



FONITRONIK CASCADE OVERVIEW

For the most recent version of this document please visit <http://bit.ly/1oZAmEv>

For all technical support please visit <http://bit.ly/1u5lua5> on Muffwiggler.



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DIY INSTRUCTIONS

This document gives detailed instructions that assume you have purchased a complete kit from www.thonk.co.uk. It also assumes no previous knowledge of electronics. To learn to solder try http://youtu.be/I_NU2ruzyc4 and the **Adafruit guide to excellent soldering** – <http://bit.ly/1I77tF4>

Watch and understand that whole YouTube video! If you're not achieving the results shown in the video then you need to buy new tools or seek advice.

You will not end up with a working module otherwise.

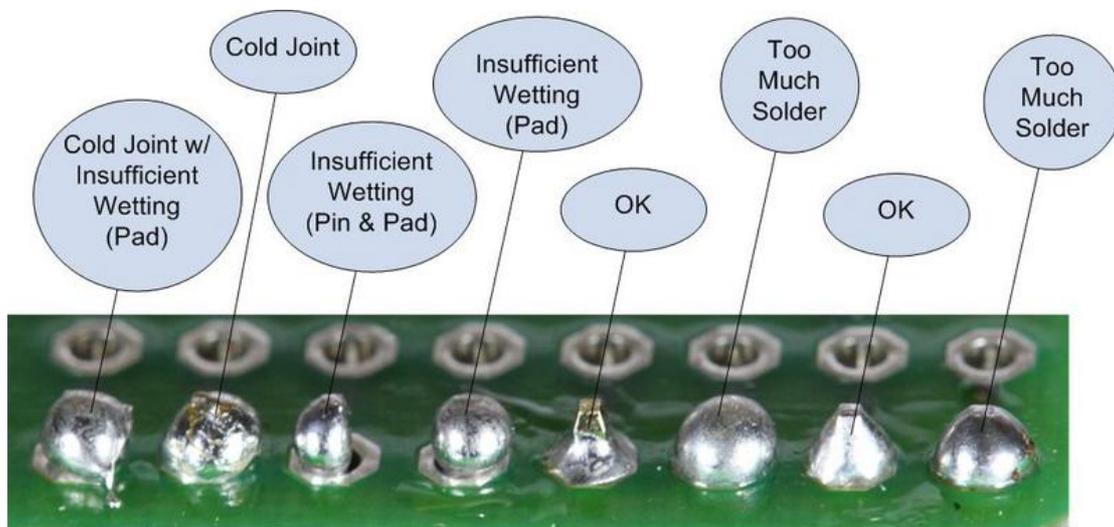
TOOLS REQUIRED

Soldering iron, tweezers for SMD parts, snipe nose pliers, wire strippers, small flat head screwdriver and diagonal cutters AKA snips AKA side-cutters. A Digital Multimeter is always helpful for checking for bad solder joints and continuity. Thonk sell a range of inexpensive tools here - <http://bit.ly/1jxqF3n>

SOLDER JOINTS

Your solder joints should look like those shown as 'OK' below, they should have that neat conical shape on **BOTH sides of the PCB**. If they don't look the same on both sides then stop! Work out why from the soldering guides linked and don't continue until you are getting those results.

This isn't about perfectionism, you are very likely to end up with a destroyed, damaged or defective unit if you're not hitting that standard.



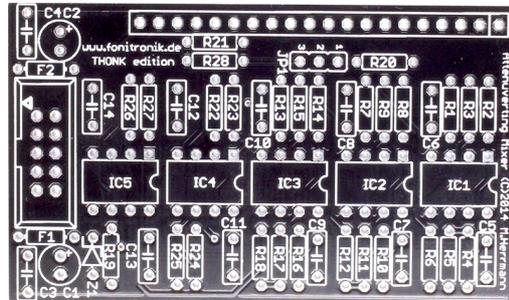
This photo is from the **Adafruit guide to excellent soldering** - bit.ly/1I77tF4 and is reproduced under an Attribution-Sharealike creative commons license - <http://creativecommons.org/licenses/by-sa/3.0/>



VCA BUILD INSTRUCTIONS

1.

