UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION

RADIO STATION AUTHORIZATION

Name: Thales Avionics, Inc.
Authorization Type: License
Non Common Carrier

Call Sign: E170068
File Number: SES-LIC-20170217-00183

Grant date: 07/07/2017 **Expiration Date:** 07/07/2032

Nature of Service: Earth Station Aboard Aircraft
Nature of Service: Fixed Satellite Service

Class of Station: Other

A) Site Location(s)

#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	NAD	Special Provisions (Refer to Section H)
1)	AES1	7415 Emerald Dunes Drive Suite 2000 Orlando, Orange, FL 32822			0	NA	

Subject to the provisions of the Communications Act of 1934, The Communications Satellite Act of 1962, subsequent acts and treaties, and all present and future regulations made by this Commission, and further subject to the conditions and requirements set forth in this license, the grantee is authorized to construct, use and operate the radio facilities described below for radio communications for the term beginning July 7, 2017 (3 AM Eastern Standard Time) and ending July 7, 2032 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is July 7, 2018 (3 AM Eastern Standard Time) . Grantee must file with the Commission a certification upon completion of construction and commencement of operation.

B) Particulars of Operations

The General Provision 1010 applies to all receiving frequency bands.
The General Provision 1900 applies to all transmitting frequency bands.
For the text of these provisions, refer to Section H.

#	Frequency (MHz)	Polarization Code	Emission	Tx/Rx Mode	Max EIRP /Carrier (dBW)	Max EIRP Density /Carrier (dBW/4kHz)	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1)	29500.0000-30000.0000	L,R	2M05G7D	Tx	45.50	18.40	AES1		Digital Data Services
2)	29500.0000-30000.0000	L,R	4M10G7D	Tx	45.50	15.40	AES1		Digital Data Services
3)	29300.0000-30000.0000	L,R	2M00G7D	Tx	45.50	18.40	AES1		Digital Data Services
4)	29300.0000-30000.0000	L,R	4M10G7D	Tx	45.50	15.40	AES1		Digital Data Services
5)	29300.0000-30000.0000	L,R	6M10G7D	Tx	45.50	13.60	AES1		Digital Data Services
6)	28438.0000-28563.0000	L,R	2M05G7D	Tx	45.40	18.30	AES1		Digital Data Services
7)	28438.0000-28563.0000	L,R	4M10G7D	Tx	45.40	15.30	AES1		Digital Data Services
8)	19700.0000-20200.0000	L,R	37M0G7D	Rx			AES1		Digital Data Services
9)	19700.0000-20200.0000	L,R	47M0G7D	Rx		0.00	AES1		Digital Data Services

FCC Form 488

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10)	18638.0000-18763.0000	L,R	37M0G7D	Rx			AES1		Digital Data Services
11)	18300.0000-19300.0000	L,R	47M0G7D	Rx			AES1		Digital Data Services

C) Frequency Coordination Limits

#	Frequency Limits (MHz)	Satellite Arc (Deg. Long.) East Limit	Satellite Arc (Deg. Long.) West Limit	Elevation (Degrees) East Limit	Elevation (Degrees) West Limit	Azimuth (Degrees) East Limit	Azimuth (Degrees) West Limit	Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
1)	18600.0000-18800.0000	105.0W	105.0W	35.0	30.0	150.0	255.0		AES1
2)	28438.0000-28563.0000	85.0W	85.0W	15.0	28.0	130.0	220.0	-18	AES1
3)	28438.0000-28563.0000	105.0W	105.0W	35.0	30.0	150.0	255.0	-25.4	AES1
4)	29500.0000-30000.0000	105.0W	105.0W	35.0	30.0	150.0	255.0	-25.4	AES1
5)	29500.0000-30000.0000	85.0W	85.0W	15.0	28.0	130.0	220.0	-18	AES1
6)	18600.0000-18800.0000	85.0W	85.0W	15.0	28.0	130.0	220.0		AES1
7)	19700.0000-20200.0000	85.0W	85.0W	15.0	28.0	130.0	220.0		AES1
8)	19700.0000-20200.0000	105.0W	105.0W	35.0	30.0	150.0	255.0		AES1
9)	29300.0000-30000.0000	97.1W	97.1W	25.0	40.0	130.0	250.0	-23.4	AES1
10)	29300.0000-30000.0000	107.0W	107.0W	25.0	40.0	130.0	250.0	-23.4	AES1
11)	18300.0000-19300.0000	97.1W	97.1W	25.0	40.0	130.0	250.0		AES1
12)	18300.0000-19300.0000	107.0W	107.0W	25.0	40.0	130.0	250.0		AES1
13)	19700.0000-20200.0000	97.1W	97.1W	25.0	40.0	130.0	250.0		AES1
14)	19700.0000-20200.0000	107.0W	107.0W	25.0	40.0	130.0	250.0		AES1

