RC Servo Driver Switch Board - 6 channel
Hyperdyne Labs, © 2006-2010
http://www.hyperdynelabs.com

*** DO NOT HOOK UP THE SERVO INCORRECTLY. READ BELOW FIRST ***

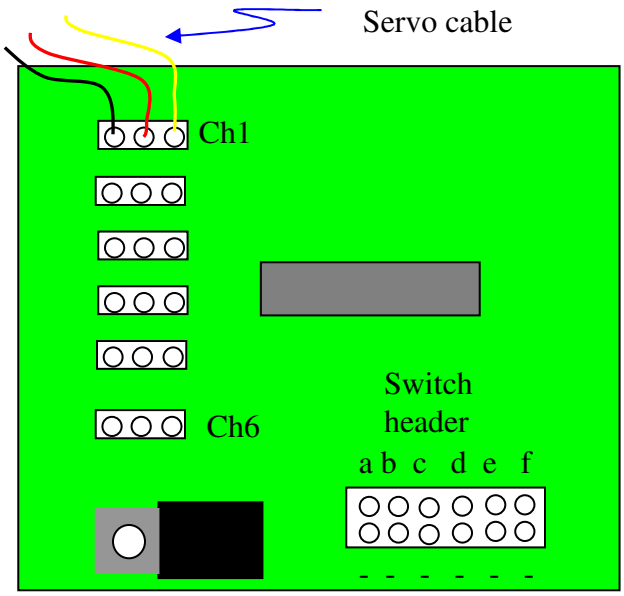
Overview

The 6ch RC servo driver board will control up to 6 servos using a standard on/off switch interface. When the switch is open, the servo will slew to the low end (1ms pulse) and when each switch is closed, the corresponding servo will slew to the high end (2ms pulse). Thus you can control the throw of a servo without the need for extra RC receiver channels. You can use a separate wireless relay switch matrix to control the servo movements, a bank of pushbuttons, or any other switch interface.

The board will operate from 6-16V DC, it has onboard voltage regulators to handle a wide input voltage range. You can connect the power wires directly to the screw terminals labeled "Vin". The positive side is labeled with a "+" sign and the negative side has a "-" label. Please connect up power correctly, or you can damage the board!!

Hooking up servos

The servos attach to the 3 pin headers on the board. The black wire on the servo connector (ground) is the one that goes nearest the board edge. This leaves the control wire (yellow or orange) nearest the IC chip. The board is labeled with a "-" sign to help you with correct polarity.



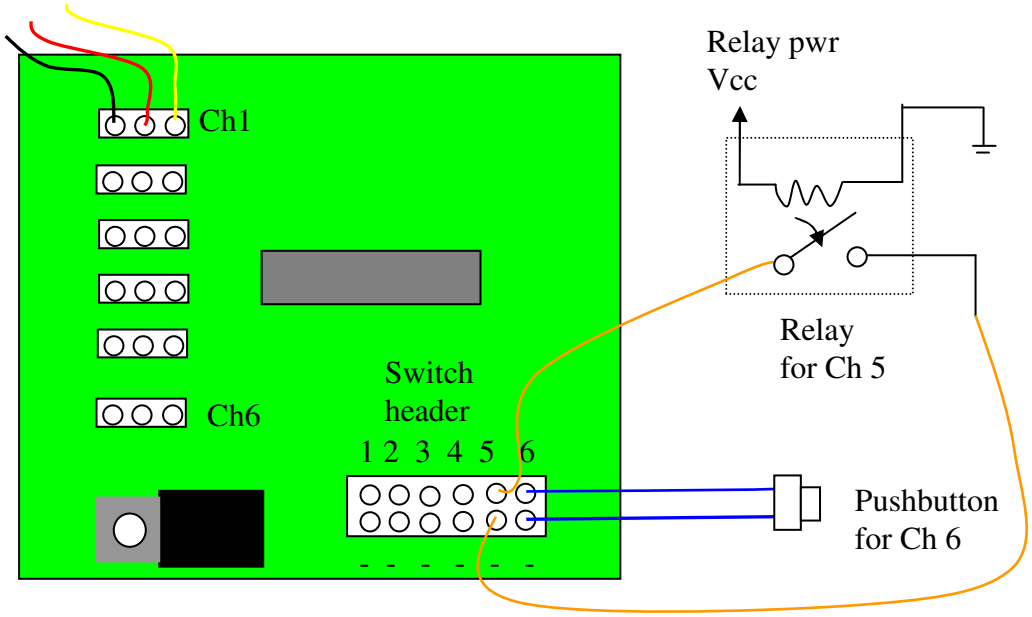
The board also has a 12-pin header that is used to wire up the external switches that control each servo. The header is labeled with the pin numbers corresponding to the servo it controls. The top row of the header is the switch input for each channel, labeled a to f (a=ch1, b=2, c=3, …).

