

Mode Switch Expansion Board for the Thomas White Resonant LPG 292c PCB

Introduction

The Thomas White Resonant LPG 292c project utilizes a 3 pole on-off-on switch to control the mode of the module. You can manually select from lopass, gate or both.

The expansion board replaces this switch by a logic, it is actually nothing but a gate controlled 3-pole on-off-on switch.

The layout of the board is optimized for use with Thomas White's great PCB for the Resonant LPG292c. However it can be used as a gate/manually controlled switch for other projects or even as a stand alone.

Constraints

Since this project utilizes a CD4053 it is limited in the amplitude of signals that can be switched. It covers a range of about 15Vp-p, that is from -7.5V to +7.5V. Take this in consideration when building a stand alone or using the board with other projects. For the LPG 292c you will be fine in general, however to avoid possible clipping refer to Appendix on page 5 of this document.

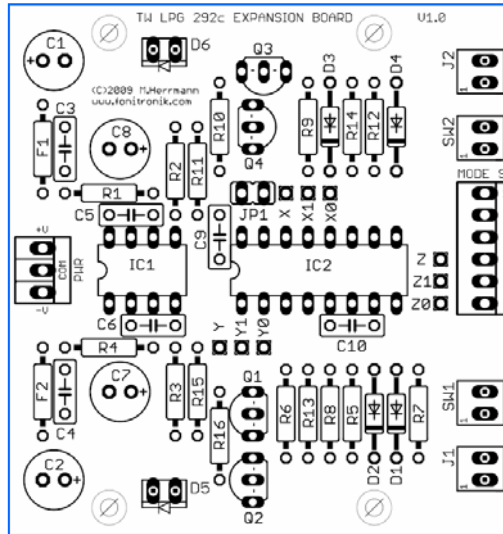
How it works

In the following I will refer to the schematic that can be found elsewhere in this document.

Gate A sets the switch in *both mode* when HI. In this state Gate B has no effect. SW1 is an additional switch that allows manual control of this gate. When the switch sets the Gate A HI, the incoming gate signal has no effect: the switch overrides the incoming gate signals. LED D5 indicates the Gates current status (on=HI).

Gate B selects between lopass mode and gate mode. It only has an effect when Gate A is LOW. There is an additional Switch and a LED, too.

Component Layout



Truth Table

Gate A	Gate B	Mode
LO	LO	Both
LO	HI	Both
HI	LO	LoPass
HI	HI	Gate

Front Panel Controls

Gate A	Gate B	
J1	J2	Jack Socket
D5	D6	HI indication
SW1	SW2	Manual

BOM

Resistors

3	1k	R6, R10, R11
2	2.7k	R14, R16
2	4.7k	R13, R15
4	10k	R1, R2, R3, R4
5	47k	R5, R7, R8, R9, R12
2	ferrite (or 10R)	F1, F2

