Request for
Special Temporary Authority

1 Nature of Request

Pursuant to ESAA license call sign E140097, Boeing operates on a near global basis its Boeing Broadband Satellite Network ("BBSN") to exclusively serve the needs of the United States Air Force Air Mobility Command ("AFAMC"). Boeing has been working with the Air Force to identify a new generation of transmit/receive antennas that are suitable for use on a new generation of aircraft that the Air Force is bringing into service.

Pursuant to FCC Experimental Call Sign, WH2XJL, Boeing has been conducting ground and domestic flight testing with one such candidate antenna – the Viasat KuKarray antenna – to ensure that it satisfies the mission requirements. The Air Force has now requested that Boeing begin on September 14, 2015 a new series of tests involving flight operations over international waters transiting both the Atlantic and Pacific oceans. Boeing's Experimental Call Sign, WH2XJL expressly limits its cover to domestic testing and excludes any testing over international waters. Therefore, Boeing requires a grant of Special Temporary Authority from the International Bureau for a period of 60 days to conduct the international waters testing that the Air Force is requiring.

2 Public Interest Justifications

Pursuant to Section 25.120 of the Commission's rules, extraordinary circumstances exist for the expeditious grant of this application. Boeing's BBSN exclusively serves the needs of the United States AFAMC to support the operation of critically-important VIP/SAM (Very Important Personnel/Special Air Mission) aircraft used to transport senior leadership of the U.S. Government and the Department of Defense. The BBSN achieves near global coverage through the use of selected U.S. and foreign satellites.

Grant of the requested STA would serve the public interest because the U.S. Air Force has requested the prompt completion of tests on a new generation of transmit/receive antenna that can be employed on new aircraft that the Air Force is bringing into service. It was not originally understood that this testing would require flight operations over international waters, but the Air Force has now indicated that such testing must be conducted. Boeing is therefore requesting that this application be granted on an expeditious basis. Boeing would operate the antenna under this STA on an unprotected, non-harmful interference basis.

3 Antenna Designation

The KuKarray antenna, manufactured by ViaSat, transmits and receives using a single horn array aperture that is mechanically steered to acquire and track the desired satellite through aircraft flight maneuvers and over a large geographic range. The polarization angle is electronically rotated to match the polarization of the satellite. The horn array aperture is mounted on the top of the aircraft body and enclosed in a radome. Associated support

electronics will be installed in the aircraft fuselage. Table 1 below provides the specifications for the KuKarray terminal, and Figure 1 provides a picture of the antenna

Specification	**Antenna Data**
Aperture Dimensions	**76.20** x **15.24** cm rectangular
Transmit Band	**14.0-14.5** GHz
Receive Band	**10.95-12.75** GHz
Frequency Tolerance	< +/-10 kHz
G/T	**11.0** dB/K **@ 11.85 GHz** (clear sky, in level flight @30k ft,-55°C air temp, EL >45°, w/ KuKarray radome)
Transmit Gain	**~33.6** dBi **@ 14.25 GHz**
Receive Gain	**~32.0** dBi **@ 11.85 GHz**
EIRP	**46.0** dBW min, **47.0** dBW typical
Pointing Error	**0.2**° degrees rms