The bottom row are all ground pins. These are included to easily wire up a switch input and a ground to a mechanical or electrical switching mechanism (pushbutton, slide switch, relay, etc). Whenever a switch input is grounded, the servo will slew to the high end. When the switch is opened, the servo will slew to the low end.

TIP: Before doing your final wiring, you can test the input and servo easily by simply shorting a channel input to one of the ground pins (using a screwdriver, paper clip, etc) and observing the servo move back and forth.

There is also an included ribbon cable that you can plug into the header. Simply splice the wires on the opposite end and solder these to your switch mechanisms. The wires do not have a polarity since a switch is not a polarized device.

Here is an example hookup to a pushbutton switch and a relay switch to the board.



Servo Specs

Any off-the-shelf 4.5-6V servo will work, as long as it has enough torque to open/close the load. Each pair of servos has onboard 5V regulators at 1A ratings. That means each servo can source a max of 500mA if loaded. If your servo is handling a large load, the board may go into thermal shutdown if the regulator is overloading for an extended period of time. If this happens try to place the higher-load servos on every other channel, and the lower-load servos on the remaining channels. This will allow the higher-load channels to source more current they may need.

Servo Range Programming

The slew range (how far each servo travels) of each servo can also be fine tuned for your application. This feature is used if you don't want the servo to slew over its entire full range – which is typically 90 degrees. For example, if you only need a small throw to open a door, you can back off the 90 deg slew range of the servo so it only moves the absolute minimum to open and close the door. This will also relieve any stress on mechanical linkages and the servo gearing. This is commonly called servo trimming on your RC radio, and this interface attempts to give you some trimming capability of the overall servo slew.

There are 2 pushbuttons on the unit, labeled "trimH" and "trimL/prog". The trimH button backs off the maximum high slew position. ***Every time you press it, only the servos that are currently slewed high (that is, their switch input is grounded) will be effected by the button press. Likewise for the trimL button.***

For example, if nothing is connected to the switch input header, then all your servos are slewed low (that is, no switch inputs are grounded). Pressing the trimL button will shorten the low slew position for ALL the

servos, since they are all actively low. Pressing the trimH button does nothing. Now if you short out one of the switch inputs to ground, then that servo channel will slew to its high position. Now pressing the trimH button will shorten the high throw position for that servo ONLY.

Using this novel interface, you can individually program the servo throw for each channel. First by moving the channels all high except for one channel, then tuning that channel's low range with the trimL button. After you are done, move that channel high, then select the next channel to go low and tune its low range. After you are done tuning all the low servo ranges, you can move all the servos to the low position and program individual high throw ranges using the same technique.

The next time you power up, the board will blink 2x at you. This tells you that it is using the programmed servo slew ranges that you previously programmed. If the board blinks 1x at power up, it says it is using the default full range values.

