

NARRATIVE STATEMENT

In this Application, The Boeing Company (“Boeing”) requests that the Commission modify Boeing’s existing experimental license to operate ten (10) mobile aircraft terminals (Call Sign WC2XVE, File No. 0145-EX-PL-2001) to permit it: (i) to operate on U.S. aircraft flying beyond the continental United States (“CONUS”), Hawaii and Alaska and in international airspace; (ii) to add new emission designators; (iii) to fulfill a contract with the United States Government; (iv) to conduct limited market studies; and (v) to add the EUTELSAT II-F4 satellite as an authorized point of communication for experimental stations on U.S. aircraft in international airspace. As demonstrated herein, expanding Boeing’s experimental operations in the manner requested would strongly serve the public interest, and is fully consistent with the Commission’s jurisdiction under the Communications Act of 1934, as amended, and past practices for granting experimental licenses.

I. AUTHORIZING BOEING TO CONDUCT EXPERIMENTAL OPERATIONS ON U.S. AIRCRAFT IN INTERNATIONAL AIRSPACE WOULD SERVE THE PUBLIC INTEREST AND IS CONSISTENT WITH THE FCC’S JURISDICTION

On March 29, 2002, Boeing was authorized by the Commission to operate in the 14-14.5 GHz band, on an experimental basis, up to ten (10) technically identical mobile aircraft stations aboard U.S. aircraft communicating with ALSAT Ku-band satellites (*i.e.*, U.S. licensed satellites and those foreign-licensed satellites on the Permitted Space Station list) over CONUS, plus

Alaska and Hawaii.¹ As the Commission is aware, many of these satellites have footprints that can serve areas well beyond CONUS, plus Alaska and Hawaii. To maximize the benefits to be derived from its experimental operations, Boeing seeks authority to operate its experimental stations on aircraft traveling outside of the United States in international airspace.

A. Authorizing Boeing To Operate its Experimental Stations On U.S. Aircraft in International Airspace Would Serve the Public Interest

As discussed in its prior experimental applications, development of Boeing's innovative two-way Aeronautical Mobile-Satellite Service ("AMSS") will provide substantial public interest benefits to U.S. Government, military and commercial users.² However, the important public interest factors that supported Commission grant of Boeing's prior experimental licenses do not end at the borders of the continental United States, Alaska and Hawaii. Rather, the benefits derived from two-way broadband connectivity aboard U.S. aircraft extend well beyond the boundaries of the United States. Of course, international flights by U.S. carriers necessarily

¹ See *The Boeing Company*, Experimental Radio Station Construction Permit and License, Call Sign WC2XVE, File No. 0145-EX-PL-2001 (effective March 29, 2002) ("*Boeing Experimental Authorization*").

² See *The Boeing Company*, Experimental Radio Station Application, File No. 0051-EX-ML-2000; *The Boeing Company*, Experimental Radio Station Application, File No. 0145-EX-PL-2001.

enter international airspace, and even U.S. domestic flights often travel into international or foreign airspace.³ As a result, there is a compelling need for Boeing to test and demonstrate its experimental stations in international airspace within the coverage areas of their authorized points of communication.

B. Authorizing Boeing To Operate its Experimental Stations On U.S. Aircraft in International Airspace Is Consistent with the FCC’s Jurisdiction

Authorizing Boeing to operate its experimental stations aboard U.S. aircraft in international airspace is fully consistent with the Commission’s jurisdiction under the Communications Act of 1934, as amended, and with past Commission practice. Section 301(e) of the Communications Act grants the Commission jurisdiction to license the operation of radio stations “upon any vessel or aircraft of the United States,” without regard to the geographic location of the aircraft.⁴ This conclusion is consistent with longstanding FCC precedent

³ For example, U.S. domestic flights in the northeast enter international airspace over the Atlantic Ocean, flights to Hawaii and U.S. Pacific territories cross vast expanses of the Pacific Ocean, flights to U.S. territories in the Caribbean enter international airspace in that region, and flights to Alaska often travel through Canadian and international airspace.

