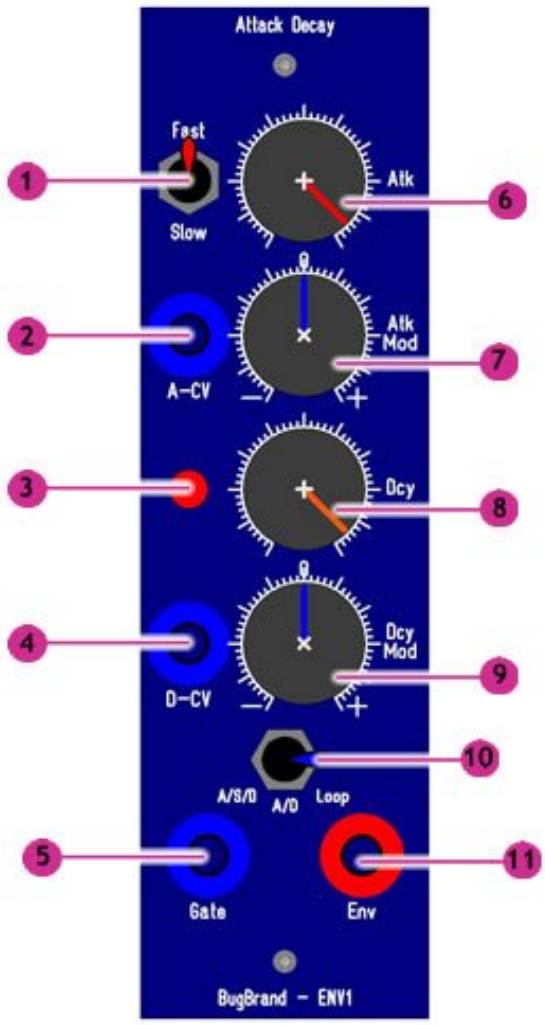
ENV1 – Attack Decay

Rev1 – June09

Overview

The ENV1 is a voltage-controlled Envelope Generator offering Attack (Sustain) Decay type events plus a looping oscillator mode.

The module uses Vactrols to control the speed of operation.



Controls

1. **Range Switch -** 3 position switch to select envelope speed.
   - Fast (Up) is designed primarily for audio-rate oscillation in loop mode.
   - Mid provides typical control envelope speeds and mid-range oscillations from LFO to low audio range.
   -Slow (Down) offers an overall slower response for low modulation rates.
2. **Attack CV Modulation Input -** typical 10V peak to peak modulation signal.
3. **Status LED**
4. **Decay CV Modulation Input -** typical 10V peak to peak modulation signal.
5. **Gate Input -** a 0 – 5v gate signal is typically applied here to trigger the envelope.
   The input is protected against negative voltages and can accept higher input signals too. This allows, for example, a VCO waveform centred around 0V to be applied – by using the A/S/D mode in Fast range tonal divisions can be achieved. Other external signals can be used to varying effect.
6. **Attack Rate Control** – Manual control for envelope Attack. Note that clockwise corresponds to a rising frequency (ie. Shorter time). At low settings the control may take a short moment to stabilize due to the nature of the Vactrol control elements.
7. **Attack Modulation Control** – a bipolar modulation depth control to modify the envelope Attack rate. Audio-rate modulation can be applied, but may not always produce a strong effect due to the nature of the Vatrols.
8. **Decay Rate Control** – Manual control for envelope Decay – similar to Attack.
9. **Decay Modulation Control** – a bipolar modulation depth control to modify the envelope Decay rate – similar to Attack.
10. **Mode Switch** – 3 way switch to select the mode of operation (see diagram overleaf)
    - A/S/D (Gated): An Attack stage is initiated by a Gate signal. Once the peak is reached, this level is sustained until the Gate signal is released, at which point the Decay stage occurs (Fig.1). If the Gate signal finishes before the Attack stage has completed then the Attack stage will still continue to peak with the Decay stage occuring immediately afterwards (similar to A/D mode)
    - A / D (Triggered): The positive going edge of a Gate signal begins the Attack stage. The output rises to peak 10V before entering the Decay stage (Fig.2). The length of Gate has no effect in this mode.
    - Loop: In this mode the envelope continually cycles between Attack and Decay. A Gate signal may still be applied to reset the envelope in loop mode, but the behaviour is somewhat unpredictable as it depends on the envelope's current status.
11. **Envelope Output -** typical 0 – 10V output signal. Note that the envelope has a roughly exponential shape.

Specifications

Current Draw: +ve 35mA, -ve 35mA (max.)

Module Width: 1 Frac-width (1.5”)

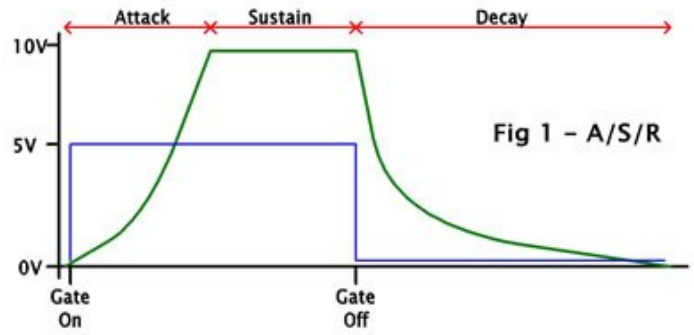


Fig 1 – A/S/R

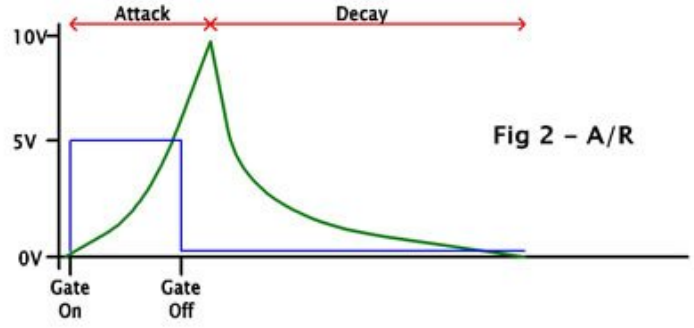


Fig 2 – A/R

Adjustment Procedure

There is one multi-turn trimmer in the circuit, but this should not need to be altered in general use. Please read the notes carefully performing any adjustments. The trimmer adjusts the triggering bias and incorrect setting can mean the envelope either does not trigger or stays permanently on.

To test correct setting (without oscilloscope) – set Range to Mid and Mode to Loop, Attack and Decay to around 2 o'clock with no modulation or gate input. In this setting the Indicator LED should pulse On / Off at a relatively quick rate.

If the LED stays permanently lit then the trimmer should be slowly turned anti-clockwise until pulsing begins.

If the LED stays permanently unlit then the trimmer should be slowly turned clockwise.