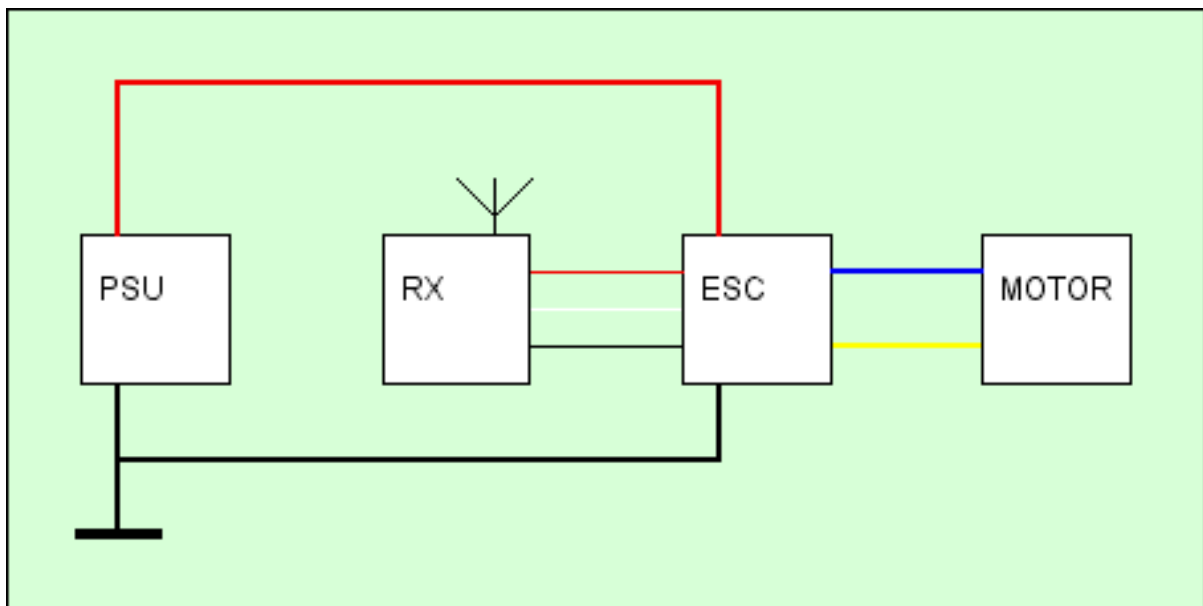


Earthing

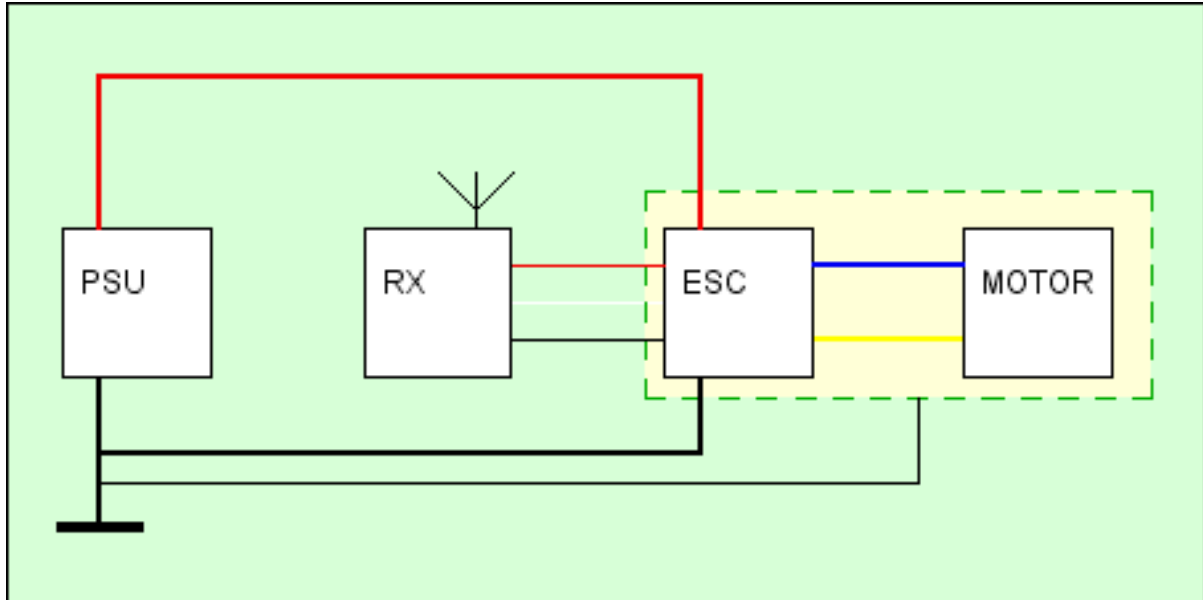
This may not at first sight be the most important thing in the design of an electrically powered locomotive -or that of a steam one either... However if you wish to have a good reception of signal for Radio Control (R/C) and also minimize the amount of electrical interference that your loco can generate then the following sequence of steps will improve it.

The first drawing shows the basic set up of an R/C system. In this worked example a 12 Volt battery feeds the Electronic Speed Control (ESC) which in turn feeds the Motor and the Receiver (RX). Everything sits earthed to the negative line.

