



UK Cellular Frequency Allocations

v13.1 – Q1 2020

Updated with
H3 5G channel
details



UK Cellular Spectrum Q1 2020

It's that time again; we've pooled the results of our own RF survey data with updates provided by our good friend Peter Clarke (of pedroc.co.uk) and have updated our UK cellular spectrum guide.

A few notable changes in the last quarter – some further consolidation of the former GSM spectrum, the continuing slow disappearance of 3G across the country, new 4G channels and a whole swathe of new 5G capacity.

GSM

Following the spectrum swap undertaken between O2 and VF last year, only two slices of the original GSM900 band (of just over 7MHz each) are still being used for GSM by O2 and VF and the rest of the 900 band is in use by UMTS900 or LTE900.

There's been a further reduction in the amount of spectrum in the 1800 band still being used by GSM, with EE taking a further 27 carriers away to use for LTE.

Arguably, GSM capacity has been wound down to just about the minimum level that's possible to allow wide-area frequency reuse to continue to operate.

UMTS

3G UMTS coverage has definitely been wound down to the absolute minimum possible level in some areas – of the 16 UMTS channels that were originally used, there are some areas where only 4 of them seem to be in regular use, 1 channel per network, with the rest having been refarmed for LTE use. You can't go any lower than that without sharing channels between operators! UMTS2100 is still being used in other parts of the most networks, though, and a transition over to full LTE2100 might take some time.

LTE

Half of the former E-GSM spectrum, that had been used for UMTS900 by O2 and VF, has been (or is in the process of being) refarmed to LTE (UARFCNs 2987 and 3050 are being phased out in favour of EARFCNs 3574/5 and 3700).

EE has rearranged its LTE1800 channels – there is now a primary 20MHz channel (1617) and two smaller secondary channels (10MHz 1761 or 15MHz 1788, but not both at the same time) deployed. Channel 1808 appears to still be in use for a 'small cells' layer.



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5G

The 5G rollout is gathering pace across the country for all four networks. In our last update we'd only been informed of EE's Band N78 assignment – 1x 40MHz channel – but in recent weeks the channels being used by other operators have become clearer, with mixtures of 20MHz, 40MHz and 50MHz channels being deployed by O2 and VF.

H3 are rolling their 5G services out in spectrum they acquired when they bought UK Broadband (UKBB) – as with all current 5G operations, H3 5G cells will be deployed as 'secondary' cells under the control of a 4G 'primary' cell – LTE2100 channels 76 & 124 seem to be being deployed to act as P-Cells in these configurations in areas where 5G is deployed in UKBB spectrum.

Future Changes

So, a fair bit of moving and shaking going on in UK spectrum, with the prospect of auctions for further 5G frequencies (for spectrum in the 700MHz and 3600-3800MHz bands) being planned for Spring 2020 and inevitable further auctions for millimeter-band 26GHz spectrum in the future.

We'll keep an eye on spectrum changes and will be back with our next update in Q2 2020, but if you notice anything new in the meantime (or if you have comments on or updates of the information in this bulletin) please get in touch – enquiries@forensicanalytics.co.uk.

References

Spectrum Auction 2020 (Ofcom) - https://www.ofcom.org.uk/data/assets/pdf_file/0028/172648/revised-proposal-auction-design.pdf

5G in the UK (Ofcom) - https://www.ofcom.org.uk/data/assets/pdf_file/0022/111883/enabling-5g-uk.pdf

Key	
ARFCN	highlights remaining GSM & UMTS channels
ARFCN	channel in use in this frequency band
ARFCN	channel no longer in general use in this frequency band
ARFCN	recently changed allocation

