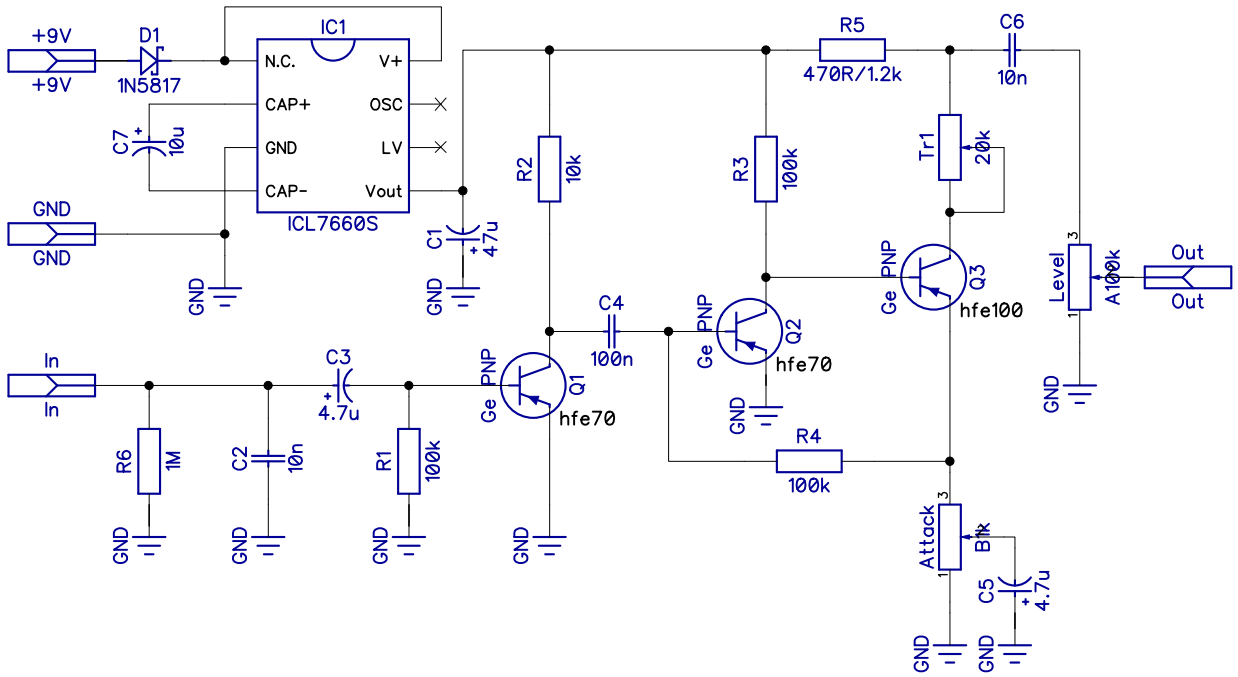
Aang

Based on the Solasound Tone Bender MK II

Release date: 2020. 02. 03.

Aang is a clone of the famous Solasound Tone Bender fuzz. With minor component value changes a Marshall Supa Fuzz can also be built on the same PCB, see the Notes section. It utilises an additional small circuit to swap the polarity of the standard +9V, so that the effect can be daisychained to your standard power suppply used for other pedals as well.

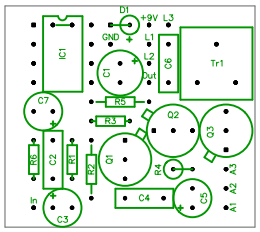
SCHEMATIC

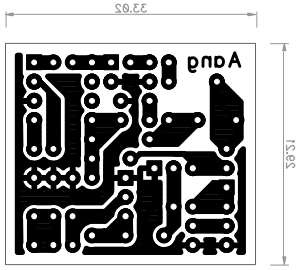


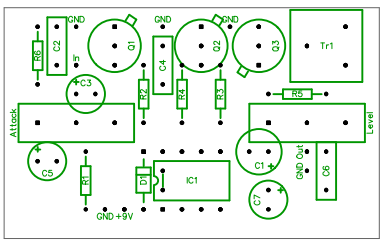
BOM							
Resistors		**Capacitors**		**Semiconductors**		**Others**	
R1	100k	C1	47u	D1	1N5817	Attack	B1k
R2	10k	C2	10n	Q1	Ge PNP (hFE~70)	Level	A100k
R3	100k	C3	4.7u	Q2	Ge PNP (hFE~70)	Tr1	20k
R4	100k	C4	100n	Q3	Ge PNP (hFE~100)		
R5	470R/1.2k	C5	4.7u	IC1	ICL7660S		
R6	1M	C6	10n				
		C7	10u				