⁴ See 47 U.S.C. § 301(e). In contrast, another immediately adjacent jurisdictional provision of Section 301 contains an explicit geographic restriction on certain radio stations over which the FCC has jurisdiction. Compare 47 C.F.R. § 301(e) with § 301(f) (“upon any other mobile stations *within the jurisdiction of the United States . . .*”) (emphasis added). Moreover, Section 301(e) *specifically eliminated* the geographic restriction on aircraft radio licensing (Continued ...)

involving Commission exercise of substantive jurisdiction over and licensing of satellite earth stations operating beyond the territorial limits of the United States.⁵ Furthermore, the Commission has issued on numerous occasions experimental authorizations for operations outside U.S. territorial limits.⁶

jurisdiction previously established by Section 1 of the Radio Act of 1927, the provision on which Section 301 is based. *See* Radio Act of 1927, P.L. No. 632, 69th Cong. (Feb. 23, 1927) at § 1. Section 1 of the Radio Act granted licensing authority over radio stations “(e) upon any vessel of the United States, or (f) upon any *aircraft or mobile stations within the United States. . .*”). *Id.* (emphasis added).

⁵ *E.g.*, *AMSC Subsidiary Corp.*, 10 FCC Rcd. 10924 (1995) (granting modification of blanket earth station license for 200,000 mobile earth terminals to operate throughout the United States and in U.S. coastal waters up to 200 miles offshore, the service area of the associated U.S.-licensed MSS satellite); *Aeronautical Radio, Inc., et al., Petition for Waiver of 87.147 and 87.187 of the Commission’s Rules*, 5 FCC Rcd. 3038 (1998) (granting a waiver of FCC rules to permit commercial airlines to operate aircraft earth stations internationally for communications using Inmarsat).

⁶ *See, e.g.*, Woods Hole Oceanographic Institution, Experimental Radio Station Construction Permit and License, Call Sign WA2XVB, File No. 6290-EX-PL-1998 (effective Dec. 21, 1998) (authorizing mobile satellite earth station operations in “oceans worldwide”); Woods Hole Oceanographic Institution, Experimental Radio Station Construction Permit and License, Call Sign WC2XOI, File No. 0031-EX-PL-2001 (effective Jan. 26, 2001) (authorizing mobile station operations up to 80 km into the ocean); AT&T Corp., Call Sign WA2XFW (1997) (authorizing communications between ships at sea in the “Pacific, Atlantic and Indian Oceans, and Gulf of Mexico”).

The Commission's decisions in the *Maritime Telecommunications Network, Inc.* ("MTN") orders are in accord.⁷ In those cases, the FCC concluded that it did not have jurisdiction over earth stations MTN sought to operate on *foreign vessels* because Section 306 of the Communications Act deprives the Commission of any authority to issue a license for an earth station on a non-U.S. vessel.⁸ Here, Boeing seeks authority to operate its experimental earth stations on *U.S. registered aircraft* in international airspace. Indeed, the *MTN* cases stand squarely for the proposition that the Commission can license earth station operations outside United States territory because MTN was, in fact, authorized to operate earth stations on U.S. vessels more than 100 kilometers from land.⁹ Thus, there is no question that the FCC has statutory authority to authorize Boeing to operate its experimental earth stations on U.S. aircraft traveling outside the continental United States, Alaska and Hawaii.

⁷ See *Maritime Telecommunications Network, Inc.*, Order on Reconsideration and Memorandum Opinion and Order, DA 01-1283 (Int'l Bur. rel. June 5, 2001) ("*MTN Reconsideration Order*"); *Maritime Telecommunications Network, Inc.*, Order, DA 00-1300 (Int'l Bur., rel. Sept. 29, 2000) ("*MTN Order*").

⁸ E.g., *MTN Reconsideration Order* at ¶¶ 13-19, 46.

⁹ E.g., *MTN Order* at ¶ 4.