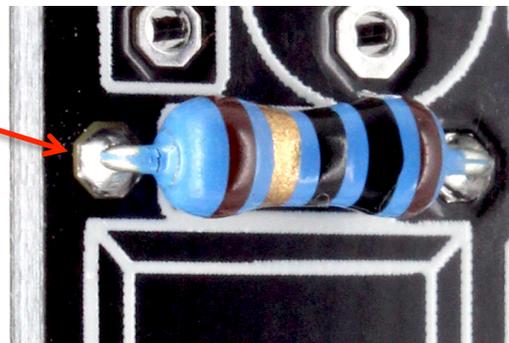
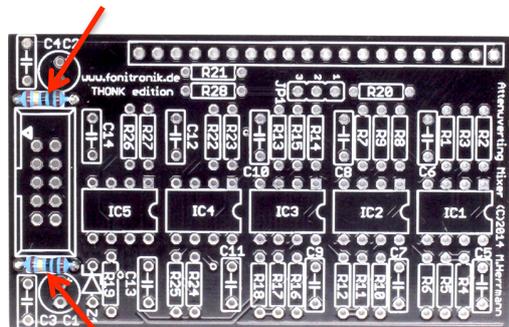
Start by emptying the **whole of the Cascade bag A** into a bowl or container. This makes it much easier to pick parts as you need them and you're a lot less likely to lose anything.



2.

Start by soldering the two **10R** Resistors into positions **F1, F2** as shown.

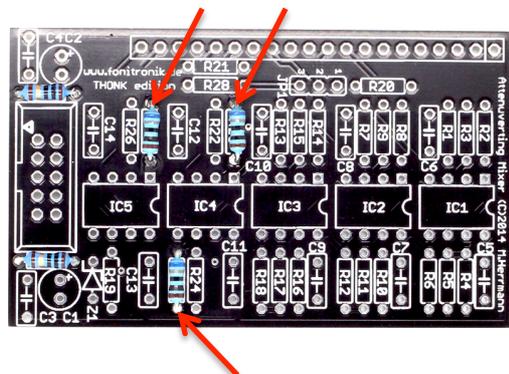
NOTE! You should have nice shiny solder cones on **BOTH** sides of the board. If you have not then re-evaluate your soldering technique and equipment and revisit the YouTube video linked on page 1 and the 'good joints' image on page 2.



3.

Next solder the three **680R** Resistors into positions **R23, R25, R27** as shown.

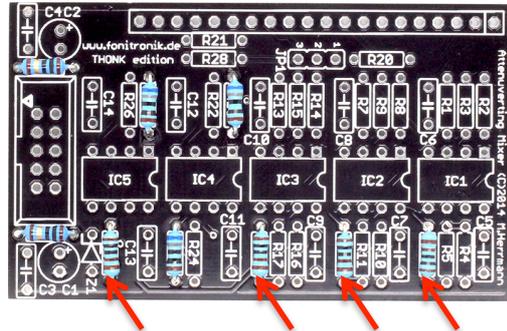
NOTE! You are getting those nice shiny solder cones on **BOTH** sides of the board right?





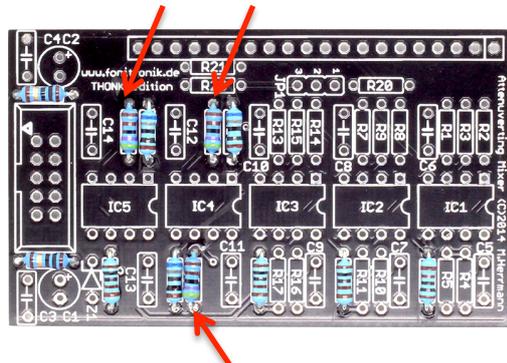
4.

Next solder the four **1K** Resistors into positions **R6, R12, R18, R19** as shown.



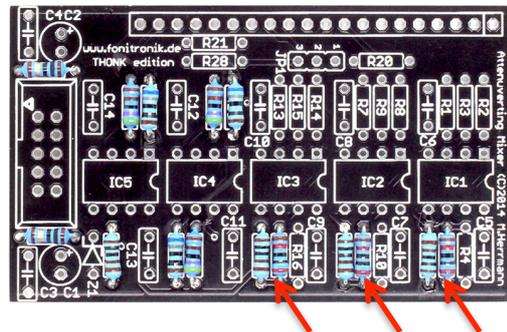
5.

Next solder the three **4.7K** Resistors into positions **R22, R24, R26** as shown.