Table 1. KuKarray Specifications

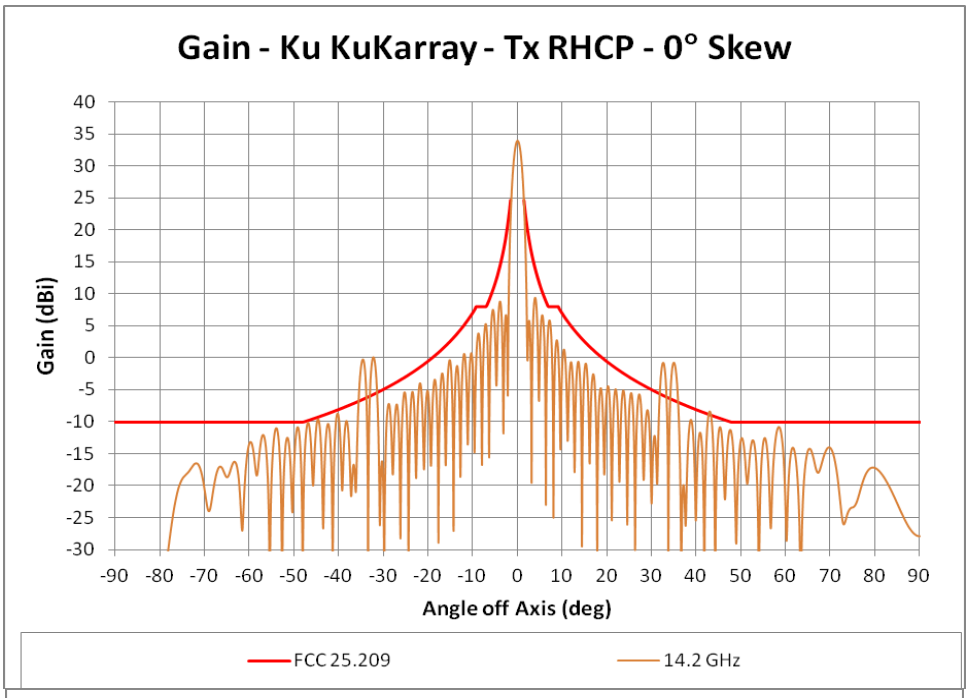
Figure 1. KuKarray Antenna Picture

3.1 Antenna Control and Pointing

The KuKarray antenna employs mechanical steering of the azimuth and elevation apertures. The antenna is pointed based on aircraft IRU data which is calibrated to the antenna at installation.

3.2 Antenna Gain Patterns

Pursuant to §25.132(b)(1-2), Boeing provides the following antenna gain patterns for the KuKarray antenna. Both azimuth (Az) and elevation (El) patterns are provided for vertical (V) and horizontal (H) polarization at 14.2 GHz.



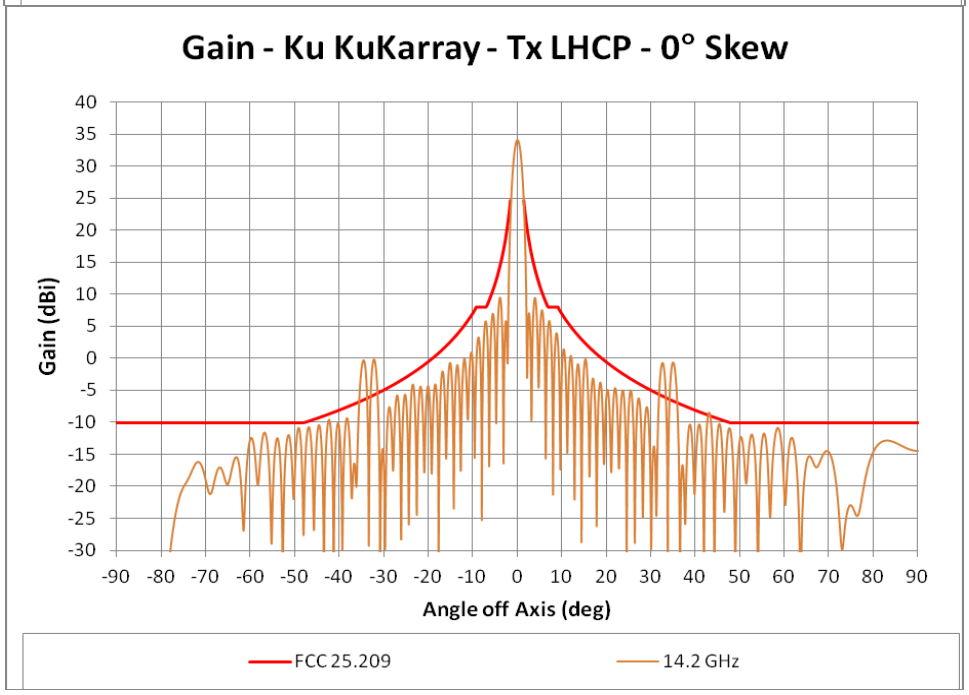


Figure 2: Antenna Measured RHCP & LHCP Azimuth Pattern at 14.2 GHz at Thetas between -75 and 75 degrees.

