

**I. EXHIBIT A, WAIVER REQUESTS
RESPONSE TO QUESTION 35**

The Commission’s Rules may be waived “for good cause shown.”¹ In particular, a waiver of the U.S. Table of Allocations to permit non-conforming spectrum uses can be granted “when there is little potential interference into any service authorized under the Table of Frequency Allocations and when the non-conforming operator accepts any interference from authorized services.”² A waiver is also appropriate where a grant “would not undermine the underlying policy objectives of the rule in question” and would be in the public interest.³ As explained below, each of these standards is satisfied in this case. Analysis (*see below*) of the proposed antenna system at the Boeing Herndon, Virginia facility indicates that the system can operate similarly to the antenna system required under US356 without causing interference. The proposed waivers conform to the Commission’s underlying policy considerations and promote efficient spectrum use as well as maximizing the effectiveness in allocating additional frequencies for unique users that otherwise could not be met with spectrum currently allocated to the conventional Ku band users.

¹ 47 C.F.R. § 1.3; *WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969).

² *See Boeing Transmit Receive Order*, ¶ 12; *Fugro-Chance, Inc.*, Order and Authorization, 10 FCC Rcd. 2860, 2860, ¶ 2 (Int’l Bur. 1995) (authorizing non-conforming MSS in the C-band); *see also Motorola Satellite Communications, Inc.*, Order and Authorization 11 FCC Rcd. 13952, 13956, ¶ 11 (Int’l Bur. 1996) (authorizing service to fixed terminals in bands allocated to the mobile-satellite service).

³ *See GE American Communications, Inc.*, Order and Authorization, 15 FCC Rcd. 3385, 3391, ¶ 14 (Int’l Bur. 1999).

II. USE OF 13.9-14 GHz FREQUENCY BAND

The Boeing Company seeks authority to use spectrum in the 13.9-14 GHz band for Fixed Satellite Service (FSS) uplinks to the Telstar 12V satellite constellation. The 13.75 GHz-14.0 GHz band is allocated to both Non-Federal fixed-satellite service (FSS) users, and U.S. Government Radiolocation services on a primary basis. Pursuant to Section 1.3 of the Commission's rules⁴, Boeing hereby requests a waiver of 47 CFR 2.106 – United States Table of Frequency Allocations, footnote US356⁵. Footnote US356 states that, FSS users are required to have a minimum antenna diameter of 4.5 meters (m) and have an Equivalent Isotropically Radiated Power (EIRP) between 68 dBW and 85 dBW. Boeing is seeking waver to use a 3.8m antenna from the Boeing Herndon, Virginia facility for services on the Telstar 12V satellite. Boeing's analysis of the proposed 3.8m antenna in lieu of the required 4.5m antenna yields similar maximum EIRP per carrier, and EIRP Density toward the Horizon. Authorization is warranted in this case because the Telstar 12V satellite located at the central orbital location 15W.L. under call sign S2933 was not granted conventional Ku band operational frequencies⁶ (14.0 GHz-14.5 GHz). Telstar 12V is the only satellite on the US permitted space station list that offers extended Ku-band data services into Europe, Africa, and the Middle East from the United States.

⁴ 47 C.F.R § 1.3.

⁵ 47 CFR 2.106 - Table of Frequency Allocations, footnote US356

⁶ S2933, SAT-LOA-20141010-00107

III. PROTECTION OF U.S. GOVERNMENT RADIOLOCATION

Boeing is seeking waver to use a 3.8m antenna from the Boeing Herndon, Virginia facility for services on the Telstar 12V satellite. Boeing's analysis of the proposed 3.8m antenna in lieu of the required 4.5m antenna yields similar maximum EIRP per carrier, and EIRP Density toward the Horizon. *See below*

Maximum EIRP (on axis):

$$\text{EIRP (dBW)} = \text{Pt (dBW)} + \text{Lt (dB)} + \text{Gt (dBi)}$$

$$(3.8\text{m}) = 12.04 \text{ dBW} + 0 + 53\text{dBi} = 65.04\text{dBW}$$

$$(4.5\text{m}) = 12.79 \text{ dBW} + 0 + 53.6\text{dBi} = 66.4\text{dBW}$$

Equivalent Off Axis Antenna Gain for both antenna's for a minimum elevation angle of 7° is:

$$29-25\log_{10}\theta \text{ for } 1.5^\circ \leq \theta \leq 7^\circ.$$

$$29-25\log_{10}(7) = -7.9 \text{ dBi}$$

—Boeing analysis shows that the 3.8m antenna system produces similar RF characteristics as a 4.5 m antenna system. Boeing therefore request that commission grant this application.