

## Phaser build notes and calibration

Because the original Formant Phaser sound did not convince Harald, we decided to develop the Phaser module based on Erica Synths Black K-Phaser, which is our take on the Krautrock optical phaser designs. It's 8-stage phased, where all-pass filters are controlled by photoresistors.

During assembly **solder the photoresistors and relevant LEDs as close to the PCB as possible**, basically, both photoresistors and LEDs have to touch the PCB with their bases.  
The 3D printed ring is hold in place by the Main and Controls PCB, when they are connected during final assembly.

**C10, C11 (47µF, 16V or 25V) are too tall, main board (piggyback) cannot be inserted properly – band their leads and install the capacitors horizontally.**

### Phaser Calibration

Remove the MAIN board.

Power on the module.

Set FREQUENCY potentiometer R1 fully Clockwise (17:00).

Set EMPHASYS (R2), LFO/ECV DEPTH (R4) potentiometers fully Counterclockwise (7:00).

Check that LFO FREQ LED is blinking and that blinking frequency changes by turning LFO FREQ potentiometer R3.

#### LFO amplitude adjustment

Set LFO FREQ potentiometer R3 in the middle position (12:00).

Adjust trimpotentiometer R43 (LFO AMPLITUDE ADJ.) to get LFO amplitude +/-5V at TP6.

#### Frequency response adjustment

Turn trimpotentiometer R53 (LED CURRENT ADJ.) fully Clockwise and measure voltage between testpoints TP21 and TP22. Voltage must be in 1.75V...1.8V range. Carefully turn trimpotentiometer R53 counterclockwise until voltage drops a few milivolts.

Turn FREQUENCY potentiometer R1 fully Counterclockwise (7:00) and measure voltage between testpoints TP21 and TP22. Voltage must be 1mV or less.

Turn FREQUENCY potentiometer R1 fully Clockwise (17:00) and check that voltage returns to previously set value ~1.75V between testpoints TP21 and TP22.

**Alternatively**, you can trim the R53 by observing the LEDs in the ring – while rotating the FREQUENCY potentiometer, adjust the R53 so that LEDs have most brightness range change in all range of the FREQUENCY potentiometer – from fully dim to fully bright.

#### Final assembly and resonance settings

When calibration is finished, power down the module, install the MAIN board and fix it with the M3 screw.

At the bottom of the module set DIP Switch's 8<sup>th</sup> switch to ON – this will insure feedback from all 8 stages. Experiment with several DIP switches (you may use multiple switches at time) and find the setting, you like the most.