SERGE Active Processor 2017 (ACPR) V1.0

The Serge Active Processor 2017 is a complete redesign by Serge of the original linear crossfader with significantly improved precision. The ACPR pcb also contains a FLIP-FLOP.

- Linear crossfader that can also be used as a linear VCA.
- For audio and CV.
- Designed by Serge Tcherepnin in 2017 for Random*Source.

How it works

The ACPR is a extremely versatile module both for CV handling and audio mixing / waveshaping.

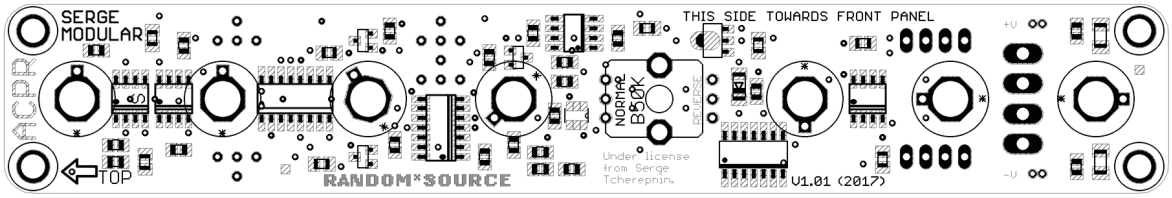
Feed two signals into IN 1 and IN 2 and the XFADE knob will blend from signal 1 to signal 2. The blend is linear and therefore ideal fior CV and phase-correlated audio-signals, like different waveforms from the same VCO or DSG to create new waveforms. You can also turn the FADE knob fully CCW and use XFADE CV (0 to 5V) to control the fade. Of course you can use CV at audio rate - e.g. a third output of an NTO or DSG XL to blend at audio rates, i.e. within one cycle of a the signal, which can generate even more unusual waveforms.

Needless to say, the ACPR can also be used as a voltage controlled attenuator by only using IN 2.

The Flip-Flop takes a pulse train as input and divides it into alternating gates - the first one to the FLIP output, the second one to the FLOP, the third one again to FLIP and so on. There are a number of uses for this, you can, for example, use this to drive 2 sequencers. Or as a pulse divider (also at audio rates - the output signal will have half the frequency, i.e. be 1 octave lower).

Building the ACPR

The ACPR uses a single pcb on which all required SMT parts already reflow soldered in. To build the board, **install only the through-hole parts listed in the BOM** and omit / ignore any others.



Please read the build instructions below before commencing the build. The module is designed to be used with a +12V / -12V power supply. Any values given here assume such a supply.

Bill of Materials (ACPR V1.01)

Variable Resistors

4	**50k Trimmer multiturn**		**Bourns 3296Y-1-503LF or anything that fits**

Misc

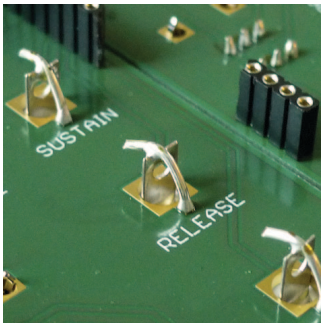
1	**MTA-156**	**PWR**	**MTA-156 power connector**
3	**Banana Jacks**	**RED for Pulse / Gate signals**	**Emerson-Johnson Mouser: 530-108-0902-1 (red)**
4	**Banana Jacks**	**(unipolar) for PAN / GAIN CV inputs**	**Emerson-Johnson Mouser: 530-108-0901-1 (white)**
1	**Potentionmeter 50K**	**XFADE: linear (B50K)**	**Alpha 9mm vertical pcb mount available from Thonk, Tayda**

General Build Recommendations

- Use antistatic precaution - try to avoid touching the SMT parts.
- You need an oscilloscope - ideally with at least 2 channels - for calibration.
- Board is designed to be powered by a +/-12V stabilized PSU only.

Building the ACPR

1. *Mount the Banana jacks onto the front panel.*
2. *Solder the trimmers and the power connector to the pcb.*
3. *Mount the pot onto the pcb (on the side opposite side of the power connector!). Don‘t solder yet.*
4. *Carefully mount the pcb (with the pot inserted) onto the front panel. You may then have to wiggle the pot a bit to get it through. Screw the pot to the panel.*
5. *Once everything is nicely in place, solder the pot in (while the front panel is attached).*
6. *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:*



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

Setup / Calibration

Calibration may appear a bit scary due to the number of trimmers, but it’s fairly easy if you have a good scope and understand the general idea. You have to calibrate both channels / sides, so that ultimately when the XFADER knob is fully CCW you get **exactly** the signal present at in IN 1 at the output and in full CW position, **exactly** the signal present at the other channel (IN 2) - both in level and offset.

Each side (channel) has two trimmers, one for DC (offset) and one to control the scale (amplification).

Feed a (audio) signal into IN 1 and turn the XFADE knob fully CCW. Watch both the incoming and outgoing signal on the scope. Use the 2 trimmers marked 1A and 1B to get the waveforms to precisely overlap.

Turn the XFADE knob fully CW and send a signal to IN2. Trimmers 2A and 2B allow you to get the output identical to the input. Turning the XFADE knob should now blend from input 1 to input 2 and you’re done :-)

Power consumption: appr. 15mA at +12V / 12mA @ -12V

(Last Change: 11. June 2018, 1:40 PM)