

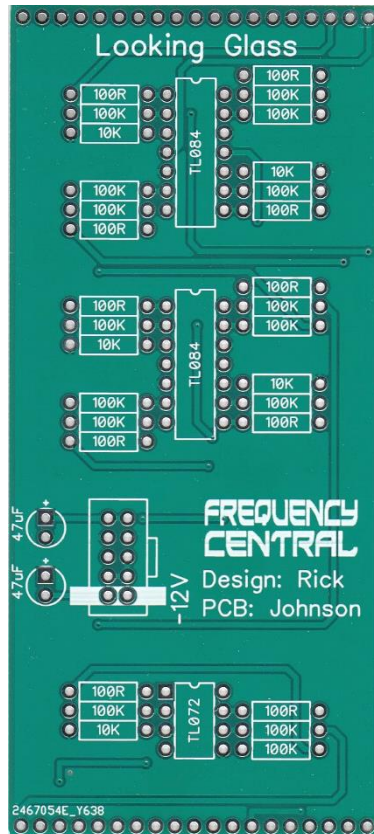
# FREQUENCY CENTRAL

Build documentation for:

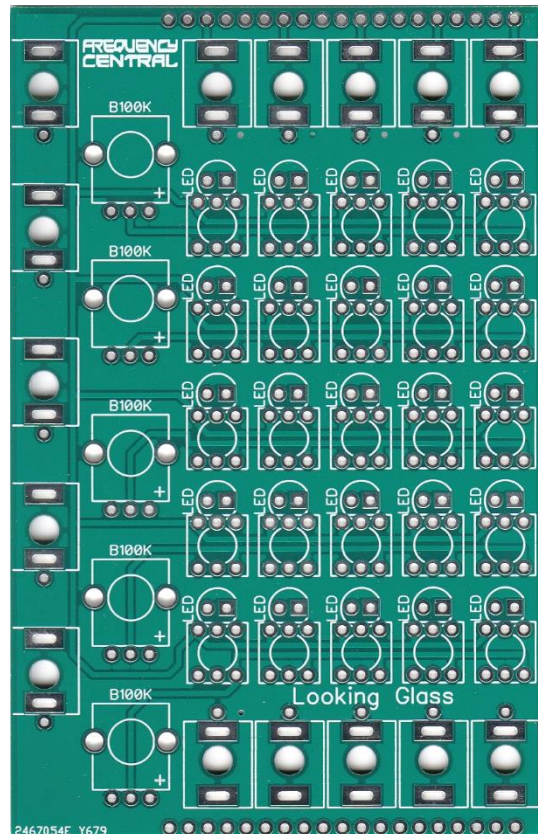
## LOOKING GLASS

5 x 5 active patchbay/matrix mixer/switcher with normal and inverted outputs and attenuators

Main PCB



Control PCB



Looking Glass is an 5x5 active patchbay/matrix mixer/switcher. It features:

- 5 inputs (1 through to 5), each with attenuators
- 5 inverted outputs (A through to E) which are 180° out of phase with the inputs
- 5 normal outputs (A through to E) which are in phase with the inputs
- A switch matrix of 25 push on/push off switches and LED status indicators

Any of the 5 inputs can be patched to any of the 5 outputs simply by pressing the corresponding switches. A patched signal will appear at both normal and inverted outputs simultaneously.

A single input can be patched to a single output. A single input can be patched to multiple outputs. Multiple inputs can be patched to a single output. Multiple inputs can be patched to multiple outputs.

The attenuators allow you to reduce the volume of an incoming signal. If you add many inputs to one output you will of course cause clipping (which may or may not be desirable!), the attenuators are your on-board way around this.

