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Call Sign WG2XNM Modification Experiment Proposal

1 Introduction

Qualcomm Incorporated (NASDAQ:QCOM - News) is a world leader in licensed 3G and 4G and unlicensed mobile technologies. For 25 years, Qualcomm ideas and inventions have driven the evolution of wireless communications, connecting people more closely to information, entertainment and each other. Today, Qualcomm technologies are powering the convergence of mobile communications and consumer electronics, making wireless devices and services more personal, affordable and accessible to people everywhere. For more information, please visit www.qualcomm.com.

Qualcomm filed a Petition for Rulemaking to Amend the Commission's Rules To Establish A Next-Generation Air-Ground Communications Service on A Secondary Licensed Basis in the 14.0 to 14.5 GHz Band, RM-11640 in July 2011. In May 2013, the FCC issued a Notice of Proposed Rulemaking proposing to establish an Air-Ground Mobile Broadband Service in this same band. See GN Docket No. 13-114; FCC 13-66. Comments and Reply Comments were filed on the NPRM in August and September 2013, with the vast majority of commenters supporting the proposed new service.

Qualcomm has operated a fixed site experimental transmitter under experimental license call signs WG2XNM and WF9XKM to complete limited testing within the 14.0 to 14.5 GHz frequency band. Qualcomm used the experimental authority for signal propagation measurements and to verify the expected performance of a 14.0 to 14.5 GHz system. There were no airborne experimental transmissions during this testing.

This experimental license modification is to add the capability to transmit experimentally from an airborne aircraft. The new transmitter information described below is captured in Tables 2 and 3. All ground transmitter information remains the same.

2 Experiment Information

Testing is expected occur periodically through February 2015. Tables 1 through 3 contain the transmit power and location information for airborne and fixed sites. The testing will consist of a single fixed site located in either San Diego, CA or Bakersfield, CA and a single airborne transmitter. Both fixed site locations will not be operated simultaneously.

The technical parameters for the ground based fixed sites authorized in Call sign WG2XNM are detailed in Tables 1 and 2.

The aircraft will fly in a region ranging from California's southern border and to Sacramento, CA (north to south) and up to 100 nautical miles off of the Pacific coast to approximately California's eastern border (west to east) as shown in Figure 2. Flight altitudes for airborne transmission will range from ground level to 40,000 feet.

The antenna mounted on the plane utilizes a steerable antenna pattern where the peak antenna gain during transmission is always aimed at the fixed antenna site to the south of the plane. The 3dB beamwidth of the antenna pattern is approximately 50 degrees in azimuth plane and 20 degrees in elevation plane and the front to back ration is approximately 20 dB. The expected elevation and azimuth antenna patterns are shown in Figure 1. Additional information on the airborne antenna design is documented in Qualcomm's filings in GN Docket No. 13-114 and RM-11640.

The mobile transmitter will either be a 20 MHz LTE transmission or a 100 kHz QPSK test signal.

Table 1 Ground Fixed Site Transmitter and Emission Information

		Conducted Power		Peak EIRP					
Type	**Frequency (MHz)**	**dBm**	**W**	**dBm**	**dBW**	**W**	**W ERP**	**Peak Antenna Gain (dBi)**	**Emission BW**
Fixed	14000-14500	29	0.8	70	40	10000	6067	41	20 MHz

