

Fitting Radio Control to a small O gauge tank loco

Introduction

In recent years it has become feasible to fit radio control to even the smallest O gauge locomotive. The advantages of radio control over conventional track based power cannot be exaggerated. First there is no need to divide the track into separate sections; second you can run any number of locomotives independently on the same track; third, there is no problem with reverse loops (i.e. a 'tear drop' layout); and lastly, but most importantly, it doesn't matter how dirty the track gets or how rusty your turnouts are, you can always guarantee that your loco will run at the slowest possible speed whatever the condition of the track.

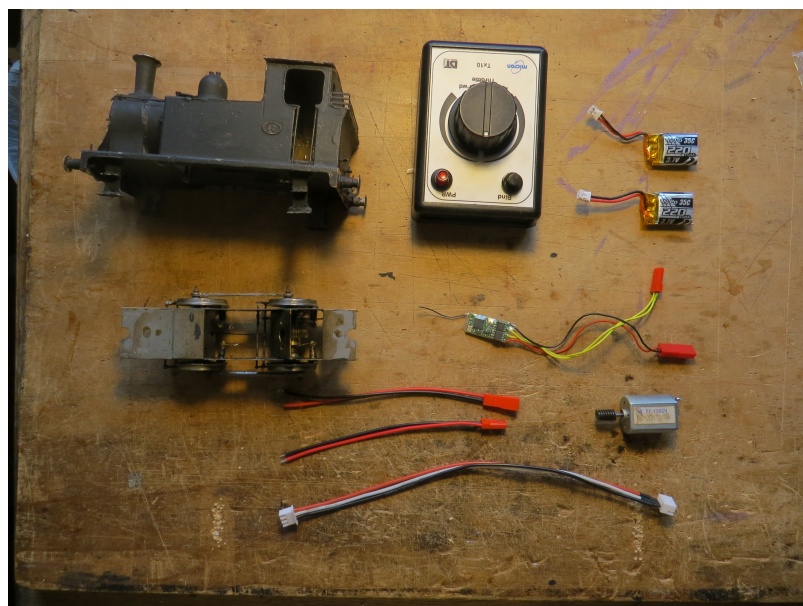
In fact there is only one disadvantage – the size of the battery.

Now modern LiPo batteries are amazingly small but if you wish to power a locomotive fitted with a standard 12V motor you are going to have to find space for at least a 3-cell (11.1V) battery. One way of accommodating this requirement with a small locomotive is to have a wagon containing the battery permanently attached to the engine but, of course, a better solution would be to have the battery inside the locomotive.

Now virtually all model railway locomotives are fitted with a 12V motor – but there is nothing sacrosanct about 12 V. If the locomotive is independent of the track, you can use any voltage. I was greatly helped by Julian Wynn of Taff Vale Models who suggested using a MABUCHI FF-130SH-14230 (see <https://product.mabuchi-motor.com/detail.html?id=25> for details) and I was able to purchase one of these remarkably quickly from efans-studio in China for the princely sum of £2:50 (postage included). (How is this possible, I ask myself?). I also purchased four 3.7V 220mAh single cell LiPo Batteries 35C with charger & cables on ebay for little over £10 (advertised as being suitable for a JJRC RC drone). These are really tiny, being only the size of a large humbug.

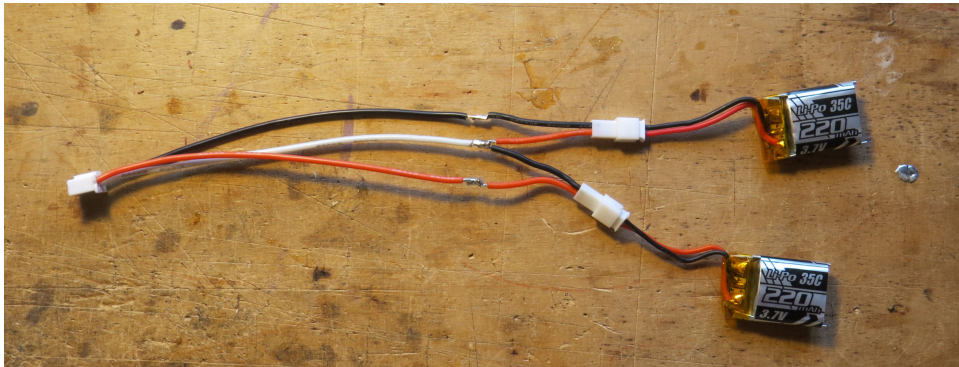
I also needed a 2-cell LiPo charger extension cable (with three wires and JST connectors) and a pair of 2-wire JST battery connectors.

Here is what I used. The radio receiver is a RX60 from Micron Radio Control and the control unit is a TX10. The tank locomotive is the beginners model from Connoisseur Models.



