



**UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION**

Name: Ligado Networks Subsidiary LLC

Call Sign: E100051

Authorization Type: Modification of License

File Number: SES-MOD-20160107-00026

Non Common Carrier

Grant date: 10/03/2016

Expiration Date: 06/25/2025



Nature of Service: Mobile Satellite Service

Class of Station: Fixed Earth Stations

A) Site Location(s)

#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	Special Provisions NAD (Refer to Section H)
1)	SCMS 2	3877 University Drive Anchorage, Anchorage Borough, AK 99508	61°11'26.0"N	149°48'30.0"W	60	83
2)	SCMS 4	10802 Parkridge Boulevard Reston, Fairfax, VA 20191	38°56'42.0"N	77°19'9.0"W	100	83
3)	SCMS 5	AVE. 167 KM. 18.9 BAYAMON, 0, PR 00957	18°22'7.8"N	66°11'1.4"W	480	83
4)	SCMS 6	4600 AIR WAY SAN DIEGO, SAN DIEGO, CA 92102	32°43'10.4"N	117°5'42.5"W	68.58	83
5)	SCMS 8	777 WESTAR LANE CEDAR HILL, Dallas, TX 75104	32°34'43.3"N	96°59'0.1"W	201.17	83
6)	SCMS 9	6155 EL CAMINO REAL CARLSBAD, SAN DIEGO, CA 92009	33°7'36.0"N	117°16'5.0"W	88	83



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION

Name: Ligado Networks Subsidiary LLC

Call Sign: E100051

Authorization Type: Modification of License

File Number: SES-MOD-20160107-00026

Non Common Carrier

Grant date: 10/03/2016

Expiration Date: 06/25/2025

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 June 25, 2010 (3 AM Eastern Standard Time) and ending June 25, 2025 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is October 3, 2017 (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)	1626.5000-1660.5000	R	N0N	Tx	16.50	16.50	M2		Unmodulated signal
2)	1626.5000-1660.5000	R	5K00G9W	Tx	16.50	15.50	M2		4800 bps QPSK data carrier
3)	1525.0000-1559.0000	R	5K00G9W	Rx	0.00	0.00	M2		4800 bps QPSK data carrier
4)	1626.5000-1660.5000	R	N0N	Tx	16.50	16.50	M4		Unmodulated signal
5)	1626.5000-1660.5000	R	5K00G9W	Tx	16.50	15.50	M4		4800 bps QPSK data carrier
6)	1525.0000-1559.0000	R	5K00G9W	Rx	0.00	0.00	M4		4800 bps QPSK data carrier
7)	1626.5000-1660.5000	R	N0N	Tx	16.50	16.50	M5		UNMODULATED SIGNAL
8)	1626.5000-1660.5000	R	5K00G9W	Tx	16.50	15.50	M5		4800 BPS QPSK DATA CARRIER
9)	1525.0000-1559.0000	R	5K00G9W	Rx			M5		4800 BPS QPSK DATA CARRIER
10)	1626.5000-1660.5000	R	N0N	Tx	16.50	16.50	M6		UNMODULATED SIGNAL
11)	1626.5000-1660.5000	R	5K00G9W	Tx	16.50	15.50	M6		4800 BPS QPSK DATA CARRIER
12)	1525.0000-1559.0000	R	5K00G9W	Rx			M6		4800 BPS QPSK DATA CARRIER
13)	1626.5000-1660.5000	R	N0N	Tx	16.50	16.50	M8		UNMODULATED SIGNAL
14)	1626.5000-1660.5000	R	5K00G9W	Tx	16.50	15.50	M8		4800 BPS QPSK DATA CARRIER
15)	1525.0000-1559.0000	R	5K00G9W	Rx	0.00	0.00	M8		4800 bps QPSK data carrier
16)	1626.5000-1660.5000	R	5K00G9W	Tx	16.50	15.50	M9		4800 BPS QPSK CARRIER
17)	1626.5000-1600.5000	R	N0N	Tx	16.50	16.50	M9		UNMODULATED SIGNAL
18)	1525.0000-1559.0000	R	5K00G9W	Rx			M9		4800 BPS QPSK DATA CARRIER



**UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION**

Name: Ligado Networks Subsidiary LLC

Call Sign: E100051

Authorization Type: Modification of License

File Number: SES-MOD-20160107-00026

Non Common Carrier

Grant date: 10/03/2016

Expiration Date: 06/25/2025

C) Frequency Coordination Limits

#	Frequency Limits (MHz)	Satellite Arc (Deg. Long.)		Elevation (Degrees)		Azimuth (Degrees)		Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
		East Limit	West Limit	East Limit	West Limit	East Limit	West Limit		
1)	1525.0000-1559.0000	101.3W	107.3W	10.1	12.3	127.8	133.7		M2
2)	1626.5000-1660.5000	101.3W	107.3W	10.1	12.3	127.8	133.7	-23.5	M2
3)	1525.0000-1559.0000	101.3W	107.3W	38.5	35.3	215.3	222.6		M4
4)	1626.5000-1660.5000	101.3W	107.3W	38.5	35.3	215.3	222.6	-39.5	M4
5)	1525.0000-1559.0000	101.3W	106.5W	44.8	38.9	245.9	250.1		M5
6)	1626.5000-1660.5000	101.3W	106.5W	44.8	38.9	245.9	250.1	-39.5	M5
7)	1626.5000-1660.5000	101.3W	106.5W	48.0	48.0	154.0	154.0		M6
8)	1525.0000-1559.0000	101.3W	107.3W	51.0	51.0	160.0	160.0	-39.5	M6
9)	1626.5000-1660.5000	101.3W	107.3W	51.8	50.5	187.4	198.7	-39.5	M8
10)	1525.0000-1559.0000	101.3W	107.3W	51.8	50.5	187.4	198.7		M8
11)	1626.5000-1660.5000	101.3W	107.5W	47.8	50.1	152.3	162.4		M9
12)	1525.0000-1559.0000	101.3W	107.5W	47.8	50.1	152.3	162.4		M9

D) Points of Communications

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

- 1) SCMS 2 to MSAT-2 satellite (AMSC-1) @ 103.3 degrees W.L. satellite (U.S.-licensed)
- 2) SCMS 2 to MSAT-1 @ 107.5 degrees W.L. (Canadian Licensed) (Non-U.S.-licensed)
- 3) SCMS 2 to SKYTERRA 1 satellite @ 101.3 degrees W.L. satellite(s) of the (U.S.-licensed)
- 4) SCMS 4 to MSAT-2 satellite (AMSC-1) @ 103.3 degrees W.L. satellite (U.S.-licensed)
- 5) SCMS 4 to MSAT-1 @ 107.5 degrees W.L. (Canadian Licensed) (Non-U.S.-licensed)
- 6) SCMS 4 to SKYTERRA 1 satellite @ 101.3 degrees W.L. satellite(s) of the (U.S.-licensed)
- 7) SCMS 5 to MSAT-2 satellite (AMSC-1) @ 103.3 degrees W.L. satellite (U.S.-licensed)
- 8) SCMS 5 to MSAT-1 @ 107.5 degrees W.L. (Canadian Licensed) (Non-U.S.-licensed)
- 9) SCMS 5 to SKYTERRA 1 satellite @ 101.3 degrees W.L. satellite(s) of the (U.S.-licensed)
- 10) SCMS 6 to MSAT-2 satellite (AMSC-1) @ 103.3 degrees W.L. satellite (U.S.-licensed)
- 11) SCMS 6 to MSAT-1 @ 107.5 degrees W.L. (Canadian Licensed) (Non-U.S.-licensed)
- 12) SCMS 6 to SKYTERRA 1 satellite @ 101.3 degrees W.L. satellite(s) of the (U.S.-licensed)
- 13) SCMS 8 to MSAT-1 @ 107.5 degrees W.L. (Canadian Licensed) (Non-U.S.-licensed)
- 14) SCMS 8 to MSAT-2 satellite (AMSC-1) @ 103.3 degrees W.L. satellite (U.S.-licensed)
- 15) SCMS 8 to SKYTERRA 1 satellite @ 101.3 degrees W.L. satellite(s) of the (U.S.-licensed)
- 16) SCMS 9 to MSAT-1 @ 107.5 degrees W.L. (Canadian Licensed) (Non-U.S.-licensed)
- 17) SCMS 9 to MSAT-2 satellite (AMSC-1) @ 103.3 degrees W.L. satellite (U.S.-licensed)
- 18) SCMS 9 to SKYTERRA 1 satellite @ 101.3 degrees W.L. satellite(s) of the (U.S.-licensed)



