

When you are happy with the printed circuit board, construction can proceed as normal, starting with the resistors first, followed by the IC socket if used, then moving onto the taller components.

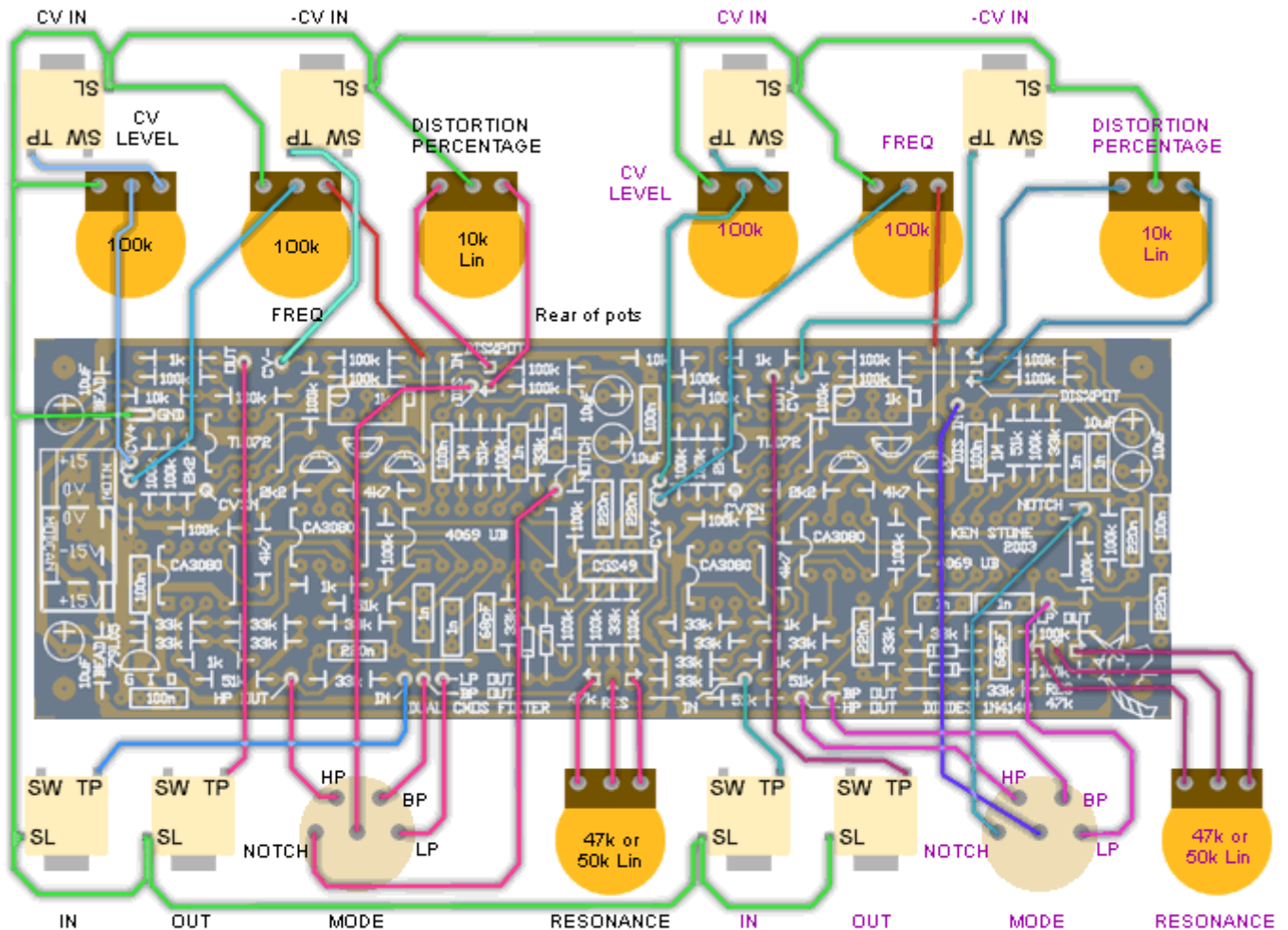
Take particular care with the orientation of the polarized components such as electrolytics, diodes, transistors and ICs.

The CMOS chip MUST be of the unbuffered type. 4069 continued to be made in UB form long after most other UB 4000 series chips were stopped, so locating them should not be difficult. CD, HEF etc. are acceptable designators. Do not use chips with designators starting with "74".

It has been suggested that connecting the frequency pot between +VE and -VE instead of +VE and GND as shown will allow the filter to be used at lower frequencies. If doing this, you may find it beneficial to change the wiper resistor up to 270k, or add an extra resistor of 150k in series with the wire from the wiper to the PCB.

Tuning. Set the trimmers for a 1 volt per octave response. It will never be as accurate as a VCO as there is no thermal compensation, so "close enough" is good enough.

The photo shows two additional 100k trimmers I added to allow centering of the frequency pots. They are wired between +VE and -VE, with 100k wiper resistors fed to the CVSN pads on each filter. Alternatively, the CCW end of the frequency pots could be wired to -VE (via resistor if needed) instead of to 0V.



FILTER 1 = Black text
FILTER 2 = Purple text

CGS49 CMOS Filter
Copyright 2003 by Ken Stone
Distortion by J.H.

Suggested wiring for the filters.

Note: The CCW end of the frequency pots should be wired to -VE instead of to 0V as shown above.

Notes:

- TI chips (CD4069UBEE4) reportedly give greater distortion than some other brands of 4069.
- If you get absolutely no response to CV, check that the trimmer for that filter is not set to the bottom of it's range.
- The Distortion channel is based on Jurgen Haible's design. Filter originally by Chris Huggett.
- **PCB info:** 2" x 6" with four 3mm mounting holes 0.15" in from the edges.
- Please [email me](#) if you find any errors.

Parts list

This is a guide only. Parts needed will vary with individual constructor's needs.

If anyone is interested in buying these boards, please check the [PCBs for Sale](#) page to see if I have any in stock.

Can't find the parts? See the [parts FAQ](#) to see if I've already answered the question. Also see the [CGS Synth discussion group](#).

Part	Quantity
Capacitors	
68pF	2
1n	8
100n	6
220n	6
10uF 25V	6
Resistors	
1k	6
2k2	4
4k7	4
10k	2
33k	18
51k	6
100k	32
1M	2
1k 25 turn trimmer	2
47k or 50k lin pot	2
100k lin pot	4
Semi's	
1N4148	4
79L05	1
BC547	2
BC557	4
CA3080 or LM3080	4
TL072	2
4069UB	2
Misc.	
Misc.	
Ferrite Bead (or 10R resistor)	2
0.156 4 pin connector	1
CGS49 PCB	1

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