

## Description

The ASR envelope is a static envelope generator with loop feature. In envelope mode, it generates the same envelope shapes as a normal ADSR envelope, however, the Decay and Release rates are controlled by a single control named Release. The envelope has traditional RC charging/discharging (exponential decay) shapes, ideal for driving a linear VCA, modulating filter cutoff, etc. While it is not be the fastest envelope in the west, or in any cardinal direction for that matter, it is reasonably snappy with a 1.5ms minimum attack time.

In loop mode it becomes a basic LFO with rates ranging from 3 seconds up to 170 Hz governed by the Attack and Decay settings.

Please read this document through before starting, and especially check the notes in the bill of materials!

## Features

- Traditional RC envelope shapes
- 7.5V peak output voltage
- Trigger threshold  $\sim 1.5V$ .
- Looping / LFO mode
- 9mm pots, Thonkiconn jacks and all throughhole components on a single PCB
- 4hp Eurorack format
- Current usage (typical):
  - +12V 15mA,
  - 12V 15mA.



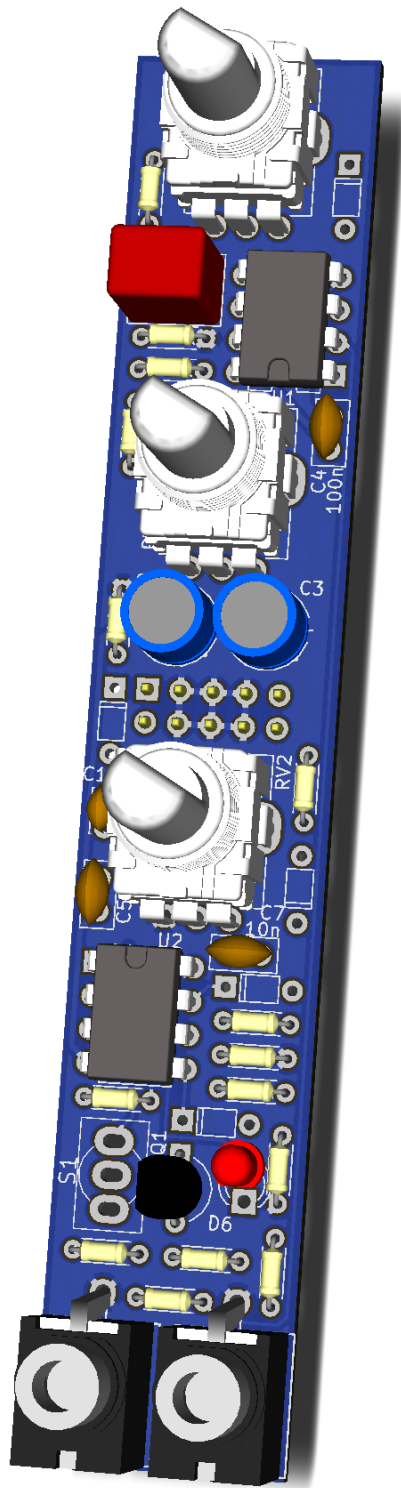
Schematics, PCB layout and documentation © 2018 Caspar Ockeloen-Korppi.

## Build instructions

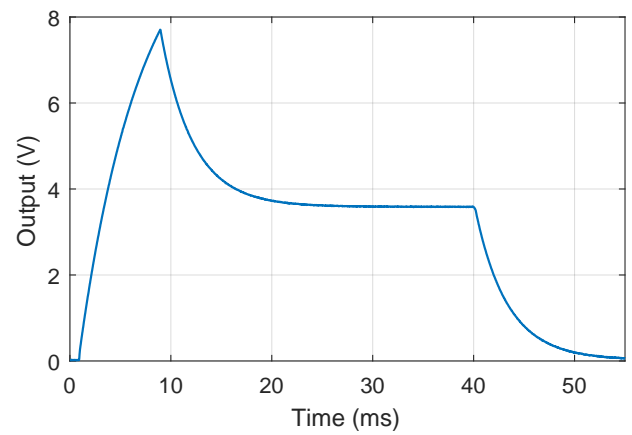
- The board is designed for small 0.4W-type metal film transistors, with 5.08mm (0.2") hole spacing. Standard 0.6W metal film will fit if you place them vertically.
- Pots are standard ALPHA 9mm vertical type, available at e.g. Thonk or Tayda.
- Jacks are Thonkiconn.
- The 10uF caps should be 2.5mm lead spacing, max diameter 6.3mm and max height 9mm. I use Nichicon UST1H100MDD.
- The power header is a 5x2-pin 2.54mm unboxed header, and should be installed on the backside of the board.

