

Hot Fuzz Professional PCB

The Hot Fuzz Pro is a circuit board that lets you build a fully professional distortion device that's been proven by other DIY effects builders. It combines the virtues of a highly sought after vintage distortion device with some modern tone control and tweaking to let you tune in a sound that's pure vintage - or pure YOU!

For followers of the effects BBS's, The Hot Fuzz Pro is the basic circuit of the original two knob Tone Bender Professional Mark 2, but with the addition of a tone control section that seems to make it sound substantially better (if that's really possible!)

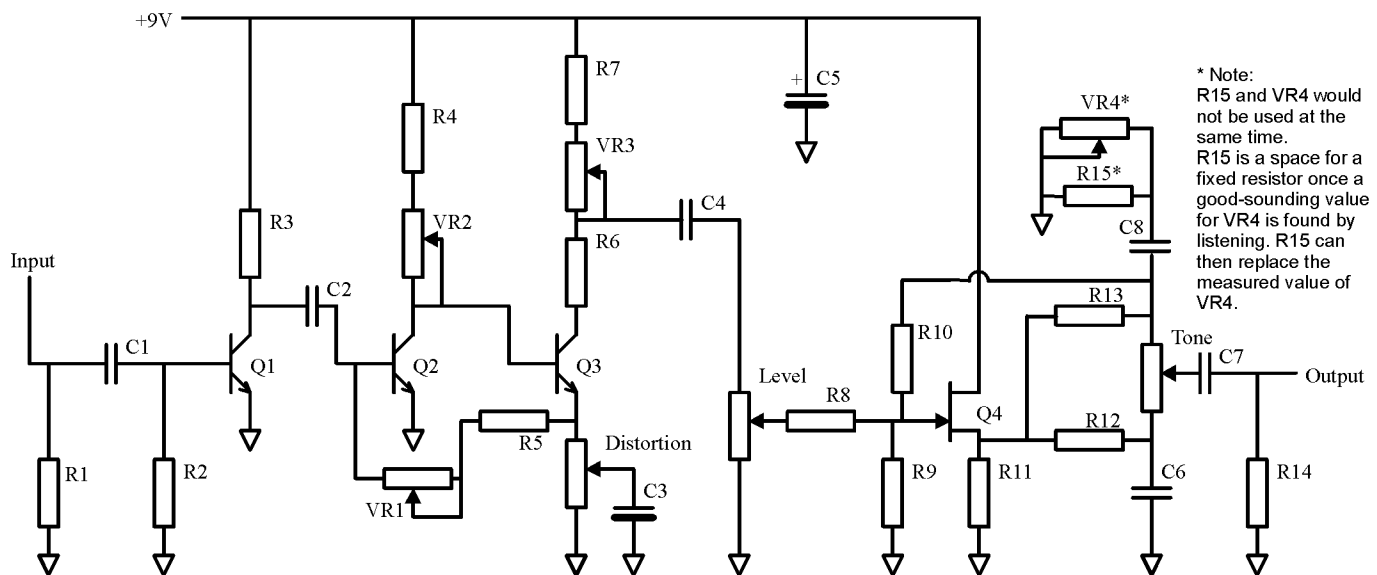
But that's not all that this PCB can do. The Hot Fuzz Pro contains the circuit of the Tone Bender. If you want to build an original circuit Tone Bender, you can do this by leaving off the tone control circuit. These instructions will show you how to do that. The Tone Bender itself was an enhancement of the Fuzz Face circuit with an extra buffer stage in front of it. You can easily leave off the buffer stage and have a Fuzz Face, or one of the several different variations of the Fuzz Face that exist (I know of about 20!)

The instructions here will tell you how.

And where can you get this board? Where else? GEO!

This is the schematic of the whole circuit, less the input/output jacks and bypass switching arrangements, which have been left out for clarity about the circuitry. The jacks, controls, and bypass switching are all shown in the wiring diagrams that follow.