6.

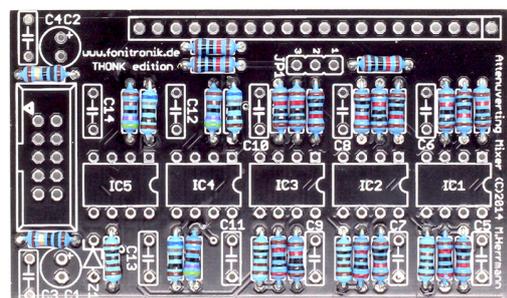
Next solder the three **20K** Resistors into positions **R5, R11, R17** as shown.



7.

You should only have slots for **10K** resistors left on the PCB now, quickly double check that before proceeding.

Next solder the fifteen **10k** Resistors into positions **R1, R2, R3, R4, R7, R8, R9, R10, R13, R14, R15, R16, R20, R21, R28**





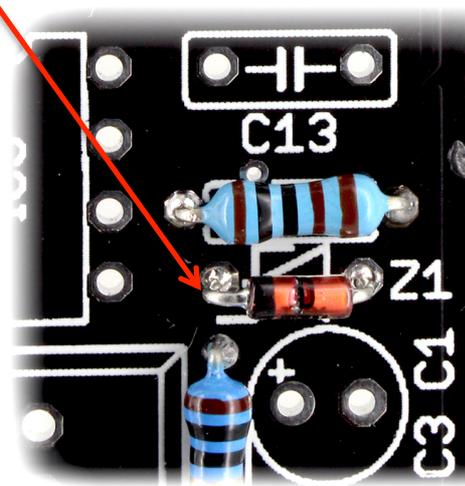
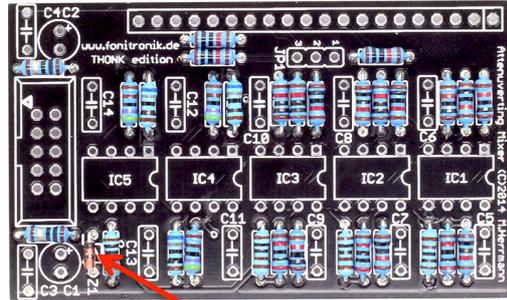
8.

Next solder the single **5.1V Zener Diode** into position **Z1** as shown.

NOTE! Orientation is **vital**. The **Black ring** on the diode should be **furthest** from the **Z1** text.

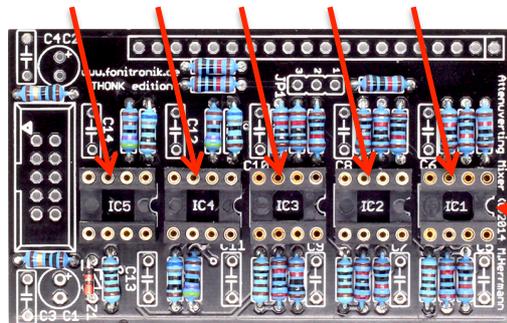
NOTE! Diodes can be damaged with a long exposure to the heat of the iron.

Solder neatly and quickly, you should achieve the nice shiny solder cones mentioned previously on both sides of the board without needing to apply heat for longer than 3 seconds per joint.



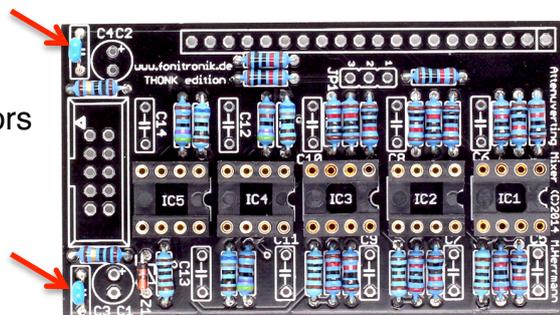
9.

Next solder the five **8 pin IC Sockets** into positions **IC1**, **IC2**, **IC3**, **IC4**, **IC5** as shown. Make sure the **notches** in the sockets match the silkscreen, they should all face in the same direction, with the **notch facing away from the Z1 diode**.



