1. Introduction:

QUALCOMM is a member of the FAA-commissioned RTCA Special Committee 202, which was established to investigate the compatibility between portable electronic devices (PED) and aircraft systems. QUALCOMM is participating in limited testing programs with Part 22 and Part 24 devices on cellular and PCS spectrum with the aim of providing data to the committee in support of this investigation as it relates to intentionally transmitting devices i.e. mobile phones.

Phase 2 of the SC202 committee is focused on emerging PED technologies. Examples of these technologies are ultra-wideband devices and PicoCells for telephone use on aircraft. Accordingly, QUALCOMM is investigating the PicoCell network design for the aircraft cabin and the potential for use during flight.

QUALCOMM has completed ground-based testing of the cabin PicoCell network using commercial aircraft. The next phase of testing continues with in-flight testing to further evaluate the airborne operation of the PicoCell network as well as measure the RF "leakage" to the terrestrial mobile phone networks.

QUALCOMM completed initial testing and an airborne demonstration during the summer of 2004 using STA file number 0320-EX-ST-2004. QUALCOMM will continue to perform periodic testing of airborne PicoCell networks during the next two years in support of the RTCA Special Committee 202 Phase 2 work, which is scheduled for completion in December of 2006. Additional, QUALCOMM will support internal engineering development and future demonstrations of airborne Pico networks. QUALCOMM requires the experimental license requested in this application to support this testing.

2. Experiment Description

QUALCOMM will perform in-flight testing of a CDMA cellular and CDMA PCS PicoCell network operating within an aircraft cabin. The goal of this testing will be to verify the operation of the airborne PicoCell network and establish the benefits of this system in mitigating the potential interference to the aircraft systems as well as the ground based mobile phone networks. In today's airborne environment a number of mobile phones are being used intentionally or unintentionally (powered on) resulting in higher risk of interference to the mobile ground systems as they attempt to communicate directly with the ground networks.

The use of the cellular and PCS spectrum will be limited to communications within the aircraft cabin. The Pico network operates in such a way that the power levels will be controlled to very low levels when compared to those used in a terrestrial network. All attempts will be made to ensure that the airborne mobile phones only communicate with the cabin PicoCell base station transceiver. No air to ground communications will be attempted using the PCS or cellular spectrum.

Test flight routes will be identified to specifically avoid metropolitan areas. The CDMA PicoCell network will be activated at altitudes above 10,000 feet, and testing will be

conducted at various altitudes between 10,000 feet and 40,000 feet. During test flights, a maximum of two CDMA RF channels will be used in one of the following three configurations:

1) 2 PCS channels
2) 1 Cellular and 1 PCS channel.
3) 2 Cellular channels

The expected duration of a flight is from 1 to 4 hours. Only one aircraft will be used for the testing at any time.

The network RF channels will be coordinated with a specific service provider, however, once the aircraft is above 10,000 feet, coordination is not possible due to the line-of-sight to other cellular and PCS trading areas owned by multiple licensees. The test flights will be coordinated with selected service providers to measure any detectable emissions on the ground originating from the airborne PicoCell network. Part of this research is to establish whether the power levels associated with an aircraft CDMA PicoCell network can be sufficiently attenuated such that there is no harmful interference to the ground networks.

3. Duration

December 1 2004 through Dec 31, 2006.

4. Test Frequencies and Equipment Information

Freq Band	Unit	Freq (MHz)	# Units	BW (MHz)	Power (EIRP)	Power (ERP)	Experimental
PCS	Mobile	1850 – 1910	50	1.25	0 dBm (1mW)	-2.17 dBm (607 uW)	No
PCS	Fixed	1930 - 1990	1	1.25	20 dBm (100 mW)	17.83 dBm (61 mW)	Yes
Cell	Mobile	824.04 - 848.97	50	1.25	0 dBm (1mW)	-2.17 dBm (607 uW)	No
Cell	Fixed	869.04 - 893.97	1	1.25	20 dBm (100 mW)	17.83 dBm (61 mW)	Yes

5. Part 22.925 Waiver

To support QUALCOMM's requests in the cellular band, a waiver of Section 22.925 of the FCC's rules is requested for the limited testing described herein. The FCC itself has an ongoing proceeding (WT Docket No. 03-103) to determine whether to modify or eliminate 22.925 due to PicoCell technology. QUALCOMM's test will provide valuable data regarding this technology.

6. Location

Continental US