D) Points of Communications

The following stations located in the Satellite orbits consistent with Sections B and C of this Entry:

1) AES1 to Echostar XVII (S2753) @ 107.1 degrees W.L. (U.S.-licensed)
2) AES1 to JUPITER 2 (S2834) @ 97.1 degrees W.L. (U.S.-licensed))
3) AES1 to AMC-15 (S2180) @ 105 degrees W.L.(U.S.-licensed)
4) AES1 to AMC 16 (S2181) @ 85 degrees W.L. (U.S.-licensed)

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E) Antenna Facilities

Site ID	Antenna ID	Units	Diameter (meters)	Manufacturer	Model number	Site Elevation (Meters)	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
AES1	AES1	250	0.365	Thales	MCT-A	0	0 AGL/ 0 AMSL	

Max Gains(s): 35.6 dBi @ 19.7000 GHz 38.9 dBi @ 29.5000 GHz
Maximum total input power at antenna flange (Watts) = 4.57
Maximum aggregate output EIRP for all carriers (dBW) = 45.50

F) Remote Control Point:

AES1 8000 Gainsford Court **Call Sign:**
Bristow, Prince William, VA 20136
703-330-3305

AES1 7415 Emerald Dunes Drive, Suite 2000 **Call Sign:**
Orlando, Orange, FL 32822
949-754-6985

G) Antenna Structure marking and lighting requirements:

None unless otherwise specified under Special and General Provisions

H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

4 --- Licensee must ensure that a current listing of the name, title, mailing address, email address, and telephone number of the responsible point of contact are on file at the FCC. Any changes must be filed electronically in the International Bureau Filing System (IBFS) in the "Other Filings" tab within 10 days of the change.

90054 --- Operations authorized pursuant to this license are operations by U.S.-registered aircraft anywhere within the coverage area/frequency bands identified in the application for the satellites listed as points of communication. Operations authorized pursuant to this license also include operations by non-U.S.-registered aircraft within U.S. territory, including territorial waters.

90067 --- Operation in the territory or airspace of any country other than the United States must be in compliance with the applicable laws, regulations, and licensing procedures of that country, as well as with the conditions of this authorization.

90075 --- Licensee is afforded 30 days from the date of release of this grant and authorization to decline this authorization as conditioned. Failure to respond within this period will constitute formal acceptance of the authorization as conditioned.

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H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

90079 --- Antenna elevation for all operations must be at least 5 degrees above the geographic horizon while the aircraft is on the ground.

90101 --- In the 17.8-20.2 GHz frequency range, in order to protect Federal satellite services, the licensee shall communicate only with satellites whose operator has completed an agreement with Federal operators pursuant to footnote US334 of the U.S. Table of Frequency Allocations, 47 C.F.R. § 2.106, and that agreement has been approved by both the Federal Communications Commission and the National Telecommunications and Information Administration. The licensee's operations pursuant to this authorization shall be consistent with such US334 agreements.

90116 --- The licensee must maintain a U.S. point of contact available 24 hours per day, seven days per week, with the authority and ability to terminate operations authorized herein. The licensee shall have available, at all times, the technical personnel necessary to perform supervision of remote station operations.

90118 --- The licensee shall comply with any pertinent limits established by the International Telecommunication Union to protect other services allocated internationally.

90122 --- The earth stations in this blanket license are operated by remote control. The remote control point is a material term of the license and may not be changed without prior authorization under Section 25.117 of the Commission's rules. Public Notice "The International Bureau Provides Guidance Concerning the Relocation of Earth Station Remote Control Points," DA 06-978 (rel. May 4, 2006).

90245 --- When the ESAA network is put into operation, the licensee must file with the Commission a certification including the following information: name of the licensee, file number of the application, call sign of the antenna, date of the license and certification that the network was put into operation and will remain operational during the license period unless the license is submitted for cancellation.

90246 --- ESAAs authorized herein must employ a tracking algorithm that is resistant to capturing and tracking adjacent satellite signals, and each station must be capable of inhibiting its own transmission in the event it detects unintended satellite tracking.

