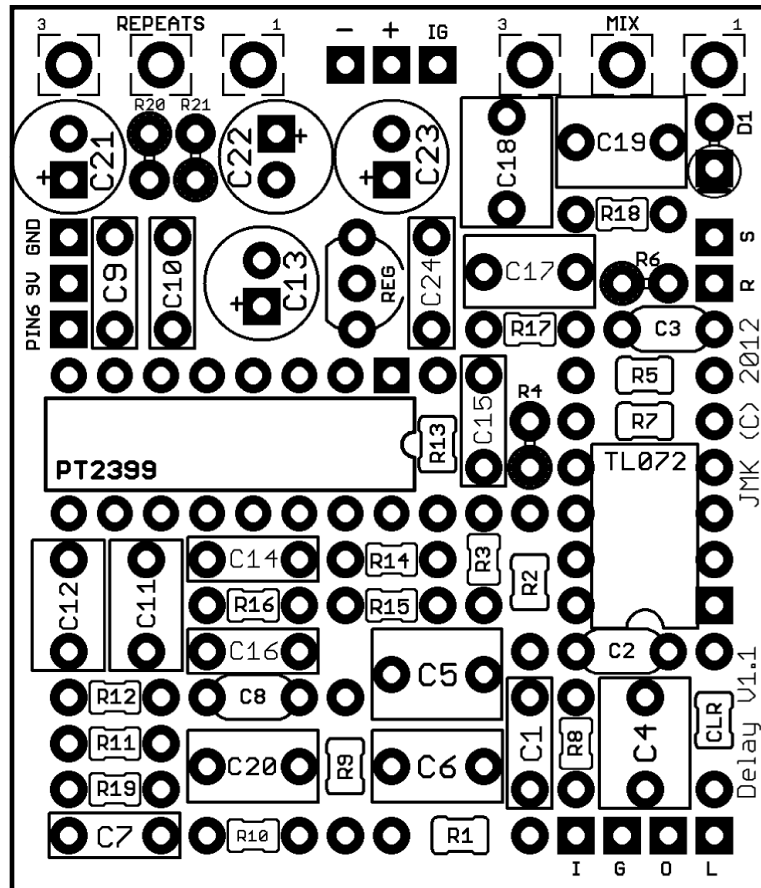


JMK PEDALS PRESENTS...

MODULAR DELAY

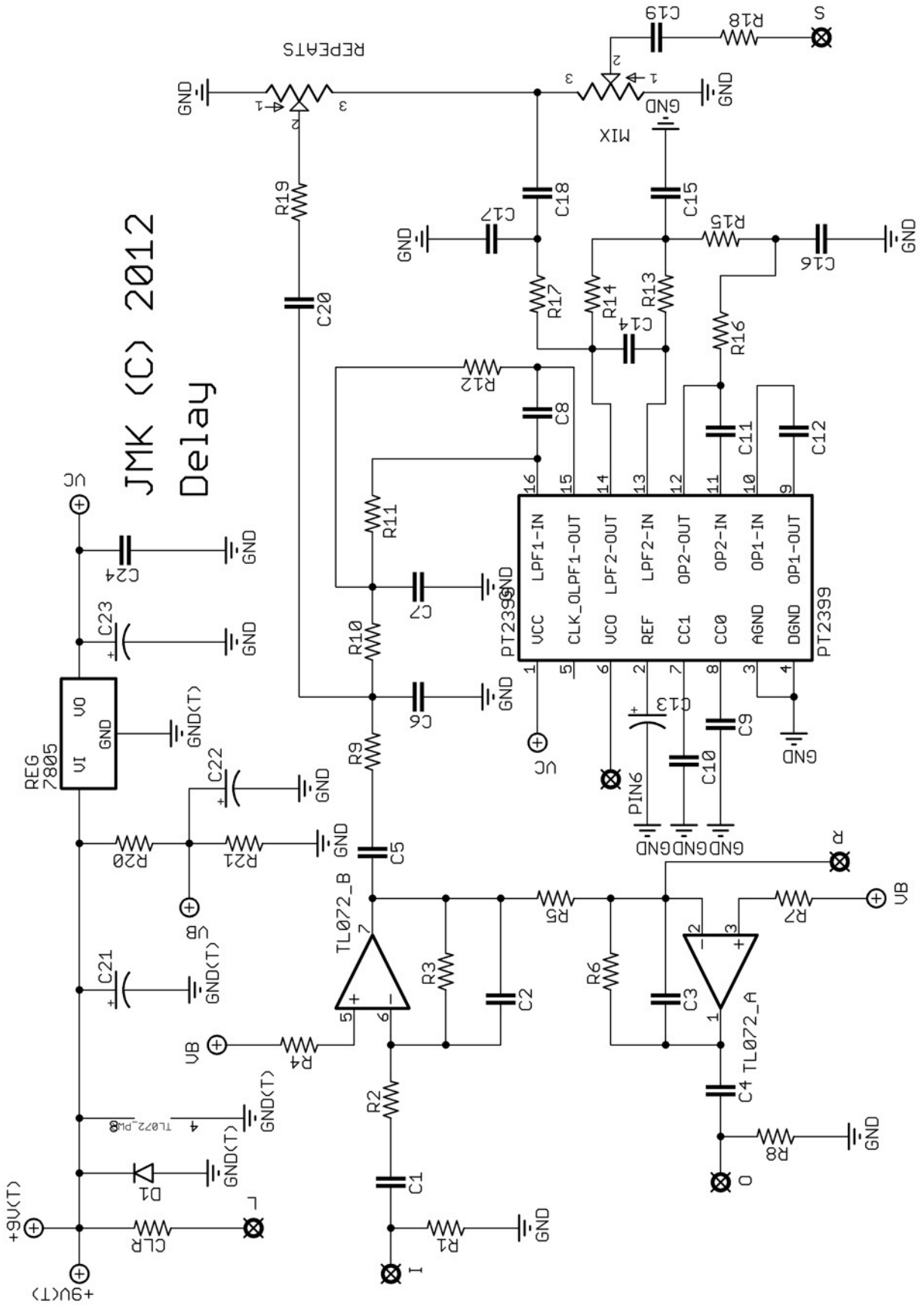
PCB AND SCHEMATIC ARTWORK (C) 2013 JMK PEDALS
VERSION 1.1: 01/22/2013