Capacitors

2	1uF (elec)	C7, C8
2	10uF (elec)	C1, C2
6	100n (bypass)	C3, C4, C5, C6, C9, C10

Semi's

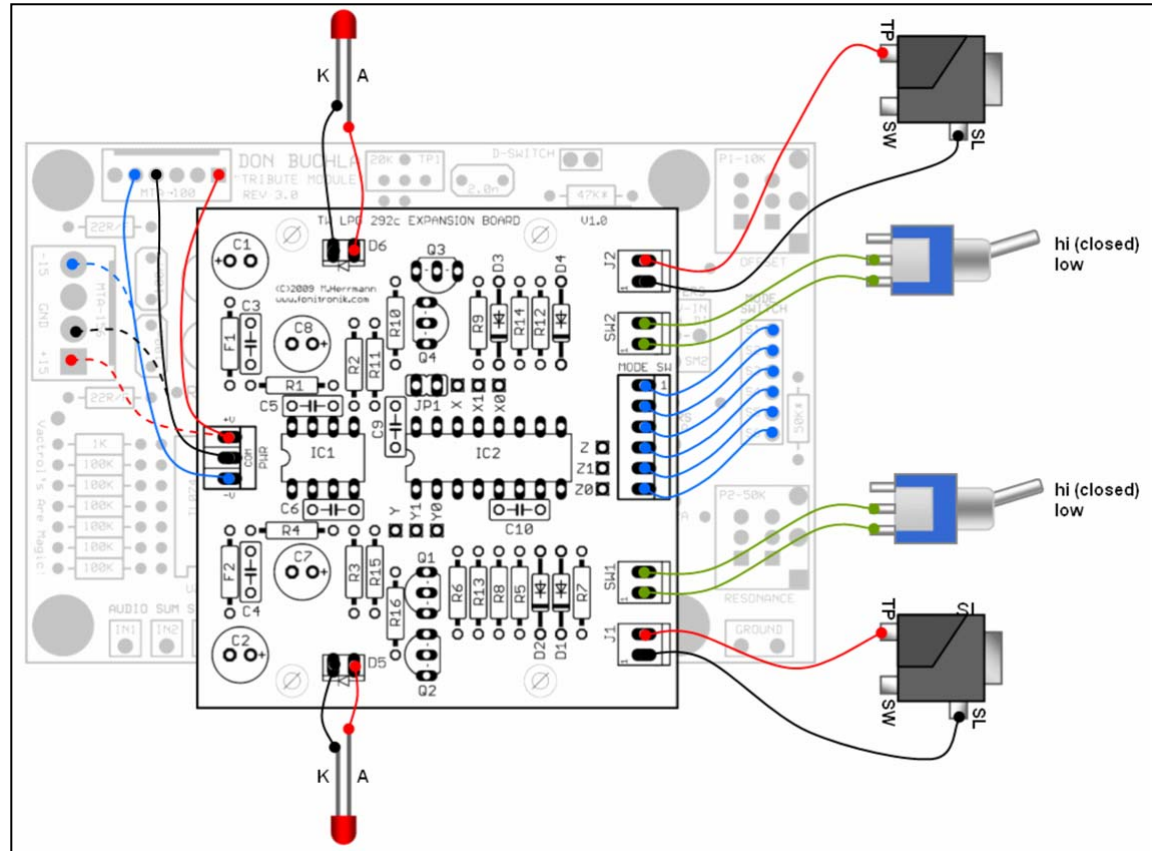
4	1N4148	D1, D2, D3, D4
4	2N3904	Q1, Q2, Q3, Q4
1	TL072	IC1
1	CD4053	IC2