90247 --- ESAAs authorized herein must be monitored and controlled by a ground-based network control and monitoring center. Such stations must be able to receive "enable transmission" and "disable transmission" commands from the network control center and must cease transmission immediately after receiving a "parameter change" command until receiving an "enable transmission" command from the network control center. The network control center must monitor operation of each ESAA to determine if it is malfunctioning, and each ESAA must self-monitor and automatically cease transmission on detecting an operational fault that could cause harmful interference to a fixed-satellite service network.

90248 --- Stations authorized herein must not be used to provide air traffic control communications.

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H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

90253 --- When operating in airspace within line-of-sight of the territory of a foreign administration where Fixed Service networks have an allocation in the 28.35- 29.1 GHz or 29.5-30.0 GHz frequency bands, the ESAAs must not exceed the following EIRP limits:

+64 dBW in any 1 MHz band if Theta is less than or equal to 0°
+64 + 3*Theta dBW in any 1 MHz band if Theta is greater than 0° but less than or equal to 5°

where Theta is the angle of elevation of the horizon viewed from the center of radiation of the antenna of the earth station and measured in degrees as positive above the horizontal plane and negative below it.

90256 --- Operation of ESAAs authorized herein are subject to any requirements the Commission may adopt in any future proceeding concerning operations in the 18.3-19.3 GHz, 19.7-20.2 GHz, 28.35-29.1 GHz, and 29.5-30.0 GHz band frequencies including, but not limited to, ESAAs communicating with geostationary orbit space stations.

90257 --- ESAAs authorized herein must be in compliance with the terms of coordination agreements with operators of non-geostationary orbit Fixed Satellite Service space stations operating in the 18.8-19.3 and 28.6-29.1 GHz frequency band. In the event another NGSO FSS system commences operation in the 18.8-19.3 and 28.6-29.1 GHz frequency bands, ESAAs operating pursuant to this authorization must cease operation unless and until such operation has been coordinated with the new NGSO system operator or the ESAA licensee demonstrates that such operation will not cause harmful interference to the new NGSO system.

90259 --- For purposes of this authorization, the term earth stations aboard aircraft, or ESAA, is used to refer to any earth station on aircraft communicating with Fixed-Satellite Service (FSS) geostationary-orbit (GSO) space stations, without reference to the technical and licensing rules specifically adopted for earth stations on aircraft in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz, and 14.0-14.5 GHz frequency bands. See 47 C.F.R. § 25.227; Revisions to Parts 2 and 25 of the Commission's Rules to Govern the Use of Earth Stations Aboard Aircraft Communicating with Fixed-Satellite Service Geostationary-Orbit Space Stations Operating in the 10.95-11.2 GHz, 11.34-11.7 GHz, 11.7-12.2 GHz and 14.0-14.5 GHz Frequency Bands, IB Docket No. 12-376, Notice of Proposed Rulemaking and Report and Order, FCC 12-161, 27 FCC Rcd 16510 (2012); Revisions of Parts 2 and 25 of the Commission's Rules to Govern the Use of Earth Stations Aboard Aircraft Communicating with Fixed-Satellite Service Geostationary-Orbit Space Stations Operating in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz and 14.0-14.5 GHz Frequency Bands, IB Docket No. 12-376, Second Report and Order on Reconsideration, FCC 14-45, 29 FCC Rcd 4226 (2014). Nothing in this authorization extends those technical and licensing rules to earth stations on aircraft not operating in those specified frequency bands.

90398 --- Changes to previously authorized transmitting facilities, operations and devices regulated by the Commission that may have significant environmental impact, and are not excluded by §1.1306, require the preparation of an Environmental Assessment (EA) by the licensee. (See 47 C.F.R. §§1.1307, 1.1308 and 1.1311)

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H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

90399 --- The licensee shall, at all times, take all necessary measures to ensure that operation of this (these) authorized earth station(s) does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR §§ 1.1307(b) and 1.1310. Physical measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions, such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling, or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for workers.