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION

RADIO STATION AUTHORIZATION

Name: Ligado Networks Subsidiary LLC

Call Sign: E100051

Authorization Type: Modification of License

File Number: SES-MOD-20160107-00026

Non Common Carrier

Grant date: 10/03/2016

Expiration Date: 06/25/2025

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)
SCMS 2	M2	1	0.76	Westinghouse	AU-10FS	60	20 AGL/ 80 AMSL	
		Max Gains(s):		19.6 dBi @ 1.5000 GHz	20.2 dBi @ 1.6000 GHz			
		Maximum total input power at antenna flange (Watts) =		.43				
		Maximum aggregate output EIRP for all carriers (dBW) =		16.50				
SCMS 4	M4	1	0.76	Westinghouse	AU-10FS	100	7.5 AGL/ 107.5 AMSL	
		Max Gains(s):		19.6 dBi @ 1.5000 GHz	20.2 dBi @ 1.6000 GHz			
		Maximum total input power at antenna flange (Watts) =		.43				
		Maximum aggregate output EIRP for all carriers (dBW) =		16.50				
SCMS 5	M5	1	0.76	WESTINGHOUSE	AU-10FS	480	2 AGL/ 482 AMSL	
		Max Gains(s):		19.6 dBi @ 1.5000 GHz	20.2 dBi @ 1.6000 GHz			
		Maximum total input power at antenna flange (Watts) =		.43				
		Maximum aggregate output EIRP for all carriers (dBW) =		16.50				
SCMS 6	M6	1	0.76	WESTINGHOUSE	AU-10FS	68.58	6.09 AGL/ 74.67 AMSL	
		Max Gains(s):		19.6 dBi @ 1.5000 GHz	20.2 dBi @ 1.6000 GHz			
		Maximum total input power at antenna flange (Watts) =		.43				
		Maximum aggregate output EIRP for all carriers (dBW) =		16.50				
SCMS 8	M8	1	0.84	Mitsubishi	AU601B	201.17	4.8 AGL/ 205.97 AMSL	
		Max Gains(s):		20.0 dBi @ 1.5450 GHz	20.6 dBi @ 1.6460 GHz			
		Maximum total input power at antenna flange (Watts) =		.39				
		Maximum aggregate output EIRP for all carriers (dBW) =		16.50				
SCMS 9	M9	1	0.84	MITSUBISHI	AU601B	88	11 AGL/ 99 AMSL	
		Max Gains(s):		20.0 dBi @ 1.5000 GHz	20.6 dBi @ 1.6000 GHz			
		Maximum total input power at antenna flange (Watts) =		.39				
		Maximum aggregate output EIRP for all carriers (dBW) =		16.50				



**UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION**

Name: Ligado Networks Subsidiary LLC

Call Sign: E100051

Authorization Type: Modification of License

File Number: SES-MOD-20160107-00026

Non Common Carrier

Grant date: 10/03/2016

Expiration Date: 06/25/2025

F) Remote Control Point:

SCMS 2	1601 Telesat Court Ottawa, Ontario, Canada, K 1B 1B9 1-800-216-6720 (24/7)	Call Sign:
SCMS 4	1601 Telesat Court Ottawa, Ontario, Canada, K 1B 1B9 1-800-216-6720 (24/7)	Call Sign:
SCMS 5	1601 Telesat Court Ottawa, Ontario, Canada, K 1B 1B9 1-800-216-6720 (24/7)	Call Sign:
SCMS 6	1601 TELESAT COURT OTTAWA, ONTARIO, CANADA, K 1B 1B9 1-800-216-6720 (24/7)	Call Sign:
SCMS 8	1601 Telesat Court Ottawa, Ontario, Canada, K 1B 1B9 1-800-216-6720 (24/7)	Call Sign:
SCMS 9	10802 PARKRIDGE BLVD RESTON, FAIRFAX, VA 20191 877-277-2360	Call Sign: 10802 PARK

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:

216 --- Operations in the 1544-1545/1645.5-1646.5 MHz frequency bands ARE LIMITED to distress and safety communications, in accordance with International Footnotes 5.356 and 5.375 of the ITU Radio Regulations.

263 --- Licensee shall coordinate with the National Science Foundation (NSF) in the 1660.0-1660.5 MHz band to ensure sharing of co-primary services.



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION

Name: Ligado Networks Subsidiary LLC

Call Sign: E100051

Authorization Type: Modification of License

File Number: SES-MOD-20160107-00026

Non Common Carrier

Grant date: 10/03/2016

Expiration Date: 06/25/2025

H) Special and General Provisions

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

- 1010 --- Applicable to all receiving frequency bands. Emission designator indicates the maximum bandwidth of received signal at associated station(s). Maximum EIRP and maximum EIRP density are not applicable to receive operations.
- 1900 --- Applicable to all transmitting frequency bands. Authority is granted to transmit any number of RF carriers with the specified parameters on any discrete frequencies within associated band in accordance with the other terms and conditions of this authorization, subject to any additional limitations that may be required to avoid unacceptable levels of inter-satellite interference.
- 2916 --- Transmitter(s) must be turned off during antenna maintenance to ensure compliance with the FCC-specified safety guidelines for human exposure to radiofrequency radiation in the region between the antenna feed and the reflector. Appropriate measures must also be taken to restrict access to other regions in which the earth station's power flux density levels exceed the specified guidelines.
- 5208 --- The licensee shall take all necessary measures to ensure that the antenna 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 wherever such exposures might occur. 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.
- 5216 --- All operations shall be on a non-common carrier basis.
- 90222 --- LightSquared's request for waiver of Section 25.283(c) of the Commission's rules, 47 C.F.R. § 25.283(c), IS GRANTED. Section 25.283(c) requires discharge of all stored energy sources when a space station is retired from service. MSAT-1 is a Boeing 601 model spacecraft, which has a liquid propulsion system that includes two helium pressurant tanks and two pairs of fuel and oxidizer tanks. The fuel and oxidizer tanks will be vented in the end-of-life shutdown procedure. The helium tanks were sealed by firing pyrotechnic valves shortly after launch in 1996, and contain an estimated mass of approximately 130 grams of helium in each tank, with each tank having a volume of 43.42 liters. We waive Section 25.283(c) in light of the fact that the action taken to seal the helium tanks was taken prior to the adoption of this rule, and compliance would require direct retrieval of the spacecraft.
- 90223 --- LightSquared's request for partial waiver of Section 25.114(c) of the Commission's rules, 47 C.F.R. § 25.114(c), IS GRANTED. The information provided satisfies the relevant informational requirements.
- 90224 --- Authorized communications with MSAT-1 are limited to frequencies within the L band (1525-1559 MHz and 1626.5-1660.5 MHz).



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION

Name: Ligado Networks Subsidiary LLC

Call Sign: E100051

Authorization Type: Modification of License

File Number: SES-MOD-20160107-00026

Non Common Carrier

Grant date: 10/03/2016

Expiration Date: 06/25/2025

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 does not meet each required construction deadline by the required date of completion unless, before such date(s), a specific application is timely filed to request an extension of the construction deadline(s), supported with good cause why that failure to construct 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.