Additional updates by Peter Clarke – www.pedroc.co.uk



UK Cellular Spectrum 800-900MHz

		Channel Numbers		Use	Comments
800 band	LTE800	Band 20			
	H3G	6175		5MHz channel	
	EE	6225		5MHz channel	
	VF	6300		10MHz channel	
	O2	6400		10MHz channel	
900 band	GSM900				
	VF (E-GSM)	975	999		Used for 3G - U09 2938
	O2 (E-GSM)	1000	1023		Used for 3G - U09 2963
	VF	1	24		Used for U09 2987 (being phased out) or L09 3574/3575
	VF	25	61		Used for GSM
	VF	62	87		Used for U09 3050 (being phased out) or L09 3700
	O2	88	124		Used for GSM
	UMTS900				
	VF	2938		HSPA+	Used for UMTS
	VF	2987		HSPA+	Used for U09 2987 (being phased out) or L09 3574/3575
	O2	2963		HSPA+	Used for UMTS
	O2	3050		HSPA+	Used for U09 3050 (being phased out) or L09 3700
	LTE900	Band 08			
	VF	3574		5MHz channel	Replaces UARFCN 2987 used in south-east
	VF	3575		5MHz channel	Replaces UARFCN 2987 used in north-west
	O2	3700		5MHz channel	Replaces UARFCN 3050



Band 8 – 900MHz

DL MHz	2G	3G	4G
925	975-999	2938 5MHz channel	
930	1000-1023	2963 5MHz channel	
935	1-24	2987 5MHz channel (being phased out)	3574/3575 5MHz channel (being phased in)
940	25-61		
945	62-87	3050 5MHz channel (being phased out)	3700 5MHz channel (being phased in)
950	88-124		
955			
960			