90418 --- The ESAAs are authorized, on a non-harmful interference basis, to transmit to the following geostationary-orbit space stations: Echostar XVII (Call Sign: S2753) at 107.1° W.L. using the 29.3 - 30.0 GHz frequency band; JUPITER 2 (Call Sign S2834) at 97.1° W.L. using the 29.3 - 30.0 GHz frequency band; AMC-15 (Call Sign: S2180) at 105.0° W.L. using the 28.438-28.563 GHz and 29.5-30.0 GHz frequency bands; and AMC 16 Call Sign: S2181) at 85.0° W.L. using the 28.438-28.563 GHz and 29.5-30.0 GHz frequency bands.

90419 --- The ESAAs are authorized, on a non-protected and non-harmful interference basis, to receive downlink transmissions from the following geostationary-orbit space stations: Echostar XVII (Call Sign: S2753) at 107.1° W.L. in the 18.3-19.3 GHz and 19.7-20.2 GHz frequency bands; JUPITER 2 (Call Sign S2834) at 97.1° W.L. in the 18.3-19.3 GHz and 19.7-20.2 GHz frequency band; AMC-15 (Call Sign: S2180) at 105.0° W.L. in the 18.638-18.763 GHz and 19.7-20.2 GHz frequency band; and AMC 16 Call Sign: S2181) at 85.0° W.L. in the 18.638-18.763 GHz and 19.7-20.2 GHz frequency band. The ESAAs operations authorized herein must accept interference from any radio system lawfully operating in the 18.3-19.3 GHz and 19.7-20.2 GHz frequency bands.

90420 --- Operations pursuant to this authorization must be in compliance with the terms of the coordination agreements with operators of Ka-band geostationary space stations within six angular degrees of the target satellites (Echostar XVII, JUPITER 2, AMC-15, and AMC 16). In the event another GSO space station commences operation in the 28.35-29.1 GHz and 29.5-30.0 GHz frequency bands at a location within thirty degrees of any of the target satellites, ESAAs operating pursuant to this authorization must cease transmitting to the target satellite(s) unless and until such operation has been coordinated with the new space station's operator or Thales Avionics, Inc demonstrates that such operation will not cause harmful interference to the new co-frequency space station.

90421 --- Waiver of Section 25.138(a)(2) of the Commission Rules is granted. The antenna performance specifications do not comply with Section 25.138(a)(2). The operation of these antennas will not be protected from harmful interference caused by other geostationary satellite networks to the extent that harmful interference would not be expected to be caused to an antenna that is compliant with the antenna performance standards of Section 25.209.

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B) This RADIO STATION AUTHORIZATION is granted subject to the additional conditions specified below:

This authorization is issued on the grantee's representation that the statements contained in the application are true and that the undertakings described will be carried out in good faith.

This authorization shall not be construed in any manner as a finding by the Commission on the question of marking or lighting of the antenna system should future conditions require. The grantee expressly agrees to install such marking or lighting as the Commission may require under the provisions of Section 303(q) of the Communications Act. 47 U.S.C. § 303(q).

Neither this authorization nor the right granted by this authorization shall be assigned or otherwise transferred to any person, firm, company or corporation without the written consent of the Commission. This authorization is subject to the right of use or control by the government of the United States conferred by Section 706 of the Communications Act. 47 U.S.C. § 706. Operation of this station is governed by Part 25 of the Commission's Rules. 47 C.F.R. Part 25.

This authorization shall not vest in the licensee any right to operate this station nor any right in the use of the designated frequencies beyond the term of this license, nor in any other manner than authorized herein.

This authorization is issued on the grantee's representation that the station is in compliance with environmental requirements set forth in Section 1.1307 of the Commission's Rules. 47 C.F.R. § 1.1307.

This authorization is issued on the grantee's representation that the station is in compliance with the Federal Aviation Administration (FAA) requirements as set forth in Section 17.4 of the Commission's Rules. 47 C.F.R.§ 17.4.

The following condition applies when this authorization permits construction of or modifies the construction permit of a radio station.

This authorization shall be automatically forfeited if the station is not ready for operation by the required date of completion of construction unless an application for modification of authorization to request additional time to complete construction is filed by that date, together with a showing that failure to complete construction by the required date was due to factors not under control of the grantee.

Licensees are required to pay annual regulatory fees related to this authorization. The requirement to collect annual regulatory fees from regulatees is contained in Public Law 103-66, "The Omnibus Budget Reconciliation Act of 1993." These regulatory fees, which are likely to change each fiscal year, are used to offset costs associated with the Commission's enforcement, public service, international and policy and rulemaking activities. The Commission issues a Report and Order each year, setting the new regulatory fee rates. Receive only earth stations are exempt from payment of regulatory fees.