II. THE TECHNICAL CONDITIONS CONTAINED IN BOEING'S EXISTING EXPERIMENTAL AUTHORIZATION ARE SUFFICIENT TO AVOID THE POSSIBILITY OF HARMFUL INTERFERENCE FROM THE REQUESTED MODIFIED OPERATIONS

In lieu of specifying frequency tolerance in Boeing's experimental authorization, the Commission imposed occupied bandwidth and power limitations to avoid the possibility of harmful interference from Boeing's experimental operations.¹⁰ Boeing recognizes and accepts that the operational conditions set forth in its existing experimental authorization will apply to its modified operations in U.S. and international airspace. These conditions will enable Boeing's experimental operations to proceed without causing any harmful interference to other authorized stations operating, either domestically or internationally, in the 14.0-14.5 GHz band. Boeing further confirms that it will operate its experimental stations aboard aircraft outside the United States in accordance with the interference levels that have been accepted by other Fixed-Satellite Service ("FSS") systems in coordinating with satellites that are authorized points of communication for Boeing's experimental stations.

In this connection, the new emission designators Boeing proposes to add to its experimental authorization either fall within the coordinated interference levels of the Ku-band

¹⁰ *Boeing Experimental Authorization at 1 and Special Condition 1.*

FSS satellites with which Boeing's experimental earth stations will communicate, or within the envelope of Boeing's previously authorized experimental transmissions. Specifically, Boeing requests authority to add an 11.9 MHz transmission using an FDMA multiple access scheme over standard Ku-band FSS transponders with a corresponding emission designator of 11M9G7D.¹¹ Furthermore, the e.i.r.p. of each channel would be reduced from 45.9 dBW (24 kW ERP) to 38.2 dBW (4.1 kW ERP). Because the relative e.i.r.p. reduction is greater than the bandwidth reduction, the e.i.r.p. density of each channel also decreases from the previously authorized levels. On the other hand, three experimental aircraft earth stations each simultaneously transmit an 11M9G7D signal over a single satellite transponder (*e.g.*, over Americom-4) then the aggregate e.i.r.p envelope of the three signals would slightly exceed the maximum e.i.r.p envelope of the currently authorized 24M3G7D signal.¹² However, as shown in Figure 1, below, the aggregate e.i.r.p. would still be less than the envelope of a similar 32.4 MHz

¹¹ For example, three separate 11.9 MHz signals could be sent through a single Americom-4 satellite 36 MHz transponder (*see* Figure 1 below), or two separate signals could be sent through a single Telstar-6 satellite 24 MHz transponder (*see* Figure 2 below).

¹² For this reason, Boeing requests specific FCC authority to add the 11M9G7D transmission, rather than merely notifying the Commission of a change in emission characteristics pursuant to Section 5.77(b) of the Rules.

signal with an e.i.r.p. of 45.9 dBW that already has been coordinated for the Americom-4 satellite.

