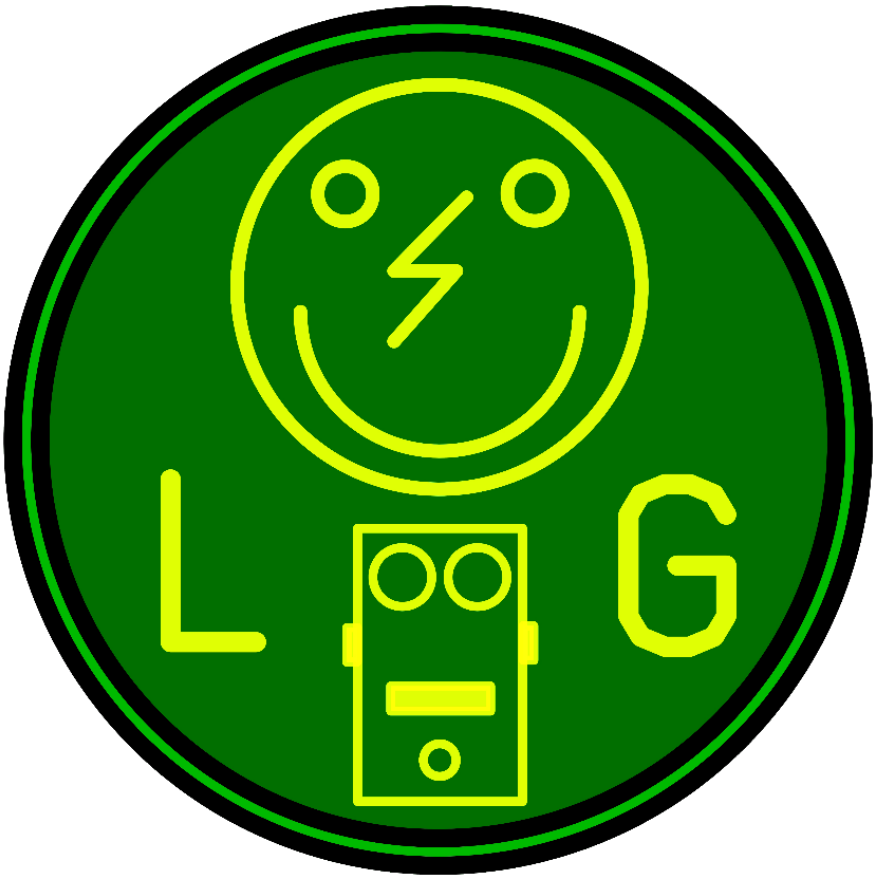
Dirty Little JCM
Building instructions
V2.0



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Read this entire manual thoroughly before you start building the effect! There are some available options and you should choose which one you want to incorporate before starting your build.

