If you are reading this, most probably, you are about to build the Erica Synths DIY SWAMP module. The module is 35mm deep, skiff friendly, has solid mechanical construction and doesn't require wiring.

The SWAMP is a random CV and audio generator inspired by the famous Wiard Wogglebug module; it's often the heart of self-generating patches and brings controllable randomness to your modular system. Random sounds and CVs in the Wogglebug are generated by the interaction between two linear CD4046-based VCOs (Tone and Woggle), where the frequency of each VCO is controlled by a sample and hold circuit that takes it's input CV from the Woggle VCO output. In addition Tone and Woggle audio ring modulated output – Ring - is available.

In the SWAMP module we introduced numerous modifications and improvements to extend potentiometer range, added an audio input, which, when connected, replaces the internal Tone oscillator, replaced the expensive dual vactrol, built S&H circuit around the made in Riga S&H IC AS1100CK2, added audio waveform selection switches, CV output configuration jumpers and much more.

The SWAMP kit comes in three versions:
1) Set of 2 PCBs + S&H IC + mechanical parts (PCB connectors and spacer),
2) Set of 2 PCBs + S&H IC + mechanical parts (PCB connectors and spacer)+ panel,
3) Full kit.

FEATURES:
- Three random audio frequency outputs
- External audio input routed to ring modulator
- Three random CV outputs
- Clock input and output to sync the module to your modular system
- CV control over internal clock for even more extreme randomness
- Skiff-friendly design

SPECIFICATIONS:
- Audio output amplitude   10Vptp
- CV output amplitude   0-10V or -5V - +5V
- Panel width   12HP
- Module depth   35mm
- Power consumption   60mA (max)@+12V, 39mA@-12V
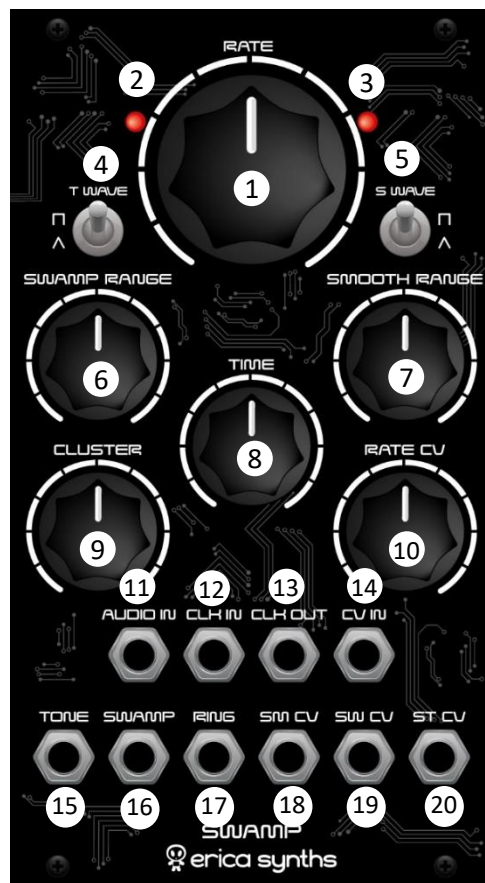
1 RATE knob sets the internal clock rate or – the frequency of random changes on output CVs and audio

2 LED gives visual feedback on the internal clock rate

3 LED gives visual feedback on the STEPPED CV output

4 5 WAVE switches select waveform on the TONE and SWAMP audio outputs. The middle position of the switch gives you a waveform that is crossfade between the triangle and pulse waves

6 This knob defines the range of CV changes on the SW CV output

7 This knob defines range of CV changes on the SM CV output

8 This knob defines the frequency of random changes on the SW CV output

9 CLUSTER knob defines, how much of random change happens on the SM CV and SW CV outputs

10 This is the RATE CV attenuator – adjust, how much external CV will affect the internal clock rate

11 This is the external audio input. External audio signal replaces internal Tone oscillator and is ring modulated with Swamp oscillator.

12 This is the external clock input – you can sync SWAMP to the master clock of your modular system

13 This is the clock output – you can sync other modules to the SWAMP's clock

14 This the RATE CV input

15 16   These are the TONE and SWAMP audio outputs

17 This is the RING audio output – ring modulated TONE (or external audio, if used) and SWAMP signal

18 This is the smooth fluctuating CV output

19 This is the SWAMP CV output

20 This is the Stepped CV output – similar to what you find in in S&H modules, but with adjustable parameters

ASSEMBLY

Take precautions with regard to electrostatic discharge (ESD) safety. Handling components should be done in an electrostatically safe environment. Use personal and workplace grounding. Any discharge (even a minor one) from your body to a component may permanently damage it.