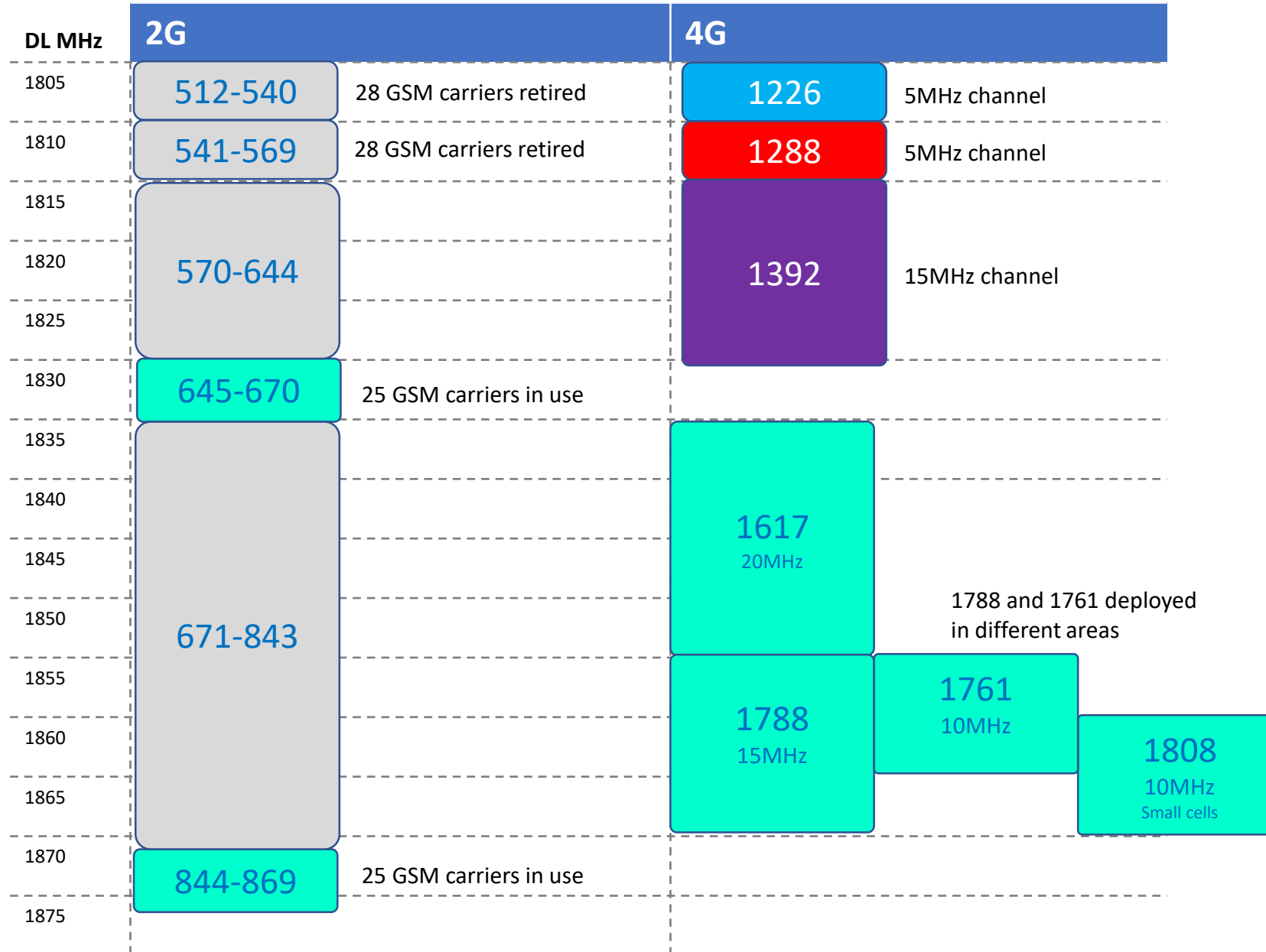


UK Cellular Spectrum 1500-1800MHz

		Channel Numbers		Use	Comments
1500	LTE1500	Band 32			Supplementary Downlink band
	VF	10020	1462 MHz	20MHz	Downlink Only
	H3G	10220	1482 MHz	20MHz	Downlink Only
1800 band	GSM1800				
	O2	512	540		Used for LTE - L18 1226
	VF	541	569		Used for LTE - L18 1288
	H3G	570	644		Used for LTE - L18 1392
	EE	645	670		Used for GSM
		671	719		Used for LTE
		720	843		Used for LTE
		844	869		Used for GSM
	LTE1800	Band 03			
	O2	1226		5MHz channel	macrocell use
		1228		5MHz channel	used for microcells, offset from macrocell channel (1226)
		1227		5MHz channel	occasional use
		1229		5MHz channel	occasional use
		1230		5MHz channel	occasional use
	VF	1288		5MHz channel	
	H3G	1392		15MHz channel	
		1363		3MHz channel	has been referred to in signalling but not detected
	EE	1617		20MHz channel	Reorganisation makes this the primary EE LTE1800 channel
		1761		10MHz channel	10MHz secondary L18 carrier
		1788		15MHz channel	15MHz secondary L18 carrier
		1808		10MHz channel	small cells