Hardware

1	Jumper	JP1 (close for use with LPG 292c PCB)
1	Jack socket	J1, J2
2	LED	D5, D6
2	SPDT on-off	SW1, SW2

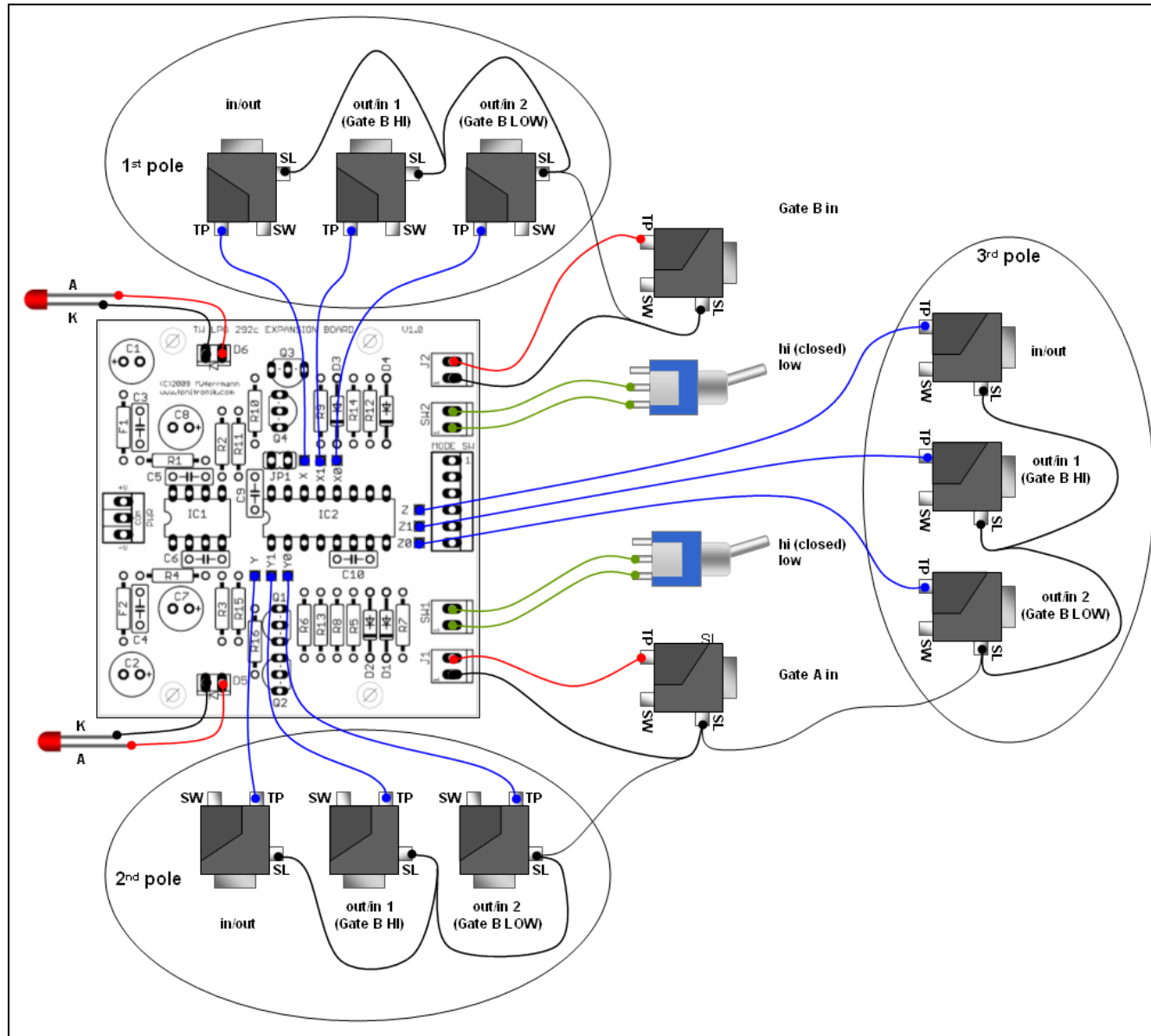
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Wiring Diagram for use with Resonant LPG 292c PCB (close Jumper JP1!)



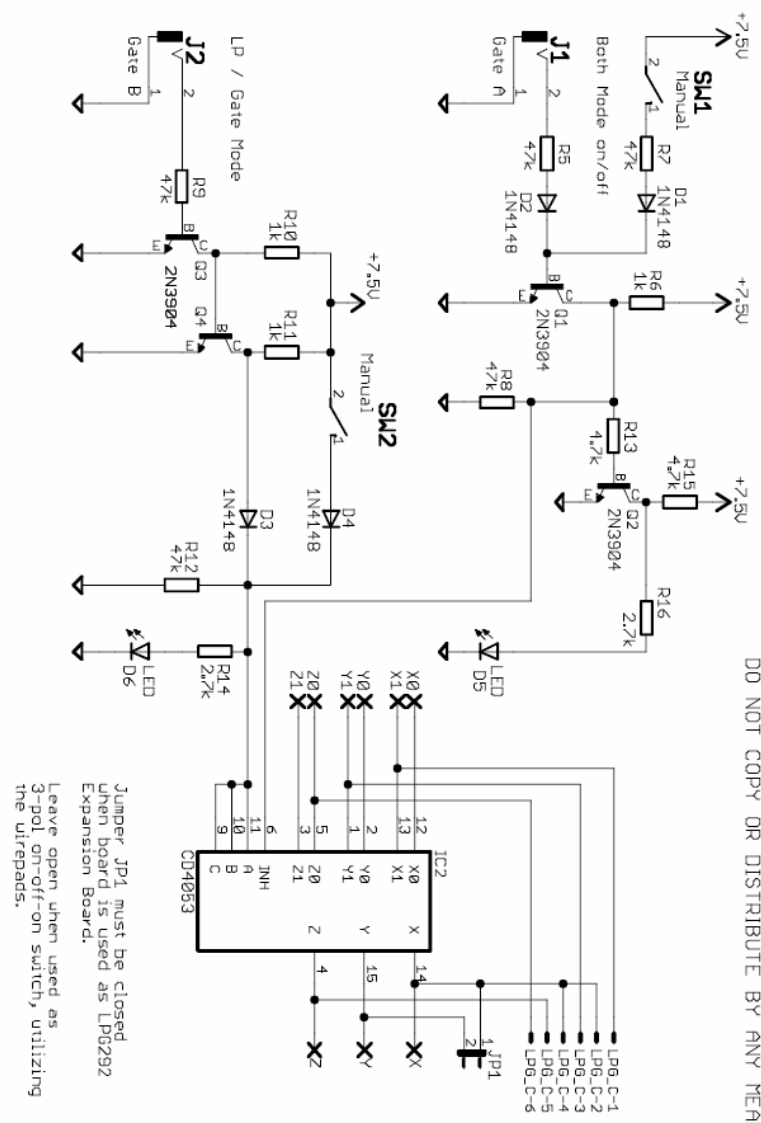
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Wiring Diagram for use as 3-pole on/off/on switch (leave jumper JP1 open!)