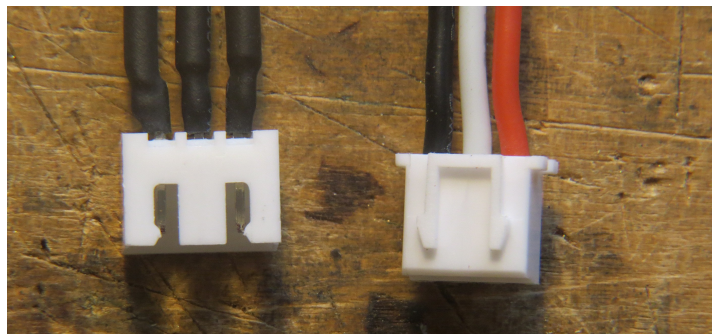
Construction

Two of the batteries must be wired in series to make a 2-cell battery. Cut the extension lead in the middle and solder it to the two batteries as shown below using the female end of the extension cable.

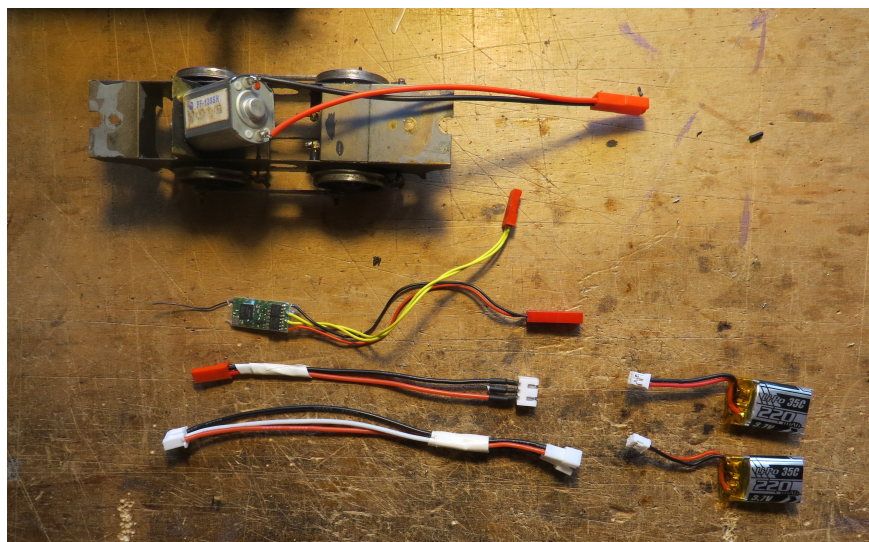


Take great care not to short the batteries while soldering the connections and insulate the joints with heat shrink sleeving or insulating tape.

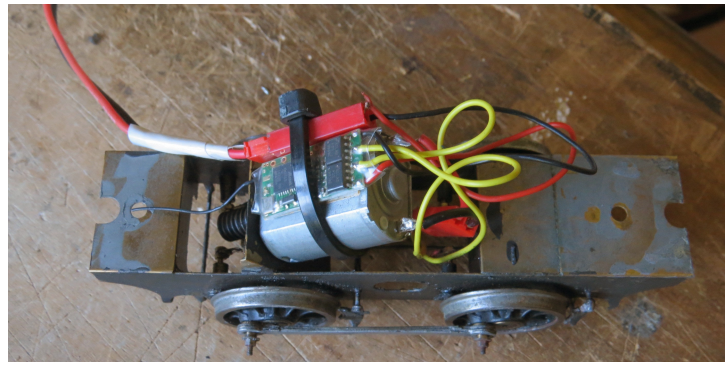
The JST connectors have little lugs on them to prevent the connectors from pulling apart but as you will be connecting and disconnecting this every time you use the loco, I think it is a good idea to remove these lugs.



Finally, clip off the centre wire from the male end of the extension cable and solder a female JST battery connector to the red and black wires observing the polarity. Solder a male connector to the motor. (You may have to reverse these connections later depending on which way the loco runs.) The complete setup now look like this:



It is not difficult to pack all this into the body of the loco. The batteries fit into the boiler; the receiver and the JST battery connector are attached to the motor with a cable tie:



Once installed, the engine is switched on and off by connecting and disconnecting the JST leads which can conveniently be stowed in the cab or the coal bunker while running.

Performance

Using a 40:1 reduction gear, I found that on full power, the wheels made 3 revolutions per second. This translates into a scale speed of 22 mph. Ideal! When running freely the motor takes about 40mA rising to over 100mA under heavy load. Even at this rate, I can expect at least half an hour of running on each charge.

Here is my trusty tank pulling a load of mixed wagons along my garden railway.



If you have any questions, feel free to contact me on joliverlinton@gmail.com

J Oliver Linton; Cumbria; June 2020