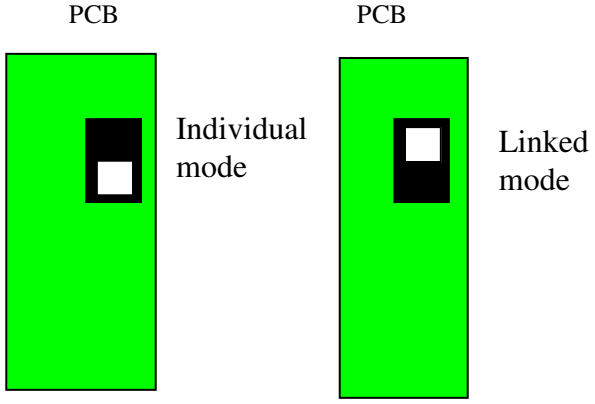
If at any time you want to clear out the programmed ranges and return to the default settings (full range), then hold the trimL button in for 2 sec then release it. The board will acknowledge by blinking several times quickly. All the servos will then go back to full range.

Heartbeat: While power is applied, there is also a heartbeat LED blink to tell you the board is active. Every second the LED will briefly blink, this is telling you the board is operating normally.

Mode Selection

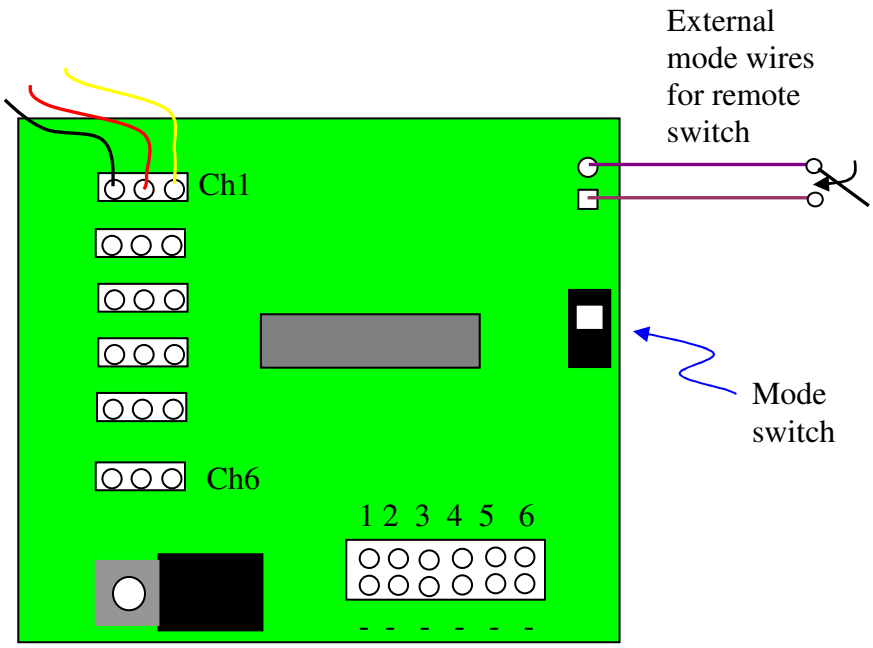
There is also a special mode selection switch on the board. This mode switch toggles between individual servo movement and linked servo movement. In the individual setting, the servos act independent of one another based on their switch input (as described above). In linked mode, all the servo channels follow channel 1. That is, if channel 1 is in the low position, all the channels will be in the low position. If channel 1's input switch is grounded, all the servos go to the high position. This is useful to implement a simultaneous opening of several panels or doors based using one master servo channel!

Here is the orientation of the onboard slide switch for the mode selection:



You can also connect 2 wires to the pads next to the mode switch if you want to remotely control the mode selection parameter. These wires can be connected to another remote switch so you can choose between individual and linked mode without using the onboard slide switch. The hookup is the same as the switch inputs. When you short the 2 wires then this activates individual mode. ***Note: If you do this you will want to set the slide switch to the linked mode position and keep it there!!***

Here is a diagram of an external switch connected to the mode selection pads



NOTICE: There is no warranty on kits!! It is your responsibility to install the board. Kits cannot be returned! Be careful if you plan to use a battery source that is capable of delivering alot of current. Contact a professional if you need assistance. Hyperdyne Labs assumes no responsibility for the misuse of this kit.