch on February 16, 2015 aboard a SpaceX Falcon 9 launch vehicle from Cape Canaveral, Florida.<sup>1</sup> Accordingly, Lockheed Martin would likely need to begin test transmissions in preparation for the launch on or about February 9, 2015.<sup>2</sup> Due to the need to place this request on FCC Public Notice and solicit public comment prior to grant under the FCC’s Rules and the Communications Act of 1934, as amended,<sup>3</sup> Lockheed Martin respectfully requests that this request be placed on Public Notice at the earliest possible date. However, as insufficient time remains prior to launch to allow complete processing of this 180-day STA Request by February 9, 2015, Lockheed Martin is also filing concurrently a request for an interim 30-day STA for these same operations to allow testing and LEOP operations to commence on a timely basis in advance of grant of the longer term authority requested here.

### **1. Requested STA Operations**

Lockheed Martin specifically seeks authority to transmit telecommand signals at the center frequencies 6020 MHz and 6025 MHz for in transit communications, and to receive telemetry signals from the satellite on the 4194.5 MHz and 4197 MHz frequencies. Additional technical parameters for the STA operation are set forth in the table that is the final page of this attachment and in the Comsearch Frequency Coordination and Interference Analysis Report (“Comsearch Report”) that is also attached to this request. Lockheed Martin is requesting STA for a total of one-hundred and eighty (180) days commencing February 9, 2015. This duration is longer than has been typical for satellite LEOP operations because the satellite employs an all-electric propulsion system. An all-electric satellite allows a much lighter payload, as heavy

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<sup>1</sup> See Stephen Clark, “Cargo flight first of many SpaceX launches planned for 2015,” Spaceflight Now, posted on January 6, 2015 (“In mid-February, a Falcon 9 rocket will launch from Florida with two Boeing-built communications satellites [Eutelsat 115 West B and ABS-3A] — the first spacecraft to use all-electric propulsion to reach their operational posts 22,300 miles above Earth’s equator”), available at <http://spaceflightnow.com/2015/01/06/cargo-flight-first-of-many-spacex-launches-planned-for-2015/>.

<sup>2</sup> The test transmissions that would begin on or about February 9<sup>th</sup> would occur over a period of approximately three to five 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.

<sup>3</sup> As detailed below, the nature of these operations requires at least 180 days of operational authority. See 47 U.S.C. §309(c)(2)(G) (non-broadcast special temporary authorizations limited to thirty days where no application for regular operation is contemplated unless public notice is provided under Section 309(b) of the Act); 47 C.F.R. § 25.120(b)(2).

chemical fuel tanks are not required. The trade-off, however, is that it takes a matter of months, rather than a couple of weeks, for an all-electric satellite to reach its final, on-orbit operating position.<sup>4</sup> Given this lengthy period for LEOP maneuvers, Lockheed Martin anticipates that it will require an additional STA to extend operations beyond the initial 180-day period.<sup>5</sup>

Lockheed Martin's proposed transmissions will use total input power and emissions for telecommand as stated in the Comsearch Report. When no commands are being sent, a CW carrier that is within the emission of Lockheed Martin's E7541 operation would be present, as provided for in its license. With the exception of the duration of the STA, the authority requested in this application is very similar to that previously granted to Lockheed Martin to perform LEOP services on several previous occasions within the past two years.<sup>6</sup> A radiation hazard study with respect non-ionizing radiation for the antenna at higher power operation was part of Lockheed Martin's original application for this facility under FCC File No. SES-LIC-20081103-01443, and that report is hereby incorporated by reference.

All of Lockheed Martin's proposed TT&C operations in support of the ABS-3A launch will be on a strictly non-harmful interference, non-protected basis as the requested transmit frequencies are not included in Lockheed Martin's current C-band authority for the Carpentersville site. Lockheed Martin designates Michael Usarzewicz to be the contact person that will be available whenever transmission to, or reception from, ABS-3A 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.

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<sup>4</sup> See Peter B. de Selding, "Electric-propulsion Satellites Are All the Rage, Space News, June 30, 2013, available at <http://spacenews.com/35894electric-propulsion-satellites-are-all-the-range/#sthash.xxbDwHS1.dpuf> (last visited December 16, 2014); see also Ex Parte Letter from Sam Black, Acting President, Satellite Industry Association, to Ms. Marlene Dortch, Secretary, FCC, GN Dkt No. 13-114, RM-11640, at 2 (dated Oct. 29, 2014) ("satellites with all-electric propulsion that promise to improve satellite economics – will result in LEOP operations being conducted over a period of many months (early plans indicate that the LEOP for all-electric propulsion satellites may take between 200 and 320 days)").