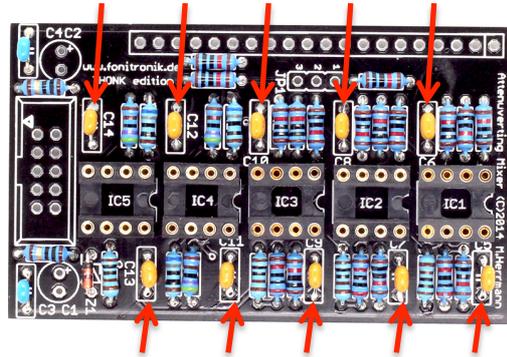
10.

Next solder the two blue **100n** capacitors into positions **C3** & **C4**.



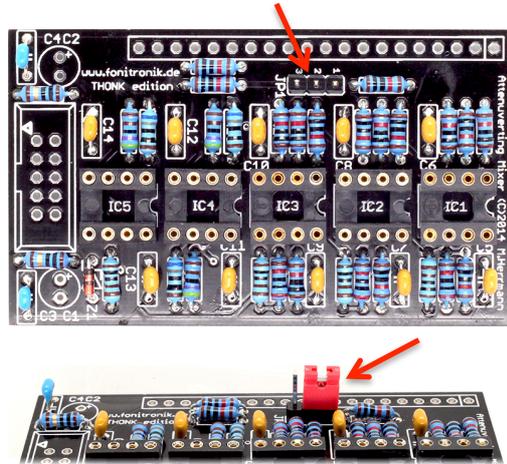
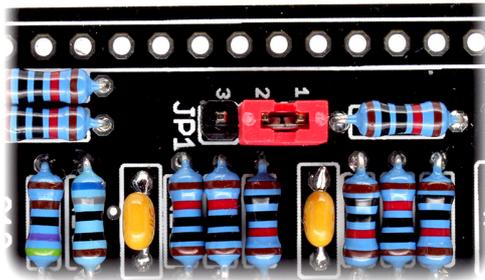
11.

Next solder the ten orange **10n** capacitors into positions **C5, C6, C7, C8, C9, C10, C11, C12, C13 & C14**



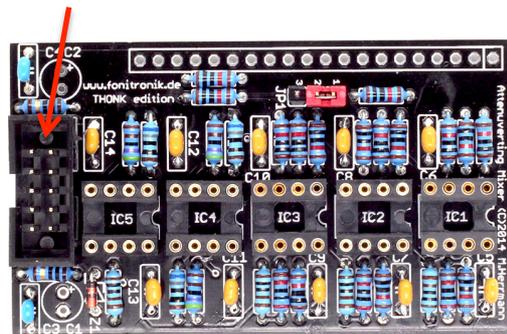
12.

Next take the **3 pin male** header and solder into position **JP1** as shown. After soldering put the red **shunt** into position as shown, on pins **1 & 2**.



13.

Next solder the **shrouded power header** into position as shown. The square hole in the side of the plastic shroud should face outwards from the centre of the board.

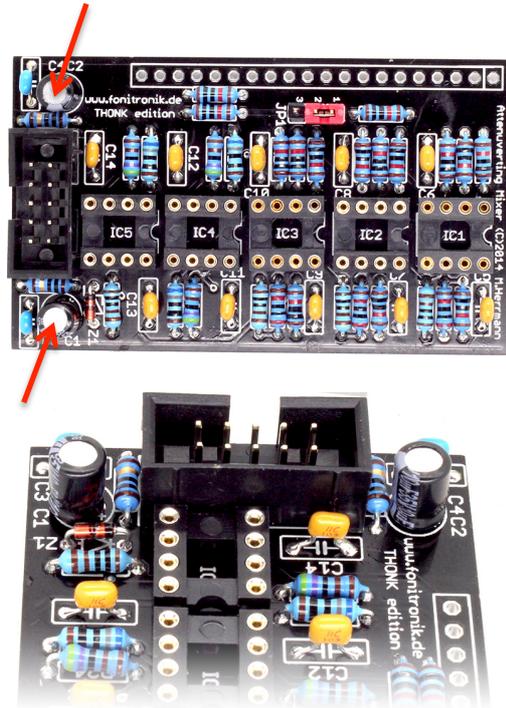


14.

Next solder the two **10uF Electrolytic Capacitors** into positions **C1 & C2**.