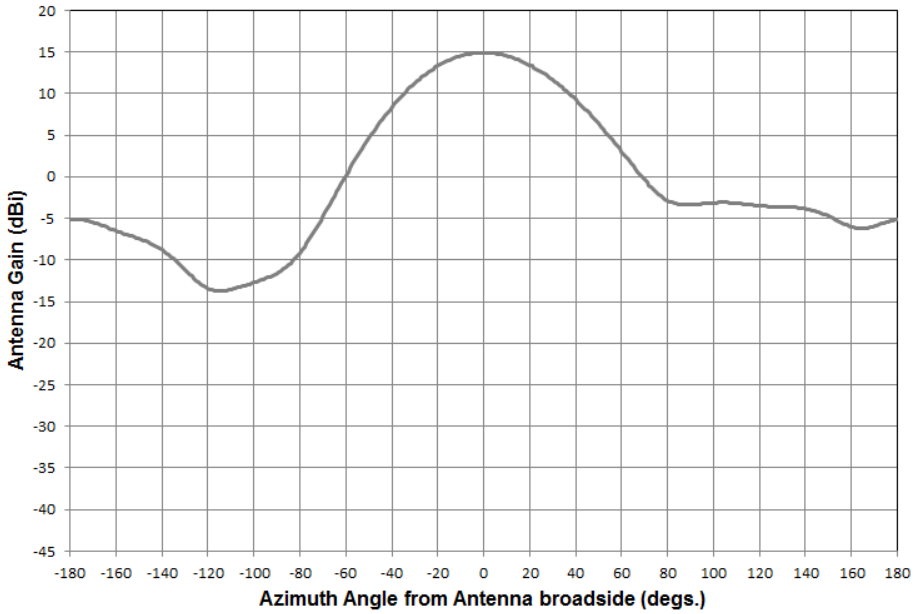
Table 2 Ground Fixed Site Location and Orientation Information

Site #	City	County	Lat	Long	3dB Beamwidth	Azimuth	Elevation	Antenna Type
1	American Tower site # CA-8322	Kern	35 2 4 N	118 57 31 W	+/- 1 degree	Variable 360 +60/-85 deg	+/-10 degrees above horizon	Directional
2	Bakersfield	Kern	35 22 32 N	119 1 18 W	+/- 1 degree	Variable 360 +60/-85 deg	+/-10 degrees above horizon	Directional
3	San Diego	San Diego	32 54 13 N	117 11 48 W	+/- 1 degree	Variable 360 +60/-85 deg	+/-10 degrees above horizon	Directional
3	San Diego	San Diego	32 53 42 N	117 11 42 W	+/- 1 degree	Variable 360 +60/-85 deg	+/-10 degrees above horizon	Directional

Table 3 Airborne Transmit Power and Emission Information

		Conducted Power		Peak EIRP					
Type	**Frequency (MHz)**	**dBm**	**W**	**dBm**	**dBW**	**W**	**W ERP**	**Peak Antenna Gain (dBi)**	**Emission BW**
Fixed	14000-14500	33	2	48	18	63.1	38.3	15	20 MHz LTE 100kHz QPSK

Figure 1 Expected Airborne antenna patterns



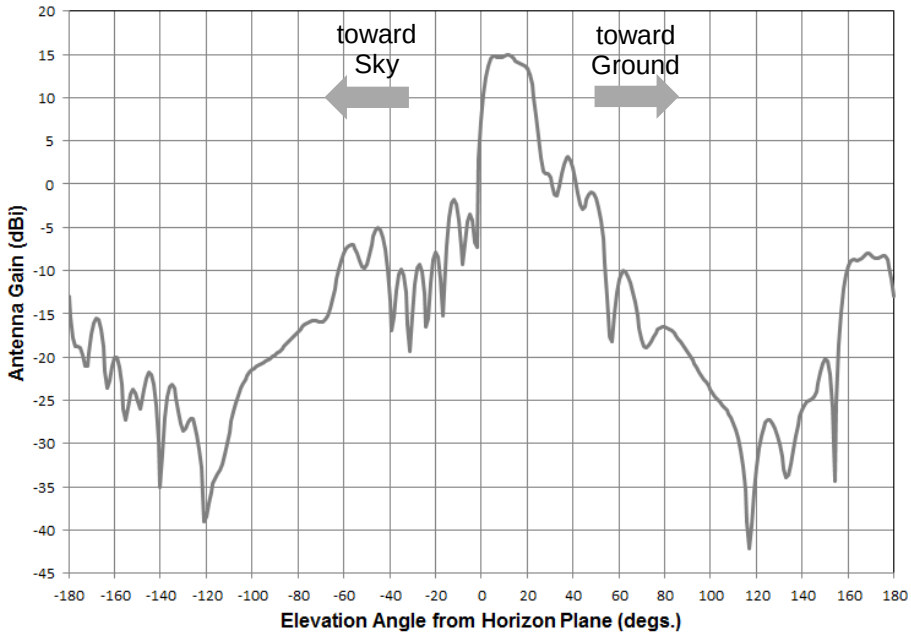


Figure 2 Airborne Flight Area