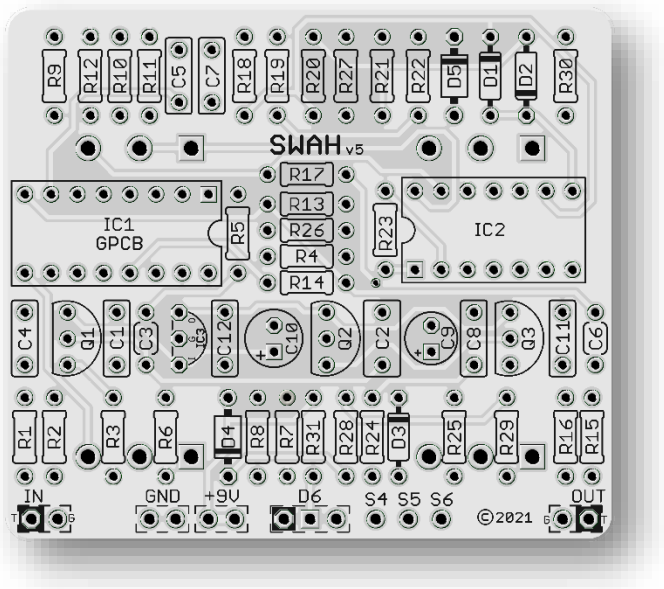
SWAH V5 2021

This is an excellent circuit based on the Snow-White Auto Wah that is known for sounding more like a real Wah than most other Auto Wah type pedals. Place the SWAH at the front of your pedal chain and let it do all of the WAH tones for you!



Board Dimensions (W x H) 2.32” x 2.04”

Part	Value
R1	10k
R2	1M
R3	1M
R4	10k
R5	5k1
R6	330R
R7	330R
R8	6k8
R9	4k7
R10	6k8
R11	330R
R12	330R

Part	Value
R13	4k7
R14	6k8
R15	1k
R16	4k7
R17	47k
R18	22k
R19	22k
R20	22k
R21	10k
R22	4M7
R23	4M7
R24	330R

Part	Value
R25	4k7
R26	6k8
R27	7k5
R28	100R
R29	47k
R30	47k
R31	1k8
C1	22n
C2	220n
C3	1u
C4	22n

Part	Value
C5	22n
C6	1u
C7	68n
C8	8n2
C9	1u
C10	100u
C11	100n
C12	100n
IC1	LM13700
IC2	TLO74
IC3	78L05