<sup>5</sup> "The Commission may grant a temporary authorization for a period not to exceed 180 days, *with additional periods not exceeding 180 days*, if the Commission has placed the [original] special temporary authority (STA) request on public notice." 47 C.F.R. § 25.120(b)(2) (emphasis added).

<sup>6</sup> See, e.g., Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of AM4R, SES-STA-20140425-00315 (granted May 6, 2014); Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of ABS-2, SES-STA-20140103-00005 (granted Jan. 28, 2014); Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of Satmex 8, File No. SES-STA-20130319-00280 (granted March 22, 2013).

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

Lockheed Martin believes that the operations it proposes in support of the launch of the ABS-3A satellite are required in furtherance of the public interest. Operations have been coordinated with all potentially affected entities that operate communications systems in compliance with the Table of Frequency Allocations, and a copy of the coordination report is attached to this application. ABS-3A will be located in geostationary orbit at 3° W.L. providing C- and Ku-band capacity to connect the Americas, Europe, Africa and the Middle East. Three C-band beams will cover the Americas, the Middle East and Africa along with a global beam, and four Ku-band beams will cover Europe, the Middle East, Africa, and the Americas. The satellite will support VSAT services, TV distribution, IP trunking, cellular backhaul and maritime services.

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 over a period of months to its final location.<sup>7</sup> 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-3A satellite is controlled while over North America; Lockheed Martin's earth station thus will serve a vital function.

\* \* \* \* \*

As outlined above, Lockheed Martin requests authority to operate its Carpentersville, NJ C-band earth station antenna to provide critical TT&C services during the launch and early operations phase of the ABS-3A satellite, for a term of 180 days commencing February 9, 2015.

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<sup>7</sup> The spacecraft will be controlled throughout the launch and transfer orbit phases by The Boeing Company, which is the manager of the LEOP portion of the mission.

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

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

*Antenna Characteristics (size & gain)*

|                      |      |
|----------------------|------|
| Size                 | 14.2 |
| Antenna Manufacturer | TIW  |

Satellites Desired: ABS-3A LEOP

Uplink Carrier Parameters

|                                      |               |
|--------------------------------------|---------------|
| Type of Service (Broadcast Data TTC) | TTC           |
| Polarization:                        | LHCP and RHCP |
| Occupied Bandwidth                   | 850 kHz       |
| Emission Designators                 | 850KFXD       |

Prepared By

## COMSEARCH

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

Prepared For

### Lockheed Martin Corporation Carpentersville, New Jersey

Temporary Transmit-Only Earth Station  
Operation Dates: 02/02/2015 - 08/02/2015

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations. Verbal and written coordination was conducted with the below listed carriers on December 12, 2014.

#### Company

256Q Networks  
AB Services LLC  
ALGONQUIN GAS TRANSMISSION, LLC  
AT&T Corporation  
AWC Networks  
Adams County Department of Emergency Svc  
Affiniti PA, LLC  
Allentown SMSA Limited Partnership  
Appalachia Engineering Services  
Appalachian Broadcasting  
Atlantic City Electric Company  
Auburn Data Systems, LLC  
BFI Licenses, LLC  
Beaver Springs Faith Baptist Church, Inc  
Bedford, County of  
Berks County Department of Emergency Ser  
Blue Ridge Carriers  
Blueline Communications  
Bucks County Dept. of Emergency Communic  
CNG Transmission Corporation  
CONSOLIDATED EDISON COMPANY OF NEW YORK  
CTAB Holdings LLC  
Capital Communications of America  
Carbon, County of 911 Center  
Cellco Partnership - Bridgeville, PA/WV  
Cellco Partnership- PA Region  
Cellco Prtnrshp - Phil. Tri-State Rgn  
Chester, County of  
Chester, County of



Company (Continued)

