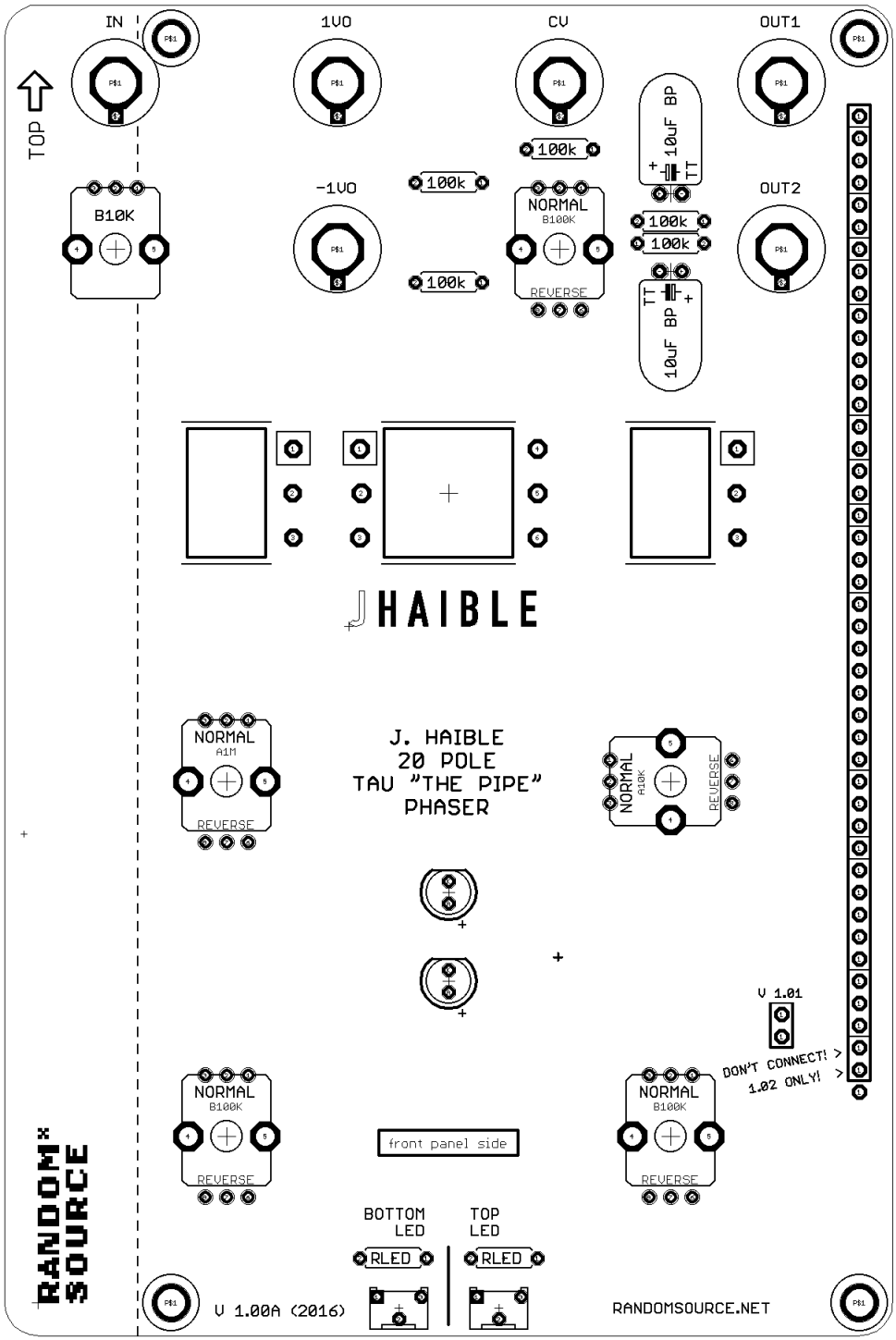
JHAIBLE TAU "PIPE" PHASER

The Haible Tau Phaser kit bringt the legendary phaser to 4U (4x4) format.

