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Title	**System parameters for 2-11 GHz Coexistence Simulations (revision 1)**
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Re:	Coexistence task group activities in session # 15
Abstract	This document provides tables of parameters and parameter values as revised during session#15, for systems operating in the 2-11 GHz frequency range. These parameters are relevant to interference calculations and simulation work.
Purpose	For use in simulation work
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System parameters for 2-11 GHz Coexistence Simulations (revision 1)

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1. Introduction

This document provides tables of parameters and parameter values as revised during session#15, for systems operating in the 2-11 GHz frequency range. These parameters are relevant to interference calculations and simulation work.

Table 1: circa. 2.5 GHz systems with a cellular architecture.

Characteristic (cellular systems)	**Examples**
Layout of system(s) including diagrams	Multi – cell (uniformly distributed), (variable cell sizes including "super cell") Block diagrams needed
Typical sector arrangements and frequencies	Typically 4-sectors per cell, 4 frequencies, V and H polarization both used; . Some systems will use adaptive antennas, pointing at users. TDD Transmitter diversity may be used (base stations only). FDD also used
Propagation	Partly obstructed paths allowed (channel model available 802.16.3c01_29r2; decision to use channel model based on FCC methodology – details tba). Rain fading assumptions – negligible. Atmospheric multipath fading not considered
Cell size	Up to 45km radius
Availability objective	99.9 – 99.99% of time for 80 – 90% coverage
Number of cells in a system	1 to 25 (typical range)
Number of terminal stations per MHz per T/R per cell	Up to 70
Distribution of terminal stations	Uniform per unit area.
Frequency of operation (for each variant to be studied)	2.15 -2.162, 2.305 – 2.32/ 2.345 – 2.360 and 2.50 to 2.69 GHz
Duplex method	TDD, FDD, Half duplex
Receiver parameters	
Channel bandwidth	1.5/3/6/12/25 MHz (N. America) 1.75/3.5/7/14 MHz (Europe)
filter response	Root Nyquist with 25% roll off factor assumed
noise floor	4dB noise figure upstream 5dB noise figure downstream
acceptable level for co-channel interference	I/N = –6dB (aggregate of all interferers)
Transmitter parameters	
Channel bandwidth	1.5/3/6/12/25 MHz (N. America) 1.75/3.5/7/14 MHz (Europe)

emission mask	See figures 6 and 7 of IEEE 802.16ab-01/01
Maximum eirp	2000W eirp at base station or subscriber
typical transmitter power	(100W at base station, 1W at subscriber)
use of ATPC, steps and range (typical)	Uplink only, 2dB steps, 50dB range
Tx-Rx parameters	NFD (net filter discrimination; call for contributions to be posted for real measurements or values calculated by numerical integration) (use TM4 values or calculate, in the absence of any other sources of data)
Antenna characteristics (base station, typical)	Use ETSI RPE for 90 degree sector Gain = 16 dBi
Antenna characteristics (subscriber station, typical)	Use ETSI RPE Gain = 16dBi; hpbw 25 degrees Some systems may use omni with 2dB gain.
Antenna characteristics (repeater station)	Assume same as BS and SS
Backhaul links	Separate assignments

Table 2: 3.5 GHz systems with a cellular architecture.

Characteristic (cellular systems)	**Examples**
Layout of system(s) including diagrams	Multi – cell (uniformly distributed), (variable cell sizes) Block diagrams needed
Typical sector arrangements and frequencies	Typically 4-sectors per cell, 4 frequencies, V and H polarization both used; . Some systems will use adaptive antennas, pointing at users. FDD and TDD used
Propagation	Partly obstructed paths allowed (channel model available 802.16.3c01_29r2, subject to formal adoption – note 2). decision to use channel model based on FCC methodology – details tba) Rain fading assumptions – negligible.
Cell size	Typically 7km
Availability objective	99.9 – 99.99% of time for 80 – 90% coverage
Number of cells in a system	1 to 25 (typical range)
Number of terminal stations per MHz per T/R per cell	Up to 70
Distribution of terminal stations	Uniform per unit area.
Frequency of operation (for each variant to be studied)	3.4 to 3.8 GHz
Duplex method	TDD, FDD, Half duplex
Receiver parameters	
Channel bandwidth	1.5/3/6/12/25 MHz (N. America) 1.75/3.5/7/14 MHz (Europe)
filter response	Root Nyquist with 25% roll off factor assumed

