Encoder for converted period GG sets using on-board GG Re-coder & Tobe Rand clone.

This is a simple 3 function encoder having proportional rudder, proportional elevator and a progressive throttle via either a two-way toggle or by separate up and down buttons.
Its intended purely for the conversion of 'period' Galloping Ghost transmitters used with either a Tobe GG actuator or with a genuine Rand LR3 or Controlaire Ghost actuator, and an on-board recoder whose job it is to produce a variable mark-space and rate pulsed drive to the actuator, from the receiver rudder and elevator channels.

The throttle operates in either of two modes, selected by an option link on D8:
The difference is in the way the actuators operate. With a Tobe actuator installation, throttle is controlled conventionally either with a throttle servo or an ESC for electrics and works independently of the Galloping Ghost emulation. If either the throttle up and down button is held, the throttle moves slowly in the appropriate direction, but in normal use they are pulsed to 'nudge' the throttle a little at a time.

With a genuine Rand, the throttle is operated by allowing the actuator to cycle on 'full tone' or 'no tone' conditions. This winds a screw thread connected to the carburettor. To emulate this, the encoder throttle channel is at 1.5ms neutral with neither throttle button pressed. The 'up' button takes the channel to 2ms, and 'down' takes it to 1ms. Using this signal change the recoder will cycle the actuator for up and down throttle.
Note that Rand throttles were very coarse – typically 5 settings from low to high.

Summarising the throttle options, throttle up = D9 button, throttle down = D10 button (or a two-way toggle for both – ground to common, up and down to either side contact).
Link on D8 to enable two-way, self-centering throttle channel for Rand cyclic throttle
Leave D8 open for progressive throttle (for direct IC throttle servo or ESC)

The encoder has individual trimpots on A6 & A7 for rudder & elevator travel adjustment (ie rates) to enable setting up of the actuator, which as a non-feedback type is dependent on linkage friction and inertia, battery voltage, temperature etc.

Stick calibrate button or link = D11
Power on with link installed or button held, move stick around extremes, remove link or release button.
Do not switch off during this process!

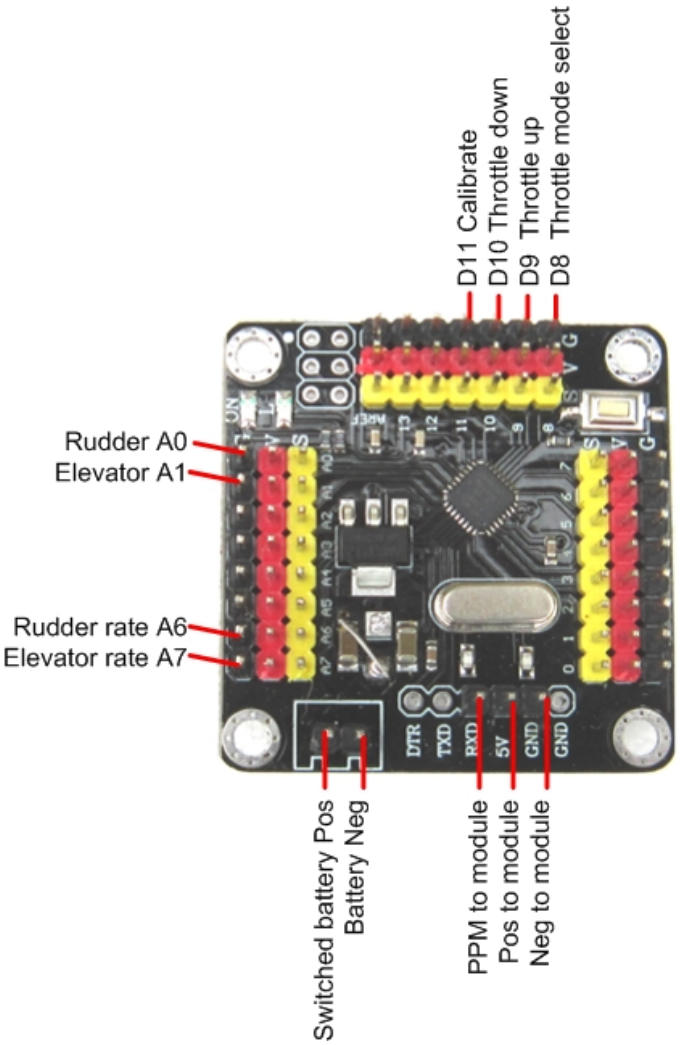
PPM output = D0 for ebay DIY-More 'Strong' board

Rates:
Rudder travel = A6 pot wired with neg to anticlockwise tag, signal to wiper, pos to clockwise tag
Elevator travel = A7 pot wired with neg to anticlockwise tag, signal to wiper, pos to clockwise tag

Calibrate & throttle buttons use signal and negative, pos is unused (insulate and tuck away)
Frsky V8 and Corona DIY will need ppm protection, 1k series resistor in ppm line, not necessary for DHT, Orangerx, Flysky etc

Servo reversing is by holding the stick over on power up.

The DIY-More 'Strong' board:



To select the throttle option, I've found these links on ebay, they're identical to Spektrum bind plugs:

Please dont use standard 5.08mm header links as they short all 3 pins together!

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