The R*S kit consists of a Tau (main) pcb (the "normal" R*S re-issue pcb version 1.01 or greater) and a 4" panel pcb serving as an interface to the front panel.



Please note:

- The (main) Tau board was designed by Jürgen Haible to be powered by +/-15V (or 18V AC). While these options still exist (actually +/-15V is probably the best way to run the Tau), this document assumes the module to be powered by a **+/-12V stabilized PSU** only. Any given for the main pcb in this document assume such **+/-12V power supply.**
- Random*Source has aquired all rights to Jürgen Haible's electronic heritage and is the only legitimate source for Haible designs.

Bill of Materials (for the panel pcb / front panel only)

Trimmers

2	2K or more	LED - on panel pcb -	Trimpot (Bourns 3362P or Vishay T73YP202KT20 or anything that matches the footprint) to adjust the LED brightness. Pick value depending on LED. Optional - use trimpot or LED resistors (not both!)

Resistors (1%)

2	RLED		* alternative to LED trimpots * pick according to LEDs, 2k to 5k should work for normal low current LEDs These LED resistors are in addition to Jürgen's design, i.e. they are optional to lower the brightness, i.e. you should be able to use small values like 100R, usually 1k or so should be fine.
5	100k		

Capacitors

2	10uF BP		BIPOLAR / NON-POLAR for audio use Electrolytic (or 22uF) >= 25V, 2.5mm ls e.g. Nichicon MUSE, Mouser: 647-UES1V100MEM

Potentiometers (Alpha 9mm vertical pcb mount)

1	B10K	10k linear	available from Thonk, Tayda
1	A10K	10k logarithmic	
1	A1M	1M logarithmic	Sets range of LFO speed knob
3	B100K	100k linear	

Misc

6	Knobs		matching pots, e.g. Davies
1	Switch DPDT	(ON - NONE - ON) or (ON - OFF)	NKK M2022SS1W01 or C&K or similar ...
2	Switch SPDT	(ON - NONE - ON) or (ON - OFF)	NKK M2012SS1W01 (no cap) or NKK M2012SS1W01-BB (white cap)

2	LED lenses 5mm		VCC, Mouser 593-3000R (red), 593-3000A (amber) ...
2	LED 5mm	low current (max) 2mA	pick color to suit LED lenses
3	Banana Jacks	bipolar (black): IN, OUT1, OUT2	Emerson-Johnson Thonk / Mouser: 530-108-0903-1 (black)
3	Banana Jacks	CV / unipolar (blue or white): CV, 1V/Oct, -1V/Oct	Emerson-Johnson Thonk / Mouser: 530-108-0910-1 (blue), 530-108-0901-1 (white)
1	SIL header(s) 43 pins or 42 + 2 pins		pin connectors, linking main pcb to component pcb - using precision strips allows to break off pieces as needed. for main pcb v1.01: use 42pins + 2pins for main pcb v1.02: use 43pins in a row as indicated on panel pcb - do not connect the three bottom pins when using a v1.01 pcb!

Building

This is simply a suggestion - you might find a different workflow more practical:

1. Mount the Banana jacks, led lenses and switches onto the front panel.

2. Main pcb and panel pcb are to be connected through precision DIP socket and pins. It is recommended to use the pins on the main pcb (facing down, soldered from above) and the pin sockets on the component pcb (standing up, soldered from the front panel side). Break or cut off the pieces you need and stick them together so that main pcb and component pcb form a nice sandwich (don't solder yet).

3. Attach any screws / spacers if desired and mount the main pcb onto the component pcb

4. **Make sure you use the right pins depending on the version of your main pcb (as marked on the pcb)! Connecting the third pin counted from the bottom of the panel pcb to a main pcb v1.01 (marked +V there) will cause a short!** Or simply: **do not connect the +V pin from the main pcb to the panel pcb** (it's not needed!). Solder all the connecting pins in while keeping the sandwich together - this avoids any misalignments.

