Mr. Byung K. (BK) Yi
Chair, 3GPP2 TSG-C
LGE USA, Inc.
10225 Willow Creek Road
San Diego, CA 92131
bkyi@lge.com

23 April 2004

Dorota Inkielman
Skierniewicka 10A
01-230 Warszawa
Poland
Dorota.Inkielman@centertel.pl

Colin Chandler
Parnell House - 2nd floor
25 Wilton Road
London SWIV 1LW
England
colinc@qualcomm.com

Re: Band Class for 450 MHz operation

Dear Dorata and Colin,

3GPP2 has received a proposal to create a new Block for Band Class 5. Band Class 5 is used for 450 MHz. The proposal creates a 25 kHz frequency raster for the frequencies covered by Block H (451.310-455.730/461.310-465.730 MHz) by creating a Block I. This is currently under discussion in 3GPP2; however, most 3GPP2 participants are not very familiar with some of the issues faced by the 450 MHz operators. Discussions with some of the 450 MHz operators have indicated that there may be additional modifications to Band Class 5 that 3GPP2 should consider to enhance roaming.

Since 3GPP2 and IA450 are planning a workshop on June 15 in Warsaw, we propose that the band plan arrangements be included as an agenda item and discussed during the workshop. We have attached the proposal to create Block I. We request that the 450 MHz operators review and provide comments on this proposal at the workshop. We also request that the 450 MHz operators suggest other modifications that 3GPP2 should consider to Band Class 5 at the workshop.

Note that 3GPP2 has also recently created a new specification, C.S0057, that removes the information related to band classes from the main cdma2000 standards; C.S0002 and C.S0024.

Regards,

Byung K. (BK) Yi
Chair, 3GPP2 TSG-C

cc:	Hideo Okinaka	3GPP2 SC Chair	okinaka@ma.kcom.ne.jp
	Henry Cuschieri	3GPP2 Secretariat	hcuschie@tia.eia.org
	George Turnipseed	Chair, 3GPP2 TSG-A	gturni01@sprintspectrum.com
	Betsy Kidwell	Chair, 3GPP2 TSG-X	ekidwell@lucent.com
	Richard Robinson	Chair, 3GPP2 TSG-S	rrobin01@sprintspectrum.com

Attachment: 3GPP2 contribution C30-20040315-050

3GPP2 cdma2000 TSG-C

TITLE: Proposal for the creation of new block /subclass within Band Class 5

SOURCE:

John Panicker (613)-765-3586
panic@nortelnetworks.com

ABSTRACT: About half the EU countries have a frequency allocation for freq. block A which is based on 25kHz channels, and many of the rest have a frequency allocation corresponding to frequency block H which is based on 20 kHz channels. With this situation, even though there is 70% frequency overlap between A block and H block, roaming between H and A block countries are not easy unless the mobiles and the infrastructure support both 25 KHz and 20 KHz based channels. In this contribution, Nortel Networks proposes the creation of a new block I within the Band Class 05 which will use the same frequency assignment as for the existing block H, but based on 25 KHz channels

RECOMMENDATION: Discuss and adopt

1.0 Introduction

Following three tables from the document TIA-1020 "Band Class Specification for cdma2000 Spread Spectrum Systems" is relevant for the topic discussed in this contribution

Table 3.1.6-1. Band Class 5 Block Frequency Correspondence and Band Subclasses

block Designator	Band Subclass	Transmit Frequency Band (MHz)	
		Mobile Station	Base Station
A	0	452.500–457.475	462.500–467.475
B	1	452.000–456.475	462.000–466.475
C	2	450.000–454.800	460.000–464.800
D	3	411.675–415.850	421.675–425.850
E	4	415.500–419.975	425.500–429.975
F	5	479.000–483.480	489.000–493.480
G	6	455.230–459.990	465.230–469.990
H	7	451.310–455.730	461.310–465.730

Table 3.1.6-2. CDMA Channel Number to CDMA Frequency Assignment Correspondence for Band Class 5

Transmitter	CDMA Channel Number	Center Frequency for CDMA Channel (MHz)
Mobile Station	1 ≤ N ≤ 300	0.025 (N-1) + 450.000
	539 ≤ N ≤ 871	0.025 (N-512) + 411.000
	1039 ≤ N ≤ 1473	0.020 (N-1024) + 451.010
	1792 ≤ N ≤ 2016	0.020 (N-1792) + 479.000
Base Station	1 ≤ N ≤ 300	0.025 (N-1) + 460.000
	539 ≤ N ≤ 871	0.025 (N-512) + 421.000
	1039 ≤ N ≤ 1473	0.020 (N-1024) + 461.010
	1792 ≤ N ≤ 2016	0.020 (N-1792) + 489.000

