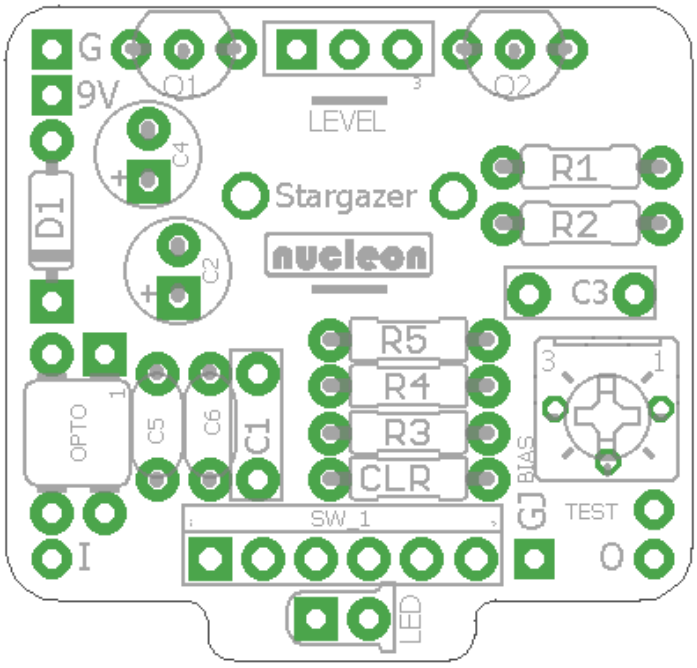
Stargazer Fuzz

Date Modified: August 1 2018

The Stargazer is an NPN rendition of the classic germanium Fuzz Face with the fuzz control set to 100% internally. The only control is a level knob. There's also an internal trimpot to set the bias point for the transistors. This thing is thick and big sounding and really produces that classic fuzz tone. Because it uses NPN transistors, you can use it with a regular +9V supply with positive sleeve and negative tip (the Boss standard).



BOM

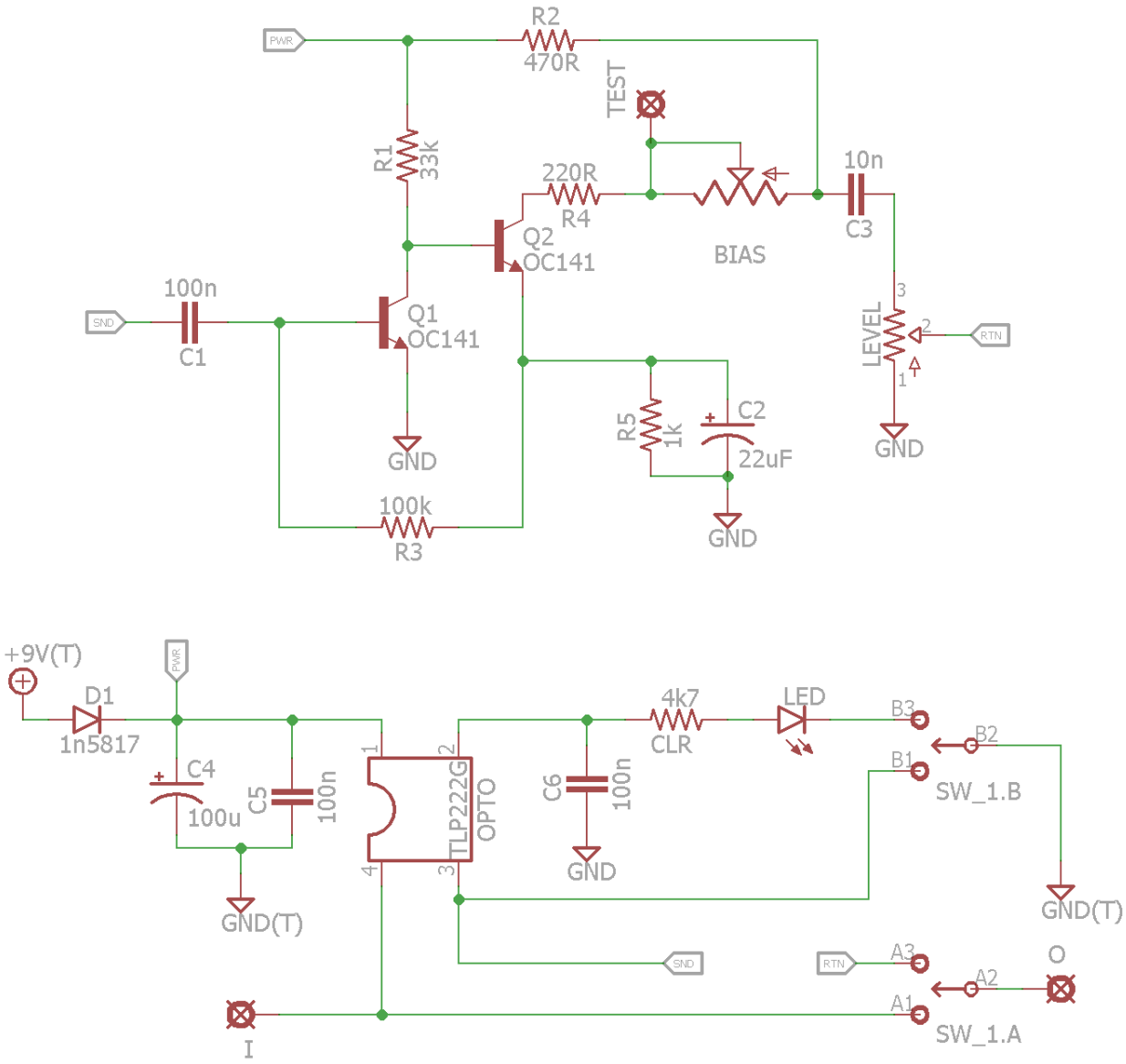
Resistors	
R1	33k
R2	470R
R3	100k
R4	220R
R5	1k
CLR	3k3 - 10k

