

Borders Model Boat Club

Legal Frequency Bands for Radio Control of Model Boats in the UK

Overview

The official frequency allocations in the UK are laid out in the Ofcom document OFW 311. All legal use of radio for controlling models stems from this document. You can view the latest copy on www.ofcom.org.uk.

Commercial radio control equipment is built to be used in a “Frequency Band” within which the particular frequency being used is set by a “crystal”. In addition two types of modulation are used to transmit data, “AM” (amplitude modulation) and “FM” (frequency modulation). If you buy new crystals to alter the frequency you are using, you must get the correct type. It is a good idea to get the crystals supplied by the equipment manufacturer as there are different cuts of crystal in use. Crystals are marked “Tx” for a transmitter crystal and “Rx” for a receiver together with a channel number.

It is courteous to display markings on your transmitter aerial to let others know what frequency you are using, so that no frequency clashes occur. These take the form of a coloured ribbon or flag fastened to the tip of the aerial, and a coloured label attached to the base of the aerial marked with the channel number or frequency. In addition, some rounded object, such as a practice golf ball, should be fitted to the tip of a whip aerial to minimise accidents.

The main frequency bands used are 27 MHz, 35MHz, 40MHz, 49MHz, 459MHz and 2.4GHz. Note that the 35MHz band is solely for use in model aircraft and must not be used in any other type of model. Similarly, the 40MHz band is solely for use in model surface vehicles, and must not be used in model aircraft. The 45MHz band may be used at low power (under 10mW) which severely limits range, and is often used in toys.

Control of frequencies at Club meetings is usually by a “peg” system. When the system is in use, there will be a board with a set of clothes pegs marked with channel identification. The procedure is that before switching on you must collect the peg corresponding to your frequency, and attach it to the aerial of your transmitter. When you have finished, switch off your equipment and return the peg to the board. You may not switch on your gear before you have the peg in your possession. Ideally this prevents frequency clashes.

Transmitter power

Commercial transmitters are produced in three power ranges, “Full Range”, “Park Range” (about 200 metres) and a reduced range for toys (less than 40 metres). A “Full Range” transmitter may well swamp a “Toy”, making it behave erratically, even if it is on a different channel.

Equipment Purchased Overseas

The regulations in other countries may well be different to those of the UK, for example, the USA permits different frequencies and higher power transmitters. If you purchase equipment from abroad via the internet, ensure that it carries a genuine “CE” marking. (Cases have occurred where equipment purchased from the far east carrying a bogus marking have caused serious trouble)

The 27MHz Band

This is the original band used for radio control, and organisation within the band has changed considerably over time. This has come about by improvements in the “bandwidth” of the equipment, which has enabled more models to be operated at the one time. Since the older equipment is still in use, this causes confusion. In addition, the CB enthusiasts stray into the radio control band by using equipment purchased overseas.

The earliest radio control gear used “super regenerative” receivers, which used the whole band and only permitted one model to be operated at a time. These were superseded by “super hetrodyne” receivers which originally had 50kHz band width, which has since been reduced first to 25kHz and currently to 10kHz. This has increased the number of frequency channels in use, but at the same time has increased the confusion as the latest 10khz channels overlap the previous allocation. The safest way is to stick to the 25MHz band allocation system. Both AM and FM systems are in use.

27MHz Band Designation

Channel	Frequency MHz	Flag Colour
4	26.995	Brown
7	27.025	Brown/Red
9	27.045	Red
12	27.075	Red/Orange
14	27.095	Orange
17	27.125	Orange/Yellow
19	27.145	Yellow
22	27.175	Yellow/Green
24	27.195	Green
27	27.225	Green/Blue
29	27.245	Blue

The 40 MHz Band

This is for use in surface models only. Identification is by a green flag or ribbon, and a green label marked with the last three digits of the frequency. Both AM and FM systems are in use, and also PCM and PPM encoding is used, with PPM being the most common. The receiver must match the encoding and modulation system used by the transmitter.

40MHz Band Designation

European Channel Number	Frequency MHz	UK Channel Number		European Channel Number	Frequency MHz	UK Channel Number
50	40.665	665		83	40.835	835
51	40.675	675			40.845	845
52	40.685	685			40.855	855
53	40.695	695		84	40.865	865
	40.705	705		85	40.875	875
54	40.715	715		86	40.885	885
55	40.725	725			40.895	895
56	40.735	735			40.905	905
	40.745	745		87	40.915	915
	40.755	755		88	40.925	925
57	40.765	765		89	40.935	935
58	40.775	775			40.945	945
59	40.785	785			40.955	955
	40.795	795			40.965	965
	40.805	805			40.975	975
81	40.815	815			40.985	985
82	40.825	825			40.995	995

The 2.4 GHz Band

This is a worldwide Industrial/Scientific/Medical (ISM) band. The system is self regulating, with many channels being able to coexist. Consequently no direct frequency control is required.

However different makes of equipment use different encoding systems, so it is important to match transmitters and receivers. Typically a brand “X” transmitter will not work with a brand “Y” receiver. As the equipment design and complexity varies between manufacturers, it is important to read the instructions carefully.

Receivers have to be “bonded” to a transmitter in order to function. This is so that it can recognise the signal from that transmitter, while ignoring all others. When you buy a “combo” set of transmitter and receiver this will already have been done, But if you buy an additional receiver, you will have to “bond” it before it will work. The procedure is usually very simple, but varies between manufacturers.

Finally, if the system includes a “Fail Safe” function, then enable it and use it.

The information given in this data sheet is given in good faith and is believed to be correct. However no liability can be accepted for any damage caused by following any advice given in the sheet.

GCH June 2014

Copyright Reserved, Borders Model Boat Club