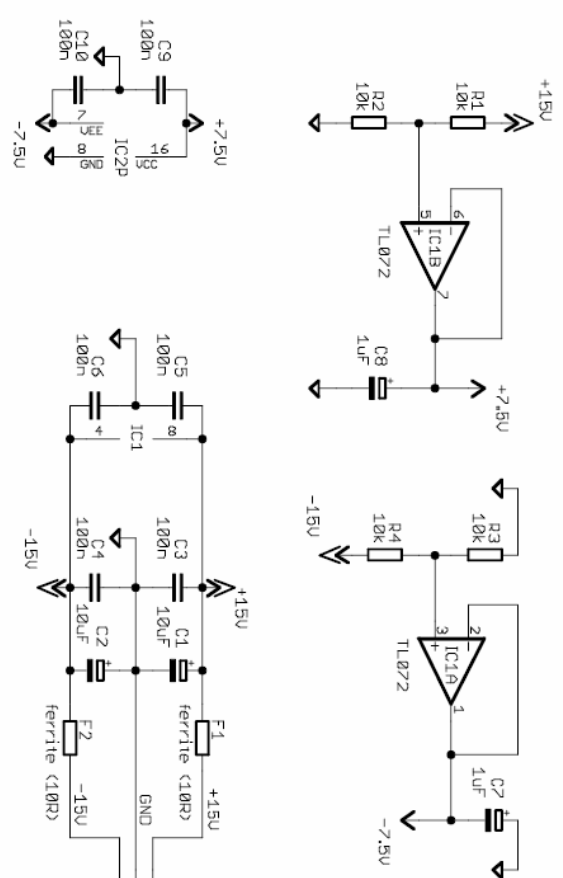


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Jumper JP1 must be closed when board is used as LpG292c Expansion Board.
Leave open when used as 3-pol on-off-on switch, utilizing the utre pads.



Truth Table		
Gate A	Gate B	Mode
Lo	Lo	Both
Lo	Hi	Both
Hi	Lo	LoPass
Hi	Hi	Gate

FONTIRONIK gate controlled 3-pol on-off-on switch

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Appendix

Since the QuadSwitch IC on the Gate Expansion Board is only capable of max 15Vp-p, some changes may be needed to avoid clipping. I say 'may' be needed, because the audio levels in my system are not that high and I never experienced any problems.

Changes needed on the LPG board:

However, you may want to change R18 to 100k. This tames the Resonance, which will otherwise possibly cause clipping. An idea was to look at it as a feature and to add a switch to change the value for R18 (distortion switch). You also may want to add attenuators to the audio inputs, all the more when using the mixer. A mixer 'sums' the inputs, so the more inputs you use, the higher the signal level.

Changes needed on the Gate Expansion Board:

If you decided to power your module from +/-12V the resistors in the voltage dividers on the Gate Expansion Board should be adapted to that. Change R1 & R3 to 12k, R2 & R4 to 20k. This will give more headroom to prevent clipping.

(Many thanks to Charlie 'The Bad Producer' for his work on this issue.)