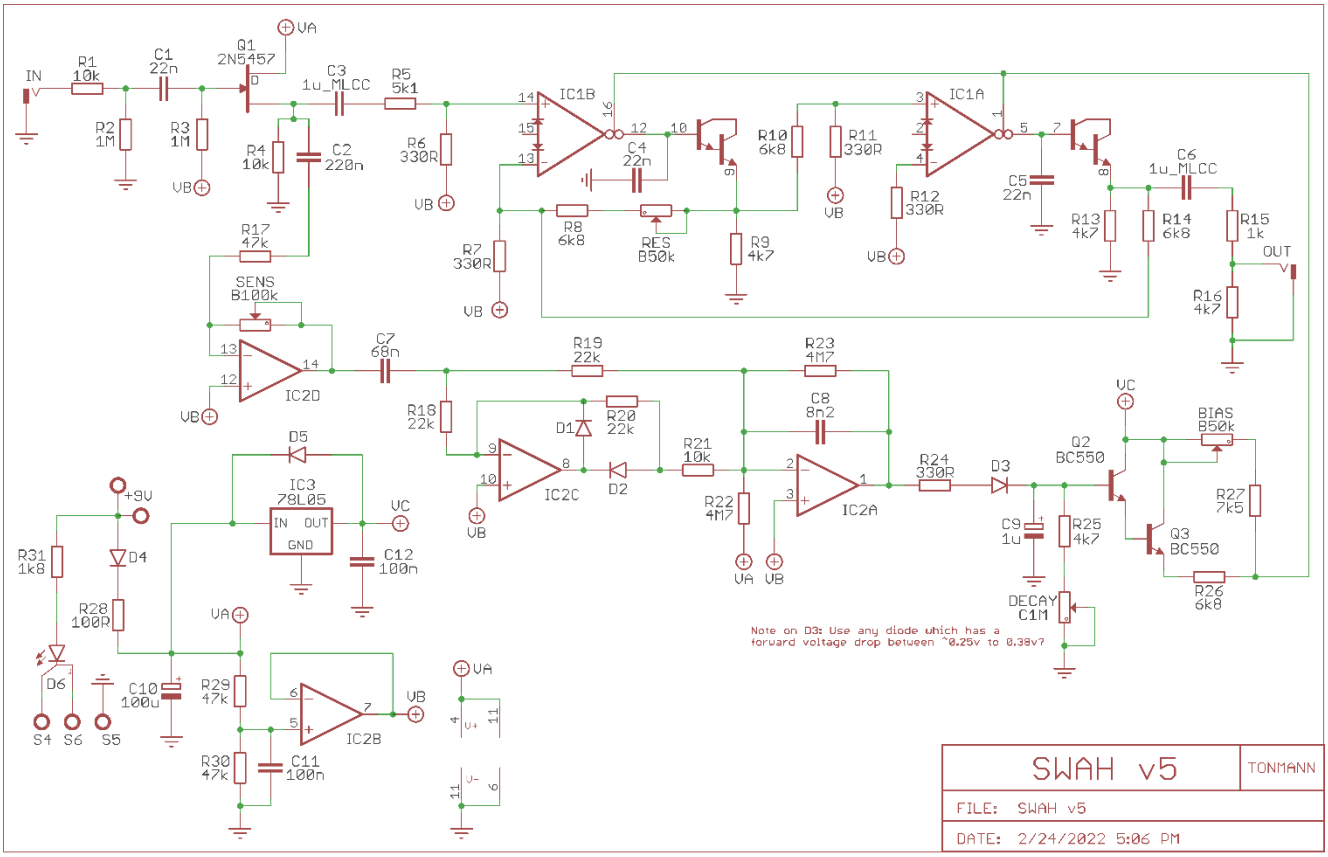
Part	Value
Q1	2N5457
Q2	BC550
Q3	BC550
D1 - D2	1N4148
D3	1N34
D4 - D5	1n4001
D6	Status LED
BIAS	B50k
DECAY	C1M
RES	B50k
SENS	B100k

STATUS LED

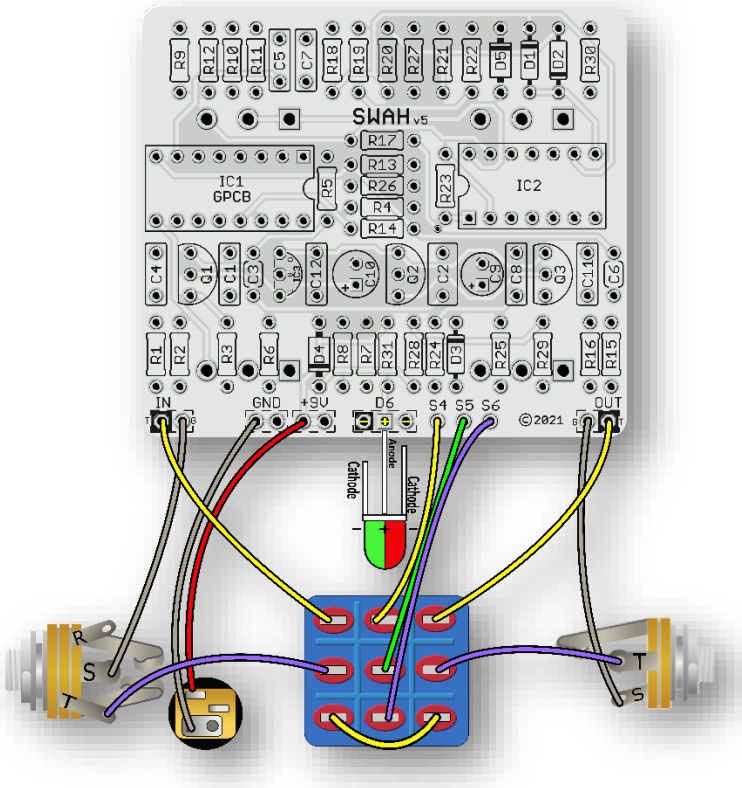
***D6** is a Status LED that can use either Bi-Color Common Anode or a Standard On/Off LED.