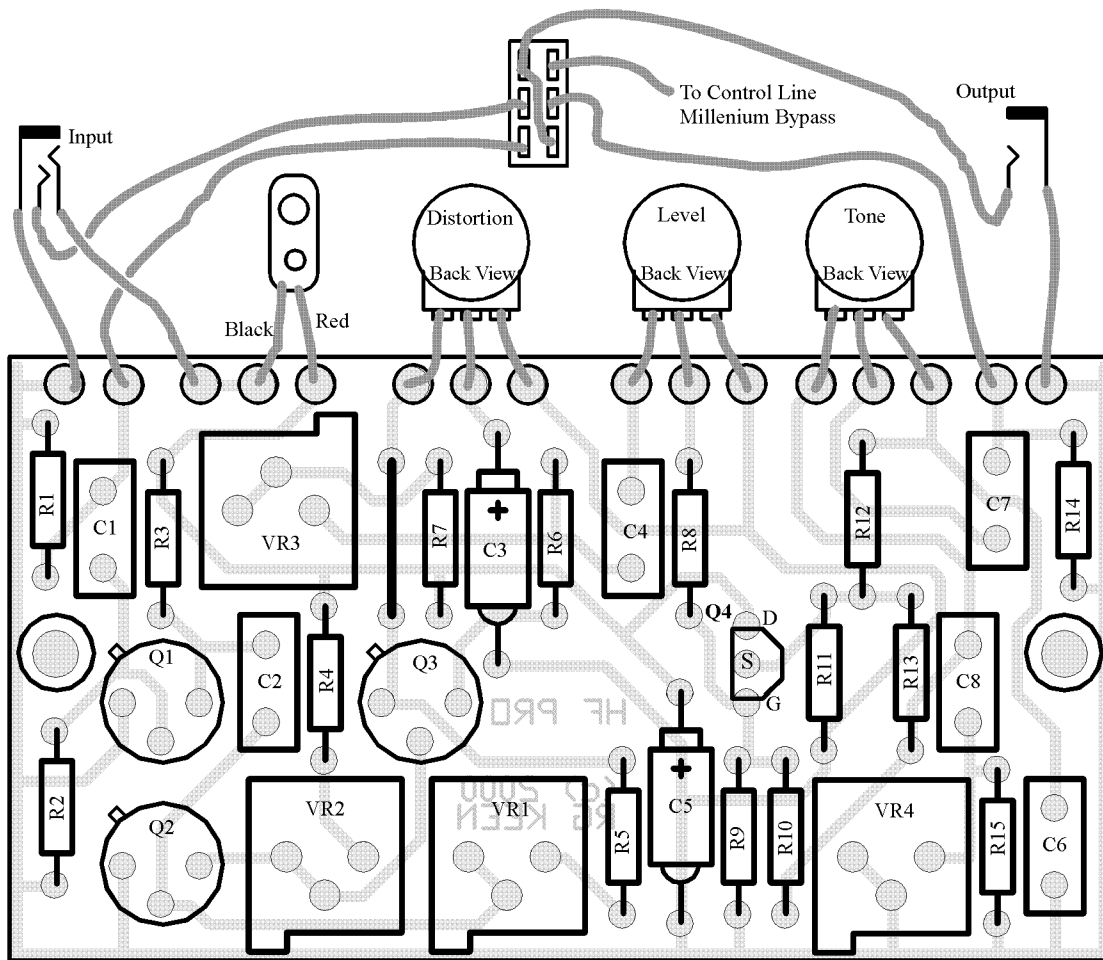
Hot Fuzz Professional - Schematic



* Note:
R15 and VR4 would not be used at the same time.
R15 is a space for a fixed resistor once a good-sounding value for VR4 is found by listening. R15 can then replace the measured value of VR4.

Original adaptation by Aron Nelson. Layout and schematic copyright 2000 R.G. Keen

Hot Fuzz Professional - Layout and Wiring



Parts List

R1 - 1M	C1 - 0.1uF
R2 - 100K	C2 - 0.1uF
R3 - 10K	C3 - 22uF
R4 - 4.7K	C4 - 0.01uF
R5 - 10K	C5 - 47uF
R6 - 8.2K	C6 - 0.022uF
R7 - 470	C7 - 0.47uF
R8 - 100K	C8 - 0.1uF
R9 - 1M	Q1 - NPN Ge
R10 - 100K	Q2 - NPN Ge
R11 - 10K	Q3 - NPN Ge
R12 - 10K	Q4 - N-ch JFET
R13 - 10K	Distn - 5K
R14 - 1M	Level - 500K
R15 - TBD*	Tone - 50K
VR1 - 100K	
VR2 - 100K	
VR3 - 50K	
VR4 - 5K	

This is the basic population for the Hot Fuzz Pro PCB. It represents the set of parts values worked out by Aron Nelson and others in adapting the two-knob Tone Bender to DIY effects use. I have modified Aron's parts list and population in a couple of ways, in the interest of making this more goof-proof, and reproducible.

