TANGLES' PIN PARTS

TPP-1020

Replacement for Sega Monster Motion Board (520-5113-00)

Description

The TPP-1020 Monster Motion board is a part designed for use in the Sega Mary Shelley's Frankenstein machine. It is a drop in replacement for SEGA part number 520-5113-00. This board managers the motion of the servomotor moving the monster's head. This part have be re-engineered using modern components. The firmware pre-programmed into this part is compatibility with the original part.

The TPP-1020 Monster Motion supports both the original Airtronics servomotors as well as JR and Futaba servos.

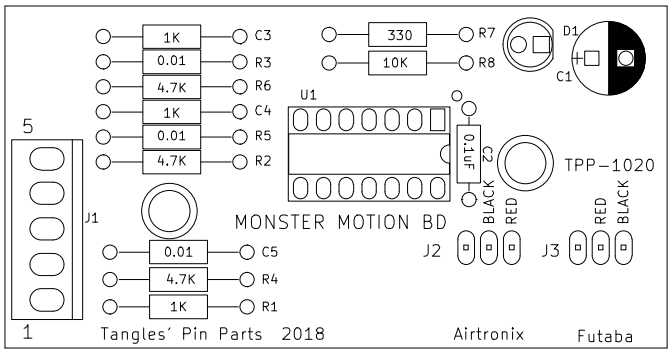
The TPP-1020 comes fully assembled. No soldering is required. No modifications are needed to your pinball machine.

Installation

Warning: High voltages are present inside the pinball machine. Ensure the power is off and the mains cable is disconnected before you commence work.

1. Ensure power is off.
2. Install the TPP-1020 to the same location as the original 520-5113-00. (TPP-1020 has the same mounting holes as the original so no new holes are needed.)
3. Connect the 5-way Molex connector to J1.
4. Plug the servo motor lead into J2 if you have an Airtronics servo (original).
5. Plug the servo motor lead into J3 if you have a JR or Futaba compatible servo.
6. Pay attention to the orientation of the servo plug black and red wires.
7. Lower the playfield.
8. Power machine on
9. Enter Test mode.
10. Perform the 'Creature Head Motion Test' as described in the MSF manual page 29.

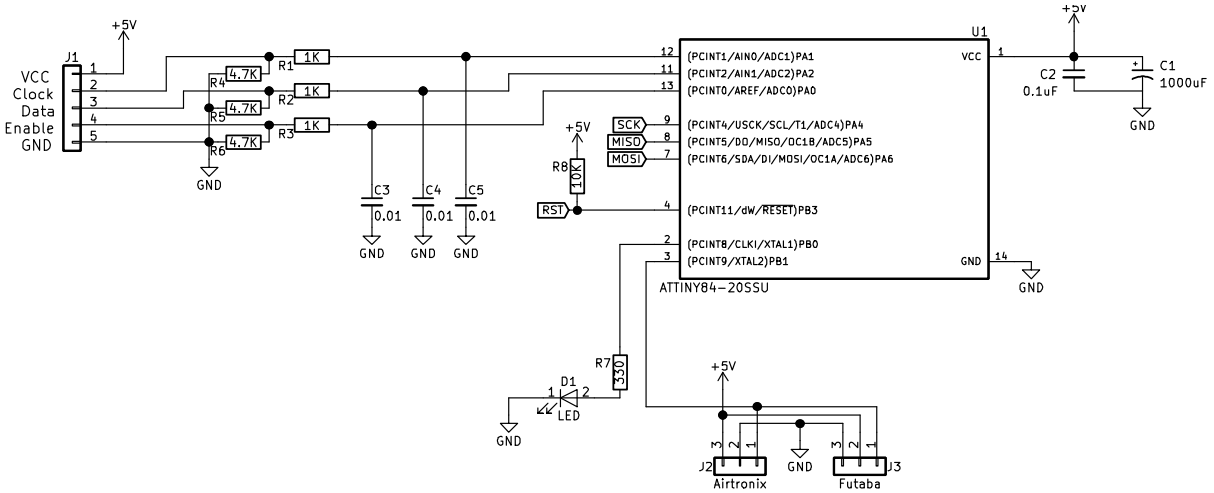
Board Layout



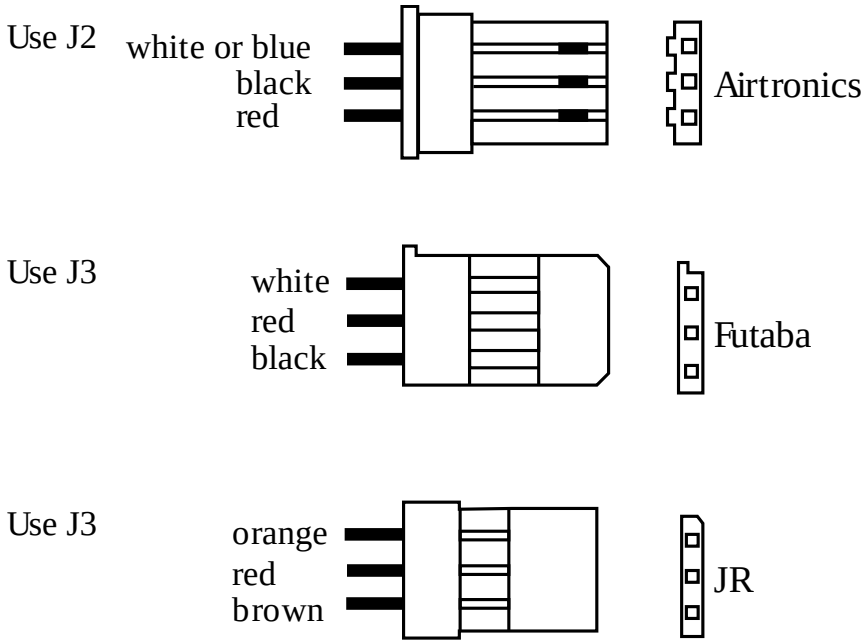
Parts List

Designator	Description
U1	ATTiny84A (TPP-1020 Firmware)
R1,R2,R3	1K Ohm 330mW resistor
R4,R5,R6	4.7K Ohm 330mW resistor
R7	330 Ohm 300mW resistor
R8	10K Ohm 300mW resistor
C1	1000uF 6.3v Electrolytic Capacitor
C2	0.1uF 50v Axial Ceramic Capacitor
C3,C4,C5	0.01uF 50v Axial Ceramic Capacitor
D1	Red LED 5mm (T-1 ¾)
J1	5-way Molex 3.96 mm pitch P/N 26-60-4050
J2, J3	3-Way Molex 2.54 mm pitch P/N 22-12-4032

Schematic



Servo Motor Connection Options



Please pay close attention to the colours of the servo wires. The servo must be plugged into the board with the correct orientation and into the correct plug (J2 or J3). The diagram above shows the commonly used wire colours for Airtronics, JR and Futaba servomotors. Noting the RED and BLACK or the RED and BROWN wires gives the best indication for how the plug must be inserted.

Whilst the original SEGA machine was manufactured with an Airtronics servomotor, many repair agents have replace these servos with other brands as they have failed. In this case the plug for the servo might have been re-wired to match the Airtronics connection on the original PCB. Taking note of where the RED (+) and BLACK (-) or BROWN (-) wires go will give the best indication of the correct orientation and connector to use.

Compatibility

Mary Shelley's Frankenstein – SEGA, 1995