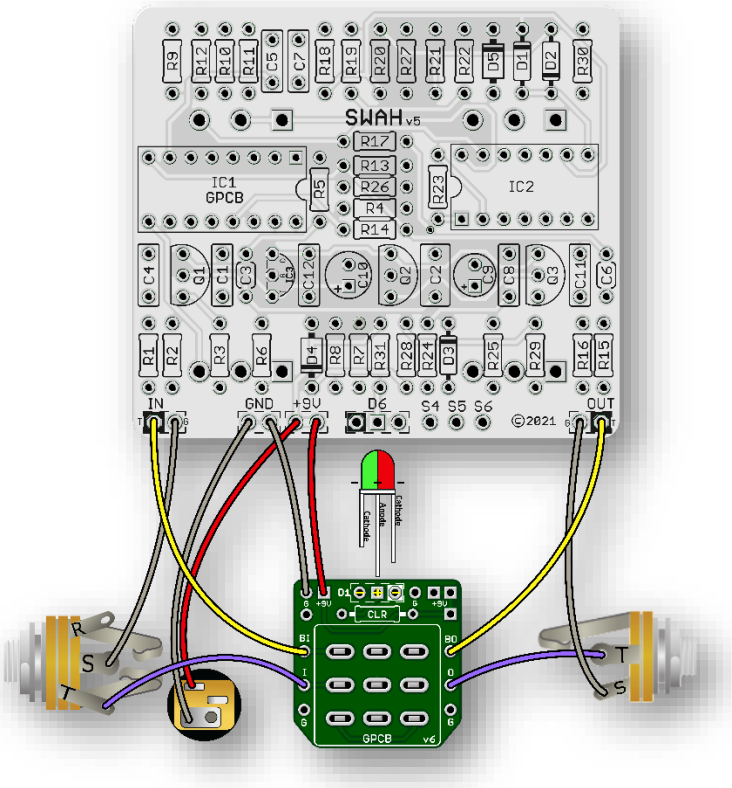
New in this GuitarPCB 2021 version release:

- Made the Bias control and on-board potentiometer which was a trimmer in previous versions.
- Added all four on-board potentiometers.
- Larger off-board wiring pads.
- Added extra +9v and Ground pads for “Combo Builds” allowing easy wiring options and connectivity.



WIRING





STATUS LED

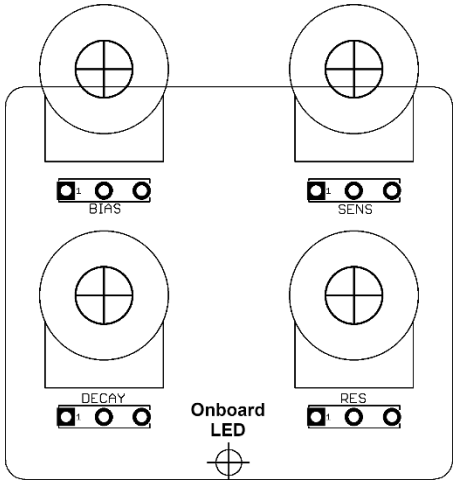
Note: If you are using our 3PDT board, you should omit wires and parts from S4, S5 & S6, D6 and R31 (CLR).
The CLR and LED will be populated on the 3PDT board instead.

Build Notes:

While not exactly a build note it is important to understand the controls so you can easily dial in the best WAH tones. Also please note that pedal placement is critical just as it is with a standard Wah and should be placed closest to your Guitar in the effects chain.

