Manual for the Kodasonic Stupendous 4PP 6P1P PCB V1.0

Created: 2021-04-10

KODASONIC

Safety warning:

This circuit uses **voltages up to 300V.** This voltage can cause **death of injury**. Capacitors on this board might **retain their charge with the power disconnected**.

Always treat this and any other project using high voltage electricity with respect and the utmost care – failure to do so **may result in your death**. You have been warned.

This amplifier also runs hot, the tubes even hotter. Keep pets and children away.

Circuit description:

This circuit uses 8 6P1P tubes per channel configured in push pull. They are strapped as triodes, and are biased by the LM317. The circuit offers low distortion and a completely class A output mode. Recommended load 2k-3kRa-a.

Two boards are needed for stereo.

No phase splitter is included on this PCB – I recommend the Kodasonic 6F12P VA/PI PCB for this. One is needed per channel.

Alternate connection for SE: If you prefer to run this as a single ended amplifier, you can do so by connecting both halfs of the board in parallel with a load higher than 1k. This will require custom magnetics as I'm currently unaware of an off the shelf part that is 1k, air gapped, and capable of handling an idle current of 320mA

This PCB is labeled as follows:

BLUE	-	Output transformer phase A
CT	-	Centre tap of output transformer
B+	-	280V-320V, ~320mA
IN1	-	Input for phase A
IN2	-	Input for phase B
12V	-	12V, 2A for heaters, DC preferred – this is not referenced to the circuit on the PCB (floating) and must be done off board. Or tie one side of 12V to GND
GND	-	Power and signal ground
BROWN	-	Output transformer phase B

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Parts list:

Quantity	Description
8	PCB mount 9 pin tube sockets, small pin circle. Ceramic recommended, plastic ok but will offgas creating an foul odour
3	2 pin connectors 5mm pitch (LCSC C8475 or equivalent)
1	3 pin connector 5mm pitch (LCSC C8483 ir equivalent)
8	21x15x25mm heatsinks
8	LM317 for setting current through tube
8	240R 1W to tie screen to plate
8	1000uF/50V capacitor 105°C to bypass LM317
8	30R 1/4W to set the current of LM317
8	1k 1/2W grid stopper
8	10R 2W (for current sharing – not strictly necessary and can be replaced with a wire)
2	100k 1/2W for grid leak
7	M3 hardware mounting holes.

Assembly tips:

Holes have been provided in the centre of each socket to help with marking the chassis. **The board is asymmetrical.** Take care to lay out the board right side up or the socket holes and mounting holes won't line up.

The silkscreen is on the parts side. **The tube sockets go on the back.**

Start with the shortest parts (connectors, resistors) and work up to the tallest.

If you use a **global negative feedback network** and you get howl on power up, reverse the connections for IN1 and IN2

All signal wiring should be run as twisted pairs or using shielded wire such as RG174 to minimize the possibility of any unwanted noise or hum.

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Schematic diagram:

Notes: This simplified schematic shows only 1 pair of four. All parts are quadruplcated except 100k which is shared. B+, CT, and the 12V heater have been left out for clarity.