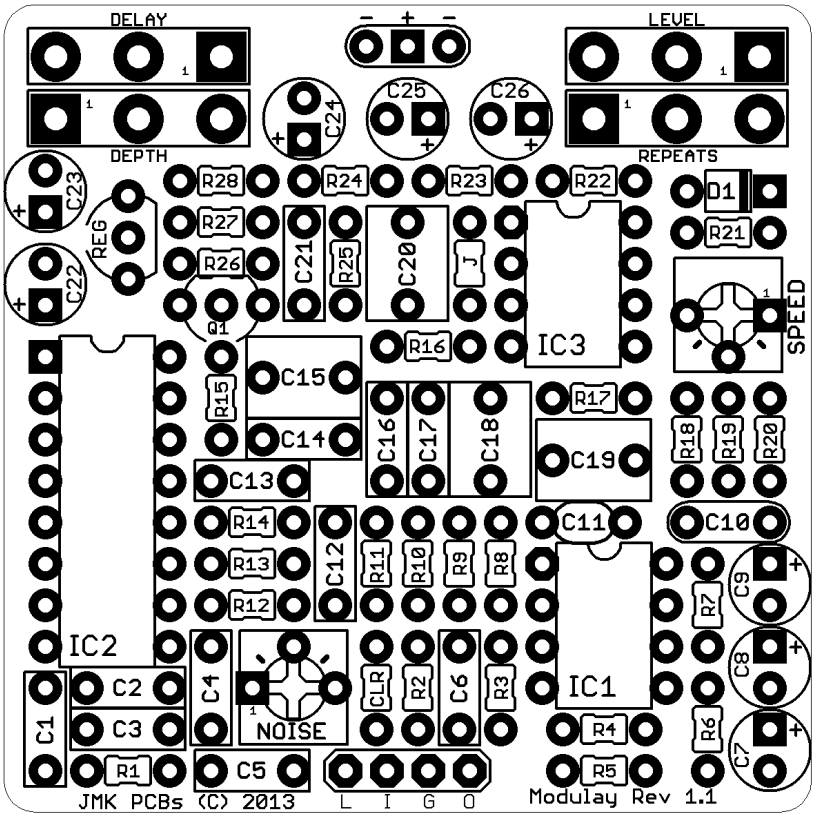
JMK PCBS PRESENTS...