Our PCBs have silkscreened both component values and designators nevertheless we highly recommend you to print out the files with the component placement before you start assembly of the module. And, please, at least take a look at this manual!

Some components are marked as NU (not used) – leave those unpopulated! Some components are market as OPTION (those are for optional modifications) – leave those unpopulated for now.
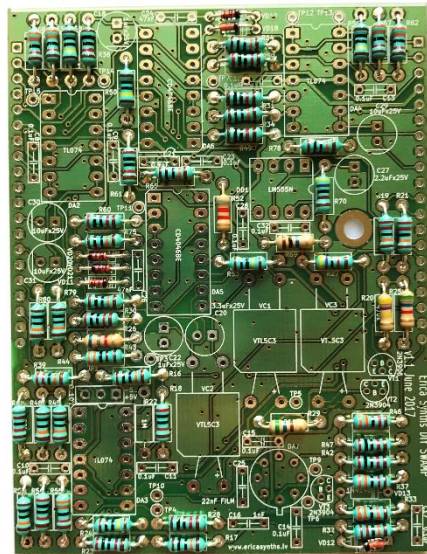
1 Solder horizontally placed resistors and diodes on both PCBs (Controls board and Main board)! Pay attention on the orientation of the diodes! Solder the ferrite beads and IC socket on the controls board!
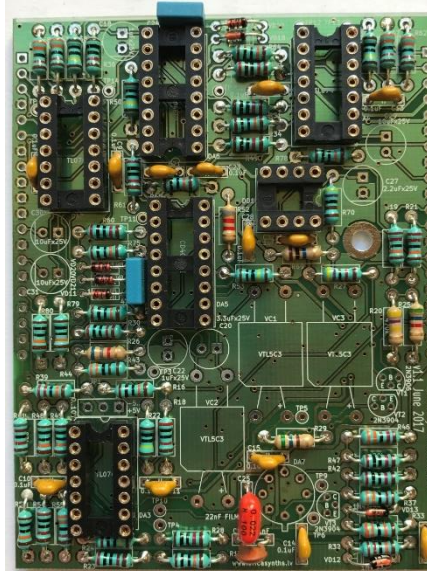
Controls board
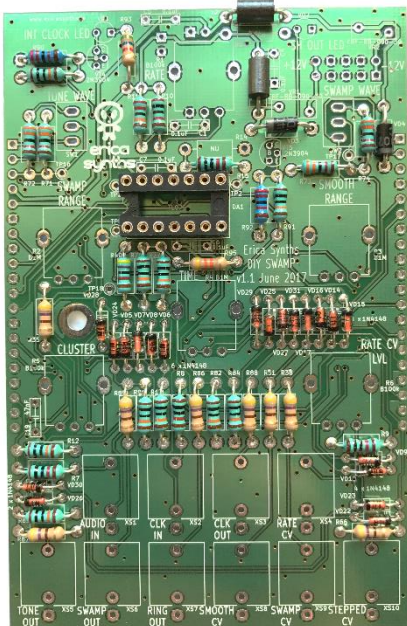
Main board

2 Solder the IC sockets and ceramic and film capacitors on both boards! Also solder the two transistors and the resettable fuses (if you have rectangular resettable fuses, you should solder them later on the opposite side of the PCB – they are too high to fit on this side of the board) on the Control board!

3 Solder the electrolytic capacitors, transistors and trimpots on the Main board! Mind the polarity of the electrolytic capacitors and the orientation of the transistors! Don't mix up NPN and PNP transistors! !
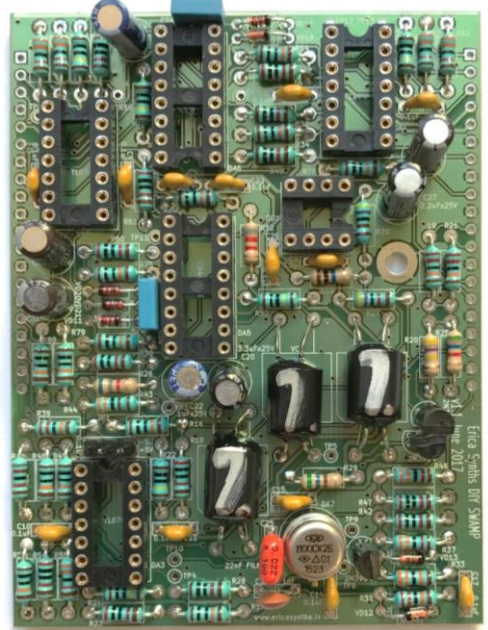
4 Solder the 3 vactrols and the S&H IC 1100CK! Make sure the key of the IC matches the silkscreen! Insert ICs in their respective sockets! Mind the direction of the ICs!

