



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION

Name: The Boeing Company

Call Sign: E000723

Authorization Type: Modification of License
Non Common Carrier

File Number: SES-MFS-20050701-00853

Grant Date: 12/20/2005 Expiration Date: 12/21/2011

Nature of Service: Domestic Aeronautical Mobile-Satellite Service
Nature of Service: Mobile Satellite Service

Class of Station: Mobile Earth Station

A) Site Location(s)

#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	NAD	Special Provisions (Refer to Section H)
1)		800 METS ABOARD AIRCRAFT OPERATING IN US INCL. AIRSPACE ABOVE TERRITORIAL WATERS Licensee certifies antenna(s) do not comply with Section 25.209. Please refer to Section E for special conditions placed upon antennas at this site.				NA	
2)	eXchange	1000 METs ABOARD AIRCRAFT OPERATING IN INCL. AIRSPACE ABOVE TERRITORIAL WATERS Licensee certifies antenna(s) do not comply with Section 25.209. Please refer to Section E for special conditions placed upon antennas at this site.				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 December 21, 2001 (3 AM Eastern Standard Time) and ending December 21, 2011 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is 00/00/0000. 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)	14000.0000-14500.0000	H,V	24M3G7D	Tx	51.20	13.40	ATR-1A		OQPSK, DATA, advanced two-way broadband AMSS service
2)	14000.0000-14500.0000	H,V	32M4G7D	Tx	51.20	12.10	ATR-1A		OQPSK, DATA, advanced two-way broadband AMSS service
3)	11700.0000-12200.0000	H,V	20M0G7D	Rx			ATR-1A		OQPSK, DATA, advanced two-way broadband AMSS service



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For the text of these provisions, refer to Section H.

#	Frequency (MHz)	Polarization Code	Tx/Rx Emission Mode	Max EIRP /Carrier (dBW)		Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
4)	11700.0000-12200.0000	H,V	32M4G7D	Rx		ATR-1A		OQPSK, DATA, advanced two-way broadband AMSS service
5)	14000.0000-14500.0000	H,V	24M3G7D	Tx	46.70	8.90	ATR-1B	OQPSK, DATA, advanced two-way broadband AMSS service
6)	14000.0000-14500.0000	H,V	32M4G7D	Tx	46.70	7.60	ATR-1B	OQPSK, DATA, advanced two-way broadband AMSS service
7)	11700.0000-12200.0000	H,V	20M0G7D	Rx		ATR-1B		OQPSK, DATA, advanced two-way broadband AMSS service
8)	11700.0000-12200.0000	H,V	32M4G7D	Rx		ATR-1B		OQPSK, DATA, advanced two-way broadband AMSS service
9)	14000.0000-14500.0000	H,V	32M4G7W	Tx	40.70	8.40	eXchange	OQPSK, DATA, advanced two-way broadband AMSS service
10)	11700.0000-12200.0000	H,V	32M4G7W	Rx		eXchange		OQPSK, DATA, advanced two-way broadband AMSS service

C) Frequency Coordination Limits

	Frequency Limits	Satellite Arc (Deg. Long.)		Elevation (Degrees)		Azimuth (Degrees)		Max EIRP Density toward Horizon (dBW/4kHz)	Associated
		East	West	East	West	East	West		
1)	11700.0000-12200.0000	93.0W	93.0W	27.0	27.0				ATR-1A
2)	14000.0000-14500.0000	101.0W	101.0W	27.0	27.0		-21		ATR-1A
3)	11700.0000-12200.0000	101.0W	101.0W	27.0	27.0				ATR-1A
4)	14000.0000-14500.0000	93.0W	93.0W	27.0	27.0		-20.1		ATR-1A
5)	14000.0000-14500.0000	93.0W	93.0W	05.0	05.0		-0.1		ATR-1B
6)	11700.0000-12200.0000	93.0W	93.0W	05.0	05.0				ATR-1B
7)	14000.0000-14500.0000	101.0W	101.0W	05.0	05.0		-0.1		ATR-1B
8)	11700.0000-12200.0000	101.0W	101.0W	05.0	05.0				ATR-1B
9)	14000.0000-14500.0000	93.0W	93.0W	05.0	05.0				eXchange
10)	11700.0000-12200.0000	93.0W	93.0W	05.0	05.0				eXchange
11)	14000.0000-14500.0000	101.0W	101.0W	05.0	05.0				eXchange
12)	11700.0000-12200.0000	101.0W	101.0W	05.0	05.0				eXchange



