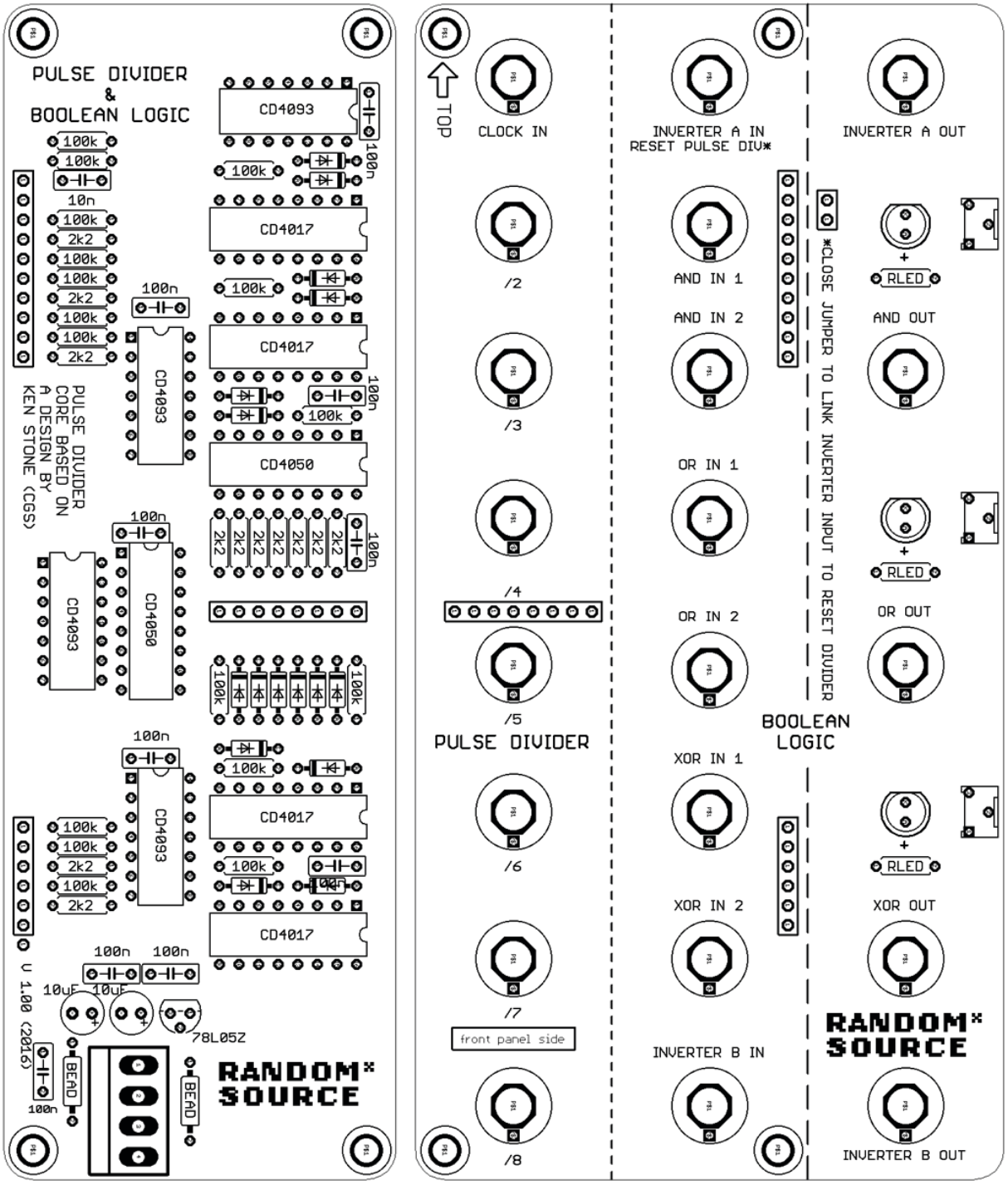
Pulse Divider & Boolean Logic

The Pulse Divider and Boolean Logic is a classic module for a wide number of rhythmic uses.