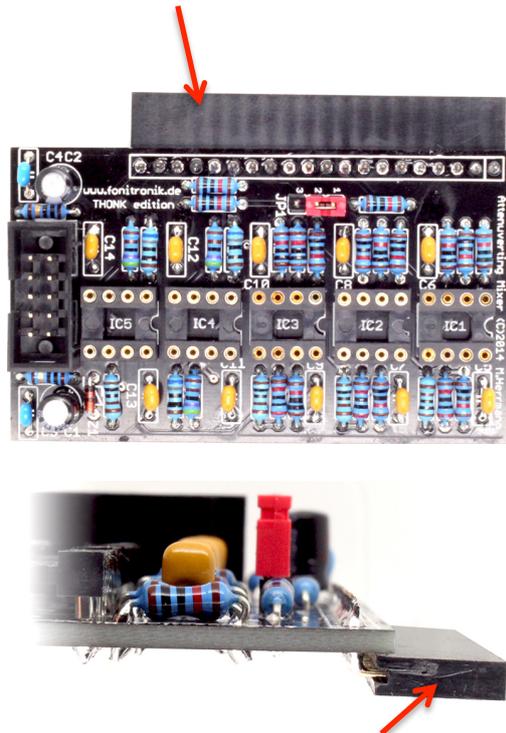
NOTE! Orientation is vital. The longer lead on the part should be positioned in the square pad marked with the plus/positive symbol.

The negative lead side can be identified with the grey stripe down the cylindrical body of the capacitor.



15.

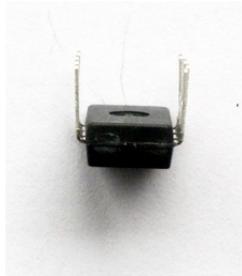
Next solder the **20 pin female socket header** into position as shown. It is important that you solder the header onto the **other side of the PCB** or the PCB may clash with any adjoining modules.



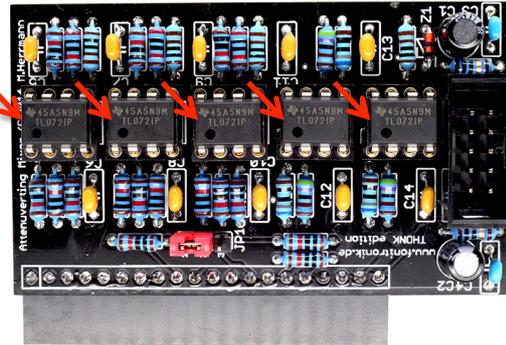
16.

Next take the five TL072 ICs out of the protective ESD packaging and position with **the circle on the top face at the same end as the notch in the socket** and silkscreen.

NOTE! You will need to bend the pins on the IC inwards slightly so they are at 90 degrees to the body of the chip. They will come slightly splayed out. This can be done safely by clamping the 4 pins in a pair of pliers and very gently bending inwards together. Repeat for the other side.



NOTE THIS IMAGE IS ROTATED 180 DEGREES
COMPARED TO PREVIOUS PAGES



17.

You have now finished the back board. If it's late at night then maybe it's time to sleep ☺ (best soldering advice in the world).

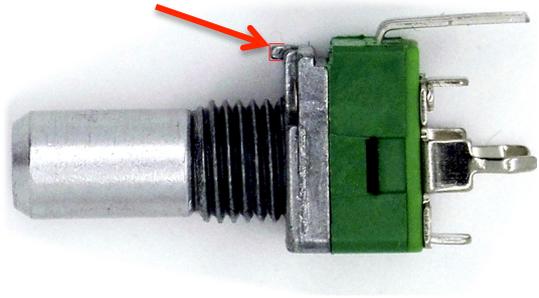
18.

Start by emptying the **whole of the Cascade bag B** into a bowl or container. This makes it much easier to pick parts as you need them and you're a lot less likely to lose anything.

19.

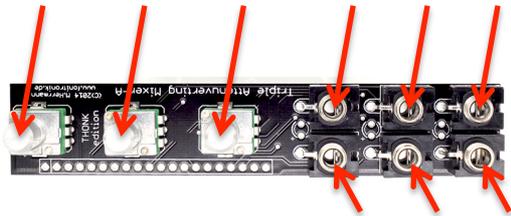
First you may need to modify the potentiometers if they have the small anti-rotation tag that protrudes from the top surface of the pot body as indicated.

The easiest way is to snap off with pliers, it comes off very easily. If you cut or file it off be careful not to damage the thread on the shaft.



