

# Tone Bender MKIII

## Colorsound MKIII Components (For VOX version: use values in brackets)

<b>C1</b>	100nF	<b>R1</b>	1M5	<b>FUZZ</b>	100K Linear
<b>C2</b>	220pF	<b>R2</b>	47K (100K)	<b>VOLUME</b>	100K Linear
<b>C3</b>	22uF Electrolytic	<b>R3</b>	220K (680K)	<b>TONE</b>	100K Linear
<b>C4</b>	220nF	<b>R4</b>	10K		
<b>C5</b>	10uF Electrolytic (6u8)	<b>R5</b>	10K	<b>Q1, Q2, Q3</b>	PNP Germanium Transistor
<b>C6</b>	100nF	<b>R6</b>	3K3		
<b>C7</b>	2n2	<b>R7</b>	none	<b>D1</b>	1N270 (or 1N34a)
<b>C8</b>	none	<b>R8</b>	18K	<b>D2</b>	1N4001
<b>C9</b>	none	<b>R9</b>	10K	<b>D3</b>	1N4148
<b>C10</b>	10uF Electrolytic	<b>R10</b>	none		
<b>C11</b>	10uF Electrolytic	<b>R11</b>	10K	<b>IC1</b>	7660S
<b>C12</b>	100uF Electrolytic	<b>R12</b>	10K		
		<b>R13</b>	220K		

To use a PNP Tone Bender with a normal 9V power supply, this circuit includes a power inverter section which is C10, C11, C12, D2, D3 and IC1 which generates the -9V required. Unless you know what you're doing and have a positive ground PSU, you should use all these components, otherwise omit them and solder a jumper between the pins of JP1. (**Do NOT** connect the jumper if using the power inverter or you will get a short circuit).

## Transistors

There are many different types of Germanium PNP transistors that you could use with this circuit. You can get matched sets for Tone Benders, but the rough guide is to use one with a gain (hfe) of 45-55 for Q1 and 90-110 for Q2 and Q3. Use sockets if you want to experiment with different kinds, and mind the pinout.

## NPN Version

It is possible to build an NPN transistor based circuit. To do this, you need to reverse the polarity of D2, leave out the voltage inverter as described above and swap the polarity of the electrolytic capacitors. Make sure the JP1 jumper is soldered.

### **CHECK ELECTROLYTIC CAPACITORS!**

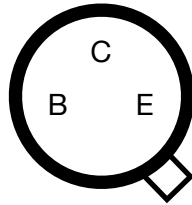
If you are building the NPN version, the **polarity of the electrolytic caps need to be reversed** from what is printed on the board, so put the negative leg in the hole with a +

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## Transistor Pinouts

Looking at the top of the board, the pinout for the transistors is:

C: Collector  
B: Base  
E: Emitter



## Jumpers

Where a component is listed as jumper, solder a piece of wire between the pads to make a connection.

## Board Connections

The PCB connections are labelled as the following:

I - Input, O - Output, V - 9V DC in, G - Ground

Potentiometers are connected from pin 1 to the square pad on the PCB. This board was designed so you can use right-angle board mount potentiometers on it if desired, otherwise you will need to solder wires from the pads to the correct pin/lug. Jack sleeves and DC centre pin should be connected to ground. V, LED + should be connected to the positive pin of the DC connector.