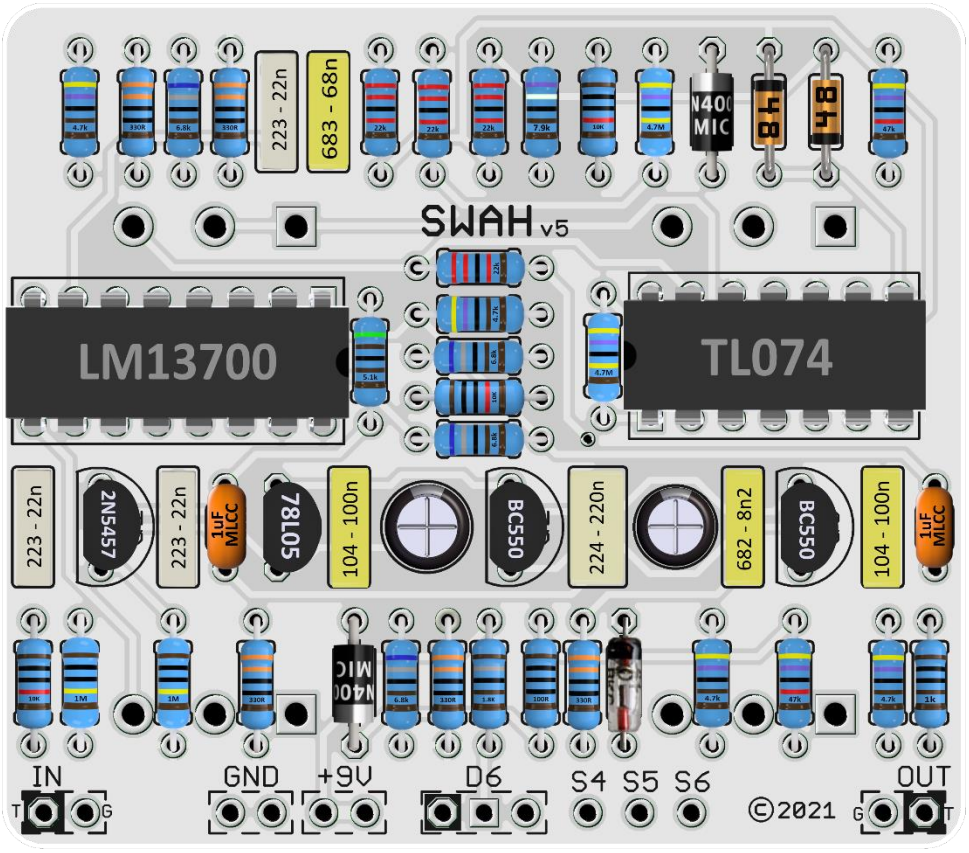
- **DECAY:** Controls how fast the filter frequency falls back to resting point (that is set with the Bias control). This can be set fast (CW) so you get the Wah effect on every note or slow for a more traditional auto Wah sound. Note that this does not affect the tone of the circuit.
- **RESONANCE:** Controls the sharpness or Q-factor of the filter.
- **SENSITIVITY:** Sets the filter trigger level, tune this carefully to fit your guitar/bass output and playing touch. You can further change the sensitivity from your guitar volume knob while playing.
- **BIAS:** Controls the filter resonance frequency
- Use **MLCC** 1uF (multi-layer ceramic capacitors) type for C3 and C6 which are cost effective and small size
- **D3 -** Use a diode which has a forward voltage drop between ~0.25v to 0.38v" like 1N34A for max effect.

For troubleshooting purposes if needed:
Proper Q voltages for comparison (all pots full CCW)
Q1: (7.27 - 3.71 - 3.23 - DSG) <- Drain Source Gate not CBE **Q2:** (5.05 - 3.75 - 2.90 - CBE) **Q3:** (5.05 - 2.90 - 2.86 - CBE)
The audio trace will go from Input to Output and should follow a straight path from IN to R1, C1, thru Q1, thru C3, R5, to IC1B-14, then 16-12-10-9 thru R10, IC1B-13, thru R8, P1, then R10, to IC1A-3, out 1-5-7-8, thru C6, thru R15.