Standard Values

Resistors			Capacitors			Diodes							
R1	1M	R9	12K	R17	2.7K	C1	82nF	C9	100nF	C17	10nF	D1	1N4001
R2	510K	R10	12K	R18	33K	C2	5pF	C10	100nF	C18	1uF	Potentiometers	
R3	510K	R11	12K	R19	15K	C3	51pF	C11	82nF	C19	1uF	REPEATS	B25K
R4	240K	R12	47K	R20	12K	C4	1uF	C12	82nF	C20	100nF	MIX	B100K
R5	24K	R13	12K	R21	12K	C5	1uF	C13	47uF*	C21	47uF*	ICs	
R6	24K	R14	24K	CLR	4.7K	C6	27nF	C14	1nF	C22	47uF*	IC1	TL072
R7	1K	R15	12K			C7	10nF	C15	10nF	C23	47uF*	IC2	PT2399
R8	100K	R16	12K			C8	560pF	C16	10nF	C24	100nF	REG	78L05

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BUILD NOTES

- The Modular Delay really only has one purpose - to be used in conjunction with the Taptation boards that are also available from JMK Pedals. The Modular Delay PCB omits a Delay pot, and instead includes three extra pads for connection of pin 6 of the PT2399, a +9V DC, and ground to the Taptation PCBs. There are three Taptation PCBs available: Mini Taptation, Taptation Standard, or Modulating Taptation. These three PCBs allow the builder to include simple tap tempo, as well as the potential for various divisions and modulation to be applied to the delay signal.
- The Modular Delay also features a Send/Return feature on the delayed signal only. The idea here is to apply an effect to the delayed signal, like a fuzz, overdrive, tremolo, or whatever, that will only be heard on the repeats of your delay. You could use a bypass switch for that effect so that you can have 'normal' repeats with whatever effect you want to apply to the delay. The 'S' and 'R' pads are located at the upper right side of the PCB. **If you are not using the Send/Return function for an effects loop, the 'S' and 'R' pads need to be jumpered.** Also, if you are using an effects loop, we recommend researching and potentially including a buffer system. Test the effect(s) you plan to use in the loop BEFORE implementing anything permanently. Some have encountered issues with using effects in the wet path of other PT2399 pedals, and we have only been able to test this feature with a small number of effects.
- Hooking up the PCB is pretty simple, but to clarify: L = the connection for the + end of an LED; O = PCB Output; G = Ground for the Switch; I = PCB Input; + = 9V input; - = Ground for DC Jack; IG = Extra Ground for 1/4" Jack; Pin6 = PT2399 connection to the Taptation Board; 9V = thru connection for power to the Taptation board; GND = thru connection for ground to the Taptation board; S = Send for the effects loop; R = Return for the effects loop.
- Notice that the great majority of the resistors on the Modular Delay board are actually 0.3" spaced instead of the standard 0.4" usually used for 1/4 watt resistors. Because of this, **we recommend using 1/8 watt resistors** for the Modular Delay **if you want your resistors to lay flat** on the PCB. You can use 1/4 watt resistors though, and in fact our prototype PCBs use them, however the 1/8 watts are smaller and will fit better in the connections. There are some .4" spaced resistor spots, and either 1/4 watt or 1/8 watt resistors will fit there just fine. There are no concerns to be noted while using 1/8 watt resistors - they will work just fine and cause no issues for your build.