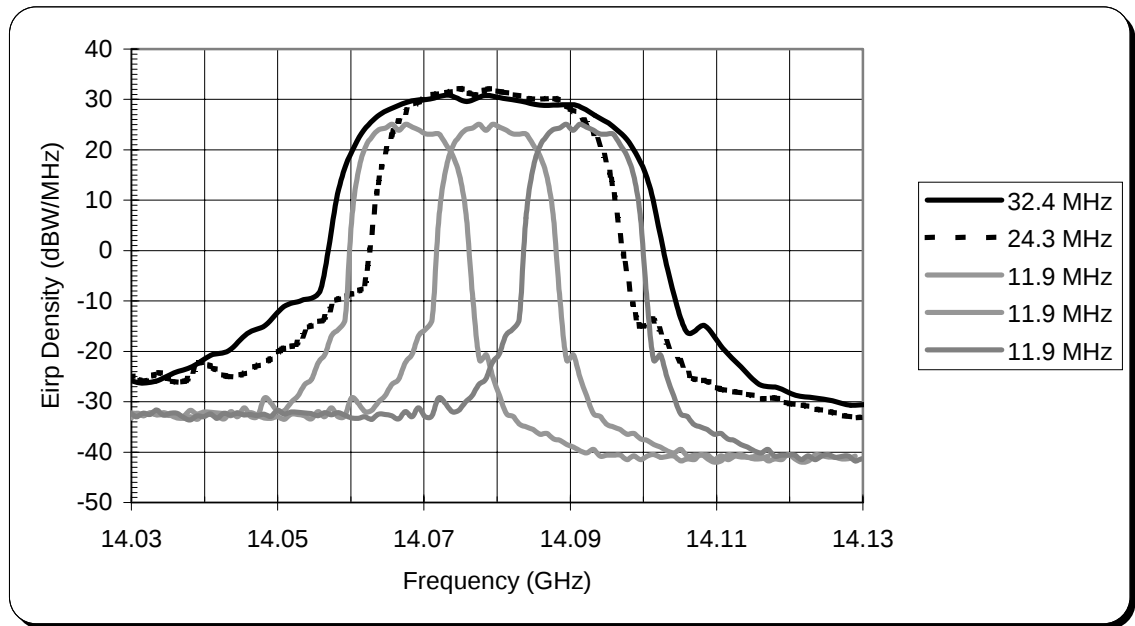


Figure 1. Aggregate spectrum for Americom-4

In addition, Figure 2 shows that if an experimental earth station simultaneously transmits two 11M9G7D signals over a single satellite transponder (*e.g.*, over Telstar-6), then the aggregate e.i.r.p falls within the envelope of Boeing's currently authorized 24M3G7D signal.

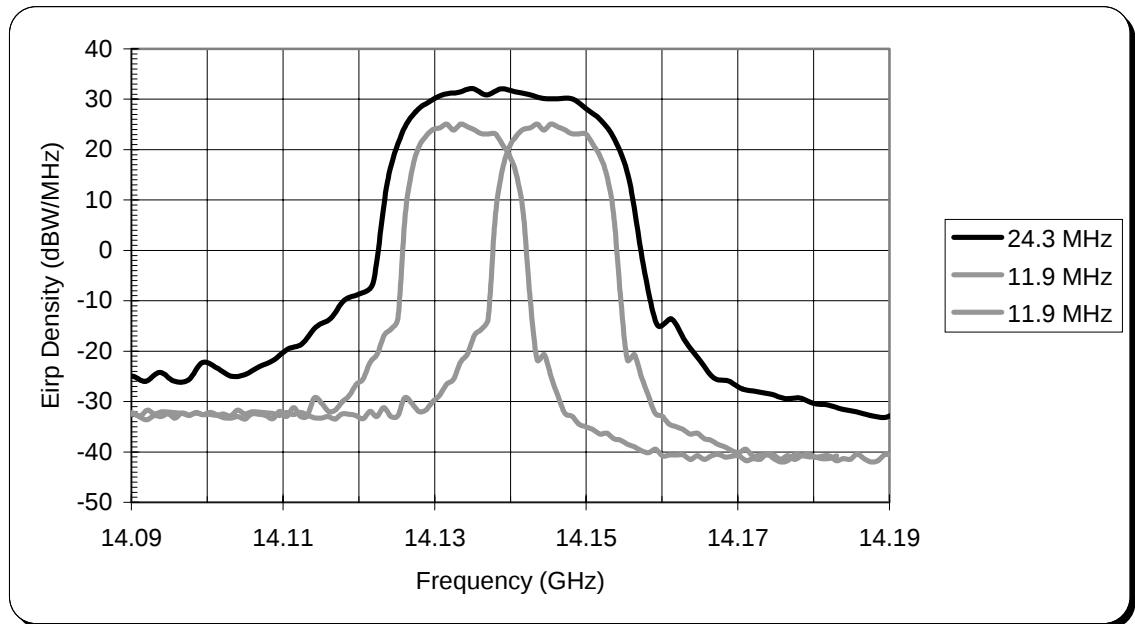


Figure 2. Aggregate spectrum for Telstar-6

Boeing also seeks to add two other emission designators to take advantage of the wider bandwidths available on other ALSAT Ku-band satellites. Specifically, Boeing requests Commission authority to add the following emission designators: 32M4G7D, with a maximum e.i.r.p. of 45.9 dBW and a maximum e.i.r.p density of 30.8 dBW/MHz; and 29M5G7D, with a maximum e.i.r.p. of 45.9 dBW and a maximum e.i.r.p density of 31.2 dBW/MHz. Because these emissions have a wider bandwidth and lower e.i.r.p. density than Boeing's currently authorized

24M3G7D signal, they fall within the maximum emissions envelope established in Boeing's existing experimental authorization.¹³

Accordingly, Boeing's requested modification to include additional emission designators will have no adverse impact on other users of the Ku-band. As an experimental station, Boeing further recognizes that it must not cause harmful interference to any other authorized station operating domestically or internationally in the 14.0-14.5 GHz band, and that it will immediately cease its experimental operations upon notification of any such harmful interference resulting from its operations.

