

# E-mu Systems, Inc.

applied magic for the arts

## EII Attack Time Modification

Recently the E-mu sound development lab discovered that the first 4 ms of their percussion samples were being truncated by the EII! This phenomenon was later traced to slow attack times caused by the capacitors used to make the VCA envelopes smoother. These smoothing circuits are in there for good reason. The EII uses an 8-bit DAC to generate the CV envelopes. On pure tone samples, (like sine waves) the quantisation of the envelopes could be heard. Adding the smoothing networks eliminated this problem. But.... you don't get anything free in this world. The envelope filters added about 4 ms of slew to the envelope voltage.

The EII Attack Time Modification is not perfect either. As it turns out, the EII's envelopes are already optimised to sound best over the entire range of the controls. Adding the Attack Mod. will improve the attack time, but will introduce an envelope clock noise (the ZIPPER effect) with some sounds and settings. This Zipper effect will be noticed at attack settings of about 3 to 8 on the VCA. The SSM 2045 VCA will also thump a bit at minimum attack. Because of these "side effects" some presets may need to be re-tweaked.

The Attack Modification works by placing (2) 1N914 diodes in parallel with the RC resistors on the CV inputs to the sound DAC and the final VCA. On slow attacks the envelope's voltage change is less than 1.4 volts, the diodes do not conduct and the Capacitor charges slowly. On fast attacks the voltage change is greater than 1.4 volts, the diodes conduct, bypassing the current limiting resistor, and the Capacitor charges faster. Overdriving of the VCA and the DAC is prevented by increasing the 4.7 K $\Omega$  resistor to 8.2 K $\Omega$ . Figures 1 and 2 show the installation for channel 1 (and 1/2 of channel 2). The other channels are identical and are modified in the same way.

**PLEASE!** Inform your customer of the "side effects" of the modification before installing it on their machine. As we have said before, E-mu Systems inc. does not take responsibility for the installation of non-E.C.O. type mods (like this one). You are on your own. However, this modification does work as promised and some EII owners will want the faster attacks that it provides.

## EII Attack Time Modification

**Purpose:** To make the attack time of the VGA envelope faster, (approx. 4 ms).

**Theory:** When the envelope voltage change is  $> 1.4$  V, the current limiting resistor is bypassed by the diodes and the capacitor charges faster.

**Materials Needed:** (32) 1N914 Diodes, (16) 8.2 K Resistors, EII Tech. Manual

### Instructions:

1. Replace R39, R174, R175, R176, R177, R178, R179, R180, R101, R100, R99, R98, R97, R96, R95, R94 with 8.2 K $\Omega$  (5%).

**Note:** To find these resistors refer to the illustrations, as all 8 channels are the same.

2. Prepare the Duo-Diode™ kludges (see illustration) and solder them across R173, R44, R38, R43, R37, R42, R36, R41, R92, R91, R90, R89, R88, R87, R86, R85. Again, refer to the illustrations to find the locations and correct polarity.