The R*S module consists of a 2” main pcb and a 3” panel pcb serving as an interface to the front panel:



Please note:

- The Pulse Divider's core is based on a design by Ken Stone and is used with kind permission.
- Board is designed to be powered by a +/-12V stabilized PSU only.
- **Update**: contrary to the pcb marking, it is recommended to use 10R or a link instead of 2k2 along the long edge of the board (boolean logic side) - see below.
- The Pulse Divider provides for an (optional) reset input that's mapped to the input of the top inverter. To use that feature, you have to set a jumper on the panel pcb (see pic above). However, this means the input of the inverter will have a dual function - to reset the pulse divider and (at the same time) serve as the input to the top inverter (i.e. the inverted reset pulse will be available at the inverter's output).

Bill of Materials

Trimmers

3	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	BEADS	F1, F2	FERRIT BEADs
3	RLED	RLED, RLED1, RLED2	* alternative to LED trimpots * pick according to LEDs, 2k to 5k should work for normal low current LEDs
5	10R or link	R1X4, R1X5, R1X7, R1X9, R1X13	UPDATE: use 10R or link instead of 2k2 for any resistor along the long side of the board (in between the 100k resistors) to get full 5V output of the Boolean Logic outputs
7	2k2	R1X1, R1X2, R1X6, R1X8, R1X10, R1X11, R1X12	Use 2k2 (as indicated on the board) only next to the center connector (8 pins).
17	100k	R1, R1X3, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16	

Capacitors

1	10n	CR	
10	100n	C3, C4, C5, CB1, CB2, CB3, CB4, CB5, CB6, CB7	Bypass caps
2	10uF	C1, C2	Electrolytic (or 22uF) >= 25V, 2.5mm ls

ICs

16	1N4148	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16	
4	CD4017B	IC2, IC3, IC4, IC5	CMOS-IC

2	CD4050B	IC6, IC7	CMOS-IC
4	CD4093B	IC1, IC8, IC9, IC10	CMOS-IC
1	78L05Z	IC11	Positive VOLTAGE REGULATOR

Misc

1	MTA-156		MTA-156 power connector
3	LED lenses 5mm		
3	LED 5mm	low current (max) 2mA	pick color to suit LED lens
1	SIL header 10pol		pin connectors, linking main pcb to component
1	SIL header 8pol		pcb - using precision strips allows to break off
1	SIL header 6pol		pieces as needed
15	Banana Jacks	(red)	Emerson-Johnson Mouser: 530-108-0902-1 (red) or Thonk
6	Banana Jacks	CV / unipolar (blue or white)	Emerson-Johnson Thonk / Mouser: 530-108-0910-1 (blue), 530-108-0901-1 (white)

Building

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

1. Mount the Banana jacks onto the front panel.

2. Use a side-cutter to separate main pcb and component pcb.

3. Mount the pots onto the component pcb. Pots should sit on the side facing the front panel (as marked on the board). Don‘t solder them in yet.

4. Carefully mount the component pcb onto 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!

5. Stuff the main board, beginning with the resistors, then caps etc.

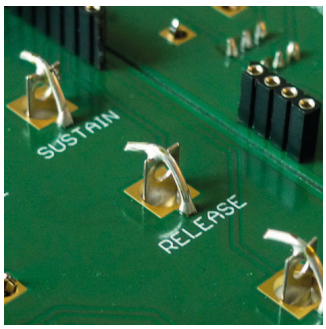
6. Main pcb and panel pcb are to be connected through precision DIP socket and pins. It is recommended to use the pins on the main pcb (facing down, soldered from above) and the pin sockets on the component pcb (standing up, soldered from the front panel side). Break or cut off the pieces you need and stick them together so that main pcb and component pcb form a nice sandwich (don‘t solder yet). Check that you didn‘t leave out any pins / holes and that the sockets are all on the same side (component pcb). Solder all the pins in while keeping the sandwich together - this avoids any misalignments.

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

8. Mount the component pcb onto the front panel again.

9. Make sure everything is in place.

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

12. 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.

(Version 8 August 2016)