TSG RAN Meeting #22 **RP-030603**
Maui, Hawaii, US, 9 - 12 December 2003

Title **CRs (Rel-6) to TS 25.101, TS 25.104, TS 25.141 for the Introduction of new channel arrangement for bands IV, V and VI**
Source **TSG RAN WG4**
Agenda Item **8.1.2**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-031094	25.101	308		B	Rel-6	6.2.0	Introduction of new channel arrangement for bands IV, V and VI	RInImp-UMTS850, UMTS800,UMTS1721
R4-031095	25.104	210		B	Rel-6	6.3.0	Introduction of new channel arrangement for bands IV, V and VI	RInImp-UMTS850, UMTS800,UMTS1721
R4-031096	25.141	333		B	Rel-6	6.3.0	Introduction of new channel arrangement for bands IV, V and VI	RInImp-UMTS850, UMTS800,UMTS1721

3GPP TSG RAN WG4 (Radio) Meeting #29 **R4-031094**

San Diego, USA 17 - 21 November 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.101** **CR** **308** ⌘ **rev** ⌘ Current version: **6.2.0** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Introduction of new channel arrangement for Bands IV, V and VI
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-UMTS850, UMTS800,UMTS1721
Date:	⌘	26/11/2003
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Introduction of channel arrangements for the new frequency bands IV, V and VI.
Summary of change:	⌘	Tx-Rx freqeuncy separation, channel raster and channel numbering (UARFCN) are introduced for the new bands. The new frequency bands IV, V and VI will all require some RF carrier positions that are not on the general 200 kHz raster for UTRA. This is solved in the same way as for band II, by “borrowing” channel numbers from low frequency ranges and map those to the additional frequencies needed that are not on the 200 kHz raster.
Consequences if not approved:	⌘	The channel arrangement for bands IV, V and VI would not be defined.

Clauses affected:	⌘	5.2, 5.3, 5.4			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	25.104
		X /	Test specifications		34.121, 34.108, 25.141
		/ X	O&M Specifications		
Other comments:	⌘				

5 Frequency bands and channel arrangement

5.1 General

The information presented in this subclause is based on a chip rate of 3.84 Mcps.

NOTE: Other chip rates may be considered in future releases.

5.2 Frequency bands

a) UTRA/FDD is designed to operate in ~~either of~~ the following paired bands:

Table 5.0: UTRA FDD frequency bands

Operating Band	UL Frequencies UE transmit, Node B receive	DL frequencies UE receive, Node B transmit
I	1920 – 1980 MHz	2110 –2170 MHz
II	1850 –1910 MHz	1930 –1990 MHz
III	1710-1785 MHz	1805-1880 MHz
IV	1710~~-1770~~ – 1755 MHz	2110~~-2170~~ – 2155 MHz
V	824 – 849MHz	869-894MHz
VI	830-840 MHz	875-885 MHz

Note: Band VI specifications are developed for use in Japan. The Band VI frequency ranges in the table are subject to coming regulatory decisions.

b) Deployment in other frequency bands is not precluded

5.3 TX–RX frequency separation

a) UTRA/FDD is designed to operate with the following TX-RX frequency separation

Table 5.0A: TX-RX frequency separation

Operating Band	TX-RX frequency separation
I	190 MHz
II	80 MHz~~.~~
III	95 MHz~~.~~
IV	400 MHz
V	45 MHz
VI	45 MHz

b) UTRA/FDD can support both fixed and variable transmit to receive frequency separation.

c) The use of other transmit to receive frequency separations in existing or other frequency bands shall not be precluded.

5.4 Channel arrangement

5.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

5.4.2 Channel raster

The channel raster is 200 kHz~~, which~~ for all bands~~, except Band II~~ which means that the centre frequency must be an integer multiple of 200 kHz. In addition a number of ~~Band II , 12~~ additional centre frequencies are specified according to ~~the~~ table 5.1A, ~~in 5.4.3 and~~ which means that the centre frequencies for these channels are shifted 100 kHz relative to the ~~normal~~ general raster.

