

REQUEST FOR SPECIAL TEMPORARY AUTHORITY

Gogo LLC (“Gogo”) hereby requests extension and expansion of the special temporary authority (“STA”) it was granted by the Commission to operate a transmit/receive earth station aboard aircraft (“ESAA”) for in-flight testing in the Ku-band.¹ Specifically, Gogo requests authority for a period of 60 days beginning on January 15, 2013, to perform in-flight testing of up to twenty terminals to be installed on Delta Airlines planes and communicating with the SES-1 and NSS-703 spacecraft. The proposed geographic area of operations includes the U.S., Canada, the North Atlantic and Western Europe.² All uplinks will use conventional Ku-band spectrum (14-14.5 GHz), and for downlinks, Gogo seeks to use conventional Ku-band spectrum (11.7-12.2 GHz), extended Ku-band spectrum (10.95-11.2 GHz and 11.45-11.7 GHz), and international Ku-band spectrum (12.5-12.75 GHz), all on an unprotected, non-interference basis. Grant of the requested STA is consistent with Commission precedent and will serve the public interest by enabling Gogo to evaluate the terminals’ operational performance prior to full-scale deployment of Gogo’s planned ESAA network.

Gogo has filed an application for a blanket license for ESAA operations.³ That application includes complete technical information regarding the Gogo ESAA network and fully describes the AeroSat terminals that will be used in this testing. Gogo incorporates that information by reference herein.

Pending Commission action on the Gogo ESAA blanket license application, Gogo sought authority to initiate testing of its ESAA network. Gogo was granted Commission STA to perform ground-based testing of the AMSS terminals in the conventional Ku-band using the SES-1 and NSS-703 spacecraft.⁴ In October 2012, Gogo requested a 180-day STA to operate up

¹ *Gogo LLC*, Call Sign E120106, File No. SES-STA-20121121-01032, granted Dec. 19, 2012 (the “Gogo In-Flight Testing STA”).

² Gogo will activate ESAA terminals in foreign airspace only if Gogo has received any necessary authority from the foreign regulator to do so. Gogo has already been granted authority to operate terminals, or received confirmation that no authority is needed, in a number of foreign countries and has requests for such authorization or confirmation pending in other jurisdictions.

³ *Gogo LLC*, Call Sign E120106, File Nos. SES-LIC-20120619-00574; SES-AMD-20120731-00709 & SES-AFS-20121008-00902 (the “Gogo ESAA Application”). The public notice period for the Gogo AMSS Application has closed, and no party has opposed grant of the application. The only comments filed involve Gogo’s proposed operations in the 12.2-12.75 GHz band in ITU Region 2. *See* Comments of EchoStar Satellite Operating Corporation, File Nos. SES-LIC-20120619-00574 *et al.*, dated Nov. 16, 2012; Comments of EchoStar Satellite Operating Corporation and DIRECTV Enterprises, LLC, File Nos. SES-LIC-20120619-00574 *et al.*, dated Nov. 16, 2012. Because Gogo is not seeking authority here to use the 12.2-12.75 GHz band in ITU Region 2, the questions raised in the comments are not relevant to the requested STA.

⁴ *Gogo LLC*, Call Sign E120106, File No. SES-STA-20120727-00698, granted Aug. 29, 2012 (testing authority for communications with SES-1); File No. SES-STA-20121009-00908,

to 30 terminals in flight using the frequencies and satellites identified in the Gogo ESAA Application.⁵ That request remains pending.

More recently, Gogo requested and received Commission authority to operate a single ESAA terminal in flight in order to perform testing needed for FAA equipment certification.⁶ The terminal was authorized to communicate in the conventional Ku-band frequencies with the SES-1 and NSS-703 spacecraft in the airspace over the continental U.S. and adjacent territorial waters within a 500-mile radius of the Detroit, MI airport.⁷

Gogo herein seeks extension of the Gogo In-Flight Testing STA for an additional period of 60 days and expansion of the authority to allow further testing of ESAA terminals now that the FAA certification tests have been successfully completed. Gogo requests authority that differs from that granted in the Gogo In-Flight Testing STA in three respects. First, Gogo seeks authority to deploy and activate up to twenty terminals. Second, Gogo proposes to operate terminals within an expanded coverage area that encompasses the U.S., Canada, the North Atlantic and Western Europe to permit testing on a variety of flight routes, including those between the U.S. and Western Europe. Third, in addition to using conventional Ku-band spectrum, Gogo seeks authority to receive downlink signals in the 10.95-11.2 GHz and 11.45-11.7 GHz portions of the extended Ku-band.

