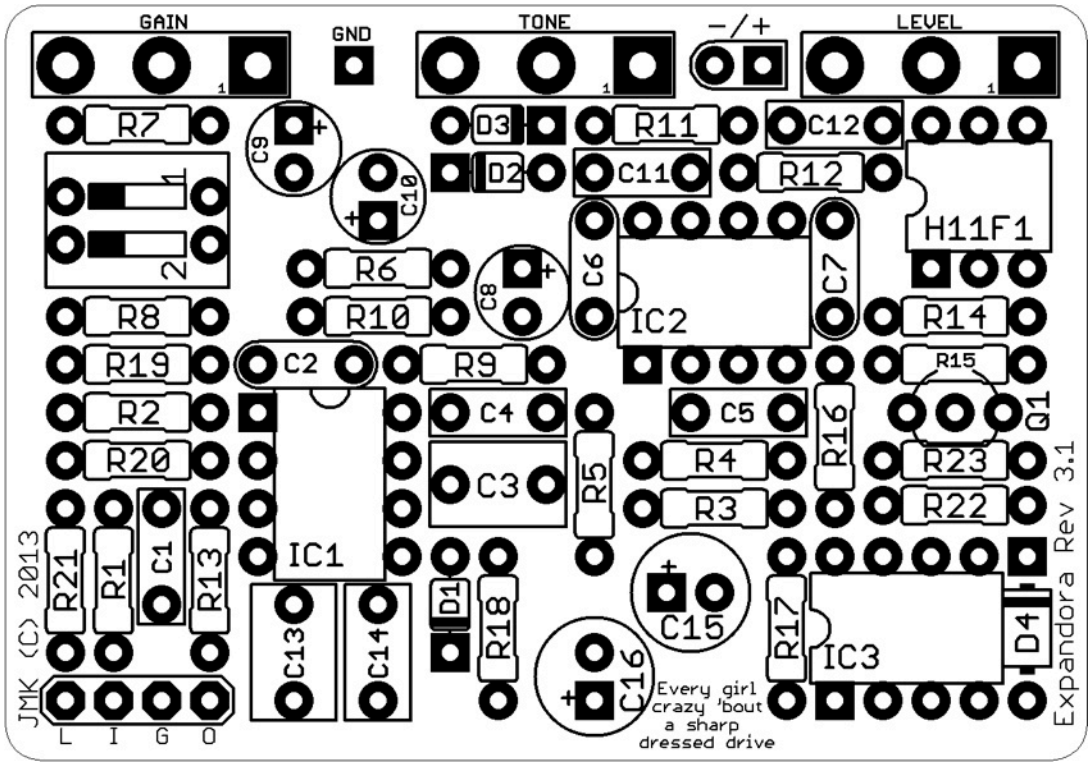
JMK PCBS PRESENTS...