China Cat Productions LLC  
City of New York  
Commonwealth of Pennsylvania-Radio Proj.  
Comprehensive Wireless LLC  
Conterra Ultra Broadband, LLC  
Converge Towers LLC  
Coral Reef Technologies Ltd  
Coralinks  
County of Burlington, Public Safety Cntr  
County of Camden  
County of Fayette  
County of Warren, NJ  
County of York  
DAUPHIN COUNTY EMERGENCY MANAGEMENT  
Delaware County (PA) Emergency Services  
Delaware Division of Communications  
Delmarva Power and Light Company  
Direct Broadcast Services, Inc.  
ECW Wireless, LLC  
EG Broadcast Newco Corp  
EMS OF NORTHEAST PENNSYLVANIA  
Eastern MLG LLC  
Eastern Pennsylvania EMS Council  
Electric Railroad, LLC  
Essex County Sheriff's Office (NJ)  
Exelon Generation Company, LLC  
FELHC  
Federal Communications Commission  
Fundamental Broadcasting LLC  
Garden State Transmissions  
Geodesic Networks LLC  
Gloucester, County of  
Greene, County of (PA)  
Hardy Cellular Telephone Company  
High Voltage Communications LLC  
Highway Networks, LLC  
Huntingdon, County of  
Jefferson Microwave, LLC  
Juniata County Emergency Services  
Kryptick Technologies  
Lackawanna, County of  
Lancaster County-Wide Communications  
Luzerne County Department of Public Sfty  
MONMOUTH, COUNTY OF  
MVC Research. LLC  
Mahwah Communications  
Maryland Public Broadcasting Commission  
Mifflin Mobilecom  
Monroe County Control Center (PA)  
Montgomery County Of  
Morris, County of

## Company (Continued)

Nassau County Police Department  
National Tower Company LLC  
NeXXCom Wireless LLC  
New Cingular Wireless PCS LLC -NJ  
New Cingular Wireless PCS - Maryland  
New Cingular Wireless PCS LLC- WV/NC/SC  
New Cingular Wireless PCS LLC-DE/NH/RI  
New Cingular Wireless PCS of PA LLC  
New Cingular Wireless PCS, LLC - PA  
New Jersey State Police  
New Jersey Transit Rail Operations, Inc.  
New Jersey Turnpike Authority-Pkwy Div  
New Jersey, State of -NJ Transit  
New York, City of  
Norfolk Southern Railway  
Northeast Pennsylvania SMSA LTD Prtnrsh  
Northumberland, County of  
OCEAN, COUNTY OF  
Ocean, County of - Div of Wireless Tech.  
Office of Emergency Telecom Services, NJ  
Old Dominion LLC  
Orange Poughkeepsie SMSA LTD Partnership  
Orange and Rockland Utilities, Inc.  
PEG Bandwidth, LLC  
PSEG Services Corporation  
Peco Energy Company  
Penn Service Microwave Co., Inc.  
Pennsylvania Turnpike Commission  
Pike, County of PA  
Pitt Power  
Pittsburgh SMSA Limited Partnership  
Port Authority of New York & New Jersey  
Qoncept Holdings LLC  
Rendezvous Communications LLC  
SCS Networks  
SCTF NET  
SOMERSET COUNTY  
SW Networks  
State of Maryland, MIEMSS  
Stevens Institute of Technology  
Texas Eastern Communications, LLC  
Thought Transmissions, LLC  
Transwave Communication Systems, Inc.  
Turtle Networks 6559  
Turtle Networks 6562  
USCOC of Cumberland, Inc.  
Velox Networks LLC  
Verizon Wireless (VAW) LLC - Delaware/NJ  
Verizon Wireless (VAW) LLC - Maryland  
Verizon Wireless (VAW) LLC-Pennsylvania  
Virginia Electric & Power Company

Company (Continued)

WITF Inc.  
WYOMING, COUNTY OF  
Weblin Holdings LLC  
White Rabbit Networks  
Wireless Internetwork LLC  
World Class Wireless, LLC  
YAB Mobile  
Zen Networks, Inc  
iSignal

There are no unresolved interference objections with the stations contained in these applications.

The following section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

Date: 12/21/2014  
Job Number: 141212COMSJC09

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### Administrative Information

Status: TEMPORARY (Operation from 02/02/2015 to 08/02/2015)  
Call Sign: TEMP08  
Licensee Code: RCASTR  
Licensee Name: Lockheed Martin Corporation

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### Site Information

**CARPENTERSVILLE, NEW JERSEY**

Venue Name  
Latitude (NAD 83): 40° 38' 39.4" N  
Longitude (NAD 83): 75° 11' 27.6" W  
Climate Zone: A  
Rain Zone: 2  
Ground Elevation (AMSL): 54.86 m / 180.0 ft

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### Link Information

Satellite Type: Geostationary  
Mode: TO - Transmit-Only  
Modulation: Digital  
Satellite Arc: 4° W to 147° West Longitude  
Azimuth Range: 102.5° to 257.9°  
Corresponding Elevation Angles: 5.5° / 5.0°  
Antenna Centerline (AGL): 9.14 m / 30.0 ft

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### Antenna Information

#### Transmit

Manufacturer: TIW  
Model: 14.2 Meter  
Gain / Diameter: 57.5 dBi / 14.2 m  
3-dB / 15-dB Beamwidth: 0.20° / 0.50°