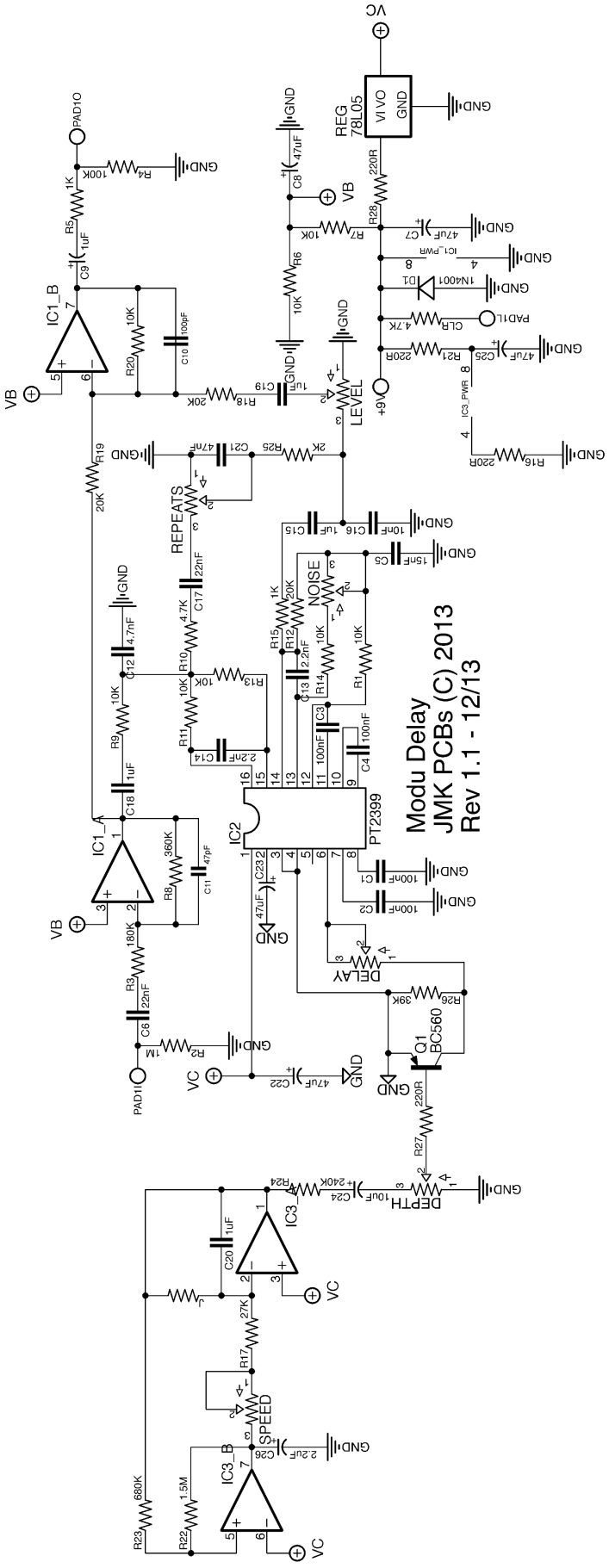
MODULAY

PCB AND SCHEMATIC ARTWORK (C) 2014 JMK PEDALS

VERSION 1.1: 04/12/2014



Resistors						Capactitors						Semiconductors	
R1	10K	R11	10K	R21	220R	C1	100nF	C11	47pF	C21	47nF	IC1, IC3	TL072
R2	1M	R12	20K	R22	1.5M	C2	100nF	C12	4.7nF	C22	47uF	IC2	PT2399
R3	180K	R13	10K	R23	680K	C3	100nF	C13	2.2nF	C23	47uF	D1	1N4001
R4	100K	R14	10K	R24	240K	C4	100nF	C14	2.2nF	C24	10uF	Q1	BC560
R5	1K	R15	1K	R25	2K	C5	15nF*	C15	1uF	C25	47uF	REG	78L05
R6	10K	R16	220R	R26	39K	C6	22nF	C16	10nF	C26	2.2uF	**Potentiometer**	
R7	10K	R17	27K	R27	220R	C7	47uF	C17	22nF			DELAY	B50K
R8	360K	R18	20K	R28	220R	C8	47uF	C18	1uF	**Trimpots**		LEVEL	B50K
R9	10K	R19	20K	CLR	4.7K	C9	1uF	C19	1uF	SPEED	B1M	REPEATS	B50K
R10	4.7K	R20	10K	J	notes	C10	100pF	C20	1uF	NOISE	B25K	DEPTH	A100K



Build Notes

• The Modulay is an amalgamation of many common DIY PT2399 delay designs. While it certainly isn't anything very new in terms of PT2399 Delays, the real kicker with this design is that it features CJ's Noise control, with modulation, AND is designed to fit in a 125B, and perhaps even a 1590B enclosure.

• A major feature of this delay is the efficient use of space. Despite it's compact size, it should be noted that **this is NOT a beginner level project**. If you have never built a pedal before, or if you're still fairly new to the DIY pedal world, we suggest a few easier projects be attempted before tackling this one. Admittedly, it's not impossible, but because of the high parts count and the very complex PCB design, this would be a project certainly aimed towards intermediate or advanced builders.

• Key in keeping the PCB size to a minimum, **this build features 1/8 watt resistors**. Typically, DIY pedals utilize 6.5mm 1/4 watt resistors. The recommended 5mm 1/8 watt resistors will look neater in terms of the finished build, and may lead to fewer issues in the assembly process and if any troubleshooting needs arise, though certainly a builder could use 1/4 watts if they choose to. 1/8 Watt resistors are available at Mouser, and we suggest searching for Xicon's 270 (Metal Film) or 299 (Carbon Film) series resistors.

• One resistor in this project is marked **J**! It's purpose is to bypass or control the modulation in the circuit. You could put this on a switch, or use sockets to connect these two pads which would stop the modulation of the repeats. **When connected, the modulation turns OFF**.

• On the PCB there are a pair of trim pots for some internal controls:

1) The *Speed* trimmer is directly connected to the modulation of the circuit. A potential mod might be to add this as external control, however, we made the decision to leave this as an internal 'set and forget' control. Note - the depth control at minimum will reduce the modulation to inaudible.

2) The *Noise* control is unique, and credit for the idea must go to DIY Forum legend Culture Jam (CJ). This control directly interacts with the filtering of the PT2399. The reason this control is useful is because as the high frequencies are cut, longer delay times experience less noise (a common problem with PT2399 chips) and thus the delay sounds both darker and cleaner. Reducing this control will bring back some highs, but will also introduce more noise to your repeated signal.

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

• The ICs and transistors in this PCB are not ripe for experimenting. Obviously, other options are available, and you can feel free to use different Semiconductors than those listed, but we don't see a need for it. **We highly recommend socketing these parts!**

•Not all PT2399 chips are created equal! It has been shown in the DIY community that various PT2399 chips display different noise and performance characteristics. If at all possible, buy several of these chips, and preferably from separate batches and/or suppliers. Use a socket, and audition your chips to see which works best in your build.

True Bypass Wiring Diagram