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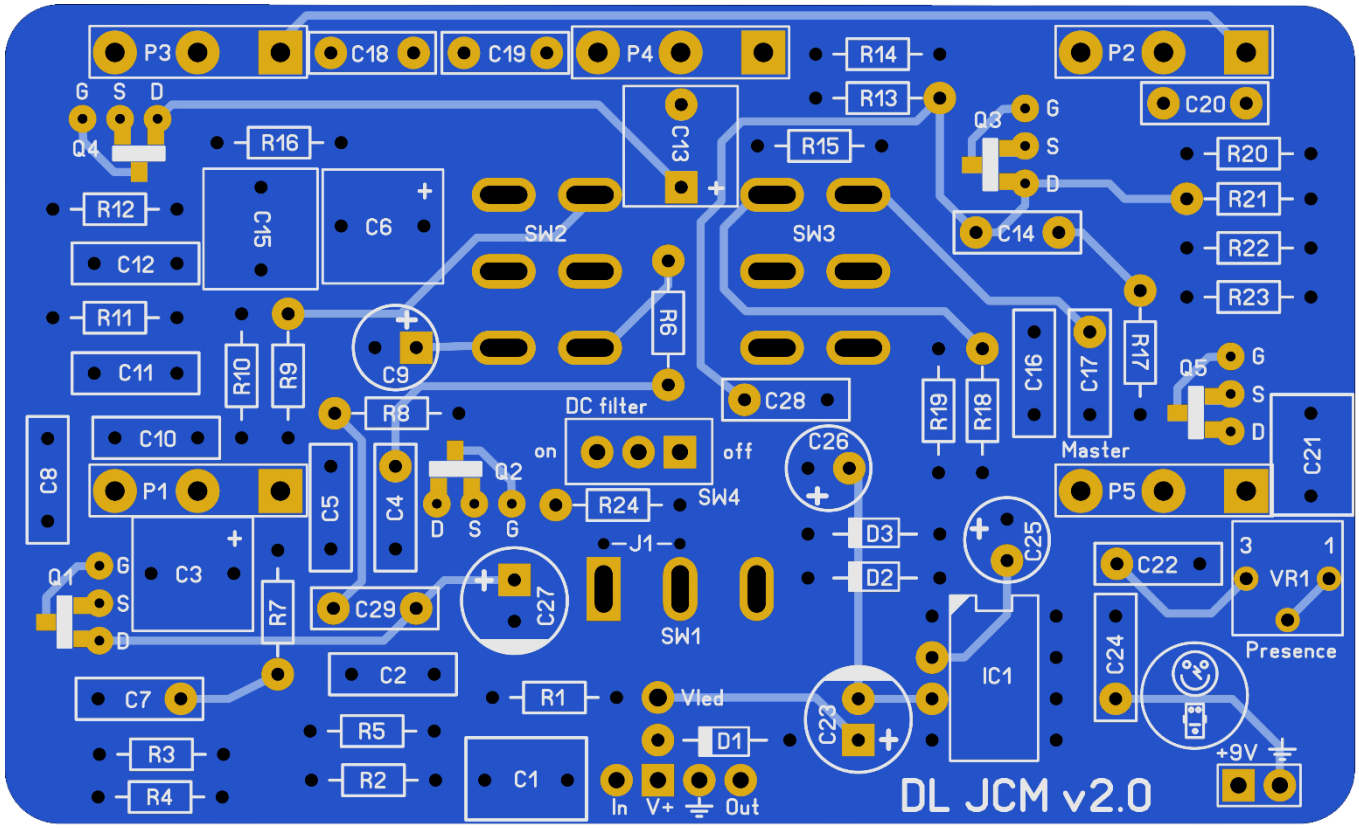
PCB layout



Dimensions: 83 mm x 50,5 mm
3.3 inch x 2 inch

Components

All parts must be rated 25V+

Name	Value	Comment	Name	Value	Comment	Name	Value	Comment
C1	220n	MKT/Wima	**R1**	1M	Metal film 1%	**D1**	1N4001	
C2	1n	MKT/Wima	**R2**	470k	Metal film 1%	**D2**	1N5817	
C3	2u2	Electrolytic	**R3**	1M	Metal film 1%	**D3**	1N5817	
C4	2n2	MKT/Wima	**R4**	1M	Metal film 1%	**IC1**	ICL7660S	or LT1054
C5	10n	MKT/Wima	**R5**	33k	Metal film 1%	**P1**	A1M	Alpha 16mm
C6	680n	MKT/Wima	**R6**	1M	Metal film 1%	**P2**	B250K	Alpha 16mm
C7	220p	Ceramic/MLCC	**R7**	1k	Metal film 1%	**P3**	A1M	Alpha 16mm
C8	22n	MKT/Wima	**R8**	820R	Metal film 1%	**P4**	B25K	Alpha 16mm
C9	22u	Electrolytic	**R9**	4M7	Metal film 1%	**P5**	B250k	Alpha 16mm
C10	47p	Ceramic/MLCC	**R10**	47k	Metal film 1%			
C11	470p	Ceramic/MLCC	**R11**	470k	Metal film 1%	**Q1**	MPF4393	
C12	470p	Ceramic/MLCC	**R12**	470k	Metal film 1%	**Q2**	MPF4393	
C13	2u2	Electrolytic	**R13**	1M	Metal film 1%	**Q3**	MPF4393	
C14	470p	Ceramic/MLCC	**R14**	1M	Metal film 1%	**Q4**	MPF4393	
C15	680n	MKT/Wima	**R15**	1k	Metal film 1%	**Q5**	MPF4393	
C16	270p	Ceramic/MLCC	**R16**	560R	Metal film 1%	**VR1**	B10k	Bourns 3362p
C17	470p	Ceramic/MLCC	**R17**	100k	Metal film 1%			
C18	22n	MKT/Wima	**R18**	33k	Metal film 1%		LED	For status
C19	22n	MKT/Wima	**R19**	56k	Metal film 1%		LED flange	
C20	22n	MKT/Wima	**R20**	1k	Metal film 1%		1590BB	Hammond
C21	220n	MKT/Wima	**R21**	2M2	Metal film 1%		Mono jack	
C22	100n	MKT/Wima	**R22**	2M2	Metal film 1%		Stereo jack	
C23	100u	Electrolytic	**R23**	4k7	Metal film 1%			
C24	100n	MKT/Wima	**R24**	100R	Metal film 1%			
C25	10u	Electrolytic	**SW1**	SPDT	PCB lugs			
C26	10u	Electrolytic	**SW2**	DPDT	PCB lugs			
C27	100u	Electrolytic	**SW3**	DPDT	PCB lugs			
C28	100n	MKT/Wima	**SW4**	SPDT	Mini PCB Lugs			
C29	100n	MKT/Wima						