I have added R4 and R5 in series with their respective trimpots, VR2 and VR1. This is a limiting resistor to keep the in-circuit resistance from going to zero if the trimpot is accidentally turned all the way down. I have added R15 as an optional replacement for VR4 in the setup process. When VR4 is set properly, you can measure its value and then solder in the closest standard value for R15 and remove VR4. Since VR4/R15 tune the bias of Q4, it is very unlikely that you'll need to change the setting in the future unless you replace Q4.

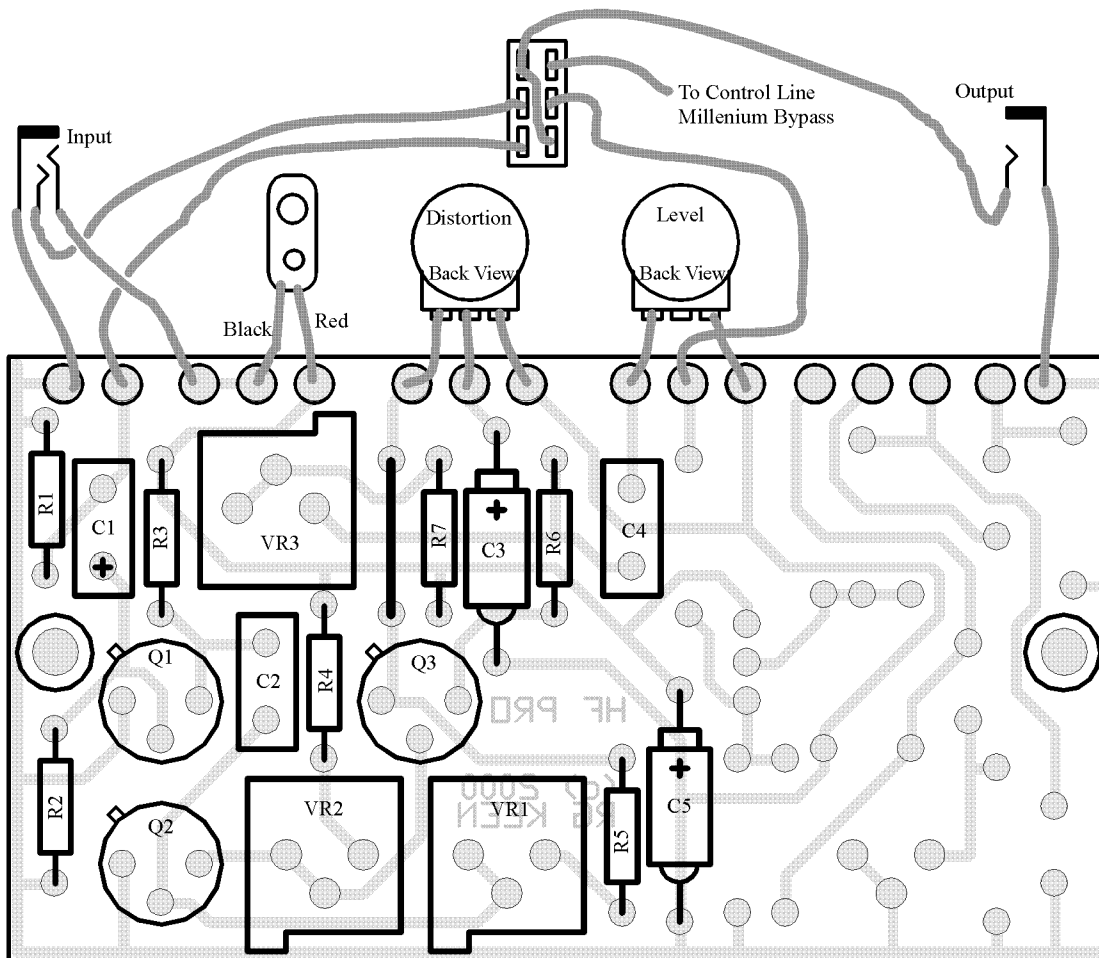
Q1, Q2, and Q3 are 2N388 in the NPN version, and Q4 is any good N-channel JFET. Although J201 was originally specified, the JFET is used as a source follower, and so any differences between JFETs will be minimal. Watch for pinout differences if you change JFET part numbers. The advantage of using NPN germanium transistors is that the battery supply can be hooked up with the negative side at ground, like almost every other "normal" effect. There should be no difference in sound between the two.