## Bill of Materials

<p><u>1/4 watt metal film:</u> 100R x 10 10K x 5 100K x 15</p> <p><u>1/8 W 1% 0805 SMD:</u> 10K x 25 100K x 25</p>	<p><u>47uF electrolytic x 2</u></p>	<p><u>TL072 x 1</u></p> <p><u>TL084 x 2</u></p> <p><u>3mm red LED x 25</u></p> <p><u>8 pin socket x 1</u></p> <p><u>14 pin socket x 2</u></p>	<p><u>B100K Song Huei tall trimmer x 5</u></p> <p><u>Push button x 25</u></p> <p><u>Button caps x 25</u></p> <p><u>3.5mm socket x 15</u></p> <p><u>Male 40 pin header</u> <u>Female 40 pin header</u> <u>10 pin box header x 1</u></p>
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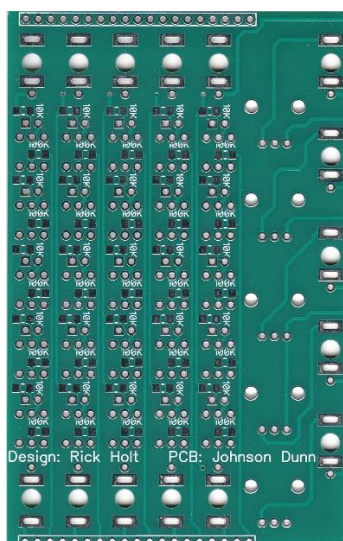
### Control PCB rear – the SMD resistors

Looking Glass uses 50 surface mount resistors on the rear of the Control PCB (the 10K are all current limiting resistors for the LEDs, while the 100K are mixing resistors). This may sound intimidating if you haven't used SMD before, but its quite easy really. We've even used larger 1206 pads to make it easier. We recommend that you use 0805 resistors. The combination of 1206 pads and 0805 resistors means that there is plenty of space to apply solder/heat around the resistor.

1. Lightly tin all SMD resistors pads on the PCB. This means that you should use your iron to heat each pad and apply a small amount of solder.
2. Pick up a 0805 resistor with tweezers and present it to the pads. While holding the resistor in place, heat the pad. This should hold the resistor in place. Now heat the other pad to complete the process of placing this resistor.
3. Sometimes it's worth retouching both pads just to make sure!