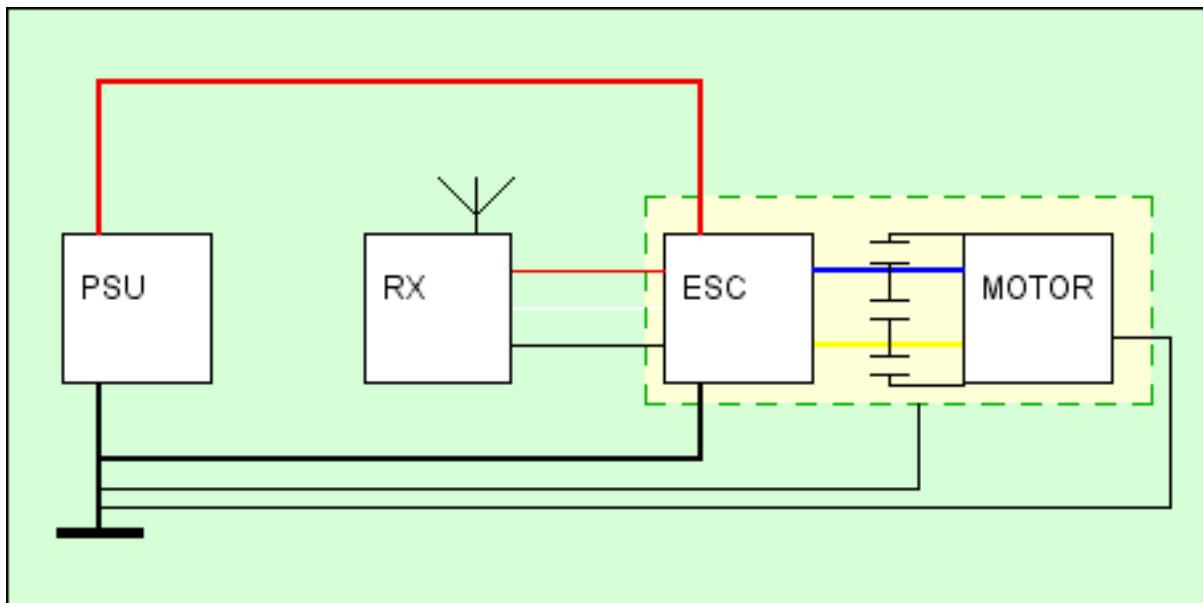


The battery generates very little noise, (possibly some from arcing of poor contacts), the ESC (dependant on manufacture) can generate a multi watt signal from 100 Hz to 32kHz. The motor will arc at each commutator, (assuming a standard design of motor). The ariel will attempt to pick up its R/C signal in this **mess** of interference...

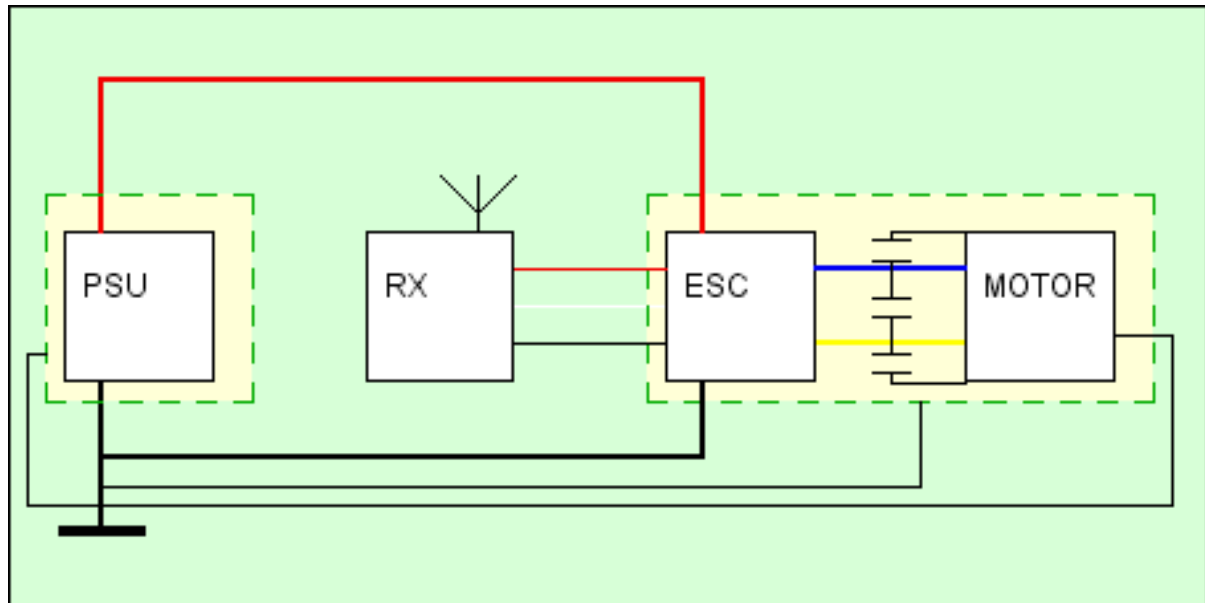
The next drawing shows a simple Faraday cage around the ESC and the Motor, this is earthed via a system normally referred to as **STAR** earthing. In this one place is chosen as the earthing point and all wires from equipment lead to it. The Faraday cage could be made of the aluminium mesh used in car body repairs or simply baking foil stuck to plastic -as long as the shielding is connected at all points then the cage is working.



The next step along the path is to "suppress" the Motor. This is done by having small capacitors across the power lines to the Motor and to the Motor casing. This is then earthed to the STAR earth point by a separate cable that does not connect anywhere else.



The last step in the process should only really be needed when the locomotive generates its own power. The generator, (either Dynamo or Alternator), should sit within a Faraday cage and again a lead from the cage should be connected to the STAR earth point



Upon no account should motor type capacitor suppression be used on an alternator as capacitors **conduct** AC flux!