



Fireground radio channel plans

The current UK national fireground radio channel plan was agreed with the Home Office in 1993 based on the use of analogue radios and frequency bands of 25 kHz (see Table 1). The reason for this bandwidth was to minimise the risk of cross channel interference from other users of the 450 - 470 MHz frequency spectrum.

Channel	Primary Use	Tx Frequency (Mhz)	Rx Frequency (Mhz)
1	General incident	457.0375	457.0375
2	UHF – VHF Relay	462.5875	457.0875
3	Breathing apparatus	457.4875	457.4875
4	Command support	457.1875	457.1875
5	Mobile or licensed fixed base stations	462.6375	457.1375
6	Breathing apparatus	457.2375	457.2375

Table 1: 1993 analogue channel plan

Early adopters of digital mobile radio technology have been supplied with radios that are programmed to replicate the analogue channel plan. This interim digital channel plan also replicates the analogue channel plan in Table 1 allocating different channel numbers to the analogue frequencies.

Channel	Primary Use	Digital / Analogue	Tx Frequency (Mhz)	Rx Frequency (Mhz)
1	General incident	Digital	457.0375	457.0375
2	UHF – VHF Relay	Digital	462.5875	457.0875
3	Breathing apparatus	Digital	457.4875	457.4875
4	Command support	Digital	457.1875	457.1875
5	Mobile or licensed fixed base stations	Digital	462.6375	457.1375
6	Breathing apparatus	Digital	457.2375	457.2375
7	General incident	Analogue	457.0375	457.0375
8	UHF – VHF Relay	Analogue	462.5875	457.0875
9	Breathing apparatus	Analogue	457.4875	457.4875
10	Command support	Analogue	457.1875	457.1875
11	Mobile or licensed fixed base stations	Analogue	462.6375	457.1375
12	Breathing apparatus	Analogue	457.2375	457.2375

Table 2: Interim digital channel plan

The interim digital channel plan does not provide the fire service with 12 channels, as the same frequencies cannot be used simultaneously in digital and analogue mode without causing co-channel interference.

This channel plan is not optimising the use of the technological improvements offered by digital mobile radio. The fire service has been in discussions with Ofcom to test alternative solutions that would offer an increase in the number of channels available without increasing the bandwidth, or cost, of the 200 kHz bandwidth already allocated to the fire service for 'at incident' voice communications.

This may be achieved by splitting each 25 kHz frequency band into 2 adjacent 12.5 kHz channels. As digital radios are less likely to cause adjacent channel interference, this option may not present any greater risk from interference than the 1993 analogue channel plan. Ofcom and the fire service have commissioned scientific testing to prove, or otherwise, the risk of interference.

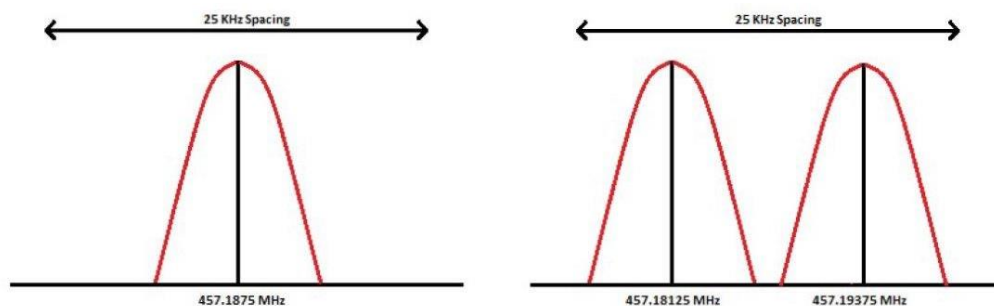


Figure 1: Centre frequency of 25kHz band split into two 12.5kHz bands

Other solutions being considered include the allocation of new channels within the 450 - 470 MHz frequency spectrum to the fire service and the reallocation of channels that are hardly used for their original purpose (i.e. UHF-VHF relay and Channel 6). Possible future uses for additional channels may include transmission of data from wearable technology such as physiological monitoring and firefighter locator devices. If feasible these possibilities will be explored further.

Below is a proposed future digital channel plan which retains 25kHz bandwidth for the most frequently used channels (1 and 3) whilst splitting the remaining frequencies to create an additional 6 channels for fireground voice communications.

Proposed fireground Digital Mobile Radio channel plan

Channel position	Centre Frequency		Width	Use
	Mobile Tx (Simplex)	Mobile Rx (Duplex)		
	Incident A			
1	457.0375 MHz		25	General incident (A1)
2	462.58125 MHz	457.08125 MHz	12.5	Command Support (A2)
3	457.4875 MHz		25	Breathing Apparatus (A3)
4	457.18125 MHz		12.5	User defined
5	462.63125 MHz	457.13125 MHz	12.5	Repeater / Fixed base stations
6	457.23125 MHz		12.5	Breathing Apparatus Sector (A6)
	Incident B			
7	457.09375 MHz		12.5	General incident (B1)
8	457.14375 MHz		12.5	Command support (B2)
9	457.19375 MHz		12.5	Breathing Apparatus (B3)
10	457.24375 MHz		12.5	User defined
11	462.59375 MHz		12.5	User defined
12	462.64375 MHz		12.5	User defined
	Analogue Interoperability			
13	457.0375 MHz		25	General incident (Analogue Ch.1)
14	457.4875 MHz		25	Breathing apparatus (Analogue Ch.3)
	Further available channels			
15				User defined
16 +				User defined