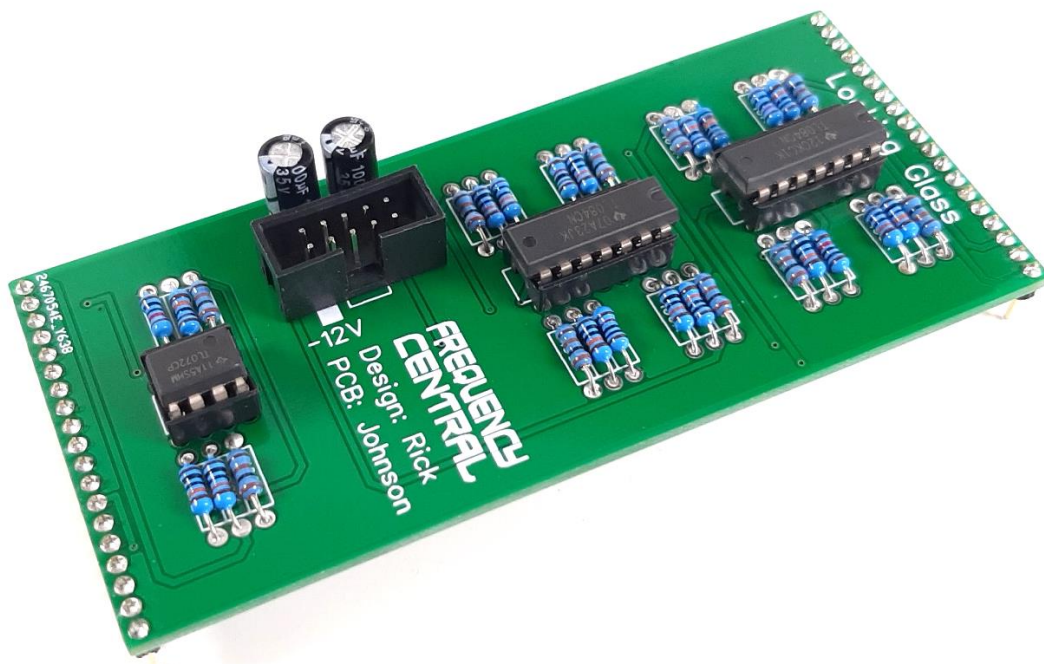
**NOTE:**

**First pass: 10K resistors**  
**Second pass: 100K resistors**  
**Don't mix them up!**



### Main PCB front – the through hole components

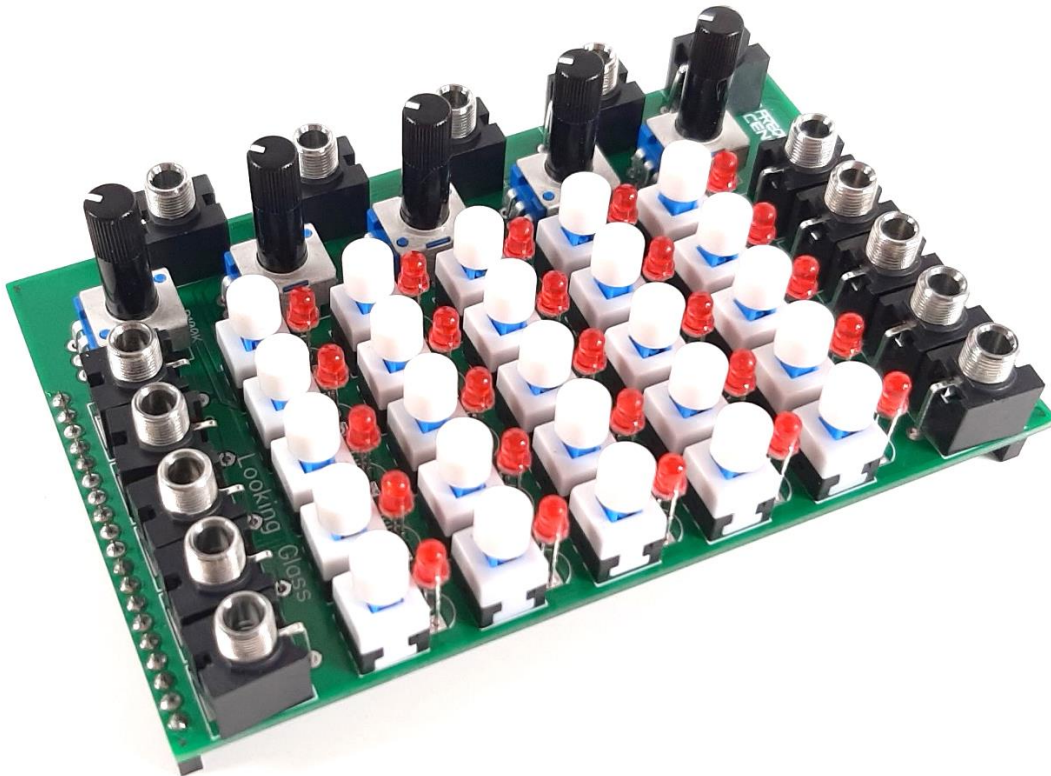
1. Solder all resistors - don't mix up the 100R and 100K
2. Solder all IC sockets
3. Solder the power header – if you're using box type, observe correct polarity
4. Solder all electrolytic capacitors
5. Cut male headers to size and solder them into place. Make sure that they stick out of the bottom of the PCB.



### Control PCB assembly

1. Place all 25 push buttons onto the PCB. Place a piece of card (or similar) over all 25 push buttons. Flip the whole lot over and solder one tab on each switch. Check that they are all seated correctly, then solder the rest of the pads.
2. Place all sockets on the PCB, making sure the ground tabs line up with the PCB's ground pads, then place the panel over them. This will assure that the sockets are correctly positioned. Flip the whole lot over and solder the sockets into place.
3. Place all 25 LEDs (short leg = square pad) and solder into place.
4. Place all 5 Song Huei tall trimmers and solder into place.

5. Cut female headers to size and solder them into place. Make sure that they stick out of the bottom of the PCB.



Make sure that you plug the **Main PCB** into the **Pots 'n' sockets PCB** the right way around – Frequency Central logo should be the right way up.

Hey Eurokidz! Tired of patch cables? Then throw them all away\* and use our nifty Looking Glass patchbay/matrix mixer/switcher instead!

\*Well, not all of them, obviously.

RDH 16/06/22

<http://www.frequencycentral.co.uk/>