Table 3.1.6-5. CDMA Preferred Set of Frequency Assignments for Band Class 5

Block Designator	Preferred Set Channel Numbers
A	160, 210*, 260
B	120, 170, 220*
C	47, 97, 147*
D	573, 623, 673*
E	731*, 781, 831
F	1841*, 1904, 1967
G	1291*, 1354, 1417
H	1087, 1150, 1213*

* CDMA frequency assignments that support inter-block roaming

From the above three tables, it can be seen that blocks A,B,C,D,E employ CDMA channel number to Frequency assignment based on 25 KHz channels, whereas F,G, H blocks use CDMA channel number to Frequency assignment based on 20 KHz channels.

It is true that each block has a channel number that supports inter-block roaming. This means that, in some cases, the infra-structure and mobiles will have to support 25 KHz based and 20 KHz based channels to enable roaming. This will create unnecessary complexities to support roaming.

Mobiles that are currently available work with either 25 kHz channels or with 20 kHz channels, not with both (most mobiles that are known use 25 kHz channels, only one mobile uses 20 kHz only). It is more expensive to make a mobile that works with both 25 KHz and 20 KHz based channels.

About half the EU countries have a frequency allocation for freq block A, which the standard prescribes 25 kHz, most of the rest have a frequency allocation corresponding to frequency block H, for which the standard prescribes 20 kHz channels.

With this situation mobile from H block countries will not be able to roam to A block countries, and the reverse is also not possible. This in spite of the fact that there is 70% frequency overlap between A block and H block.

Therefore, Nortel Networks, propose the creation of a new block I and subclass 8 within the Band Class 05. This new block/subclass will use the same frequency assignment as for the existing Block H and subclass 7, but based on 25 KHz channels

This change would allow mobile roaming between the two groups of countries, as well as common supply of terminals and BTS infrastructure to be used by all.

This will bring the Band Class 05 network up to the expected European standard of universal roaming.

2. 0 Changes Needed in the Document

Following are the changes needed in the TIA-1020 "Band Class Specification for cdma2000 Spread Spectrum Systems" to effect the change

3.1.6 Band Class 5 (450 MHz Band)

The Band Class 5 block designators for the mobile station and base station shall be as specified in Table 3.1.6-1.
There are eight band subclasses specified for Band Class 5. Each band subclass corresponds to a specific block designator (see Table 3.1.6-1). Each band subclass includes all the channels designated for that block.
The channel spacings, CDMA channel designations, and transmit center frequencies for Band Class 5 shall be as specified in Table 3.1.6-2. The Band Class 5 channel numbers are shown in Tables 3.1.6-3 and 3.1.6-4. Note that certain channel assignments are not valid and others are conditionally valid. Transmission on conditionally valid channels is permissible if the adjacent block is allocated to the same licensee or if other valid authorization has been obtained. The preferred set of CDMA frequency assignments for Band Class 5 is given in Table 3.1.6-5.

Table 3.1.6-1. Band Class 5 Block Frequency Correspondence and Band Subclasses

Block Designator	Band Subclass	Transmit Frequency Band (MHz)	
		Mobile Station	Base Station
A	0	452.500–457.475	462.500–467.475
B	1	452.000–456.475	462.000–466.475
C	2	450.000–454.800	460.000–464.800
D	3	411.675–415.850	421.675–425.850
E	4	415.500–419.975	425.500–429.975
F	5	479.000–483.480	489.000–493.480
G	6	455.230–459.990	465.230–469.990
H	7	451.310–455.730	461.310–465.730
I	8	451.325–455.730	461.310–465.725

Table 3.1.6-2. CDMA Channel Number to CDMA Frequency Assignment Correspondence for Band Class 5

Transmitter	CDMA Channel Number	Center Frequency for CDMA Channel (MHz)
Mobile Station	1 ≤ N ≤ 300	0.025 (N-1) + 450.000
	539 ≤ N ≤ 871	0.025 (N-512) + 411.000
	1039 ≤ N ≤ 1473	0.020 (N-1024) + 451.010
	1792 ≤ N ≤ 2016	0.020 (N-1792) + 479.000
Base Station	1 ≤ N ≤ 300	0.025 (N-1) + 460.000
	539 ≤ N ≤ 871	0.025 (N-512) + 421.000
	1039 ≤ N ≤ 1473	0.020 (N-1024) + 461.010
	1792 ≤ N ≤ 2016	0.020 (N-1792) + 489.000

Table 3.1.6-3. CDMA Channel Numbers and Corresponding Frequencies for Band Class 5 and Spreading Rate 1