5.4.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). The UARFCN values are defined as follows:

~~**Table 5.1: UARFCN definition**~~

	~~UARFCN~~	~~Carrier frequency [MHz]~~
~~Uplink~~	~~$N_u = 5 * F_{uplink}$~~	~~0.0 MHz ≤ F_{uplink} ≤ 3276.6 MHz where F_{uplink} is the uplink frequency in MHz~~
~~Downlink~~	~~$N_d = 5 * F_{downlink}$~~	~~0.0 MHz ≤ $F_{downlink}$ ≤ 3276.6 MHz where $F_{downlink}$ is the downlink frequency in MHz~~

Table 5.1: UARFCN definition (general)

UPLINK (UL) UE transmit, Node B receive		**DOWNLINK (DL)** UE receive, Node B transmit	
UARFCN	**Carrier frequency [MHz]** (F_{UL}) (Note 1)	**UARFCN**	**Carrier frequency [MHz]** (F_{DL}) (Note 2)
$N_u = 5 * F_{UL}$	0.0 MHz ≤ F_{UL} ≤ 3276.6 MHz	$N_d = 5 * F_{DL}$	0.0 MHz ≤ F_{DL} ≤ 3276.6 MHz
Note 1 F_{UL} is the uplink frequency in MHz Note 2 F_{DL} is the downlink frequency in MHz			

~~**Table 5.1A: UARFCN definition (Band II additional channels)**~~

	~~UARFCN~~	~~Carrier frequency [MHz]~~
~~Uplink~~	~~$N_u = 5 * (F_{uplink} - 1850.1$ MHz)~~	~~F_{uplink} =1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5~~
~~Downlink~~	~~$N_u = 5 * (F_{downlink} - 1850.1$ MHz)~~	~~$F_{downlink}$ =1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5~~

Table 5.1A: UARFCN definition (additional channels)

Band	UPLINK (UL) UE transmit, Node B receive		DOWNLINK (DL) UE receive, Node B transmit	
	UARFCN	Carrier frequency [MHz] (F_{UL})	UARFCN	Carrier frequency [MHz] (F_{DL})
I	-	-	-	-
II	$N_u = 5 * (F_{UL} – 1850.1\ MHz)$	1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5	$N_d = 5 * (F_{DL} – 1850.1\ MHz)$	1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5
III	-	-	-	-
IV	$N_u = 5 * (F_{UL} – 1480.1\ MHz)$	1712.5, 1717.5, 1722.5, 1727.5, 1732.5, 1737.5 1742.5, 1747.5, 1752.5	$N_d = 5 * (F_{DL} – 1820.1\ MHz)$	2112.5, 2117.5, 2122.5, 2127.5, 2132.5, 2137.5, 2142.5, 2147.5, 2152.5
V	$N_u = 5 * (F_{UL} – 670.1\ MHz)$	826.5, 827.5, 831.5, 832.5, 837.5, 842.5	$N_d = 5 * (F_{DL} – 670.1\ MHz)$	871.5, 872.5, 876.6, 877.5, 882.5, 887.5
VI	$N_u = 5 * (F_{UL} – 670.1\ MHz)$	$832.5 \le F_{UL} \le 837.5$	$N_d = 5 * (F_{DL} – 670.1\ MHz)$	$877.5 \le F_{DL} \le 882.5$

5.4.4 UARFCN

The following UARFCN range shall be supported for each paired band

~~**Table 5.2: UTRA Absolute Radio Frequency Channel Number**~~

~~Operating Band~~	~~Uplink UE transmit, Node B receive~~	~~Downlink UE receive, Node B transmit~~
~~I~~	~~9612 to 9888~~	~~10562 to 10838~~
~~II~~	~~9262 to 9538 and 12, 37, 62, 87, 112, 137, 162, 187, 212, 237, 262, 287~~	~~9662 to 9938 and 412, 437, 462, 487, 512, 537, 562, 587, 612, 637, 662, 687~~
~~III~~	~~8562 to 8913~~	~~9037 to 9388~~

Table 5.2: UTRA Absolute Radio Frequency Channel Number

Band	Uplink (UL) UE transmit, Node B receive		Downlink (DL) UE receive, Node B transmit	
	General	Additional	General	Additional
I	9612 to 9888	-	10562 to 10838	-
II	9262 to 9538	12, 37, 62, 87, 112, 137, 162, 187, 212, 237, 262, 287	9662 to 9938	412, 437, 462, 487, 512, 537, 562, 587, 612, 637, 662, 687
III	8562 to 8913	-	9037 to 9388	-
IV	8562 to 8763	1162, 1187, 1212, 1237, 1262, 1287, 1312, 1337, 1362	10562 to 10763	1462, 1487, 1512, 1537, 1562, 1587, 1612, 1637, 1662
V	4132 to 4233	782, 787, 807, 812, 837, 862	4357 to 4458	1007, 1012, 1035, 1037, 1062, 1087
VI	4162 to 4188	812 to 837	4387 to 4413	1037 to 1062

