

## ADSR Description

This is a close clone of the Elektor Formant ADSR. Here I only describe the changes I have made. The description of the other parts of the circuitry can be found in the original Elektor Formant documentation. The gate signal input resistance is raised from 33kOhm to 1megOhm with the input buffer DA1D. This protects against double triggering with the falling edge of the gate signal when using sequencers. R10 is used to fix the input to a defined potential when no signal is attached to the input. C5 was lowered to 6n8 from 10nF. In combination with C7 and the raised charging voltage through DA1A/R17 this makes for faster attack time. The load capacitor of 10u was replaced with two selectable capacitors of 2,2uF and 10uF. This make for a finer adjustment of the response times of the ADSR. The voltage divider R29/R30 was adjusted to ensure that the output level of 5V is reached when the offset option with R32 is used. If this feature is not used R30 should be lowered to 7.5k. Construction conditioned the output at DA2C only reaches a minimal voltage of about 0,5V. To compensate for this I added DA2A/DA2B. With R32 you can trim the output down to zero volts. If the ADSR is not used the output voltage is now at -0,5V. If you don't want to use this feature just turn R32 to ground and you will have the original behavior of the original Elektor Formant ADSR.

## ADSR Calibration

### SUSTAIN

The calibration of the sustain level with R35 is done as described in the original documentation.

To test the envelope shaper a gate pulse must be available from the 'GATE' output of the interface receiver board. The EOS output ("OUT") of the envelope shaper is monitored on an oscilloscope with the Y sensitivity set to about 1 V/div and the timebase set to about 10 ms/div. For the first test, the sustain level is set to zero, SW1 is set to the 'AD' position and the attack and decay potentiometers are set to 'fast'. The release potentiometer has no effect during this test. If a key is depressed at short intervals then a short AD envelope curve will be seen, which rises and falls between about 0.5 V and 5 V. The output of DA1B (TP3) can also be monitored, to check that it swings briefly between -12 V and +12 V when the peak of the attack curve is reached.

The only adjustment required to the envelope shaper is to set the 100% sustain level, using R35, to correspond with the voltage on C6/C7 at the end of the attack period. If it is too low, then there will always be a decay, even at 100% sustain level; if it is too high then the calibration of R3 (SUSTAIN) will be inaccurate, since 100% sustain will be reached before maximum rotation of the potentiometer.

To make the adjustment, the sustain level is set to 100% and medium attack and decay times are selected. Preset R35 is then adjusted until there is just no decay after the attack period (i.e. the attack period blends into the sustain level with no dip). The adjustment can be checked by turning R3 slightly to the left, when a slight dip after the peak of the attack period should be noted. As R3 is turned further anticlockwise then the decay down to the sustain level will become greater and greater, until finally, at 0% sustain level, pure AD curves will be produced. The envelope shaper is now ready for use.

### OFFSET

With R32 you can compensate for the residual voltage. In idle mode adjust R32 for about 0.3..0,5V at the output