Capacitors	
C1	100n
C2	22u
C3	10n
C4	100u
C5	100n MLCC
C6	100n MLCC

Diodes and misc	
D1	1n5817
Opto	TLP222G
Q1, Q2	AC176, OC141

Controls	
LEVEL	100kA, 500kA
Bypass	DPDT Stomp

Schematic



NOTES

See the General Build Doc on the website for general tips on building pedals and soldering germanium transistors.

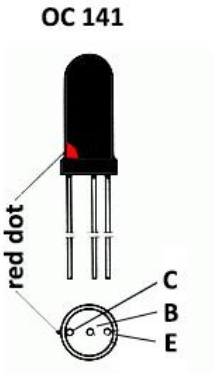
Germanium Transistors

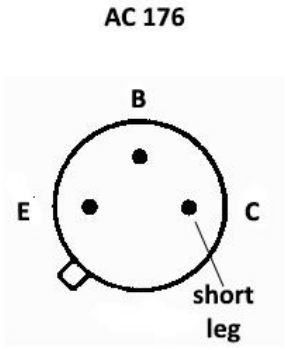
You can use any type of NPN germanium transistor you prefer with a gain of about 75 to 150. This should be the 'true' gain of the transistor, compensated for leakage. You can use an instrument like a Peak DCA55 to measure this or follow this procedure by guru RG Keen on Geofex:

http://www.geofex.com/article_folders/ffselect.htm

My personal Stargazers are built with Philips OC141 transistors. These have very low leakage (a few μA at most) which leads to very predictable behaviour. I've also successfully built units with AC176 transistors. These vary more in their specs so you will have to do some more careful sorting. Common knowledge dictates a gain of 75 - 90 for Q1 and 90 - 120 for Q2 but please don't take this as set in stone. It's a good rule of thumb, nothing more. For instance, I've built very nice sounding units with a 120 + 180 set. One thing to keep in mind that all Stargazers will share a big common ground, but exact reproducability is not something to expect from a germanium Fuzz.

Be sure to check the pinout of your transistors. See the diagram below for OC 141 and AC176.