Drill Tips: Measure your components before selecting a drill bit. We recommend drilling the pot holes, mounting the pots in the enclosure, and then soldering the pots to the board. This approach should resolve the issue of the pots not fitting through the holes after soldering. We also recommend you make the holes for the pots a little larger than the threads in case you decide to remove the board and put it back in during the build, to avoid problems. Use this guide at your own risk. Make sure page scaling is turned off when you print this PDF, or the image above may be smaller than expected. Verify everything before drilling.

Populated Board Image and Resistor Chart for Troubleshooting

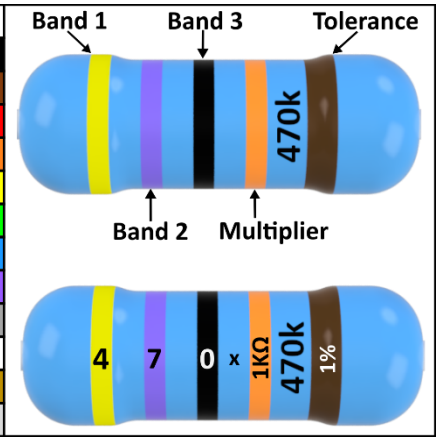


For more build guides and tutorials please visit the [Guides Page](#) at GuitarPCB.com
For specific build support please visit our dedicated [Support Forum](#)
[Soldering Tutorial on YouTube](#)

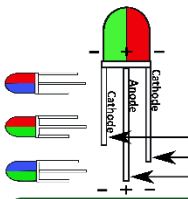
Need Kits - Check out our authorized worldwide distributors:

- **USA – Check out [PedalPartsAndKits](#) for all your GuitarPCB kit needs in the USA.**
- **Europe – [Das Musikding](#) Order either boards or kits direct from Europe.**
- **[PedalPartsAustralia](#) - Order either boards or kits direct from Australia**

COLOR	1st Band	2nd Band	3rd Band	Multiplier	Tolerance
BLACK	0	0	0	1Ω	
BROWN	1	1	1	10Ω	±1%
RED	2	2	2	100Ω	±2%
ORANGE	3	3	3	1KΩ	
YELLOW	4	4	4	10KΩ	
GREEN	5	5	5	100KΩ	±0.5%
BLUE	6	6	6	1MΩ	±0.25%
VIOLET	7	7	7	10MΩ	±0.10%
GREY	8	8	8	100MΩ	±0.05%
WHITE	9	9	9	1GΩ	
GOLD				0.1Ω	±5%
SILVER				0.01Ω	±10%



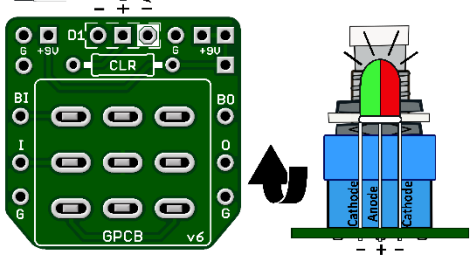
GuitarPCB Tip Sheet



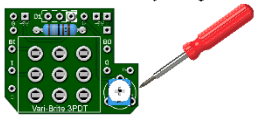
Bi-color Common Anode LED example
Green = On Status and Red = Off Status

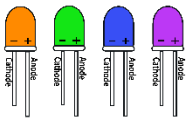
Try any of three different color sets
Red/Blue, Red/Green or Blue, Green

Short Lead = "On" status color
Medium Lead = "Off" status color
Long Lead = Common Anode +

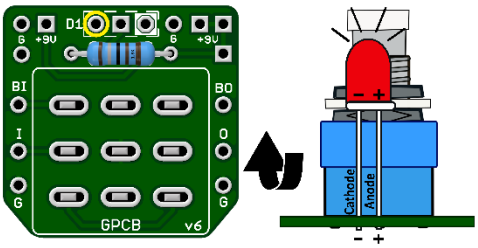


Try our 3PDT Vari-Bright version w/
on-board Trimmer to adjust brightness

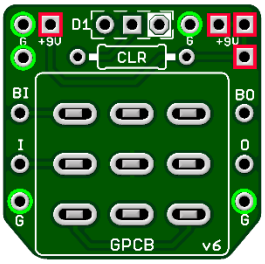




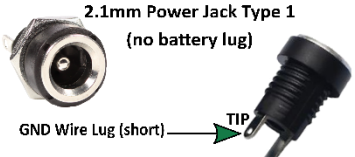
Standard On/Off Status LED
D1 Circle Pad connects to LED Cathode