Max Available RF Power (dBW/4 kHz): 7.2  
(dBW/MHz): 31.2

Maximum EIRP (dBW/4 kHz): 64.7  
(dBW/MHz): 88.7  
(dBW): 88.0

Interference Objectives: Long Term: -154.0 dBW/4 kHz 20%  
Short Term: -131.0 dBW/4 kHz 0.0025%

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### Frequency Information

#### Transmit 6.1 GHz

Emission / Frequency Range (MHz): 850KFXD / 6020.0  
850KFXD / 6025.0

Max Great Circle Coordination Distance: 566.1 km / 351.7 mi  
Precipitation Scatter Contour Radius: 434.7 km / 270.1 mi

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

### Coordination Values

### CARPENTERSVILLE, NJ

Licensee Name Lockheed Martin Corporation  
Latitude (NAD 83) 40° 38' 39.4" N  
Longitude (NAD 83) 75° 11' 27.6" W  
Ground Elevation (AMSL) 54.86 m / 180.0 ft  
Antenna Centerline (AGL) 9.14 m / 30.0 ft  
Antenna Model TIW 14.2 Meter  
Antenna Mode Transmit 6.1 GHz  
Interference Objectives: Long Term -154.0 dBW/4 kHz 20%  
Short Term -131.0 dBW/4 kHz 0.0025%  
Max Available RF Power 7.2 (dBW/4 kHz)

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 6.1 GHz   |                            |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|
|             |                       |                            | Horizon Gain (dBi) | Coordination Distance (km) |
| 0           | 3.52                  | 102.08                     | -10.00             | 100.00                     |
| 5           | 4.01                  | 97.51                      | -10.00             | 100.00                     |
| 10          | 4.15                  | 92.51                      | -10.00             | 100.00                     |
| 15          | 2.87                  | 87.51                      | -10.00             | 108.36                     |
| 20          | 2.87                  | 82.52                      | -10.00             | 108.42                     |
| 25          | 3.07                  | 77.52                      | -10.00             | 104.78                     |
| 30          | 3.50                  | 72.52                      | -10.00             | 100.00                     |
| 35          | 3.79                  | 67.52                      | -10.00             | 100.00                     |
| 40          | 3.82                  | 62.52                      | -10.00             | 100.00                     |
| 45          | 3.86                  | 57.53                      | -10.00             | 100.00                     |
| 50          | 3.66                  | 52.53                      | -10.00             | 100.00                     |
| 55          | 3.45                  | 47.54                      | -9.93              | 100.00                     |
| 60          | 3.33                  | 42.56                      | -8.72              | 104.82                     |
| 65          | 3.16                  | 37.57                      | -7.37              | 112.99                     |
| 70          | 2.88                  | 32.61                      | -5.83              | 124.18                     |
| 75          | 3.16                  | 27.60                      | -4.02              | 125.69                     |
| 80          | 3.14                  | 22.63                      | -1.87              | 133.98                     |
| 85          | 3.07                  | 17.67                      | 0.82               | 145.02                     |
| 90          | 3.08                  | 12.74                      | 4.37               | 162.01                     |
| 95          | 2.95                  | 7.93                       | 9.52               | 192.78                     |
| 100         | 2.73                  | 3.74                       | 17.67              | 240.61                     |
| 105         | 2.74                  | 3.71                       | 17.75              | 368.41                     |
| 110         | 2.60                  | 7.45                       | 10.20              | 203.67                     |
| 115         | 2.77                  | 10.94                      | 6.02               | 179.26                     |
| 120         | 2.69                  | 14.50                      | 2.96               | 163.75                     |
| 125         | 2.32                  | 18.20                      | 0.50               | 160.32                     |
| 130         | 1.61                  | 22.03                      | -1.57              | 171.33                     |
| 135         | 2.18                  | 24.78                      | -2.85              | 148.08                     |
| 140         | 2.74                  | 27.34                      | -3.92              | 133.78                     |
| 145         | 2.33                  | 30.44                      | -5.09              | 135.93                     |
| 150         | 2.25                  | 33.04                      | -5.98              | 134.18                     |
| 155         | 1.92                  | 35.57                      | -6.78              | 137.91                     |
| 160         | 2.20                  | 37.24                      | -7.28              | 131.46                     |
| 165         | 2.65                  | 38.35                      | -7.59              | 121.70                     |
| 170         | 2.47                  | 39.64                      | -7.95              | 123.79                     |
| 175         | 1.94                  | 40.84                      | -8.28              | 133.10                     |
| 180         | 1.90                  | 41.11                      | -8.35              | 133.62                     |