Band 3 – 1800MHz





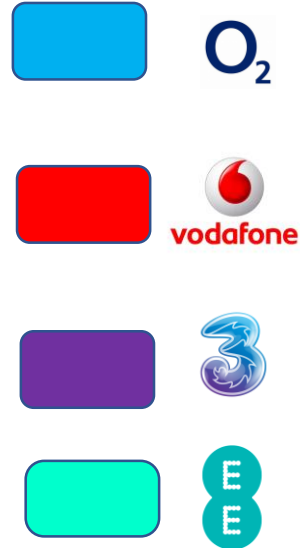
UK Cellular Spectrum 2100MHz

		Channel Numbers		Use	Comments
2100 band	UMTS2100				
	H3G	10564		HSPA+	Used for UMTS
		10588		HSPA+	Used for LTE in areas where 5G is deployed
		10612		HSPA+	Used for LTE in areas where 5G is deployed
	O2	10637		HSPA+	Used for LTE in some areas
		10661		HSPA+	Used for LTE in some areas
	VF	10687		Sure Signal femtocells/HSPA+	Used for LTE in some areas
		10712		HSPA+	Used for LTE in some areas
		10736		HSPA+	Used for LTE in some areas
	EE	10761		HSPA+	Used for UMTS
		10786		HSPA+	Used for LTE
		10811		HSPA+	Generally used for LTE but has been detected as UMTS
		10836		HSPA+	Used for LTE
	LTE2100	Band 01			
	H3G	99		10MHz channel	replaces UMTS 10588 & 10612
		76		5MHz channel	Used as 4G primary cell in UKBB 5G areas
		124		5MHz channel	Used as 4G primary cell in UKBB 5G areas
	O2	199		10MHz channel	replaces UMTS 10637 & 10661
	VF	323		15MHz channel	replaces UMTS 10687, 10712 & 10736
		347		10MHz channel	replaces UMTS 10712 & 10736 only
	EE	522		15MHz channel	replaces UMTS 10786, 10811 & 10836



Band 1 – 2100MHz

DL MHz	3G	4G
2110	10564 UMTS Carrier in use	
2115	10588 Used in areas where LTE 99 isn't deployed – sometimes used in conjunction with LTE 76 & 124	99 10MHz
2120	10612	76 124 Used a primary cells in areas where 5G is deployed
2125	10637 Used in areas where LTE 199 isn't deployed	199 10MHz
2130	10661	
2135	10687	323 15MHz
2140	10712 Used in areas where LTE isn't deployed	347 10MHz LTE 347 deployed in conjunction with UMTS 10687
2145	10736	
2150	10761 UMTS Carrier in use	
2155	10786	
2160	10811	522 15MHz
2165	10836	
2170		





UK Cellular Spectrum 2300-2600MHz

2300	LTE2300 TDD	Band 40			
	O2	39250	2360.0 MHz	20MHz channel	
		39448	2379.8 MHz	20MHz channel	
2600 band	LTE2600 FDD	Band 07			
	VF	2850		20MHz channel	
	EE	3176		15MHz channel	small cell kiosks
		3179		15MHz channel	
		3350		20MHz channel	
		3026		15MHz channel	small cell kiosks
		3029		15MHz channel	Third Band 7/L26 carrier, currently on very busy sites only
	LTE 2600 TDD	Band 38			
	VF	37900		20MHz channel	
	BT	TBD			



UK Cellular Spectrum 3400-3600MHz

	Channel Numbers		Use	Comments
3400-3600 band	LTE 3400	Band 42		
	VF	TBD	10MHz channel	Theoretical channel, not been detected in live network yet
		TBD	20MHz channel	Theoretical channel, not been detected in live network yet
		TBD	20MHz channel	Theoretical channel, not been detected in live network yet
	H3G	TBD	20MHz channel	Theoretical channel, not been detected in live network yet
		TBD	20MHz channel	Theoretical channel, not been detected in live network yet
	UK BB (H3G)	42490	20MHz channel	
		43490	20MHz channel	
		43740	20MHz channel	
		43940	20MHz channel	
		44140	20MHz channel	
		44340	20MHz channel	
	O2	TBD	20MHz channel	Theoretical channel, not been detected in live network yet
		TBD	20MHz channel	Theoretical channel, not been detected in live network yet
	EE	TBD	20MHz channel	Theoretical channel, not been detected in live network yet
		TBD	20MHz channel	Theoretical channel, not been detected in live network yet
	5G 3400-3600	N78		
	EE	637334	40MHz channel	
	VF	629332	50MHz channel	Newly deployed channel
		627638	50MHz channel	Newly deployed channel
		627648	50MHz channel	Newly deployed channel
		628320	50MHz channel	Newly deployed channel
		629332	40MHz channel	Newly deployed channel
		628588	40MHz channel	Newly deployed channel
	O2	634666	40MHz channel	Newly deployed channel
		634656	40MHz channel	Newly deployed channel
		633696	40MHz channel	Newly deployed channel
		634368	20MHz channel	Newly deployed channel
	H3G	642000	100MHz channel	Newly deployed channel



If you have questions or comments please let us know

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