20.

Next position the three pots and six jacks into position as shown but **DO NOT SOLDER** yet.



21.

Carefully place the panel into position. Hand-tighten a nut and washer on the middle pot to hold the panel and PCB together.

Now you can solder the 3 pots and 6 jacks into position. This is 33 solder joints in total; make ensure you do them all.

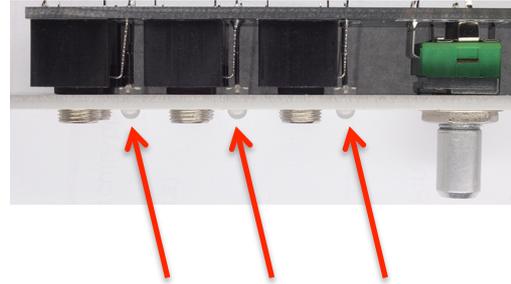


22.

Next remove the panel and put the LEDs into the PCB with the longer lead going into the hole marked with a + sign but **DO NOT SOLDER** yet.

Carefully place the panel into position and hand tighten a nut and washer on the middle pot to hold the panel and PCB together.

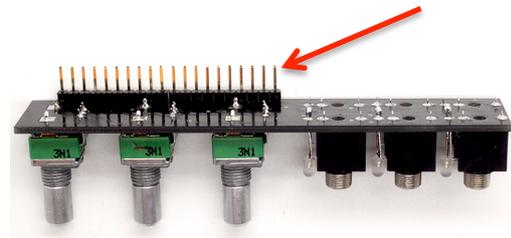
You now want to carefully guide the LEDs into position so they stick as far through the holes on the panel as possible. They will probably grip into place in the hole but it's advisable to bend the leads out to stop them moving once you have them into position. You can now solder them into place.



23.

Remove the panel again (last time!)

Now you will solder the two 10 pin headers into position as shown. They should be facing AWAY from the potentiometers.



24.

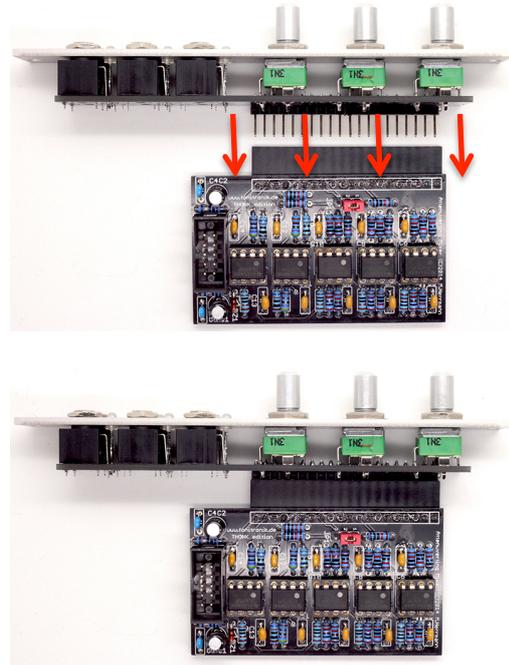
You can now put the panel into position and finally tighten the six small nuts into position on the jacks, and the three washers and nuts into position on the pots. Put the knobs into place.





25.

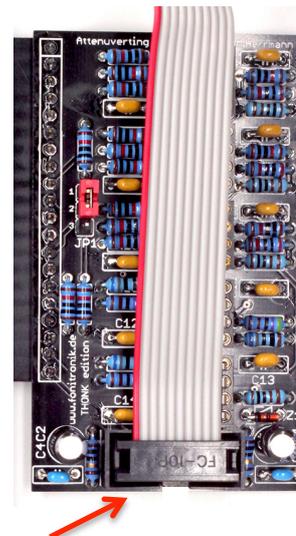
Now join the front panel section to the back mixer PCB as shown.



26.

Attach the power cable as shown, if you have used a shrouded power header, be sure again you soldered it in the right way round before attaching the keyed cable!

The red stripe should be on the side of the PCB closest to the female header and furthest from the diode.



27.

You are now ready to power up & read the instruction manual from Fonitronik here:

<http://bit.ly/1oZ5muZ>

And if you have any build problems please direct them to the Muffwiggler forum here:

<http://bit.ly/1u5lua5>