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D) Points of Communications

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

- 1) 1 to TELSTAR 6 @ 93 degrees W.L. (U.S.-licensed domestic satellite)
- 2) 1 to AMC-4 @ 101 degrees W.L. (U.S.-licensed domestic satellite)
- 3) eXchange to TELSTAR 6 @ 93 degrees W.L. (U.S.-licensed domestic satellite)
- 4) eXchange to AMC-4 @ 101 degrees W.L. (U.S.-licensed domestic satellite)

E) Antenna Facilities

Site/Elevation:

Site ID	Antenna ID	Diameter (meters)	Manufacturer	Model	Max Antenna Height (Meters)	Special Provisions (Refer to Section 1)
1	ATR-1A	125 0.371	BOEING	ATR-1A PHASED ARRAY		
Max Gains(s): 42.0 dBi @ 12.0000 GHz 34.9 dBi @ 14.2500 GHz Maximum total input power at antenna flange (Watts) = 43.00 Maximum aggregate output EIRP for all carriers (dBW) = 51.20						
1	ATR-1B	675 0.196	BOEING	REFLECTOR .196x.65m		
Max Gains(s): 33.1 dBi @ 14.2000 GHz 31.6 dBi @ 12.0000 GHz Maximum total input power at antenna flange (Watts) = 23.00 Maximum aggregate output EIRP for all carriers (dBW) = 46.70						
eXchange	eXchange	1000 0.29	ROCKWELL	eX500		
Max Gains(s): 30.3 dBi @ 12.0000 GHz 31.0 dBi @ 14.0000 GHz Maximum total input power at antenna flange (Watts) = 7.60 Maximum aggregate output EIRP for all carriers (dBW) = 40.70						

F) Remote Control Point:

1	BLDG. 18-03, RM 21C6, 20403 68TH AVE., S KENT, KING, WA 98023 253-773-0609	Call E000723 Sign:
1	BLDG. 12-126 RM 10A4, 18300 CASCADE AVE. S. TUKWILA, KING, WA 98188 425-393-1982	Call E000723 Sign:



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F) Remote Control Point:

eXchange BLDG. 18-03, RM 21C6, 20403 68TH AVE., S

Call Sign: E000723

KENT, KING, WA 98023

253-773-0609

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 provisions:

- 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.
- 2300 --- Authority is granted to operate this station by remote control provided that: (1) The parameters of the transmissions of this station monitored at the remote control point, and the operational functions sufficient to insure that the operations of this station are in full compliance with the station authorization at all times; (2) upon detection by the grantee, or upon notification from the Commission, of a deviation of the operation of this station shall be immediately suspended until the deviation is corrected, except the transmissions concerning the immediate safety of life or property may be conducted for the duration of such emergency; and (3) the grantee shall have available, at all times, the technical personnel necessary to perform the technical servicing and maintenance of this station expeditiously.
- 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.
- 3857 --- Use of the authorized frequency bands has been cleared through the National Telecommunications and Information Administration, Frequency Assignment Committee of the Interdepartment Radio Advisory Committee.
- 5216 --- All operations shall be on a non-common carrier basis.



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H) Special and General Provisions

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

5411 --- The aggregate off-axis EIRP spectral density for co-polarized signals, emitted from all simultaneously transmitting AES antenna in the plane of the geostationary satellite orbit as it appears at the particular earth station location (i.e., the plane determined by the focal point of the antenna and the line tangent to the arc of the geostationary satellite orbit at the position of the target satellite), shall not exceed a 1 dB margin below the following values:

15 - $25\log(\text{THETA})$ dBW/4kHz for $1.25^\circ \leq \text{THETA} \leq 7.0^\circ$
-6 dBW/4kHz for $7.0^\circ < \text{THETA} \leq 9.2^\circ$
18 - $25\log(\text{THETA})$ dBW/4kHz for $9.2^\circ < \text{THETA} \leq 48^\circ$
-24 dBW/4kHz for $48^\circ < \text{THETA} \leq 180^\circ$

For $\text{THETA} > 7^\circ$, the values above may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the criteria given by more than 3 dB.