Pots: A=Log, B=Lin, C=Rev. Log

Orange marked parts are optional!

Build sequence

Soldering this board can be very complicated for some people since the solder pads are very close together. Use a magnifying glass to make the job easier. The trick to soldering a PCB is to work from small to big components. My building sequence suggestions in this section are based on the parts I used myself. Sometimes some components are smaller (or bigger) so always use your own common sense and change the order. Usually capacitors differ a lot in size depending on their rating.

Note: Do not blow on your solder in an attempt to cool it down. That will possibly result in a bad join that might corrode!

Start by soldering the resistors, then the diodes and then the ceramic capacitors.

If you want to experiment with other transistors then you could socket them instead of soldering them to the board. You'll need a some 20 SIL sockets, break off the sockets and solder them to the board. Now is the time to solder these sockets on the PCB as well as the socket for the IC. Place the transistors and IC once you are finished with all soldering and off board wiring!

Now continue by soldering small MKT (<680n) capacitators then the rest of the MKT capacitors and then the electrolytes.

I suggest you now drill the holes in your enclosure so you can use it during the off board wiring.

Note: Really take some time to determine where to place the pots, switches, jacks and PCB in the enclosure before you start drilling. Measure twice, drill once.

Transistors

The MPF4393 are hard to find and expensive. You could replace them with PN4393, 2N5457 or J201. I advise the 2N5457 for the pure subjective reason that I like the sound.

Power section

The original pedal does not have a power doubler section (which provides more headroom). If you want to keep it original, you need to leave out **SW1, D2, D3, C24, C25, C26** and **IC1**. Instead you will need to jumper **JP1** on the PCB with a piece of left over lead wire from a resistor else the effect will have no power at all.