3GPP TSG RAN WG4 (Radio) Meeting #29 **R4-031095**

San Diego, USA 17 - 21 November 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.104** **CR** **210** ⌘ **rev** ⌘ Current version: **6.3.0** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Introduction of new channel arrangement for Bands IV, V and VI
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-UMTS850, UMTS800,UMTS1721
Date:	⌘	26/11/2003
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Introduction of channel arrangements for the new frequency bands IV, V and VI.
Summary of change:	⌘	Tx-Rx freqeuncy separation, channel raster and channel numbering (UARFCN) are introduced for the new bands. The new frequency bands IV, V and VI will all require some RF carrier positions that are not on the general 200 kHz raster for UTRA. This is solved in the same way as for band II, by “borrowing” channel numbers from low frequency ranges and map those to the additional frequencies needed that are not on the 200 kHz raster.
Consequences if not approved:	⌘	The channel arrangement for bands IV, V and VI would not be defined.

Clauses affected:	⌘	5.2, 5.3, 5.4			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	25.101
		X /	Test specifications		25.141, 34.121, 34.108
		/ **X**	O&M Specifications		
Other comments:	⌘				

5 Frequency bands and channel arrangement

5.1 General

The information presented in this section is based on a chip rate of 3.84 Mcps.

NOTE 1: Other chip rates may be considered in future releases.

5.2 Frequency bands

a) UTRA/FDD is designed to operate in ~~any of~~ the following paired bands:

Table 5.0: Frequency bands

Operating Band	UL Frequencies UE transmit, Node B receive	DL frequencies UE receive, Node B transmit
I	1920 – 1980 MHz	2110 –2170 MHz
II	1850 –1910 MHz	1930 –1990 MHz
III	1710-1785 MHz	1805-1880 MHz
IV	1710~~-1770~~ – 1755 MHz	2110~~-2170~~ – 2155 MHz
V	824 – 849MHz	869-894MHz
VI	830-840 MHz	875-885 MHz

b) Deployment in other frequency bands is not precluded

5.3 Tx-Rx frequency separation

a) UTRA/FDD is designed to operate with the following TX-RX frequency separation

Table 5.0A: Tx-Rx frequency separation

Operating Band	TX-RX frequency separation
I	190 MHz
II	80 MHz.
III	95 MHz.
IV	400 MHz
V	45 MHz
VI	45 MHz

b) UTRA/FDD can support both fixed and variable transmit to receive frequency separation.

c) The use of other transmit to receive frequency separations in existing or other frequency bands shall not be precluded.

5.4 Channel arrangement

5.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

5.4.2 Channel raster

The channel raster is 200 kHz~~, which~~ for all bands~~, except Band II~~ which means that the centre frequency must be an integer multiple of 200 kHz. In addition a number of ~~Band II, 12~~ additional centre frequencies are specified according to

~~the~~ table 5.1A, ~~in 5.4.3 and~~ which means that the centre frequencies for these channels are shifted 100 kHz relative to the ~~normal~~ general raster.

5.4.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). The UARFCN values are defined as follows:

~~**Table 5.1: UTRA Absolute Radio Frequency Channel Number**~~

	~~UARFCN~~	~~Carrier frequency [MHz]~~
~~Uplink~~	~~$N_u = 5 * F_{uplink}$~~	~~0.0 MHz ≤ F_{uplink} ≤ 3276.6 MHz where F_{uplink} is the uplink frequency in MHz~~
~~Downlink~~	~~$N_d = 5 * F_{downlink}$~~	~~0.0 MHz ≤ $F_{downlink}$ ≤ 3276.6 MHz where $F_{downlink}$ is the downlink frequency in MHz~~

Table 5.1: UARFCN definition (general)

UPLINK (UL) UE transmit, Node B receive		DOWNLINK (DL) UE receive, Node B transmit	
UARFCN	**Carrier frequency [MHz]** (F_{UL}) (Note 1)	**UARFCN**	**Carrier frequency [MHz]** (F_{DL}) (Note 2)
$N_u = 5 * F_{UL}$	0.0 MHz ≤ F_{UL} ≤ 3276.6 MHz	$N_d = 5 * F_{DL}$	0.0 MHz ≤ F_{DL} ≤ 3276.6 MHz
Note 1 F_{UL} is the uplink frequency in MHz Note 2 F_{DL} is the downlink frequency in MHz			