The specific frequencies depend on the spacecraft providing service.⁸ The capacity Gogo will use on SES-1 and on NSS-703's spot beam 2 is in the conventional Ku-band. Gogo also proposes to use NSS-703's spot beam 1, which has downlink spectrum in the extended Ku-band, and NSS-703's spot beam 3, which has downlink spectrum in the international Ku-band. As Gogo has previously stated, the coverage of NSS-703 spot beam 3 is limited to ITU Region 1, consistent with the Ku-band FSS allocation for the 12.5-12.75 GHz band in that Region.⁹ Furthermore, Gogo will use the 12.5-12.75 GHz band in foreign airspace only if it has received either enabling authority granted by the relevant foreign regulator or a confirmation that no such authority is required.

granted Oct. 24, 2012 (extension for SES-1 and expansion of STA to include spot beam 2 on NSS-703); File No. SES-STA-20121219-01118, granted Dec. 27, 2012 (further extension for both SES-1 and NSS-703).

⁵ *Gogo LLC*, Call Sign E120106, File No. SES-STA-20121009-00907.

⁶ *See Gogo In-Flight Testing STA*, Narrative at 1.

⁷ *See id.*, grant conditions at 1.

⁸ A chart identifying the frequencies associated with each satellite proposed for use in the Gogo ESAA Application is on file with the Commission. *See Gogo LLC*, Call Sign E120106, File No. SES-AMD-20120731-00709 ("Gogo July Amendment"), Amended Technical Appendix at 7.

⁹ *See Gogo LLC*, Call Sign E120106, File No. SES-AFS-20121008-00902, Narrative at 6.

In all other respects, the planned testing will conform to the specifications described in the Gogo In-Flight Testing STA request and to the conditions adopted when that request was granted.¹⁰ Gogo seeks to perform testing only, with no provision of commercial services to customers for a fee. The testing will be conducted in a manner that is also consistent with the rules recently adopted by the Commission for ESAA networks, although those rules have not yet taken effect.¹¹ A full list of the conditions pursuant to which Gogo proposes to perform testing under this STA is provided in Attachment A hereto. In order to accommodate the schedule for the planned further testing, Gogo respectfully requests action on this STA request by January 15.

Grant of the requested authority will not adversely affect other licensed operations. Affidavits confirming that the proposed operation of the AeroSat terminals has been coordinated with operators of the satellites within six degrees on either side of both SES-1 and NSS-703 are already on file with the Commission.¹² The Gogo In-Flight Testing STA was coordinated through the National Telecommunications and Information Administration (“NTIA”) for operations through March 19, 2013.¹³ Gogo has entered into a coordination agreement with the National Science Foundation to protect radioastronomy operations¹⁴ and has negotiated an agreement with NASA to ensure protection of Tracking and Data Relay Satellite Service (“TDRSS”) facilities.¹⁵ Gogo will also comply with power flux density limits to protect terrestrial services outside the U.S. In any event, Gogo seeks to operate on an unprotected, non-harmful interference basis, so operations pursuant to the requested STA will not harm other regularly licensed Ku-band spectrum users.

¹⁰ For example, the conditions imposed require Gogo to operate on a non-interference basis, to conform to the terms of applicable coordination agreements, and to comply with requirements to maintain a point of contact with the ability to terminate operations and to perform certain record-keeping. *See* Gogo In-Flight Testing STA, grant conditions at 1-2.

¹¹ *See 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, 11.45-11.7 GHz, 11.7-12.2 GHz and 14.0-14.5 GHz Frequency Bands; Service Rules and Procedures to Govern the Use of Aeronautical Mobile Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed Satellite Service*, IB Docket Nos. 12-376 & 05-20, Notice of Proposed Rulemaking and Report and Order, FCC 12-161 (rel. Dec. 28, 2012) at Appendix C.

¹² Gogo July Amendment, Amendment Exhibit A.

¹³ *See* Gogo In-Flight Testing STA, grant conditions at 2.

¹⁴ *Id.*, Amendment Exhibit B.

¹⁵ The agreement with NASA has been finalized and signed by Gogo, and Gogo is currently awaiting receipt of the NASA counter-signature. Under the conditions proposed in Attachment A, Gogo would be barred from operating in the 14.0-14.2 GHz band within line of sight of an operational TDRSS facility until it has received the signed NASA agreement, and thereafter would be obligated to comply with the agreement’s terms.

Grant of the requested authority is consistent with prior Commission actions¹⁶ and will serve the public interest by permitting Gogo to continue developing a competitive ESAA network that will enhance service to air travelers and airline crew members.

¹⁶ The International Bureau has previously granted special temporary authority for other entities to perform testing of ESAA terminals pending regular licensing of ESAA operations. *See, e.g., Row 44, Inc.*, File No. SES-STA-20080711-00928, grant-stamped Mar. 13, 2009 (60-day STA for in-flight testing of twelve ESAA terminals).