You can make it with PNP germaniums of course. To do this, simply replace Q1-3 with your selected PNP germaniums, and reverse the polarity of the battery, C3 and C5.

There is one jumper on the board, shown by the heavy dark line.

Tone Bender Professional - Layout and Wiring

(Includes Marshall Supra-Fuzz)



Parts List For TB/SF

R1 - 1M	C1 - 4.7uF (10uF)*
R2 - 100K (10K)	C2 - 0.1uF
R3 - 10K	C3 - 4.7uF (10uF)
R4 - 100K (47K)	C4 - 0.01uF
R5 - 100K	C5 - 47uF
R6 - 8.2K	C6 -
R7 - 470	C7 -
R8 -	C8 -
R9 -	Q1 - NPN Ge
R10 -	Q2 - NPN Ge
R11 -	Q3 - NPN Ge
R12 -	Q4 -
R13 -	Distn - 1K
R14 -	Level - 100K
R15 -	Tone -
VR1 - 100K	
VR2 - 100K	
VR3 - 100K	
VR4 -	

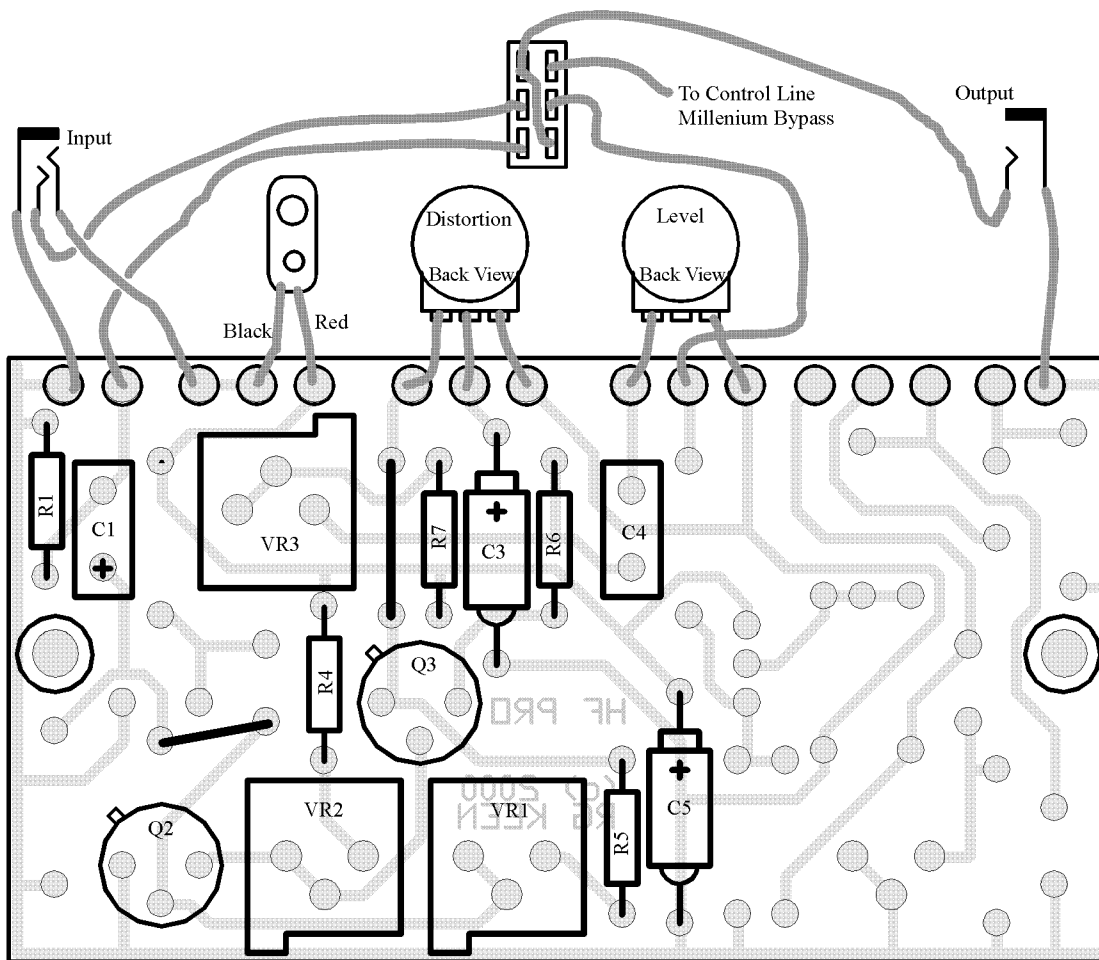
This version makes either the Color Sound Tone Bender MK2 or the Marshall Supra Fuzz. Notice that the right hand third of the board, which held the tone control section in the Hot Fuzz is simply blank. The output is taken off the wiper of the Level control instead. the parts values in parentheses are the Supra Fuzz values.