noise floor	4dB noise figure upstream 5dB noise figure downstream
Acceptable level for co-channel interference	I/N = –6dB (aggregate of all interferers)
Transmitter parameters	
Channel bandwidth	1.5/3/6/12/25 MHz (N. America) 1.75/3.5/7/14 MHz (Europe)
emission mask	See figures 4 and 5 of IEEE 802.16ab-01/01
Maximum eirp	? not defined
typical transmitter power	TBA (10W at base station, 1W at subscriber)
use of ATPC, steps and range	Uplink only, 2dB steps, 40dB range
Tx-Rx parameters	NFD (net filter discrimination; call for contributions to be posted for real measurements or values calculated by numerical integration) (use TM4 values or calculate, in the absence of any other sources of data)
Antenna characteristics (base station)	Use ETSI RPE for 90 degree sector Gain = 12.5 dBi
Antenna characteristics (subscriber station)	Use ETSI RPE Gain = 16dBi – note 3
Antenna characteristics (repeater station)	Assume same as BS and SS
Backhaul links	Separate assignments

Table 3: 10.5 GHz systems with a cellular architecture.

Characteristic (cellular systems)	**Examples**
Layout of system(s) including diagrams	Multi – cell (uniformly distributed), (variable cell sizes)
Typical sector arrangements and frequencies	Typically 4-sectors per cell, 4 frequencies, V and H polarization.
Propagation	Line of sight paths only. (channel model agreed at session 15 see [ref to be added]). Rain fading important – ITU equations to be used. Atmospheric multipath fading not considered
Cell size	Typically 7km
Availability objective	99.9 – 99.99% of time for approx. 50% coverage
Number of cells in a system	1 to 25 (typical range)
Number of terminal stations per MHz per T/R per cell	70
Distribution of terminal stations	Uniform per unit area.
Frequency of operation (for each variant to be studied)	10.5 to 10.68 GHz
Duplex method	TDD, FDD, Half duplex
Receiver parameters	
Channel bandwidth	3/6/12/25 MHz (N. America) 3.5/7/14 MHz (Europe)
filter response	Root Nyquist with 25% roll off factor assumed
noise floor	6dB noise figure

acceptable level for co-channel interference	I/N = –6dB (aggregate of all interferers)
Transmitter parameters	
Channel bandwidth	3/6/12/25 MHz (N. America) 3.5/7/14 MHz (Europe)
emission mask	Not defined (use ETSI)
Maximum power	Not defined
typical power	(5W at base station, 1W at subscriber)
use of ATPC, steps and range	Uplink only, 2dB steps, 40dB range
Tx-Rx parameters	NFD (net filter discrimination; call for contributions needed) (use TM4 values or calculate, in the absence of any other source of data)
Antenna characteristics (base station)	Use ETSI RPE for 90 degree sector Gain = tba (RW will research PW to remind RW)
Antenna characteristics (subscriber station)	Use ETSI RPE Gain = tba (RW will research)
Antenna characteristics (repeater station)	TBA
Backhaul links	Separate assignments

Note 1: A channel model has now been identified for 2.5 GHz and 10.5 GHz. Further work will be completed on 2.5/3.5 GHz for session #16.

Note 3: The ETSI 3.5 GHz specification requires a much lower minimum gain. This is a typical value for a directional antenna.

Note 4: Some operators of 3.5 GHz and lower frequency systems are considering the use of indoor radio terminal equipment. This has significant propagation modeling consequences. Call for contributions needed.

Note 5: OFDMA may also be used. This may affect the susceptibility of the receiver to interference, if interfering and victim bandwidths are different.

END