- The Delay chips used in this circuit, the PT2399, are not created equal - you may find that you need to buy more than one as sometimes they prove to be duds or sonically inferior than others. Honestly, there's no rhyme or reason to where you get good or bad ones, as cheapos from eBay or Tayda Electronics sound great, or bad, and the expensive ones from reliable Smallbear Electronics also prove to be duds sometimes. **We highly recommend socketing your and ICs!** Socketing allows you to switch your parts easily if you they don't work great or need to be replaced, and also allows you to swap out and try other ICs to see which you like the best. The Dual Op Amp works as a buffer for your clean signal's input and output, and while the TL072 is perfectly suited to this purpose, you may also choose to use any number of Dual Op Amps, including but not limited to: JRC4558, JRC4580, OPA2134, TL2272, etc.

ALTERNATE BOMs

One of the cool features of DIY PT2399 delays is that there are many similarities in the various iterations out there. Below are some alternate BOM's that you can consider using if you'd like.

- 1) There may be **other PT2399 Delays** that you can build with this PCB. Compare the schematics and see what components should be changed or omitted
- 2) There may be modifications or **off-board wiring** needed to build some of the various delay iterations available using this PCB
- 3) These are **unverified** and **imperfect**. Sometimes there are additional differences that have been omitted here below. We've done our best, but look closely at the schematics, and if you can make it closer, go for it!

Sea Urchin Values

Sea Urchin Values													
Resistors				Capacitors				Diodes					
R1	1M	R9	10K	R17	1K	C1	22nF	C9	100nF	C17	10nF	D1	1N4001
R2	180K	R10	JUMP	R18	20K	C2	47pF	C10	100nF	C18	1uF	Potentiometers	
R3	360K	R11	10K	R19	5.1K	C3	100pF	C11	100nF	C19	1uF	REPEATS	50KB
R4	JUMP	R12	10K	R20	10K	C4	1uF	C12	100nF	C20	22nF	MIX	50KB
R5	22K	R13	10K	R21	10K	C5	1uF	C13	47uF	C21	100uF	ICs	
R6	12K	R14	20K	CLR	4.7K	C6	4.7nF	C14	2.2nF	C22	47uF	IC1	TL072
R7	JUMP	R15	JUMP			C7	EMPTY	C15	EMPTY	C23	47uF	IC2	PT2399
R8	EMPTY	R16	10K			C8	2.2nF	C16	15nF	C24	EMPTY	REG	78L05

DeProfundis Values

DeProfundis Values													
Resistors				Capacitors				Diodes					
R1	1M	R9	22K	R17	1K	C1	22nF	C9	100nF	C17	10nF	D1	1N4001
R2	150K	R10	JUMP	R18	22K	C2	100pF	C10	100nF	C18	1uF	Potentiometers	
R3	330K	R11	10K	R19	10K	C3	100pF	C11	100nF	C19	1uF	REPEATS	B50K
R4	JUMP	R12	10K	R20	10K	C4	1uF	C12	100nF	C20	22nF	MIX	B50K
R5	22K	R13	10K	R21	10K	C5	1uF	C13	47uF	C21	100uF	ICs	
R6	10K	R14	22K	CLR	4.7K	C6	10nF	C14	2.2nF	C22	47uF	IC1	TL072
R7	JUMP	R15	JUMP			C7	EMPTY	C15	EMPTY	C23	100uF	IC2	PT2399
R8	EMPTY	R16	10K			C8	2.2nF	C16	100nF	C24	EMPTY	REG	78L05

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TRUE BYPASS WIRING DIAGRAM