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

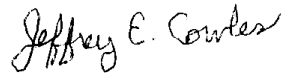
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|                                    |                             |
|------------------------------------|-----------------------------|
| <b>Coordination Values</b>         | <b>CARPENTERSVILLE, NJ</b>  |
| Licensee Name                      | Lockheed Martin Corporation |
| Latitude (NAD 83)                  | 40° 38' 39.4" N             |
| Longitude (NAD 83)                 | 75° 11' 27.6" W             |
| Ground Elevation (AMSL)            | 54.86 m / 180.0 ft          |
| Antenna Centerline (AGL)           | 9.14 m / 30.0 ft            |
| Antenna Model                      | TIW 14.2 Meter              |
| Antenna Mode                       | Transmit 6.1 GHz            |
| Interference Objectives: Long Term | -154.0 dBW/4 kHz 20%        |
| Short Term                         | -131.0 dBW/4 kHz 0.0025%    |
| Max Available RF Power             | 7.2 (dBW/4 kHz)             |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 6.1 GHz   |                            |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|
|             |                       |                            | Horizon Gain (dBi) | Coordination Distance (km) |
| 185         | 1.86                  | 40.92                      | -8.30              | 133.67                     |
| 190         | 1.24                  | 40.83                      | -8.27              | 150.23                     |
| 195         | 1.32                  | 39.60                      | -7.94              | 149.37                     |
| 200         | 2.35                  | 37.10                      | -7.24              | 128.68                     |
| 205         | 1.72                  | 35.75                      | -6.83              | 142.81                     |
| 210         | 1.78                  | 33.44                      | -6.11              | 144.38                     |
| 215         | 2.16                  | 30.58                      | -5.14              | 139.18                     |
| 220         | 3.42                  | 26.81                      | -3.71              | 122.18                     |
| 225         | 3.60                  | 23.70                      | -2.37              | 123.93                     |
| 230         | 4.84                  | 19.63                      | -0.32              | 113.44                     |
| 235         | 4.35                  | 16.73                      | 1.41               | 126.85                     |
| 240         | 4.47                  | 13.24                      | 3.95               | 134.19                     |
| 245         | 3.78                  | 10.22                      | 6.76               | 158.23                     |
| 250         | 2.48                  | 7.55                       | 10.05              | 205.66                     |
| 255         | 2.26                  | 4.02                       | 16.89              | 393.03                     |
| 260         | 2.60                  | 3.21                       | 19.35              | 566.09                     |
| 265         | 3.20                  | 7.32                       | 10.39              | 191.75                     |
| 270         | 3.30                  | 12.21                      | 4.84               | 159.38                     |
| 275         | 2.81                  | 17.22                      | 1.10               | 151.78                     |
| 280         | 2.82                  | 22.19                      | -1.65              | 139.71                     |
| 285         | 3.08                  | 27.15                      | -3.84              | 127.86                     |
| 290         | 3.59                  | 32.11                      | -5.67              | 112.00                     |
| 295         | 4.24                  | 37.09                      | -7.23              | 100.00                     |
| 300         | 5.02                  | 42.08                      | -8.60              | 100.00                     |
| 305         | 5.51                  | 47.09                      | -9.82              | 100.00                     |
| 310         | 5.46                  | 52.09                      | -10.00             | 100.00                     |
| 315         | 5.56                  | 57.09                      | -10.00             | 100.00                     |
| 320         | 4.72                  | 62.08                      | -10.00             | 100.00                     |
| 325         | 3.93                  | 67.09                      | -10.00             | 100.00                     |
| 330         | 3.38                  | 72.09                      | -10.00             | 100.00                     |
| 335         | 3.19                  | 77.09                      | -10.00             | 102.55                     |
| 340         | 3.12                  | 82.09                      | -10.00             | 103.84                     |
| 345         | 3.01                  | 87.09                      | -10.00             | 105.90                     |
| 350         | 3.24                  | 92.08                      | -10.00             | 101.54                     |
| 355         | 3.48                  | 97.08                      | -10.00             | 100.00                     |

## Certification

I hereby certify that I am the technically qualified person responsible for the preparation of the frequency coordination data contained in this report. I am familiar with Parts 101 and 25 of the FCC Rules and Regulations and I have either prepared or reviewed the frequency coordination data submitted with this report, and that it is complete and correct to the best of my knowledge and belief.



Jeffrey E. Cowles  
Engineer III, Telecommunications  
COMSEARCH  
19700 Janelia Farm Blvd.  
Ashburn, Virginia 20147

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