Attachment A: Proposed Conditions for Operation

Gogo proposes to perform the testing described in this STA request pursuant to the following conditions:

1. Temporary authority is granted for in-flight testing over the continental U.S. and adjacent territorial waters and over Canada, the North Atlantic, and Western Europe.
2. Gogo LLC must not cause harmful interference to, and must not claim protection from, any other lawfully operating radio station. In the event harmful interference results from operation pursuant to this authorization, Gogo LLC must cease operations immediately upon notification of such interference, and must immediately inform the Federal Communications Commission, in writing, of the incident.
3. Operation pursuant to this authorization must be in compliance with the terms of Gogo LLC's coordination agreement with the National Science Foundation pertaining to operation of aircraft earth stations in the Ku-Band.
4. Gogo LLC may not operate in the 14.0-14.2 GHz band within line of sight of any operational National Aeronautics and Space Administration (NASA) Tracking and Data Relay Satellite Service (TDRSS) facilities until Gogo LLC has a signed coordination agreement with NASA. Once the Gogo LLC coordination agreement with NASA is in place, Gogo LLC will comply with the terms of that agreement pertaining to operation of aircraft earth stations in the Ku-band in the vicinity of TDRSS facilities.
5. Operation pursuant to this authorization must conform with the terms of coordination agreements between a) the operator of NSS-703 and operators of other Ku-band geostationary satellites within six angular degrees of NSS-703, and b) the operator of SES-1 and operators of other Ku-band geostationary satellites within six angular degrees of SES-1.
6. Communications between Gogo LLC's earth station and the NSS-703 space station must be in compliance with all existing and future space station coordination agreements reached between Gibraltar and other Administrations.
7. Gogo LLC must take all necessary measures to ensure that the operation authorized 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. 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. 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.

8. Gogo LLC must maintain a point of contact who will be available 24 hours per day, seven days per week, with the authority and ability to terminate operations authorized, for discussing interference concerns with other licensees and U.S. Government agencies. For operations under this STA, the point of contact is: Network Operations Center, Gogo LLC, 1250 N. Arlington Heights Road, Itasca, IL 60143, NOC Engineer on Duty, Phone: +1 866-943-4662, e-mail: noc@aircell.com.
9. Aircraft earth stations 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.
10. Aircraft earth stations 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 aircraft earth station to determine if it is malfunctioning, and each aircraft earth station must self-monitor and automatically cease transmission on detecting an operational fault that could cause harmful interference to a fixed satellite service network.
11. Stations authorized herein must not be used to provide air traffic control communications.
12. Gogo shall maintain records of the following data for each operating aircraft earth station: location (latitude, longitude, altitude); aircraft attitude (pitch, yaw, roll); transmit frequency and occupied bandwidth; data rate; EIRP; and target satellite. This data shall be recorded at intervals of no more than two minutes while an AES is transmitting and every 30 seconds when aircraft roll angle is greater than 10 degrees. Gogo shall also record instances when AES pointing error exceeds 0.2 degrees. Gogo shall make this data available upon request to an FSS system operator or the Commission within 24 hours after receiving the request.
13. Grant of this authorization is without prejudice to any determination that the Commission may make regarding pending (SES-LIC-20120619-00574, SES-AMD-20120731-00709, SES-AFS-20121008-00902, and SES-STA-20121009-00907) or future applications.
14. Any action taken or expense incurred as a result of operations pursuant to this special temporary authority is solely at Gogo LLC’s risk.
15. In the 10.95-11.2 GHz (space-to-Earth) and 11.45-11.7 GHz (space-to-Earth) frequency bands, Gogo LLC shall not claim protection from interference from any authorized terrestrial stations to which frequencies are either already assigned, or may be assigned in the future.
16. Each Gogo LLC ESAA terminal shall automatically cease transmitting within 100 milliseconds upon loss of reception of the satellite downlink signal or when it detects that unintended satellite tracking has happened or is about to happen.

17. Each Gogo LLC ESAA terminal shall be self-monitoring and, should a fault which can cause harmful interference to FSS networks be detected, the terminal must automatically cease transmissions.
18. While operating in the international airspace within line-of-sight of the territory of a foreign administration where fixed service networks have primary allocation in the Ku-band, the maximum power flux density (pfd) produced at the surface of the Earth by emissions from a single aircraft carrying a Gogo LLC ESAA terminal shall not exceed the following values unless the foreign Administration has imposed other conditions for protecting its fixed service stations:

$-132+0.5 \cdot \theta$	dB(W/(m ² · MHz))	For	$\theta \leq 40^\circ$
-112	dB(W/(m ² · MHz))	For	$40^\circ < \theta \leq 90^\circ$

Where: θ is the angle of arrival of the radio-frequency wave (degrees above the horizontal) and the aforementioned limits relate to the pfd and angles of arrival that would be obtained under free space propagation conditions.

19. Prior to operations within a foreign nation's airspace, Gogo LLC will ascertain whether the relevant administration has operations that could be affected by ESAA terminals, and will determine whether that administration has adopted specific requirements concerning ESAA operations. When the aircraft enters foreign airspace, the ESAA terminal is required to operate under the Commission's rules, or those of the foreign administration, whichever is more constraining. To the extent that all relevant administrations have identified geographic areas from which ESAA operations would not affect their radio operations, Gogo LLC is free to operate within those identified areas without further action. To the extent that the foreign administration has not adopted requirements regarding ESAA operations, Gogo LLC is required to coordinate its operations with any potentially affected operations.