circuitbenders.co.uk PHONIC TAXIDERMIST 47.2b

Read the build guide to the end before ordering parts or starting work.

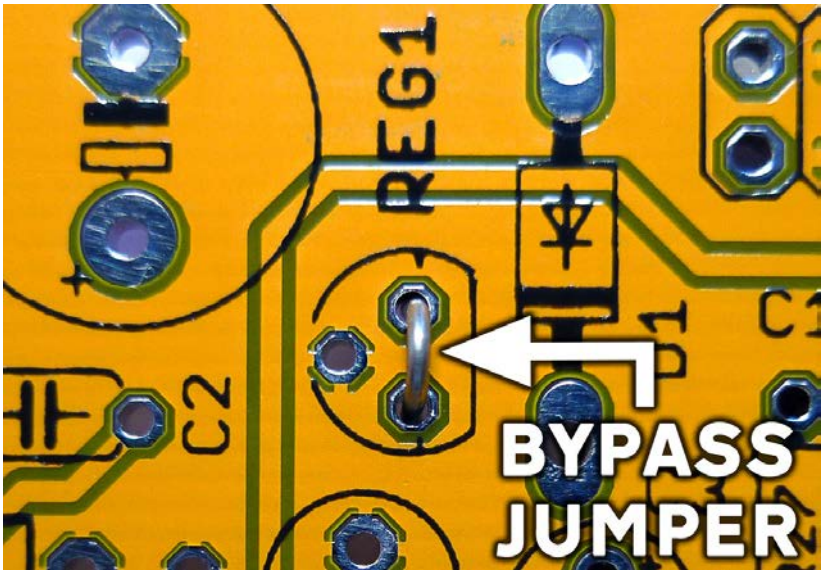
The Phonic Taxidermist 47.2b is a fairly simple board to build. Theres no setup or calibration necessary, so in theory theres no reason why it shouldn't be a beginners project. None of the parts are too difficult to get hold of, although you probably won't find the HT8955A 'voice echo' chip or its associated RAM in places like Mouser or Farnell. A search on the net should turn up plenty of places to get hold of them.

The circuit will always produce a certain amount of background noise leaking from the chopping stage. This is **completely normal**. The noise has been minimised on this PCB in comparison to the original Maplin Voice Vandal, which was a **lot** worse.
Having spent far too long trying to track down noise problems on a prototype, that finally turned out to be caused by a batch of blatant quality control failure LM358 opamps from Tayda electronics, we would advise using decent quality components from a trusted supplier.

Power:

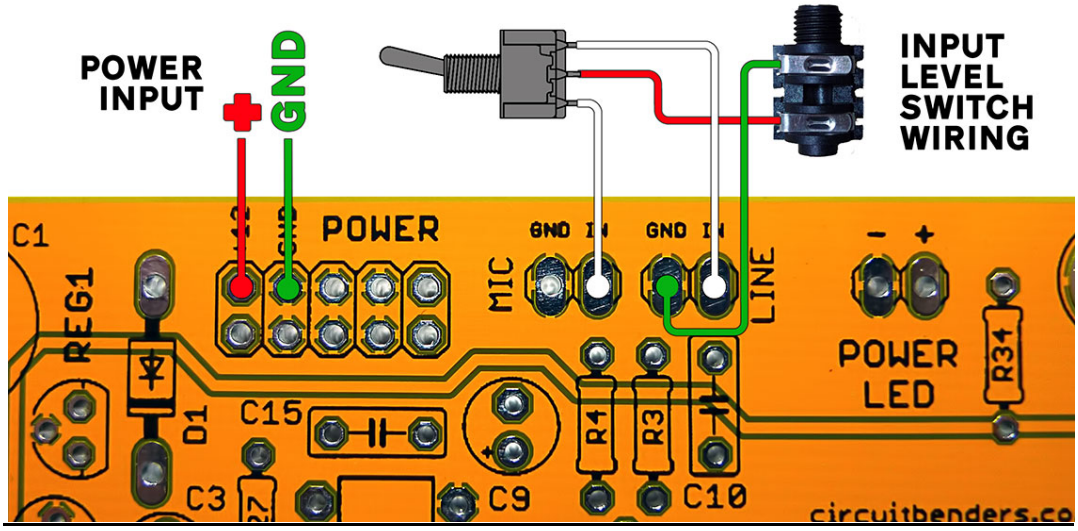
For some reason the original Maplin Voice Vandal didn't have any voltage regulation for the audio side of the circuit, and as a result unless you had a very well regulated power supply it was very prone to noise and PSU hum. The Phonic Taxidermist 47.2b has several options for powering the board.

The voltage regulator at REG1 can be either a 78L09, a 78L12, or be bypassed completely. The board is perfectly happy running on anything between 9v and around 15v, but the higher the voltage after REG1, the better the noise floor tends to be.
Actually using a regulator at REG1 is probably the best plan , but you can experiment with bypassing it for your individual setup.



