

GG Recoder2 for 16Mhz DigiSpark and DRV8838 bridge

Some of us love the DigiSpark board – its so cute!

This is a cheap but fully functional recoder for Galloping Ghost or Rudder-only (RO) actuators. It works in exactly the same way as the PIC recoder, but replaces the PIC with the 16Mhz DigiSpark PCB. The rudder & elevator channels from the receiver control the mark-space and rate respectively as the Tiny pulses the DRV8838 bridge to and fro.

The connections are arranged such that no modifications to the DigiSpark board are necessary, no removal of diodes, no 'defluffing' at all. This avoids any of the on-board USB circuitry making it a much easier DIY proposition.

The same recoder runs either rudder/elevator galloping-ghost or rudder-only ('RO' or Adams clone) without any changes, just omit the elevator connection. In the absence of an elevator input it defaults to the appropriate pulse-rate for rudder-only.

As with the PIC there is no specific GG throttle function, that is left to your conventional ESC or throttle servo for IC.

Just like the PIC, there is no facility to adjust anything within the recoder itself, the intention is that any adjustments are made using throw variations (ATV or whatever) on a programmable transmitter.

The sketch can be tweaked of course if preferred, but in use it has no adjustment, that has to be done via transmitter programming.

DigiSpark port connections are:

P0: is the rudder channel input from the rx (used for mark/space)

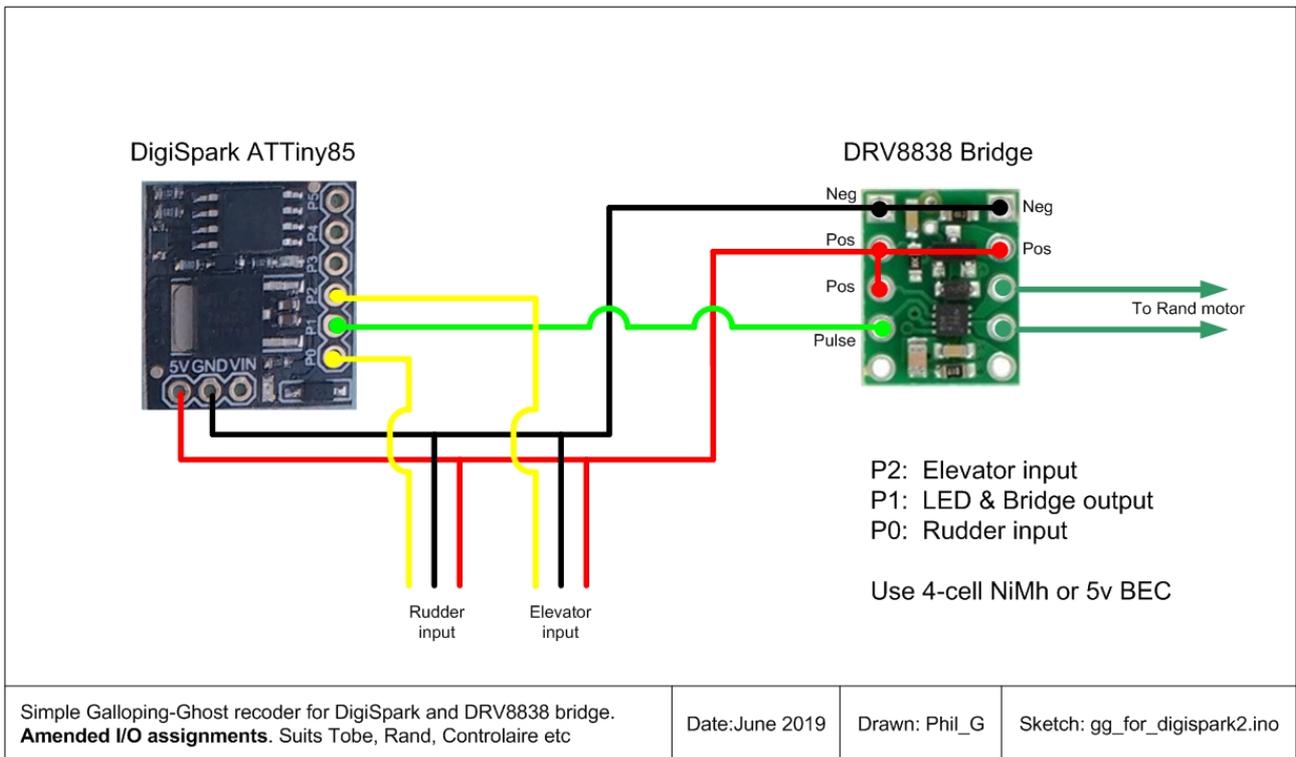
P1: is the digispark's on-board LED used to indicate pulsing and the output to the DRV8838 bridge

P2: is the elevator channel input from the rx (used for pulse rate)