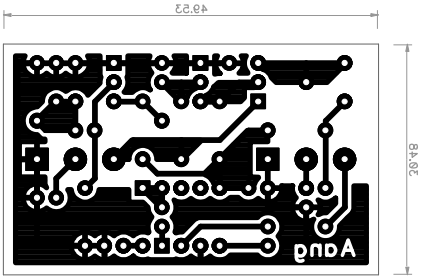
LAYOUT

Print out the PCB design without any resizing options and make sure you switch off the “fit to page” option. The design is free for personal/home use and you also may build one or two for your friends, but the PCB layout is my artwork, therefore protected by copyright and is not permitted to be used for commercial purposes. The smaller design fits into a 1590A box, the larger one can be built into a standard 1590B or 125B enclosure.

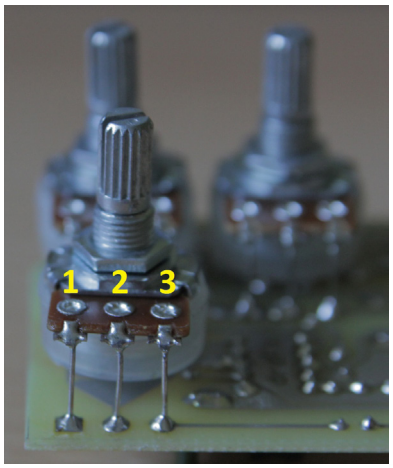








NOTES



On the large layout the pots are board mounted to the bottom of the board. The square pads mark the lug 1, for the numbering of the lugs see the picture. On the smaller layout the pots are off-board mounted with wires.

The original circuit is a positive ground type of circuit, so it can't be daisy chained to the power supply used for your standard negative ground pedals. In this version I have added a little extra circuit based on the ICL7660S voltage converter IC that converts the standard negative ground power to the needed positive ground solution. Instead of the ICL7660S you can use a MAX1044 or an LT1054 voltage converter as well, however with the LT1054 omit the jumper under the IC that connects pins 1 and 8.

The original used OC81 Ge transistors. Ge transistors are these days harder to come by, so I have not marked their types. I have used Tungsram AC125 and OC1075 types with great success. Instead of the exact type it is more important the hFE value of the transistors in each position. I have marked the optimal values on the schematic and also in the BOM. For Q1 use a transistor that has a bit of leakage, say something around 100-150uA. If you happen to have only better transistors than that, use a "leakage simulation resistor" between the base and the collector. Note that there is no space foreseen on the PCB for this purpose, so if you chose to go this way you will have to improvise a bit. Q3 is less crucial, you could even use a Si transistor here.

Tr1 sets the bias of the last transistor. I usually tune that by ear.

With some value modifications you can build yourself a Marshall Supa Fuzz too on the same board:

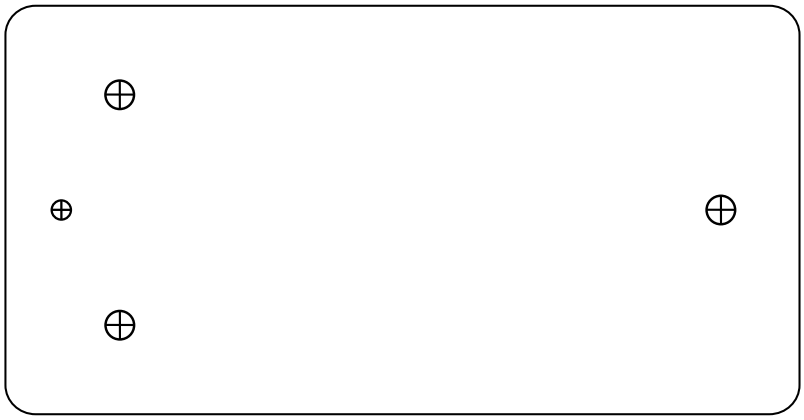
C3 – 10uF
C5 – 10uF
R1 – 100kOhm
R3 – 100kOhm

The Fuzz pot is marked as B1k on the schematic and this was actually the value in the historic units as well. I've found however that with this value the amount of fuzz barely changes when turned down. I used B5k with better results, but B2k or B2.5k would be probably good too.

DRILLING TEMPLATES

Here are two drilling templates that can be used for the 1590A and the 1590B enclosures.

1590A



1590B