~~**Table 5.1A: UARFCN definition (Band II additional channels)**~~

	~~UARFCN~~	~~Carrier frequency [MHz]~~
~~Uplink~~	~~$N_u = 5 * (F_{uplink} - 1850.1$ MHz)~~	~~F_{uplink} = 1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5~~
~~Downlink~~	~~$N_u = 5 * (F_{downlink} - 1850.1$ MHz)~~	~~$F_{downlink}$ = 1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5~~

Table 5.1A: UARFCN definition (additional channels)

Band	UPLINK (UL) UE transmit, Node B receive		DOWNLINK (DL) UE receive, Node B transmit	
	UARFCN	**Carrier frequency [MHz]** (F_{UL})	**UARFCN**	**Carrier frequency [MHz]** (F_{DL})
I	-	-	-	-
II	$N_u = 5 * (F_{UL} - 1850.1$ MHz)	1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5	$N_d = 5 * (F_{DL} - 1850.1$ MHz)	1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5
III	-	-	-	-
IV	$N_u = 5 * (F_{UL} - 1480.1$ MHz)	1712.5, 1717.5, 1722.5, 1727.5, 1732.5, 1737.5 1742.5, 1747.5, 1752.5	$N_d = 5 * (F_{DL} - 1820.1$ MHz)	2112.5, 2117.5, 2122.5, 2127.5, 2132.5, 2137.5, 2142.5, 2147.5, 2152.5
V	$N_u = 5 * (F_{UL} - 670.1$ MHz)	826.5, 827.5, 831.5, 832.5, 837.5, 842.5	$N_d = 5 * (F_{DL} - 670.1$ MHz)	871.5, 872.5, 876.6, 877.5, 882.5, 887.5
VI	$N_u = 5 * (F_{UL} - 670.1$ MHz)	832.5 ≤ F_{UL} ≤ 837.5	$N_d = 5 * (F_{DL} - 670.1$ MHz)	877.5 ≤ F_{DL} ≤ 882.5

3GPP TSG RAN WG4 (Radio) Meeting #29 **R4-031096**

San Diego, USA 17 - 21 November 2003

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CHANGE REQUEST

⌘ **25.141** **CR** **333** ⌘ **rev** ⌘ Current version: **6.3.0** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Introduction of new channel arrangement for Bands IV, V and VI
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-UMTS850, UMTS800,UMTS1721
Date:	⌘	26/11/2003
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Introduction of channel arrangements for the new frequency bands IV, V and VI.
Summary of change:	⌘	Tx-Rx freqeuncy separation, channel raster and channel numbering (UARFCN) are introduced for the new bands. The new frequency bands IV, V and VI will all require some RF carrier positions that are not on the general 200 kHz raster for UTRA. This is solved in the same way as for band II, by “borrowing” channel numbers from low frequency ranges and map those to the additional frequencies needed that are not on the 200 kHz raster.
Consequences if not approved:	⌘	The channel arrangement for bands IV, V and VI would not be defined.

Clauses affected:	⌘	5.2, 5.3, 5.4			
Other specs affected:	⌘	**Y** / **N**		⌘	
		X /	Other core specifications		25.101, 25.104
		X /	Test specifications		34.121, 34.108
		/ **X**	O&M Specifications		
Other comments:	⌘				

3.4 Radio Frequency bands

3.4.1 Frequency bands

a) UTRA/FDD is designed to operate in ~~any of~~ the following paired bands:

Table 3.0: Frequency bands

Operating Band	UL Frequencies UE transmit, Node B receive	DL frequencies UE receive, Node B transmit
I	1920 – 1980 MHz	2110 –2170 MHz
II	1850 –1910 MHz	1930 –1990 MHz
III	1710-1785 MHz	1805-1880 MHz
IV	1710~~-1770~~ – 1755 MHz	2110~~-2170~~ – 2155 MHz
V	824 – 849MHz	869-894MHz
VI	830-840 MHz	875-885 MHz

b) Deployment in other frequency bands is not precluded

3.4.2 TX–RX frequency separation

a) UTRA/FDD is designed to operate with the following TX-RX frequency separation

Table 3.0A: TX–RX frequency separation

Operating Band	TX-RX frequency separation
I	190 MHz
II	80 MHz.
III	95 MHz.
IV	400 MHz
V	45 MHz
VI	45 MHz

b) UTRA/FDD can support both fixed and variable transmit to receive frequency separation.

c) The use of other transmit to receive frequency separations in existing or other frequency bands shall not be precluded.