Green = Ground Pads (5)
Red = + 9v Power Pads (4)
D1 = LED Pads
CLR = Current Limiting Resistor
BI = From Main Board IN
BO = From Main Board OUT
I = To Jack Tip IN
O = To Jack Tip OUT

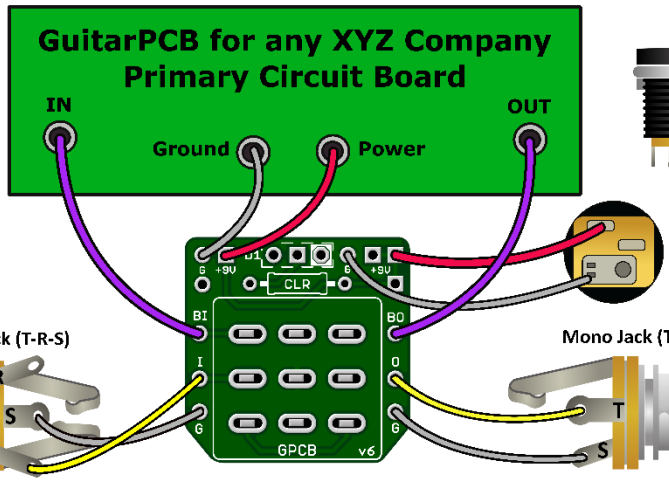


2.1mm Power Jack Type 1
(no battery lug)

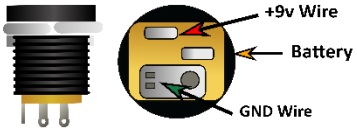


GND Wire Lug (short) → TIP
+9v Wire Lug (long) → SLEEVE

Do not over-tighten (hand tight)



2.1mm Power Jack Type 2



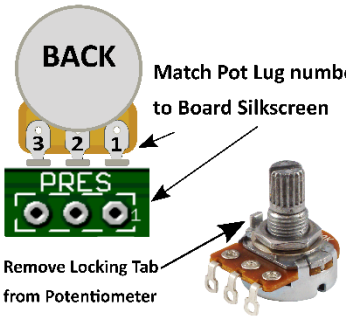
T = Tip
R = Ring
S = Sleeve

Stereo Jack (T-R-S)

Mono Jack (T-S)

T = Tip
S = Sleeve

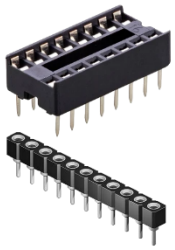
Multiple +9v and Ground Pads are convenient hookup points for additional circuits within the same enclosure. This also allows for diverse wiring schemes to suit indiviual needs.

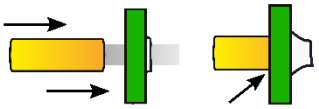


Match Pot Lug number
to Board Silkscreen

Remove Locking Tab
from Potentiometer

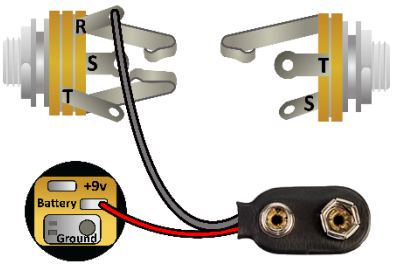
Sockets make troubleshooting easier





When soldering wire to a PCB
push the protective PVC jacket
flush with the board and pad.

Main Board IN/OUT Pads



Input/Output Jack Wiring

T = Tip | R = Ring | S = Sleeve

A Stereo Jack is only needed if using a Battery. Otherwise use a Mono Jack
Battery Strap RED wire is connected to Power Jack
Battery Strap Black wire is connected to RING (stereo jack)
If wiring an LED to our 3PDT Wiring Board then S4, S5 & S6 are not needed