

Radio control of electrically powered 5" gauge model locomotives

The radio system to operate on a frequency of 2.4GHz⁽¹⁾ with Spread Spectrum⁽²⁾ technology, and to incorporate both under voltage (of transmitter and receiver) and radio interference failsafes.

When the transmitter and receiver are initially "bound", the transmitter failsafe must have the throttle control set to stop⁽³⁾. The system must then be checked before each running session to ensure that a loss of signal or electrical supply (to transmitter or receiver) will in fact bring the loco to a rapid stop.

The transmitter should be clearly labelled with the name or number of the loco which it is set to control⁽⁴⁾.

Other safe operating methods as normally used on non-radio controlled locos, eg driver awareness, sight and security of train etc, must still of course be observed at all times.

Some systems have a switch which gives them the ability to alternate the throttle failsafe between either stopping the loco, or keeping it running at it's current speed. Any part of the control system which has this option MUST have it permanently disabled.

Radio controlled steam locos will not be accepted.

1. An advantage of the use 2.4GHz over the more traditional MHz frequencies is that it is much less susceptible to 'noise' from the other electronic components on the loco.

2. Spread Spectrum technology means that once a transmitter and receiver are paired together, known as "binding", they will change their operating frequency together (within the designated 2.4GHz bandwidth), randomly, and at over 1000 times a second. This means that it is to all intents and purposes impossible for one transmitter to control any receiver other than the one to which it has been bound. This allows the safe operation of many models in the same area. Reliable Spread Spectrum radio equipment is available from Spektrum, Taranis and Futaba. It is highly recommended that only radio equipment designed for large scale models is used in a model loco. RC equipment designed for model railways or toy vehicles is not suitable for large scale locos.

3. The receiver constantly looks for a signal to follow from it's own transmitter. If the signal is lost, very weak, or is drowned by interference, it will in effect see no signal. This causes the receiver to 'failsafe' and send the same signal to the speed controller as the transmitter was set to when bound. This makes the radio system failsafe.

4. Labelling the transmitter should prevent a driver from thinking he is controlling one loco, whilst a different one moves off unseen because he has picked up the wrong transmitter.