FREQUENCY CENTRAL

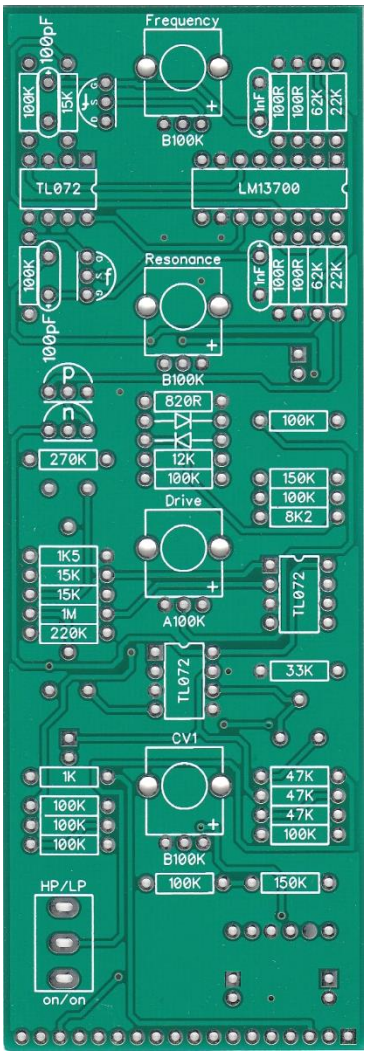
Build documentation for:

WHITEFACE

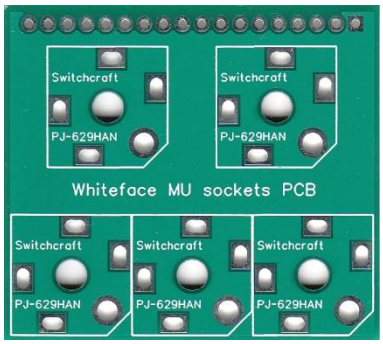
Based on the legendary ARP 4023 VCF often found within “whiteface” ARP Odyssey Mk1. I've engineered out the rare parts and the need for matched transistors for the CV input section by using a Roland style circuit there instead, no change to the vibe though! The audio path remains pure ARP, with one exception. Built stock from the schematic, the resonance would clip like a motherfucker above 3 o'clock, in a way which is neither musical or desirable. I've come across a couple of other versions which have this *'don't turn it up past 8'* trait. I've engineered that out - a single resistor values change. Now resonance is usable and musical over the entire range. As a bonus feature, there’s a switch for super exciting highpass mode!

Whiteface features 2 PCBs:

Main PCB



Sockets PCB



Key to PCB screen print:
n: This signifies NPN BC547 transistors. Note the correct pinout as shown by the half circles.
p: This signifies PNP BC557 transistors. Note the correct pinout as shown by the half circles.
f: This signifies 2N5458 FET. Note the correct pinout as shown by the half circles.

The PCB shows the correct orientation for BC547/BC557/2N5458. Other transistor types can be used (eg 2N3904/2N3906), but please observe the correct pinout.

Please observe correct polarity of the electrolytic caps, voltage regulators, transistor, ICs etc!