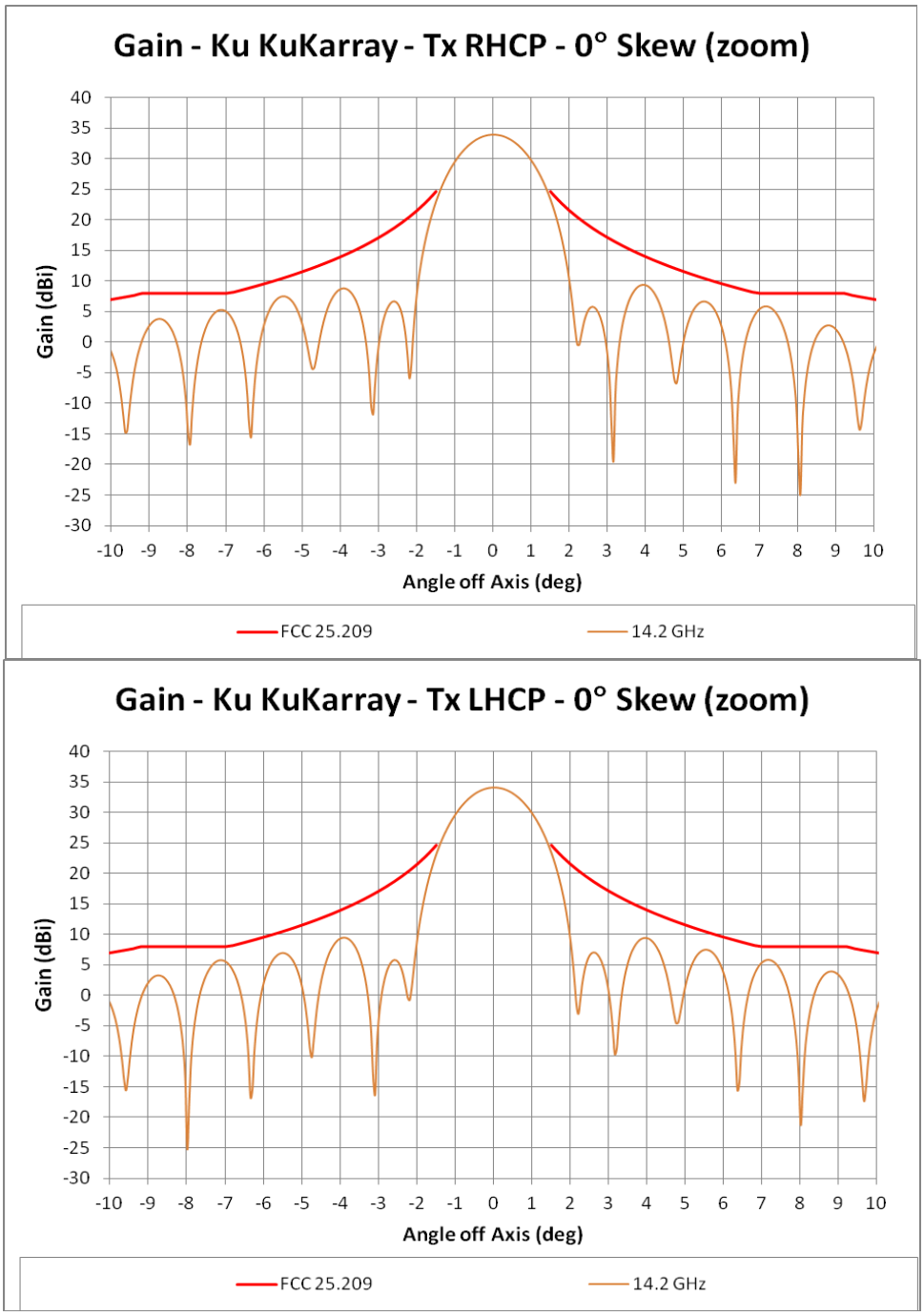


Figure 3: Measured RHCP & LHCP Azimuth Pattern at 14.2 GHz at Thetas between -7 and 7 degrees.