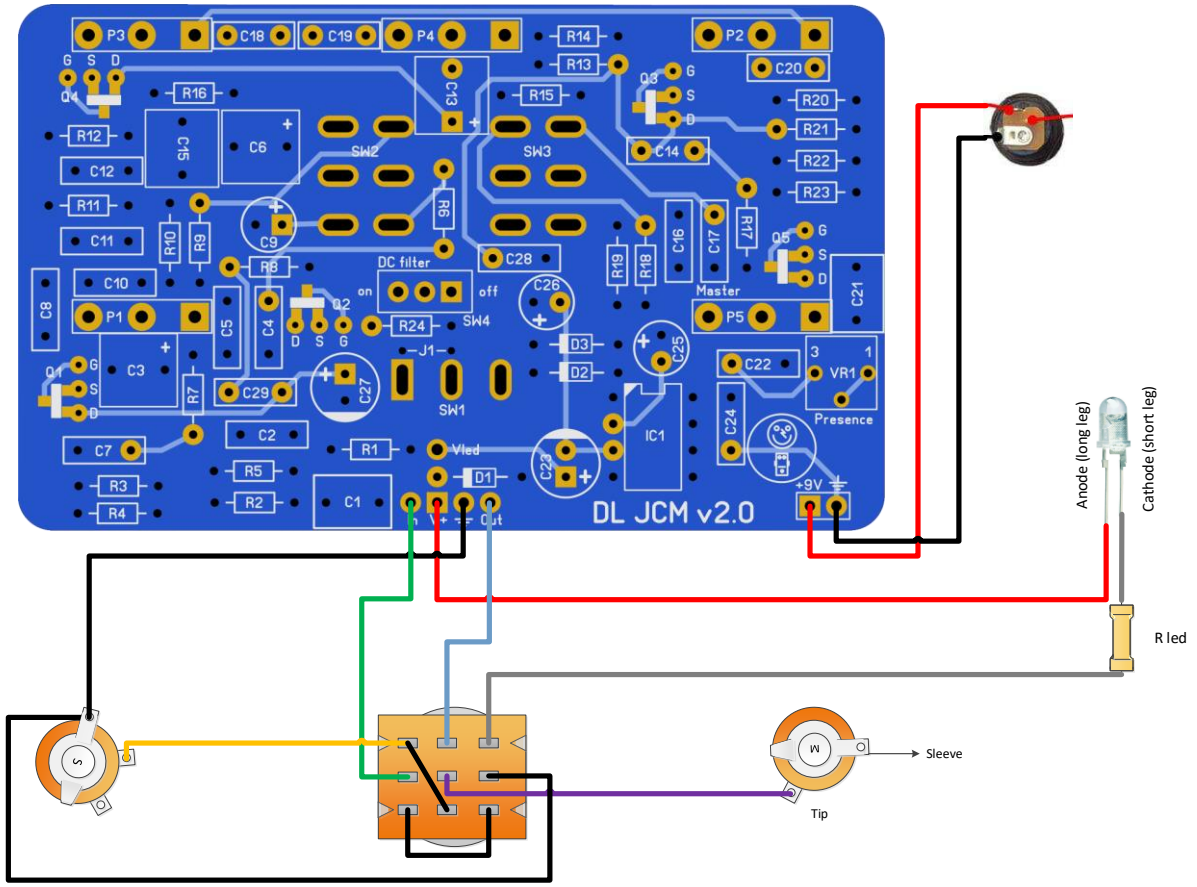
Modifications

R1 is an optional pull down resistor. For more versatility in the gain you can add **C5** and **R9**.

C28 and **C29** are optional extra DC filters to prevent high pitched interference. In the schematic on the last page are some extra values added in green for tweaking if needed.

Another mod for better gain and less wooly sound is altering all transistors to 2N5457's, **C4** to 220n, **C22** to 22n, **R7** and R15 to 220R, **R16** to 1k also add **C5** and **R9**. These alterations are also marked in green in the schematic.

Off board wiring



All pots are PCB mounted versions. The pads marked as rectangles represent pin 1, as marked in the photo.

You can break of the pin I marked with the yellow circle with a small pair of pliers.

Note that this wiring is using a sort of star grounding and the output connector must make good electrical contact with the enclosure else the grounding will not work properly and the effect might start to buzz loudly.

Also Note that **R led** is a **4k7** resistor. You can change this value depending on the type of LED you use but 4k7 is safe enough for almost all LEDs @9V.

It is now time to place your transistors and IC in the sockets if needed. Connect everything, build it in your enclosure and enjoy your effect!

Troubleshooting

All PCB's have been 100% factory e-tested and out of every batch I receive I build an effect to double check, so there should not be a connection problem on the PCB itself.

The board is not working (at all), what now?

- Check if your 9V is plugged in correctly (and/or soldered correctly on the board). Pay special attention to the polarity.
- Check that you oriented the capacitors, IC's ,transistors and diodes the right way. SMF, MKT and ceramic capacitors as well as resistors do not need to be oriented. A likely sign of incorrect capacitors and/or orientation is when an effect is sputtering, rumbling or "motorboating".
- Check if you used the correct values of the components. For resistors you can look here: http://www.diyaudioandvideo.com/Electronics/Color/
- Double and triple check your soldering! A loose or cold solder can be really bad for your board.
- Replace the IC and/or transistors, one might be defective. Before doing that first unplug the 9V and wait for 5 seconds.
- Check that you have good/high grade components. A lot of Chinese sourced parts are fakes (especially high end opamps, audio capacitors, vintage diodes and transistors) so be careful that you source your parts from reliable suppliers.

Schematic