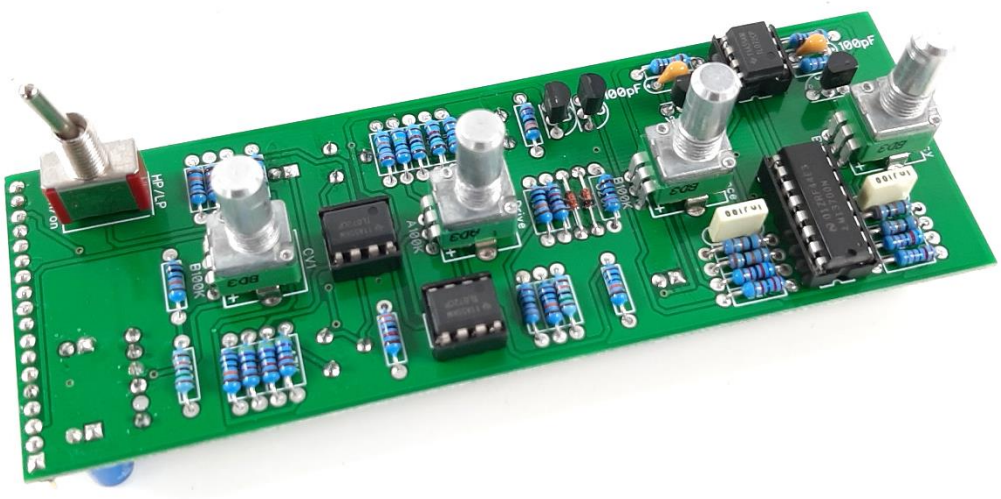
Bill of Materials

100R x 4 820R x 1 1K x 1 1K5 x 1 8K2 x 1 12K x 1 15K x 3 22K x 2 33K x 1 47K x 3 62K x 2 100K x 10 150K x 2 220K x 1 270K x 1 1M x 1 All resistors ¼ watt metal film.	100pF x 2 1nF x 2 10uF x 2 47uF x 2	LM13700 x 1 TL072 x 3 BC547 x 1 BC557 x 1 2N5458 x 2 1N4148 x 2 16 pin IC socket x 1 8 pin IC socket x 3	A100K x 1 B100K x 3 SDPT toggle x 1 10K trimmer x 2 100K trimmer x 1 6.3mm socket x 5 Male 40 pin header x 1 Female 40 pin header x 1 DOTCOM 6 pin header (MTA-100 2.54mm)

Main PCB:

Populate the Main PCB front first, as shown on the silkscreen, starting with the lowest profile components, so:

- Resistors, diodes
- IC sockets
- Non-electrolytic capacitors and transistos
- Pots and switch - it can be useful to use the panel to make sure of nice fit.



Now populate the rear of the Main PCB:

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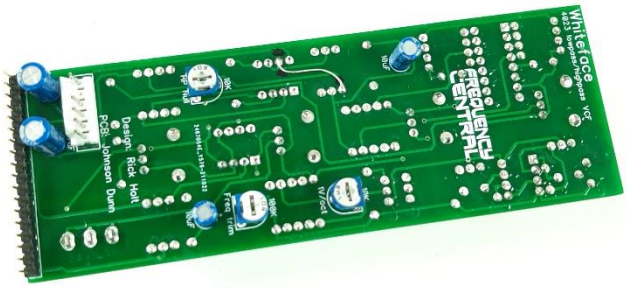
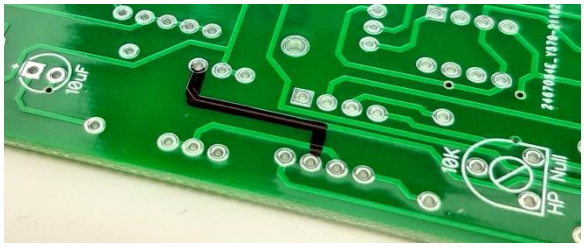
- Trimmers
- Header for Sockets PCB (cut to size)
- Power header
- Electrolytic capacitors



Main PCB bug fix!

The first version of the PCB has a tiny error, there's a missing trace. Rather than waste ~~the planet~~ this run of PCBs when there's a very easy fix, we've marked in black where you need to use a bit of wire (or resistor leg). **If your PCB isn't marked in black anywhere, we already fixed it.** Check the photos:



Now mount the PCB to the panel with the various washers and nuts.

Sockets PCB

- Place all sockets on the PCB, 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.
- Cut the male header to size and place the long end into the female header of the Main PCB
- Present the populated sockets PCB to the panel, making sure the male header passes through the PCB pads.
- Make sure everything fit's nice and snug and solder the header into place.

Calibration

1. **1V/Oct trimmer:** turn Resonance all the way to self oscillation. Patch a 1V/oct source into CV input 1, with the attenuator fully clockwise. Play octaves and adjust the V/Oct trimmer until they are spot on.

2. **Offset trimmer:** you want to tweak this so that the filter is fully open when the Cutoff pot is fully clockwise.

3. **HP Null:** Patch a VCO into an audio input and turn up the drive. Set the switch to Highpass mode and turn the Resonance to a position just before self oscillation. Adjust the null trimmer until you can hear that the filter totally cuts all low end when the Frequency is turned right up.

RDH 06/02/22

https://www.frequencycentral.co.uk/