5. Carefully separate the sandwich - if you used precision sockets, this may not to too easy - they stick together nicely (giving a good connection).

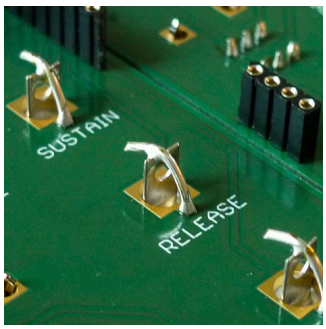
6. Mount the pots onto the panel pcb. Pots should sit on the side facing the front panel (as marked on the board). Stick the LEDs in, too. Don't solder them in yet.

7. Carefully mount the component pcb onto the front panel. Screw the pots to the front panel. Once everything is nicely in place, solder the pots onto the component pcb (while the front panel is attached). DO NOT SOLDER THE BANANA JACKS YET!

8. Make sure everything is in place - including LEDs.

9. Solder the switches to the adjacent pads using short pieces of (stiff) wire.

10. Solder the banana jacks in. You can either solder them directly to the surrounding vias (i.e. the ring around) or - which makes removing easier should you ever need to do that - by inserting a stiff (bare) wire into the little hole (via) and solder that wire to the top of the banana jack:

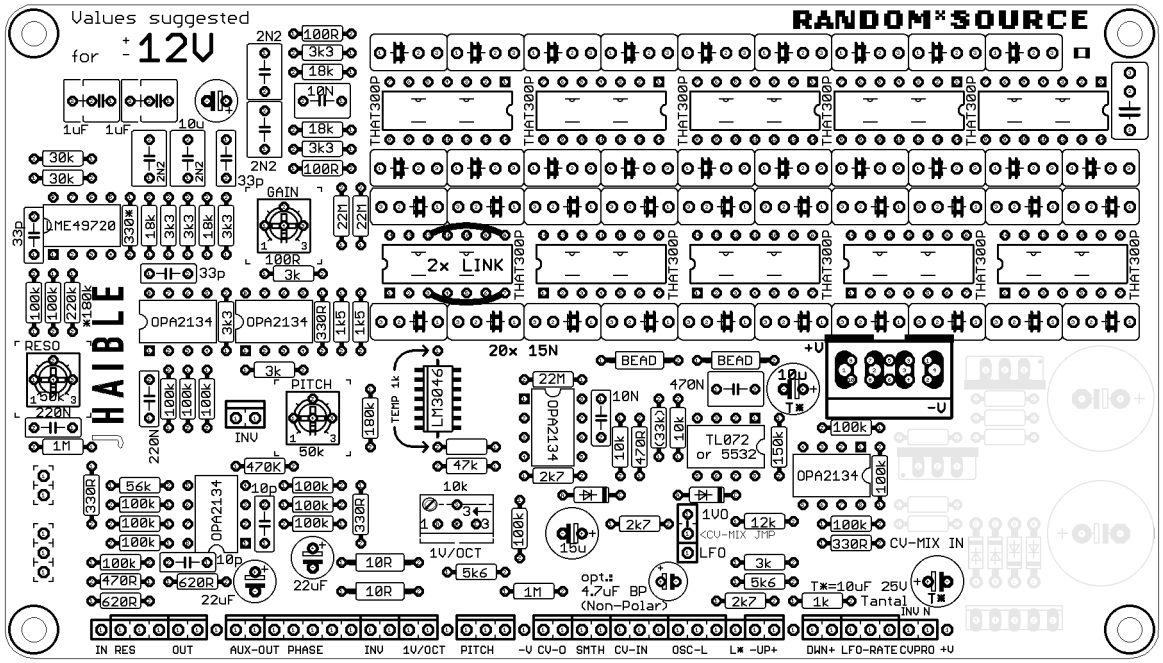


11. Connect a power cord supplying +12V, GND, GND, -12V to the MTA-header on the main board and you should be ready to go :-)

Calibration

No calibration required.

Appendix: Suggested 12V values for main pcb - do not stuff the greyed-out areas:



(Version 21 July 2016)