Be careful soldering transistors to the board. They don't like heat too much. I'd suggest keeping the leads long and sticking out 2 or 3 cm above the board (that's about an inch). This will act as a heat sink. Solder one lead and then wait a few seconds (solder the lead on the other transistor for instance).

Bias

Adjust the trimpot and measure the voltage between the test point and ground (usually the enclosure will work). Aim for +4.5V as a start. You can lower it further to about +3.5V for more squish.

Radio interference

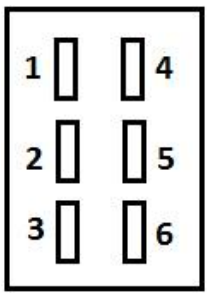
Connect a strat to a Stargazer and plug it into an amp. Dial back the guitar's volume control. You'll probably pick up some AM radio in a foreign language. This is classic Fuzz Face behaviour and has even been used as an 'effect' on records. There's ways to counter this but again no 'one size fits all' solution. You could try shielding input and output wires or wrapping them around ferrite beads. In the end most people agree that it's the nature of the beast and we should live with it.

Wiring

I - tip of input jack
O - tip of output jack
GJ - sleeve of output jack

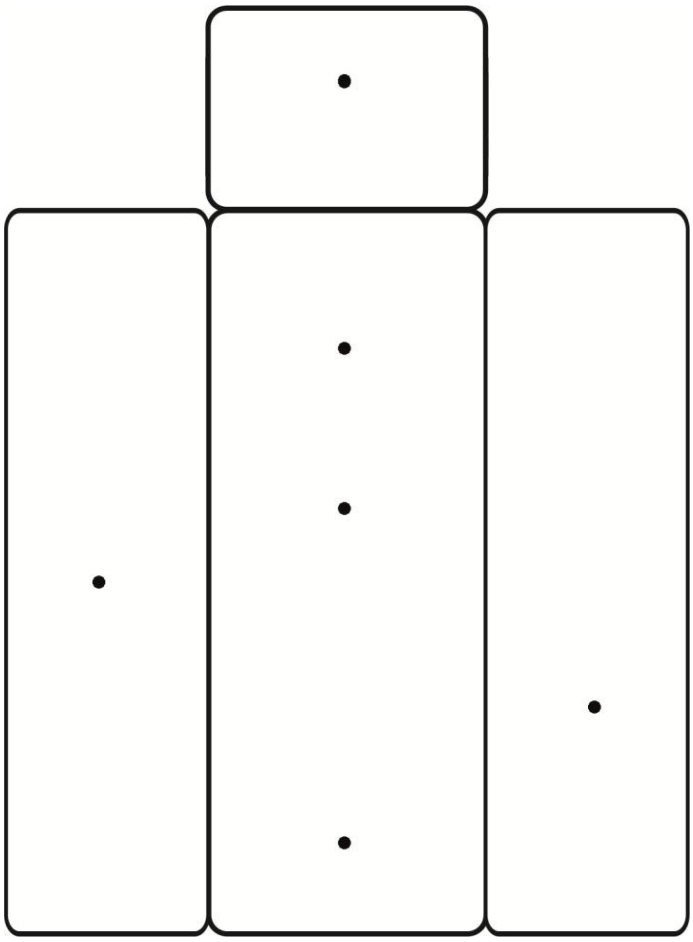
9V - sleeve of power jack
G - center of power jack

Bypass DPDT
Two sets of three (1 + 2 + 3 and 4 + 5 + 6) corresponding to columns on a DPDT switch.
1 and 4: top lug
2 and 5: center lug
3 and 6: bottom lug



For quick and easy wiring consider using the Nucleon Bypass board.

Drill template (1590A)



Drill Sizes

Pots: 7 mm minimum (use 8mm if you need some wiggle room)
Toggle switch: 6mm (7mm for extra wiggle room)
Jacks: 9 or 10 mm
Stomp: 12 or 13 mm (5 inches usually)
DC Jack: 7 mm (small barrel, no switch) to 13 mm (round 'Boss style' switched jacks)