

QUALCOMM 2.5 GHz Experiment Proposal

1 Introduction

QUALCOMM will be performing new developmental testing and demonstration of its flash-OFDM technology with networks located in Bedminster, New Jersey and San Diego, CA. QUALCOMM will be utilizing 2.5 GHz BRS spectrum for this developmental work.

The overall objective of the testing is to understand the performance of the system under real world conditions, which cannot be effectively understood or modeled in a lab setting. These conditions include environment, propagation, frequency reuse, mobility user behavior, traffic mix, and system loading. Flarion Technologies, a company acquired by QUALCOMM in 2006, has successfully tested its prototype base station and mobile units and now requires more rigorous field testing of the devices under varied real conditions.

The initial test phase will utilize a Frequency Division Duplex (FDD) RF network. The single channel FDD network will use one BRS channel for the mobile frequency and a second channel for the fixed site transmitter frequency. All mobile and fixed transmitters share the same respective BRS mobile or fixed channels. The second phase of testing will utilize a Time Division Duplex (TDD) RF network where only one BRS channel will be utilized.

2 Frequency Information

Table 1 summarizes the frequencies requested in this license application. Channels E1 and F1 are utilized for TDD operations, while the FDD system will use either B4 or C1 paired with H2 or G3. The specific channels used will be determined after frequency coordination efforts are completed with the BRS spectrum owners.

Both the FDD and TDD systems will share the same fixed sites discussed in Section 4. The network is capable of supporting a signal bandwidth of 1.25 MHz to 10 MHz.

Table 1 Requested Frequency vs Channel information

Requested Frequency Range (MHz)	BRS Channel Designation	Lower Frequency (MHz)	Upper Frequency (MHz)	QUALCOMM Proposed Usage
2542-2548	B4	2542	2548	Fixed (TDD)
2542-2554	B4	2542	2548	Mobile (FDD)
	C1	2548	2554	Mobile (FDD)
2596-2608	E1	2596	2602	Fixed/Mobile (TDD)
	F1	2602	2608	Fixed/Mobile (TDD)
2662-2674	H2	2662	2668	Fixed (FDD)
	G3	2668	2674	Fixed (FDD)

3 Frequency Coordination

Prior to transmission, QUALCOMM will coordinate with licensees affected by the proposed networks.

Two channels (B4 and C1) in New Jersey have no identified owners with 32km of the proposed fixed sites per the FCC ULS database. Based on this conclusion, no coordination will occur for these two frequencies for the mobile devices. Before the higher power TDD fixed sites are activated, QUALCOMM will coordinate with affected licensees.

In addition to searching the ULS database, QUALCOMM performed extensive spectrum surveys of the operational areas to verify the spectrum was not actively used.

Table 2 License Ownership for Proposed Frequencies

BRS Channel Designation	New Jersey	San Diego
B4 (Fixed)	License owner identified.	Not used for fixed
B4 (mobile)	No coordination requirement identified. No license found in ULS data base in 32km radius.	License owner identified
C1	No coordination requirement identified. No license found in ULS data base in 32km radius.	License owner identified
E1	License owner identified	License owner identified
F1	License owner identified	License owner identified
H2	License owner identified	License owner identified
G3	License owner identified	License owner identified

4 Site Information and Power

The maximum output power for mobile and fixed sites in listed is Table 3. The actual fixed site ERP deployed may be lower then 700W after the network design has been finalized. This information could not be determined at the time of this experimental license application submission because licensee coordination negotiations, fixed site negotiations, and RF network plans are still in process.

Table 3 Transmit Powers

Transmitter Type	Signal Band width	Max ERP
Fixed Site ERP	1.25 to 10 MHz	700 W (58 dBm)
Mobile ERP	1.25 to 10 MHz	400 mW (26 dBm)

QUALCOMM will commission five fixed transmitter sites both in the Bedminster and San Diego areas. Mobile devices will be operated within a 20km (12 miles) radius of the coordinates specified in Table 4. The maximum ERP for mobile devices is 400mW.

The sites proposed at the time of this application are listed in Table 5 and Table 6. The fixed site location and configurations may change pending coordination limitations and antenna site availability.

Table 4 Coordinates of Operational Region Center Point

Site#	Area Center Points	Deg	Min	Sec		Deg	Min	Sec	
1	Bedminster, NJ	40	38	41	N	74	38	25	W
2	San Diego, CA	32	53	43	N	117	11	42	W

Table 5 Bedminster, NJ Proposed Fixed Site Locations

Site#	Site Name	Deg	Min	Sec		Deg	Min	Sec		AMSL (ft)	AGL (ft)	RC- AMSL (ft)	ERP (W)	ERP (dBm)
1	Hilltop Site	40	38	49	N	74	37	20	W	580	180	760	433	56
2	Crown - Lamington	40	38	38	N	74	41	45	W	157	75	232	664	58
3	Crown- SOMERVILLE	40	34	46	N	74	37	50	W	141	95	236	612	58
4	Town & Country	40	36	15	N	74	37	33	W	101	180	281	433	56
5	Boundbrook (Amer Tower)	40	34	14	N	74	33	47	W	88	155	243	481	57

Table 6 San Diego, CA Proposed Fixed Site Locations

Site#	Site Name	Deg	Min	Sec		Deg	Min	Sec		AMSL (ft)	AGL (ft)	RC- AMSL (ft)	ERP (W)	ERP (dBm)
1	Building L	32	53	43	N	117	11	42	W	300	110	410	657.05	58
2	Building WT	32	54	15	N	117	11	48	W	350	180	530	657.05	58
3	Building A	32	53	51	N	117	13	7.5	W	74	45	119	331.13	55
4	Building AA	32	53	26	N	117	13	20	W	319	75	394	657.05	58
5	Building AR	32	54	54	N	117	13	41	W	110	58	168	657.05	58