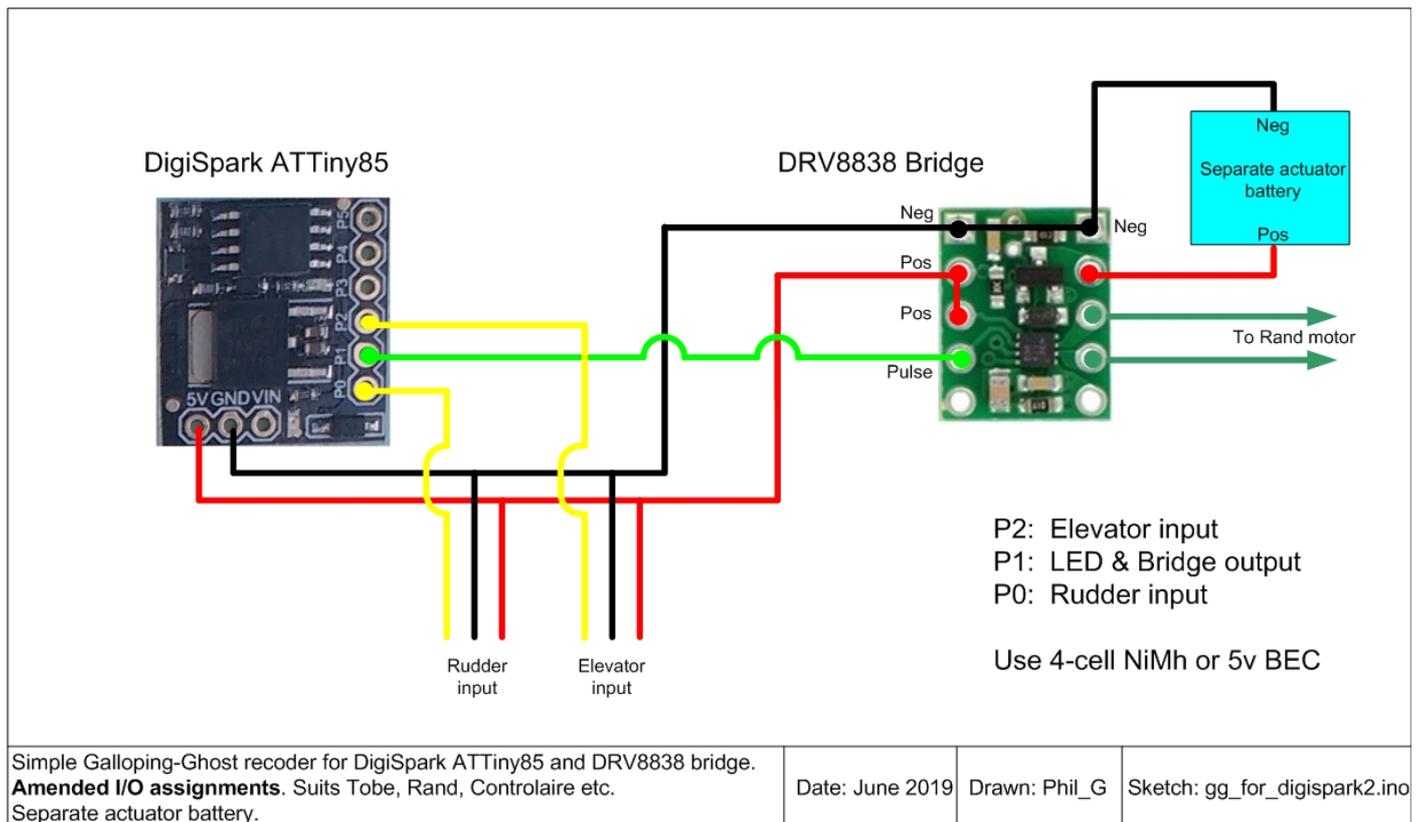
P3: unused

P4: unused

P5: unused



This way the actuator is powered from the receiver supply, but as with the PIC recoder, the actuator can optionally have a **separate battery** if required by chopping the receiver positive supply to pin 9, and providing a new positive from the separate battery. The negatives are common:



The original PIC and the Digispark recorders use completely different methods of producing GG so I suppose its inevitable that the prototype would show slight timing differences. To try to maintain some accurate benchmark 'standards' I connected two of the old PIC recorders and two Digispark recorders to a common rudder & elevator signal source and compared the timings with a lab-quality precision counter, and I've tweaked the timings of the sketch so that they match the original PIC recorders exactly. This means that you can unplug one of the original PIC recorders and replace it with a Digispark and not notice any difference at all – this has been confirmed in practice.

I dont know if thats an advantage but as the PIC/Tobe combo is well established it seems logical to use that as a timing benchmark. The sketch is easily modified to suit any GG actuator but as published has “PIC equivalent” timings and suits the 'Tobe' actuator perfectly.

Phil_G Nov 2018 revised June 2019 (changed I/O assignments)

philg@talk21.com