R4 and R5 are still in series with their respective trimpots, VR2 and VR1. In the parts list, I have shown R4 and R5 as the real values of the fixed resistors in the original pedals. If you want to "tune" the values, put in about half of the stated values for R4 and R5, and insert VR2 and VR1. If you just want an accurate reproduction of the original pedal, put in the listed value and insert a jumper wire in the holes to short out where VR2 and VR1 would have been. Note that C1 is now a polarized capacitor and the positive lead should be as shown.

Q1, Q2, and Q3 are 2N388 in the NPN version. Again, the advantage of using NPN germanium transistors is that the battery supply can be hooked up with the negative side at ground, like almost every other "normal" effect. There should be no difference in sound between the two. The original pedals were PNP germanium.

You can make it with PNP germaniums of course. To do this, simply replace Q1-3 with your selected PNP germaniums, and reverse the polarity of the battery, C3 and C5 and also C1.

Fuzz Face - Layout and Wiring



Parts List For Fuzz Face Clone

R1 - 1M	C1 - 2.2uF
R2 -	C2 -
R3 -	C3 - 22uF
R4 - 33K	C4 - 0.01uF
R5 - 100K	C5 - 47uF
R6 - 8.2K	C6 -
R7 - 470	C7 -
R8 -	C8 -
R9 -	Q1 -
R10 -	Q2 - NPN Ge
R11 -	Q3 - NPN Ge
R12 -	Q4 -
R13 -	Distn - 1K
R14 -	Level - 100K
R15 -	Tone -
VR1 - 100K	
VR2 - 100K	
VR3 - 100K	
VR4 -	

This version makes a Fuzz Face. Notice that Q1, R2, R3, and C2 have been left off, and a jumper installed to get the input signal from C1 to the base of Q2. Like the Tone Bender and Supa Fuzz, the output is taken off the wiper of the Level control.

R4 and R5 are still in series with their respective trimpots, VR2 and VR1. In the parts list, I have shown R4 and R5 as the real values of the fixed resistors in the original pedals. If you want to "tune" the values, put in about half of the stated values for R4 and R5, and insert VR2 and VR1. If you just want an accurate reproduction of the original pedal, put in the listed value and insert a jumper wire in the holes to short out where VR2 and VR1 would have been. Note that C1 is now a polarized capacitor and the positive lead should be as shown.

Q2, and Q3 are 2N388 in the NPN version. Again, the advantage of using NPN germanium transistors is that the battery supply can be hooked up with the negative side at ground, like almost every other "normal" effect. There should be no difference in sound between the two. The original pedals were PNP germanium.

You can make it with PNP germaniums of course. To do this, simply replace Q1-3 with your selected PNP germaniums, and reverse the polarity of the battery, C3 and C5 and also C1.