## Bill of materials

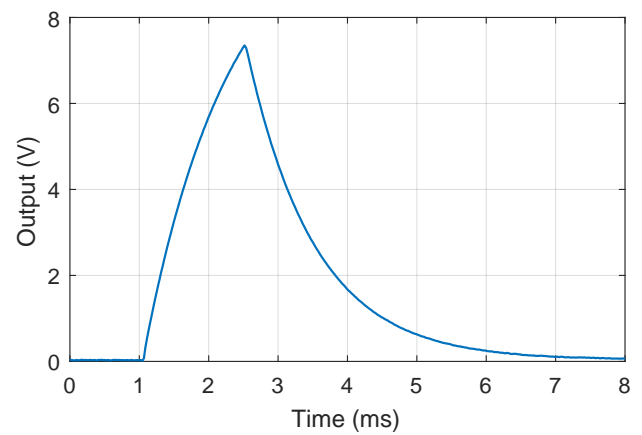
Qty	Designator	Value	Note
1	C1	1n	Ceramic, X7R or NP0, 2.5mm lead spacing
1	C7	10n	Ceramic, X7R, 2.5mm spacing
2	C4, C5	100n	Ceramic, X7R, 2.5mm spacing
1	C2	1u	Film, see schematic for details
2	C3, C6	10u	Min. 25V, 2.5mm pitch, max dia. 6.3mm, max height 9mm. Example: Nichicon UST1H100MDD
5	D1,D2,D3,D4,D5	1N4148	
1	D6		3mm red LED, high brightness
2	J1, J2		Thonkiconn
1	J3		2x5 pin unboxed male header, 2.54mm pitch
1	Q1	2N3904	BC547 etc can be used but has reversed pinout!
2	R1,R14	10k	All resistors 1% metal film small type (1/8 W or 0.4W).
1	R15	2.2k	
1	R13	4.7k	
4	R4,R5,R10,R11	1k	
1	R9	22k	
2	R3,R8	100k	
1	R7	220k	
3	R2,R6,R12	1M	
2	RV1,RV3	A1M	Alpha 9mm vertical
1	RV2	B100K	Alpha 9mm vertical
1	S1	SPDT switch	TS-01 or SMTS-102 (see schematic)
2	U1,U2	TL072	DIP8



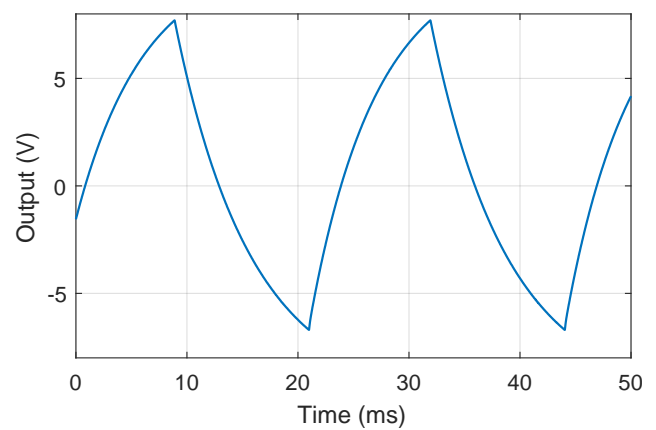
Board view



Typical envelope output



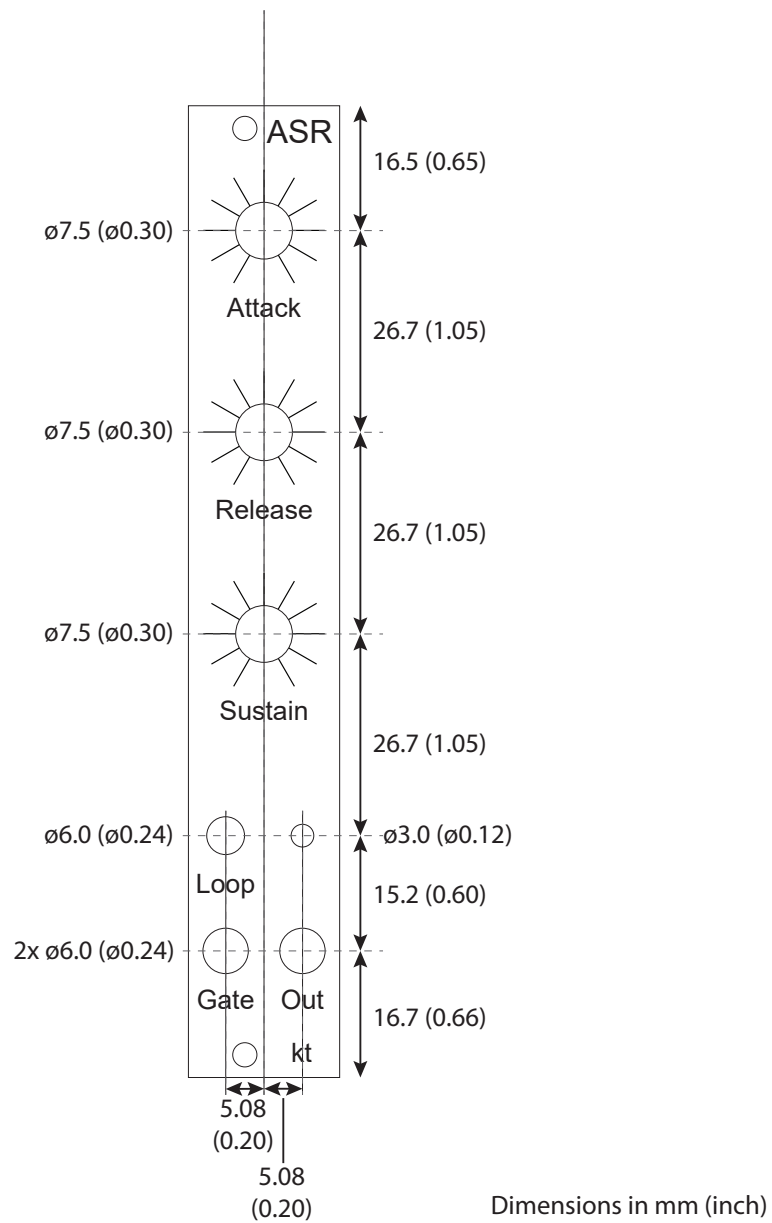
Fastest envelope (all knobs CCW)



Typical loop output



## Front panel dimensions



## Revision history

### Board revisions

- 1.0 Prototype
- 1.1 First release

### Documentation revisions

- A Initial documentation for board revision 1.1
- B Add front panel dimensions

## Contact

Check for updated documentation and other information on my blog at [kassu2000.blogspot.com](http://kassu2000.blogspot.com).  
I am always happy to answer questions and receive feedback at [kassutronics@gmail.com](mailto:kassutronics@gmail.com).