Block Designator	CDMA Channel Validity	CDMA Channel Number	Transmit Frequency Band (MHz)	
			Mobile Station	Base Station
A (4.5 MHz)	Not Valid Cond. Valid Valid Not Valid	121-125 126-145 146-275 276-300	453.000-453.100 453.125-453.600 453.625-456.850 456.875–457.475	463.000-463.100 463.125-463.600 463.625-466.850 466.875-467.475
A' (0.5 MHz)	Not Valid	101-120	452.500-452.975	462.500-462.975
B (4.5 MHz)	Not Valid Valid Not Valid	81-105 106-235 236-260	452.000-452.600 452.625-455.850 455.875–456.475	462.000-462.600 462.625-465.850 465.875-466.475
C (4.8 MHz)	Not Valid Valid Not Valid	1-25 26-168 169-193	450.000-450.600 450.625-454.175 454.200–454.800	460.000-460.600 460.625-464.175 464.200-464.800
D (4.2 MHz)	Not Valid Valid Not Valid	539-563 564-681 682-706	411.675-412.275 412.300-415.225 415.250-415.850	421.675-422.275 422.300-425.225 425.250-425.850
E (4.5 MHz)	Not Valid Valid Not Valid	692-716 717-846 847-871	415.500-416.100 416.125-419.350 419.375-419.975	425.500-426.100 426.125-429.350 429.375-429.975
F (4.5 MHz)	Not Valid Valid Not Valid	1792-1822 1823-1985 1986-2016	479.000-479.600 479.620-482.860 482.880-483.480	489.000-489.600 489.620-492.860 492.880-493.480
G (4.76 MHz)	Not Valid Valid Not Valid	1235-1265 1266-1442 1443-1473	455.230-455.830 455.850-459.370 459.390-459.990	465.230-465.830 465.850-469.370 469.390-469.990
H (4.42 MHz)	Not Valid Valid Not Valid	1039-1069 1070-1229 1230-1260	451.310-451.910 451.930-455.110 455.130-455.730	461.310-461.910 461.930-465.110 465.130-465.730
I (4.42 MHz)	Not Valid Valid Not Valid	54-78 79-205 206-230	451.325-451.925 451.950-455.100 455.125-455.725	461.325-461.925 461.950-465.100 465.125-465.725

Table 3.1.6-4. CDMA Channel Numbers and Corresponding Frequencies for Band Class 5 and Spreading Rate 3

Block Designator	CDMA Channel Validity	CDMA Channel Number	Transmit Frequency Band (MHz)	
			Mobile Station	Base Station
A (4.5 MHz)	Not Valid Valid Not Valid	121-200 201 202-300	453.000-454.975 455.000 455.025–457.475	463.000-464.975 465.000 465.025-467.475
A' (0.5 MHz)	Not Valid	101-120	452.500-452.975	462.500-462.975
B (4.5 MHz)	Not Valid Valid Not Valid	81-170 171 172-260	452.000-454.225 454.250 454.275–456.475	462.000-464.225 464.250 464.275-466.475
C (4.8 MHz)	Not Valid Valid Not Valid	1-96 97 98-193	450.000-452.375 452.400 452.425–454.800	460.000-462.375 462.400 462.425-464.800
D (4.2 MHz)	Not Valid	539-706	411.675-415.850	421.675-425.850
E (4.5 MHz)	Not Valid Valid Not Valid	692-781 782 783-871	415.500-417.725 417.750 417.775-419.975	425.500-427.725 427.750 427.775-429.975
F (4.5 MHz)	Not Valid Valid Not Valid	1792-1903 1904 1905-2016	479.000-481.220 481.240 481.260-483.480	489.000-491.220 491.240 491.260-493.480
G (4.76 MHz)	Not Valid Valid Not Valid	1235-1353 1354 1355-1473	455.230-457.590 457.610 457.630-459.990	465.230-467.590 467.610 467.630-469.990
H (4.42 MHz)	Not Valid Valid Not Valid	1039-1149 1150 1151-1260	451.310-453.510 453.530 453.550-455.730	461.310-463.510 463.530 463.550-465.730
I (4.42 MHz)	Not Valid Valid Not Valid	54-141 142 143-230	451.325-453.500 453.525 455.550-455.725	461.325-463.500 463.525 465.550-465.725

Table 3.1.6-5. CDMA Preferred Set of Frequency Assignments for Band Class 5

Block Designator	Preferred Set Channel Numbers
A	160, 210*, 260
B	120, 170, 220*
C	47, 97, 147*
D	573, 623, 673*
E	731*, 781, 831
F	1841*, 1904, 1967
G	1291*, 1354, 1417
H	1087, 1150, 1213*
I	92, 142, 192*

* CDMA frequency assignments that support inter-block roaming