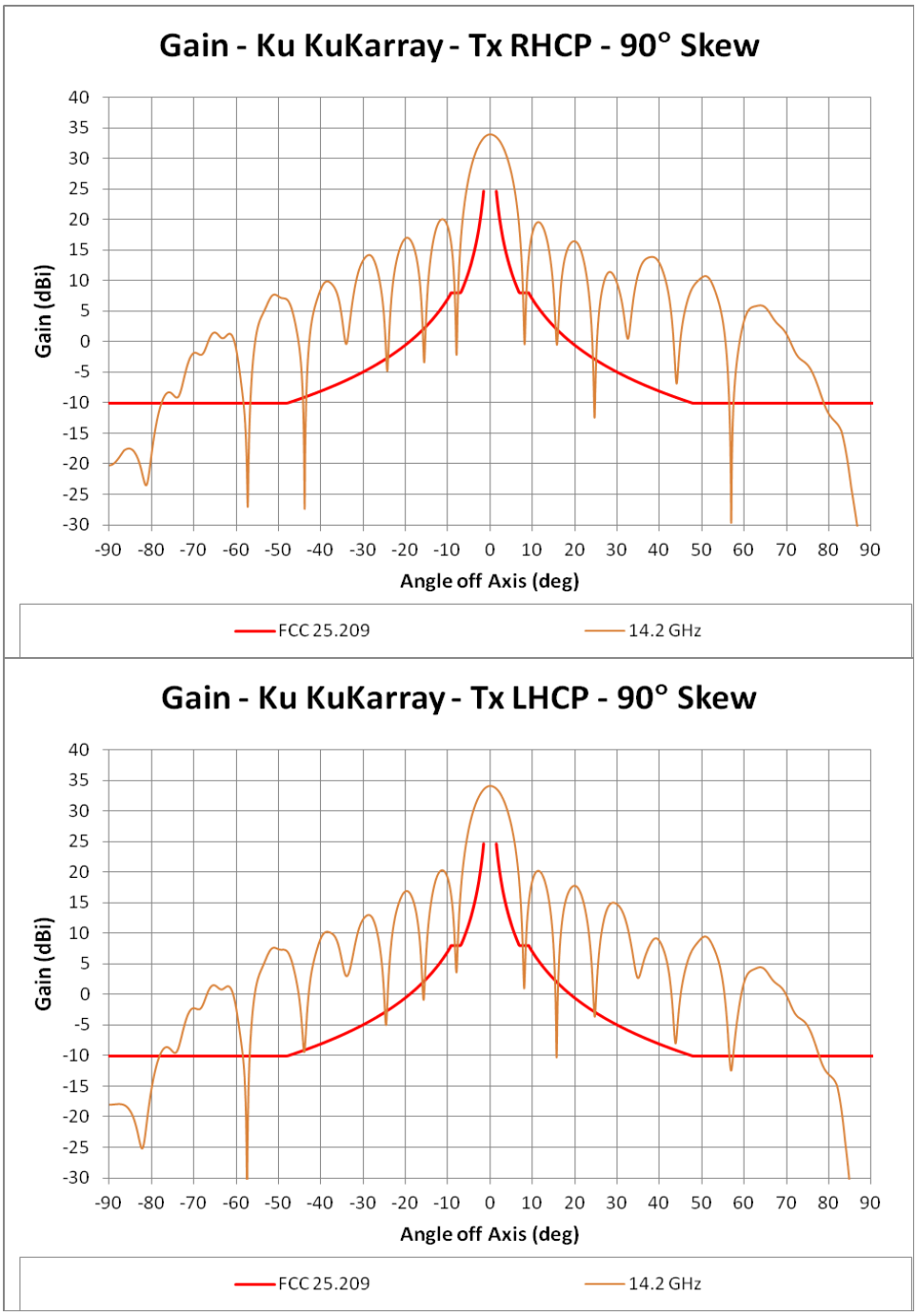


Figure 4: Antenna Measured RHCP & LHCP Elevation Pattern at 14.2 GHz at Thetas between -75 and 75 degrees..