III. AUTHORIZING BOEING TO CONDUCT EXPERIMENTS TO FULFILL CONTRACTUAL AGREEMENTS WITH THE UNITED STATES GOVERNMENT WOULD SERVE THE PUBLIC INTEREST

Pursuant to Sections 5.3(b) and 5.63(b) of the Rules, Boeing also requires an expansion of its experimental authorization to encompass operations that will be conducted pursuant to a government contract. Boeing currently has a contract with the U.S. Air Force Materiel Command ("AFMC"), Contract No. F33657-01-D-0013, to provide, among other things, two-way broadband digital communications to U.S. Government aircraft.

¹³ These two emission designators are subject to the notification procedures set forth in Section 5.77(b) of the Rules.

The Commission has authorized experimental operations in fulfillment of government contracts on countless occasions, necessarily finding that such experimental operations would serve the public interest.¹⁴ In this case, the direct and substantial public benefits of the services provided under Boeing's contract are profound. Boeing's experimental operations will afford U.S. Government officials and decision makers access to real-time, broadband communications services aboard government aircraft, enabling them to communicate effectively and make timely and informed decisions affecting national security, foreign policy and other important U.S. Government matters. The need for U.S. Government access to such advanced communications services has never been clearer, particularly at this critical juncture following the recent terrorist attacks on the United States and heightened international tensions. Thus, authorizing Boeing's experimental operations to provide critical communications services pursuant to a contract with the U.S. Government plainly would serve the public interest.

¹⁴ See, e.g., Woods Hole Oceanographic Institution, Experimental Radio Station Construction Permit and License, Call Sign WA2XVB, File No. 6290-EX-PL-1998 (effective Dec. 21, 1998) (authorizing mobile satellite earth station operations required by National Science Foundation, an independent agency of the United States Government, in "oceans worldwide"); AT&T Corp., Call Sign WA2XFW (1997) (new experiment to test point-to-point communications between ships at sea to fulfill U.S. Navy contract); Lockheed Martin Corp., Call Sign WA2XGJ (1997) (new experiment to support U.S. Army contract); Westinghouse Comm. Services, Inc., Call Sign KG2XLV (1995) (new experimental for fulfillment of U.S. Navy contract).

**IV. AUTHORIZING BOEING TO CONDUCT LIMITED MARKET STUDIES
WOULD SERVE THE PUBLIC INTEREST**

Pursuant to Sections 5.3(j) and 5.93 of the Rules, Boeing requests authority to conduct limited market studies to demonstrate and validate its innovative service offerings. As noted in Boeing's prior experimental application, commercial airlines, military services and government agencies have expressed a desire to obtain in-flight, two-way data communications services.¹⁵ As the Commission is aware, further development and ultimate deployment of Boeing's innovative communications system will improve commercial airline safety and efficiency by providing greater information regarding aircraft operations, and will provide airline passengers with more versatile in-flight services. In addition, U.S. military and government users will have access to critical, real-time information and the means to conduct multi-party videoconferences and other communications between personnel in transit and on the ground.

Boeing continues to finance internally the considerable costs associated with developing its AMSS system. It has made significant progress to date in demonstrating the technical feasibility of its proposed services and equipment. However, in order to demonstrate the economic feasibility of its service offerings to prospective customers, Boeing may need to

¹⁵ See The Boeing Company, Experimental Radio Station Application, File No. 0145-EX-PL-2001.

conduct limited market studies on commercial and business aircraft. The requested modification of its experimental license will provide Boeing with sufficient flexibility to do so as the need arises. In this regard, Boeing agrees to abide by the conditions set forth in Section 5.93 of the Rules for conducting such studies.