In all other directions, the off-axis EIRP spectral density for co-polarized signals emitted from the AES shall not exceed a 1 dB margin below the following values:

18 - $25\log(\text{THETA})$ dBW/4kHz for $1.25^\circ \leq \text{THETA} \leq 48^\circ$
-24 dBW/4kHz for $48^\circ < \text{THETA} \leq 180^\circ$

In all directions, the off-axis EIRP spectral density for cross-polarized signals emitted from the AES shall not exceed a 1 dB margin below the following values:

5 - $25\log(\text{THETA})$ dBW/4kHz for $1.8^\circ \leq \text{THETA} \leq 7^\circ$
-16 dBW/4kHz for $7^\circ < \text{THETA} \leq 9.2^\circ$

where THETA is the angle in degrees from the axis of the main lobe.

5412 --- Within 90 days of this authorization for the eX500 antenna, submission of the following data is required:

A series of e.i.r.p. density charts or tables, calculated for a production earth station antenna using maximum input power, based on measurements taken on a calibrated antenna range at 14.2 GHz, with the off-axis e.i.r.p. envelope set forth in Condition 5411 superimposed, as follows:

(i) Showing off-axis co-polarized e.i.r.p. spectral density in the azimuth plane, for off-axis angles from minus 10° to plus 10° and from minus 180° to plus 180° .

(ii) Showing off-axis co-polarized e.i.r.p. spectral density in the elevation plane, at off-axis angles from 0° to plus 30° .

(iii) Showing off-axis cross-polarized e.i.r.p. spectral density in the azimuth plane, at off-axis angles from minus 10° to plus 10° .

(iv) Showing off-axis cross-polarized e.i.r.p. spectral density in the elevation plane, at off-axis angles from minus 10° to plus 10° ;



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5415 --- This authorization is subject to any pertinent rules subsequently adopted by the Commission in IB Docket No. 05-20 or any related proceedings.

5779 --- Upon completion of construction each 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 construction of the facility as authorized has been completed, and that the station is operational including the date of commencement of service, and will remain operational during the license period unless the license is submitted for cancellation.

5842 --- This authorization is issued pursuant to and subject to the terms and conditions in the Commission's Order released December 21, 2001, DA 01-3008, with regard to all Points of Communications listed in Section D of this License.

5868 --- A Waiver of Section 25.212(c) of the Commission's Rules is hereby granted for (125) 17" x 26" Boeing model ATR-1A (phased-array) and (675) 65cm x 19.6cm Boeing reflector Airborne antennas to receive a maximum downlink EIRP density of +13 dBW/4kHz from the AMC-4 satellite at 101 degrees West Longitude (WL) and TELSTAR 6 at 93 degrees WL for the associated emissions 32M4G7D and 20M0G7D.

5869 --- The ATR-1A airborne antenna is authorized to transmit a maximum EIRP, as authorized by the network operations centers (NOC), of 51.2 dBW while the aircraft is in flight. The maximum transmit EIRP of the phased array antenna are hardware/software limited to no more than 49.5 dBW (at 63 degrees scan) when the aircraft is on the ground.

5948 --- On August 14, 2002, the licensee filed a report regarding its compliance with the conditions set forth in the Commission's Order released December 21, 2001, DA 01-3008, as required by paragraph 19(h)(5) of that Order. The licensee must update its submission by filing any new or modified information (as specified in paragraph 19(h)(5) of the Order) that has not otherwise been provided to the Commission no later than 30 days prior to commencing commercial operations using the ATR-1B antenna.

5949 --- Communications between Boeing phased-array and reflector aircraft earth stations and the Loral's TELSTAR 6 @ 93 degrees W.L. and AMC-4 @ 93 degrees W.L. shall be in compliance with the engineering certifications of SES Americom, Inc. and Loral Skynet filed in this proceeding, File Nos. SES-LIC-20001204-02300, SES-MOD-20020308-00429, and SES-MOD-20030512-00639.



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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 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.