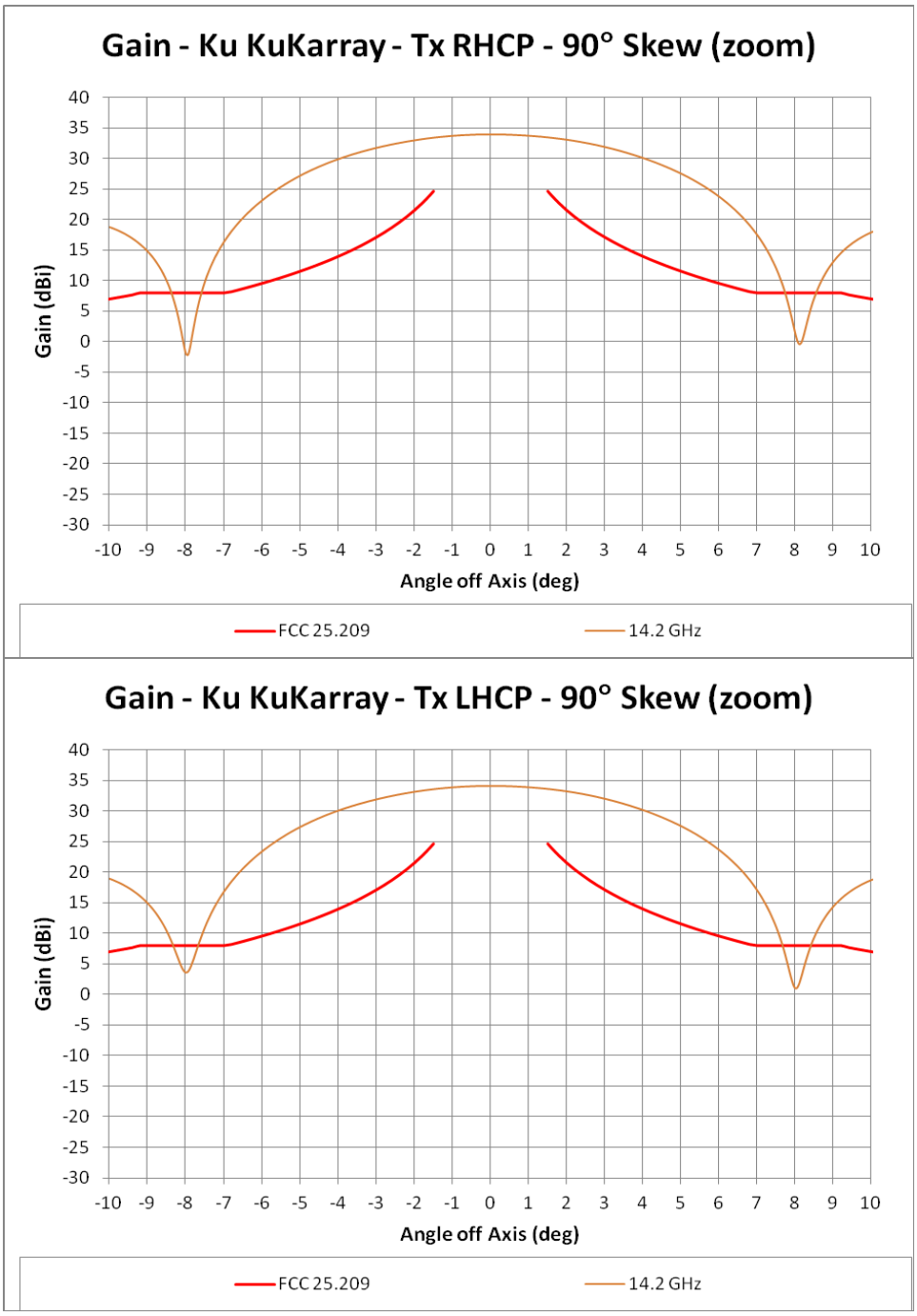


Figure 5: Antenna Measured RHCP & LHCP Elevation Pattern at 14.2 GHz at Thetas between -7 and 7 degrees.