Because Boeing's existing experimental license authorizes the operation of only ten (10) mobile stations, any market studies conducted using these stations necessarily would be "limited" in scope and comply with the Commission's Rules. This conclusion is underscored by Boeing's estimate that full commercial introduction of its in-flight, two-way data communications service would require hundreds, if not thousands, of mobile aircraft earth stations to meet expected demand for two-way broadband service. Accordingly, the planned scope of these market studies is appropriate to the nature of the service provided and not larger than is necessary to adequately examine market responses and technological performance under market conditions.¹⁶ In view of these circumstances, and the substantial public benefits that will

¹⁶ See *Amendment of Part 5 of the Commission's Rules to Revise the Experimental Radio Service Regulations, Report and Order*, ET Docket No. 96-256, FCC 98-283 at ¶ 23 (rel. Oct. 27, 1998).

result from further development of Boeing's innovative services authorizing Boeing to conduct limited market studies plainly would serve the public interest.¹⁷

V. AUTHORIZING BOEING TO COMMUNICATE WITH THE EUTELSAT II-F4 SATELLITE WOULD SERVE THE PUBLIC INTEREST

Boeing also requests authority to add the EUTELSAT II-F4 satellite as an authorized point of communication for experimental stations on U.S. aircraft in international airspace only.¹⁸ The EUTELSAT II-F4 satellite, operated by EUTELSAT and coordinated by the Administration of France, is in the process of being moved from its former orbital location of 25.5° E.L. to 12.5° W.L., and should begin operating at its new location by mid-July 2002. EUTELSAT intends to file a petition for declaratory ruling to add EUTELSAT II-F4 to the U.S. Permitted Space Station List. However, because a final FCC decision in that proceeding could take some months and Boeing seeks to communicate with this satellite when it becomes operational at 12.5° W.L., Boeing respectfully requests that the Commission add the

¹⁷ See, e.g., *Mobile Telesystems, Inc.*, Call Sign KE2XFK (1995) (new experimental authorization to demonstrate terminals to prospective buyers); *Aircell, Inc.*, Order, DA 98-2590 (WTB, rel. Dec. 24, 1998) at ¶¶ 4-5.

¹⁸ Boeing does not seek FCC authority for its experimental earth stations on planes operating in U.S. airspace to communicate with the EUTELSAT II-F4 satellite.

EUTELSAT II-F4 satellite as an authorized point of communication for Boeing's experimental earth stations on aircraft operating outside the United States.

In this connection, the Commission already has included a virtually identical EUTELSAT satellite currently operating at the 12.5° W.L. orbital location, EUTELSAT II-F2, on the Permitted Space Station List.¹⁹ For all of the reasons set forth in the Commission's order placing EUTELSAT II-F2 and other EUTELSAT satellites on the Permitted Space Station List,²⁰ Boeing requests that EUTELSAT II-F4 be added as an authorized point of communication for its experimental aircraft earth station operations. Because the EUTELSAT II-F4 satellite will be used along with other authorized points of communication to provide the services described herein, authorizing Boeing to communicate with EUTELSAT II-F4 would strongly serve the public interest.

Finally, it is important to note that Boeing has limited its request to communicate with EUTELSAT II-F4 to experimental earth stations on U.S. aircraft operating in international

¹⁹ See *European Telecommunication Satellite Organization*, Order, File No. SAT-PDR-20000214-00059, DA 00-1741 (rel. Aug. 11, 2000); see also FCC Permitted Space Station List, available at <<http://www.fcc.gov/ib/sd/se/permitted.html#5>>.

²⁰ See *European Telecommunication Satellite Organization*, Order, File Nos. SAT-PDR-20010118-00011 and SAT-PDR-20010207-00012, DA 01-2040 (rel. Aug. 30, 2001).

airspace. Because these experimental stations will operate outside the United States only, the typical coordination and other concerns associated with a foreign satellite communicating with earth stations located in the United States (*e.g.*, compliance with two-degree spacing, domestic spectrum allocation limitations, etc.) do not apply. As noted above, however, Boeing will operate its experimental stations within the coordinated operational parameters of the EUTELSAT II-F4 satellite and in accordance with the technical limitations set forth herein.

VI. CONCLUSION

For all of the foregoing reasons, Boeing respectfully requests that the Commission modify Boeing's experimental authorization to permit expanded operations of its experimental stations as set forth herein and the accompanying FCC Form 442.