Negative lug of electrolytic capacitor is marked with a stripe!

5 Solder the potentiometers and jacks on the Control PCB! Do not mix the values of the potentiometers!

6 Turn the Control PCB around and solder the board connectors and the PSU connector. Then solder the two electrolytic capacitors. (This picture shows rectangular resettable fuses on this side of the PCB. Note that one fuse is bent down horizontally!)
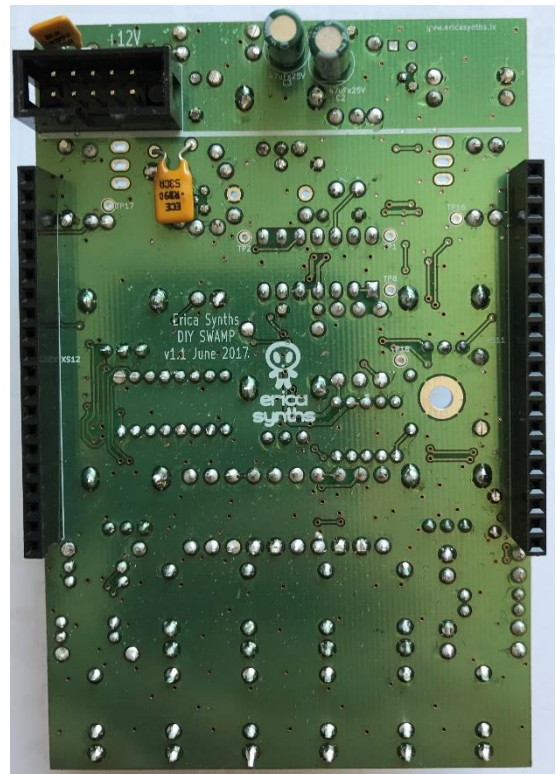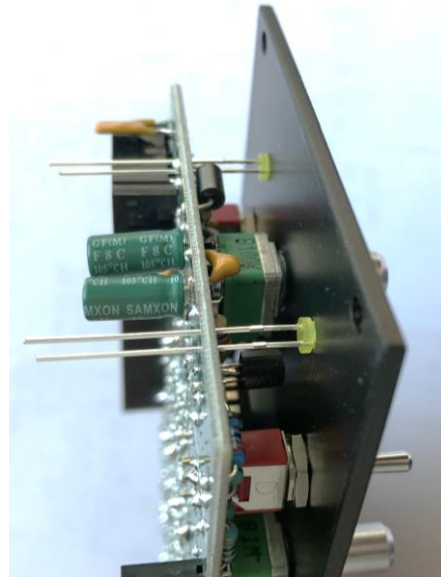
7 Insert the TL074 IC! Solder the two switches and place the LEDs in their places. **Do not solder the LEDs yet!**
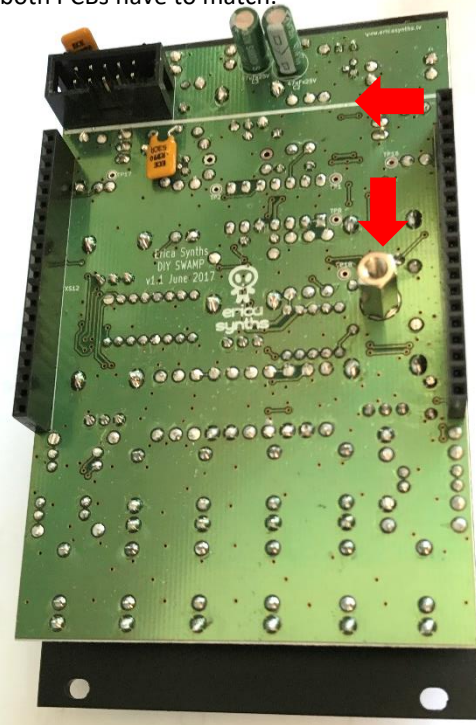

8 Put the front panel on and push the LEDs into their places. Now you can solder them.

9 Use the M3x6 screw to attach the spacer to the Control PCB! Connect both PCBs together and secure the bottom one with the other M3x6 screw! For all our modules with 2 PCBs the white stripes on both PCBs have to match.

10 Install the front panel and potentiometer knobs! **Congratulations! You have completed the Erica Synths SWAMP module!** It does not need calibration and will work straight away.