3.5 Channel arrangement

3.5.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

3.5.2 Channel raster

The channel raster is 200 kHz~~, which~~ for all bands, ~~except Band II~~ which means that the centre frequency must be an integer multiple of 200 kHz. In addition an number of ~~Band II , 12~~ additional centre frequencies are specified according to ~~the~~ table ~~in~~ 3.2, ~~and~~ which means that the centre frequencies for these channels are shifted 100 kHz relative to the ~~normal~~ general raster.

3.5.3 Channel number

The carrier frequency is designated by the UTRA Absolute Radio Frequency Channel Number (UARFCN). The UARFCNvalues are defined as follows.

~~**Table 3.1: UTRA Absolute Radio Frequency Channel Number**~~

	~~UARFCN~~	~~Carrier Frequency [MHz]~~
~~Uplink~~	~~$N_u = 5 * (F_{uplink}$ MHz)~~	~~0.0 MHz ≤ F_{uplink} ≤ 3276.6 MHz where F_{uplink} is the uplink frequency in MHz~~
~~Downlink~~	~~$N_d = 5 * (F_{downlink}$ MHz)~~	~~0.0 MHz ≤ $F_{downlink}$ ≤ 3276.6 MHz where $F_{downlink}$ is the downlink frequency in MHz~~

Table 3.1: UARFCN definition (general)

UPLINK (UL) UE transmit, Node B receive		**DOWNLINK (DL)** UE receive, Node B transmit	
UARFCN	**Carrier frequency [MHz]** (F_{UL}) (Note 1)	**UARFCN**	**Carrier frequency [MHz]** (F_{DL}) (Note 2)
$N_u = 5 * F_{UL}$	0.0 MHz ≤ F_{UL} ≤ 3276.6 MHz	$N_d = 5 * F_{DL}$	0.0 MHz ≤ F_{DL} ≤ 3276.6 MHz
Note 1 F_{UL} is the uplink frequency in MHz Note 2 F_{DL} is the downlink frequency in MHz			

~~**Table 3.2: UARFCN definition (Band II additional channels)**~~

	~~UARFCN~~	~~Carrier Frequency [MHz]~~
~~Uplink~~	~~$N_u = 5 * (F_{uplink}$ – 1850.1 MHz)~~	~~F_{uplink} = 1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5~~
~~Downlink~~	~~$N_d = 5 * (F_{downlink}$ – 1850.1 MHz)~~	~~$F_{downlink}$ = 1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5~~

Table 3.2: UARFCN definition (additional channels)

Band	**UPLINK (UL)** UE transmit, Node B receive		**DOWNLINK (DL)** UE receive, Node B transmit	
	UARFCN	**Carrier frequency [MHz]** (F_{UL})	**UARFCN**	**Carrier frequency [MHz]** (F_{DL})
I	-	-	-	-
II	$N_u = 5 * (F_{UL}$ – 1850.1 MHz)	1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5	$N_d = 5 * (F_{DL}$ – 1850.1 MHz)	1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5
III	-	-	-	-
IV	$N_u = 5 * (F_{UL}$ – 1480.1 MHz)	1712.5, 1717.5, 1722.5, 1727.5, 1732.5, 1737.5 1742.5, 1747.5, 1752.5	$N_d = 5 * (F_{DL}$ – 1820.1 MHz)	2112.5, 2117.5, 2122.5, 2127.5, 2132.5, 2137.5, 2142.5, 2147.5, 2152.5
V	$N_u = 5 * (F_{UL}$ – 670.1 MHz)	826.5, 827.5, 831.5, 832.5, 837.5, 842.5	$N_d = 5 * (F_{DL}$ – 670.1 MHz)	871.5, 872.5, 876.6, 877.5, 882.5, 887.5
VI	$N_u = 5 * (F_{UL}$ – 670.1 MHz)	832.5 ≤ F_{UL} ≤ 837.5	$N_d = 5 * (F_{DL}$ – 670.1 MHz)	877.5 ≤ F_{DL} ≤ 882.5