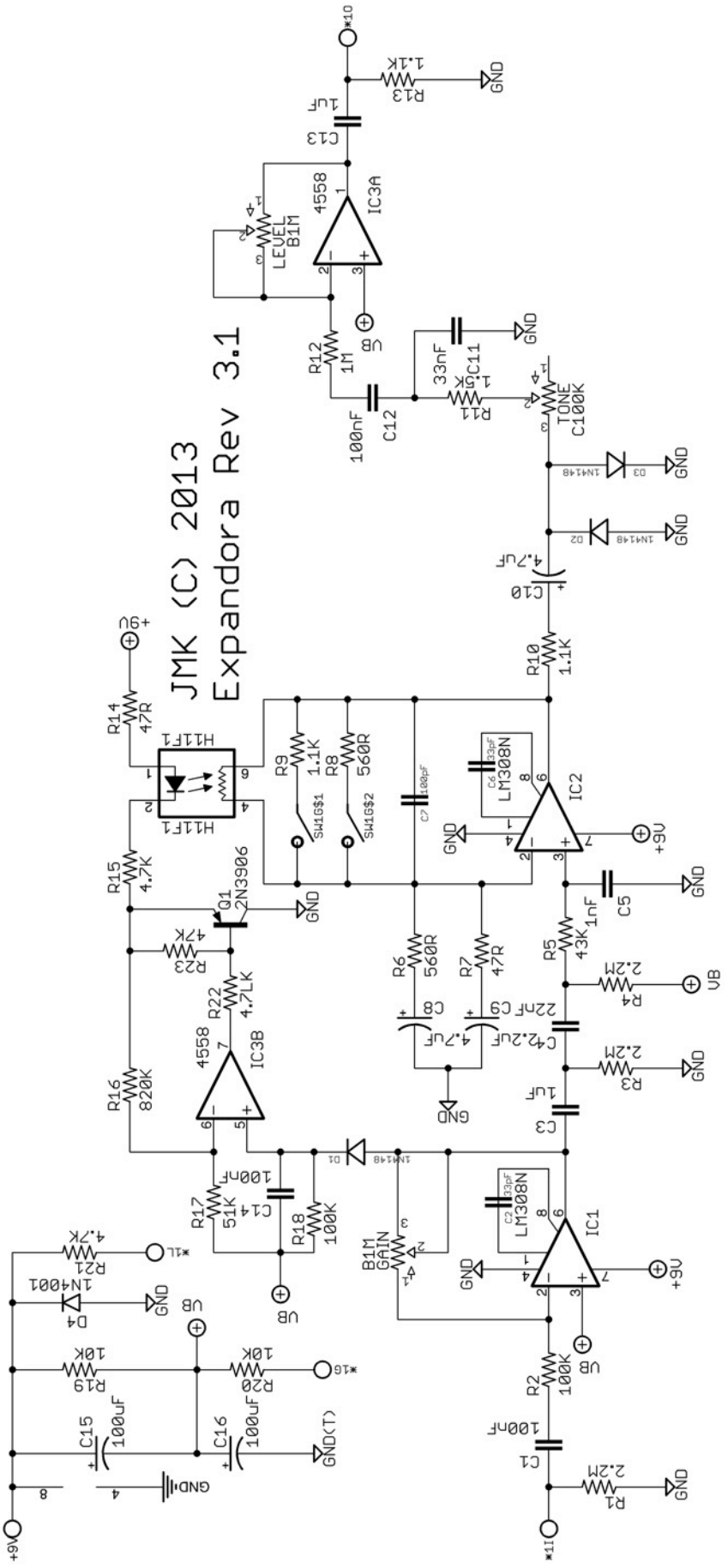
EXPANDORA

PCB AND SCHEMATIC ARTWORK (C) 2013 JMK PEDALS

VERSION 3.1.1: 9/23/2013



Resistors						Capactitors				Diodes	
R1	2.2M	R9	1.1K	R17	51K	C1	100nF	C9	2.2uF	D1-3	1n4148
R2	100K	R10	1.1K	R18	100K	C2	33pF	C10	4.7uF	D4	1N4001
R3	2.2M	R11	1.5K	R19	10K	C3	1uF	C11	3.3nF	Potentiometer	
R4	2.2M	R12	1M	R20	10K	C4	22nF	C12	100nF	LEVEL, GAIN	B1M
R5	43K	R13	1.1K	R21	4.7K	C5	1nF	C13	1uF	TONE	C100K
R6	560R	R14	47R	R22	4.7K	C6	33pF	C14	100nF	ICs	
R7	47R	R15	4.7K	R23	47K	C7	100pF	C15	100uF	IC1, IC2	LM308N
R8	560R	R16	820K			C8	4.7uF	C16	100uF	IC3	JRC4558
Other										LDR1	H11F1
SW1	DIP 2	Q1	2N3906								



Build Notes

• The Expandora is a unique circuit that features an ingenious method for creating a wide variety of distortion, from light overdrive through to crazy fuzz.

• ***Special Note*** - V3 was the first Expandora version released by JMK, and it features a backwards GAIN pot. This means that if you have a V3 board, you'll need to wire the pot backwards (swap pads 3 and 1). V3.1 and on have no issues.

• The Vactrol originally required was the Sharp PC419. However, this vactrol has become very difficult to find at a reasonable price. Because of the rarity of this chip, we have proposed an alternate Vactrol in the H11F1, found at Mouser Electronics and elsewhere. One could also 'roll your own' vactrol by partnering an LED and LDR sourced separately. **We highly recommend socketing!** Socketing allows you to try another vactrol to see if it gives you a better response.

• Hooking up the PCB is pretty simple, but to clarify: L = the connection for the + end of an LED (CLR is R21); I = PCB Input; SG = Ground for the Switch; O = PCB Output; + = 9V input; - = Ground for DC Jack; IG = Extra Ground for 1/4" Jack

• It should be noted that there are several odd parts in the BOM for this project. Below are some common substitutes for these parts. You can find precise parts if you would like, but in most cases the common values are going to give the same tonal response.

Part Number	Original Value	Common Substitute
C2, C6	33pF	30pF
R5	43K	39K/47K
R9, R10, R13	1.1K	1K/1.2K

• Like with most overdrive pedals, the ICs used are an integral part of the sound. While many Single Op Amps may be used, the LM308 has a very specific pinout and is not a pin-for-pin swap for other single op-amps. Keep in mind that another choice may or may not be better, the choices we make in this area are subjective. **We highly recommend socketing your transistors and ICs!** Socketing allows you to switch your Semiconductors easily if they fail, and also allows you to swap out and try other parts you like best. For IC3, try a TL072, OP2134, TL2272, etc. We recommend leaving IC1/2 as an LM308.

• The DIP switch on the PCB can be used, but a pair of SPST toggle switches could be used to mount the control externally. These control a pair of resistors that are in parallel with the LDR in the feedback loop of IC2. By adding extra resistance, you increase the distortion available from mild overdrive, to medium distortion, to heavy duty fuzz.

• Consider socketing and experimenting with the values of R8 and R9 for variations on the level of distortion these switches add. Also note that one of the potential settings was known as the 'forbidden' setting, as it was terrible sounding.

• Credit should go to Gus Smalley who created the schematic this project is derived from. Thanks to Gus for his work previous to this project being released. Also, thanks to R.G Keen who also put work into translating the Expandora.

True Bypass Wiring Diagram