If you have a 12v supply you should use a 78L09 at REG1, so the main circuit will be running on 9v. If your 12v supply is **very** clean and stable, you can bypass REG1 and run the board directly on 12v.
If you have a 15v supply you should use a 78L12 at REG1, so the circuit will be running on 12v. As with 12v, if your 15v supply is **very** stable, you can bypass REG1 and run the board directly on 15v.
If you have a very stable 9v supply, you might get away with just bypassing REG1 and running the circuit directly on 9v, but you might have noise issues with trying to use something like a guitar pedal power supply.

The board has a eurorack modular 10 pin power connector at the back. Only the pins labelled +12 and GND are actually connected, so for any other type of power connection you only need to use these two pins.

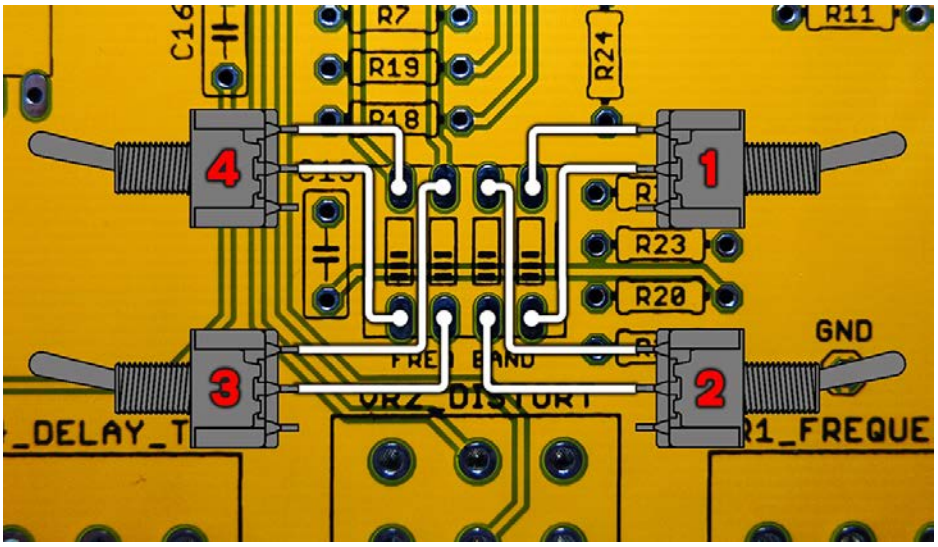


MIC/LINE:

On the rear of the board there are two pairs of headers for inputs and outputs. These are identical to those found on the original Voice vandal. For line level signals you should use the LINE connections, and you can probably work out the rest yourself! Its a simple job to make the input and output level switchable with a SPDT switch wired between the socket and the board connections. The wiring for a switchable input level is shown above

FREQUENCY BAND SWITCHES:

The four frequency band on/off switches are implemented on the board using a four way DIP switch. Unless you want to set the effect to one frequency band and leave it, you'll probably be wanting to bring these switches out to a panel. This can be done very simply by just wiring a switch across the corresponding solder pads, as shown in the diagram below. It'd probably be best to keep this wiring as short as possible



DELAY JUMP:

The jumper labelled 'DELAY JUMP' behind the feedback pot connects the delay signal back to the main mix. On the real Voice Vandal this is a permanent connection and you can never really turn off the delay completely. If you want this board to function as the original, just install a wire jumper here, but you can also install a switch to allow you to turn the delay return on and off.

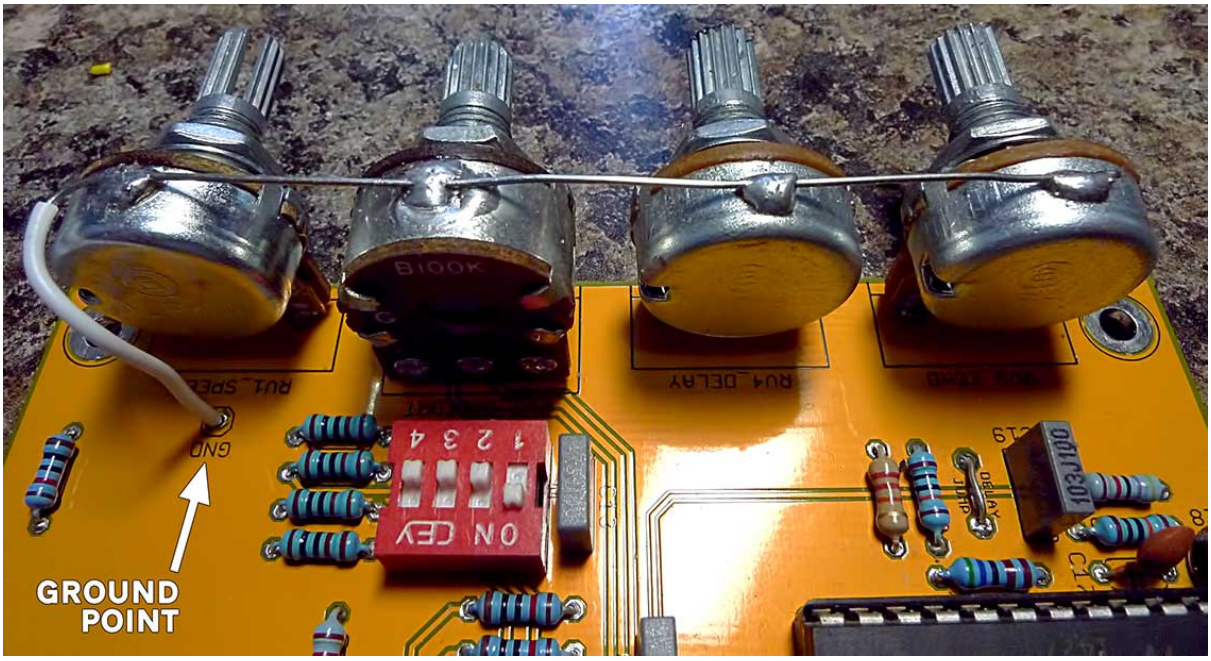
GROUNDING POTS:

In order to minimise the noise floor, the casings of the pots need to be grounded. Actually its probably only really VR3 and VR4 that need this, but it can't hurt to do the others as well. All the pots are grounded in this manner on the original Voice Vandal.

If you are using this board to build a module for a modular synth, and the front panels are grounded via the casing, then this step probably isn't necessary. If not, you need to ground the bodies of the pots via the ground point provided, as shown in the image below.

This is best achieved by slight abrading the pot surface, heating the pot surface slightly with your iron, and then flowing some solder onto the pot body. Using some extra solder flux will help a lot here, but its not 100% necessary. Once you done this with all 4 pots, you can use a piece of stripped wire to ground them to the ground point. Solid core wire is probably easier to deal with, but stranded will work just as well.

If you chose not to mount the pots on the front of the board in the spaces provided, its still important that you make sure that they're grounded.



PARTS LIST:

PART NUMBER	PART VALUE	NOTES
D1	1N4001	Polarity protection diode
D2, D3	1N914	Diode
R33	4R7	All resistors standard 1/4 watt carbon or metal film
R6, R20, R21, R22, R23	1K	
R34	1K5	
R31	5K6	
R1, R2, R4, R15, R16, R17 R18, R19, R25, R26, R36	10K	
R27	15K	
R32	22K	
R24, R28, R38, R39	47K	
R3, R5, R7, R8, R9, R10, R11, R12 R13, R14, R29, R30, R35, R37	100K	
C11	10pF	Ceramic
C12, C22	100pF	Ceramic
C17	330pF	Ceramic
C19	10nF	Poly Film
C13, C16	47nF	Poly Film
C2, C8, C14, C21	100nF	Ceramic
C10, C15	100nF	Poly Film
C9	1uF	Electrolytic*
C3, C4, C5, C6, C7, C20, C23	10uF	Electrolytic
C18	100uF	Electrolytic
C1	470uF	Electrolytic
Q1-Q4	BC548	or equivalent transistor
REG1	78L09-78L12 or jumper**	Voltage regulator
REG2	78L05	Voltage regulator
IC1	LM358	Op Amp
IC2	LM358	Op Amp
IC3	4066	Quad Bilateral Switch
IC4	4060	14 Stage Binary Counter
IC5	HT8955A	'Voice Echo' Delay Controller
IC6	41256***	RAM
Power LED	LED	Its an LED!
VR1_FREQUENCY	B1M	Potentiometer****
VR2_DISTORT	B100K	Dual Potentiometer
VR3_FEEDBACK	B470K or C470K*****	Potentiometer - 500K is ok
VR4_DELAY_TIME	B470K	Potentiometer - 500K is ok
DELAY JUMP		Wire Jumper

* All electrolytic caps rated at 25v or more. For some reason the + markings to indicate the polarity of the electrolytic caps are not as clear as they should be on some boards. If in doubt, take a look at the parts layout to make sure which way round they should be soldered.

**See power section on the first page.

***This is a standard 256K RAM chip, but it comes under many different names from different manufacturers. These include uPD41256, MN41256, D41256 and various others. Any of them should work ok, but you may need to pay attention to the access speed. This is indicated by a dash and then a number on the end of the part number i.e. MN41256A-10. The lower the number, the faster the RAM access speed.
The original Voice Vandal came with -10 RAM. We've tried it with -10 and -08 speed chips, and it works fine. There are also -12 and -15 versions commonly available, but we have not tried these and cannot verify how well they might work.

****All potentiometers should be metal bodied types. See the 'grounding pots' section for details

*****A pot with an antilog curve (commonly labelled with a 'C') will give a more controllable feedback response here, but the original Voice Vandal uses a linear curve pot for VR3.

The schematic can be downloaded HERE.