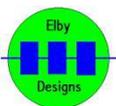




CGS738 Mangler Construction Guide

Revision 1.0

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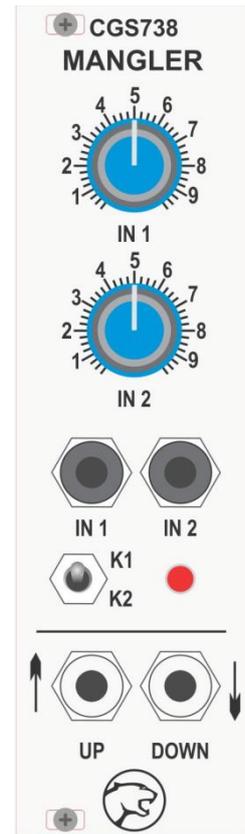
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Construction of the [CGS738](#) requires the assembly of 1 board:-

Column 1 - CGS738 PCB ([3D Model](#))

Constructors should refer to the [PCB Overlay](#) for any specific comments regarding the board assemblies, the [Bill of Materials](#) for the current value of all components and [General Construction Notes](#) for general PCB assembly guidelines.

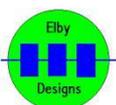
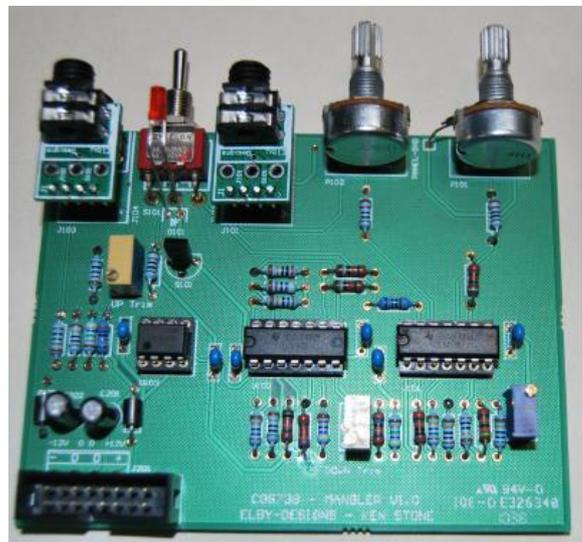
1. Fit all components to the board except the LED, jacks and headers,
2. Mount and solder the jacks on to the Carrier Boards,
3. Position the 2x Jack Carrier assemblies J101 and J103 on to the PCB and offer the assembly up to the panel.
4. Offer the assembly up to the front panel and use the relevant nuts to hold the assembly in place. You will need to manoeuvre the jack/Carrier assemblies in to place as this is done. When tightening the nuts on the jacks, try to keep the boards parallel to the main board.
5. Solder the Carrier Boards in to place – this can be done from the topside as the holes are plated.
6. Using a pair of fine nose pliers, bend the legs of the LEDs to approximately 50° starting at about 5mm from the body of the LED and taking note of the orientation of the LED to the PCB. Slip the legs in to place on the PCB while also feeding the LED head in to the panel hole. When completed, the LED legs should clear the switch beneath it and should run parallel to each other down to the PCB
7. Flip the assembly over and solder the LEDs in to place.
8. Make sure all nuts are tight. Do not over-tighten the jack nuts as this may strip the thread – I like to do the jack nuts up finger tight and then use a 10.5mm open-ended spanner to tighten the nut until one of the flats is parallel to the bottom edge of the panel. A similar approach is used with the switch nut. Pot nuts should be done up tighter as they provide the main support for the PCB.



CALIBRATION

Two procedures are offered for calibrating the Mangler. The first only requires a multi-meter while the second requires an oscilloscope.

- 1) Calibrating with a multi-meter
 - a. Power the module with nothing connected to the inputs.
 - b. Set the K1-K2 switch to its centre position.
 - c. Adjust P105 until the voltage on U101 Pin7 = +2.5 volts
 - d. Adjust P104 (DOWN Trim) until the DOWN output reads 0.0 volts.
 - e. Connect a positive DC voltage of 5 volts or more to IN 1.
 - f. Starting with POT IN 1 fully counter clockwise, turn clockwise it until the LED lights, then back off again until it just extinguishes.
 - g. Adjust P103 (UP Trim) until the UP output reads 5.0 volts.



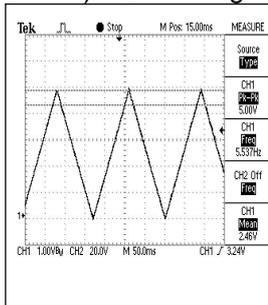
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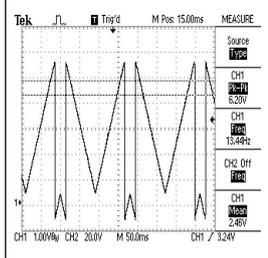
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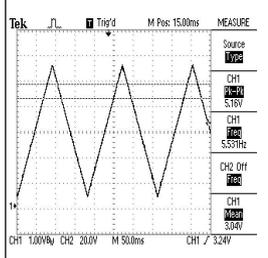
2) Calibrating with an oscilloscope



Apply a TRIANGLE waveform to both IN 1 and IN 2. The waveform should be 0V to 5V as shown to the left

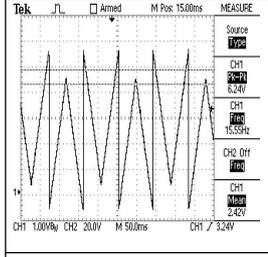


Set the KILL switch to K2 and connect a scope to the UP output. Adjust the IN 1 level control until the LED starts flickering. The waveform will develop a 'glitch' as shown to the left.

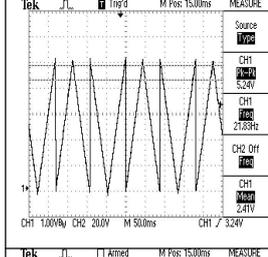


Set the KILL switch to K1 and repeat this time adjusting the IN 2 level pot.

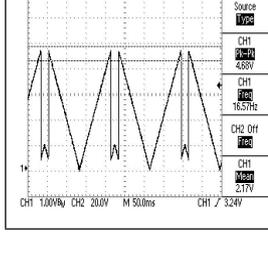
Slowly wind the pot back until the LED just stops flickering. The 'glitch' in the waveform will start to disappear and should be gone at the same time as the LED stops flickering.



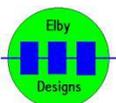
Set the KILL switch to the centre position where you will see an output similar to that shown to the left.



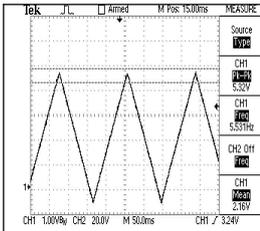
Adjust the UP Trim (P103) until all the bottom of the waveforms all hit 0V



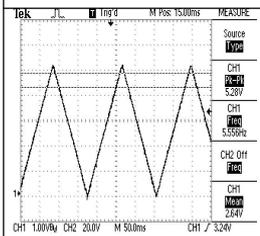
Connect the oscilloscope to the DOWN output and disconnect the TRIANGLE from IN 1. You should see a waveform similar to that shown at left



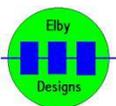
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Adjust P105 until the 'glitch' disappears. The waveform should look similar to that shown at left. There will probably be a DC offset as you can see here.



Adjust the DOWN Trim (P104) until the bottom of the waveform hits 0V



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