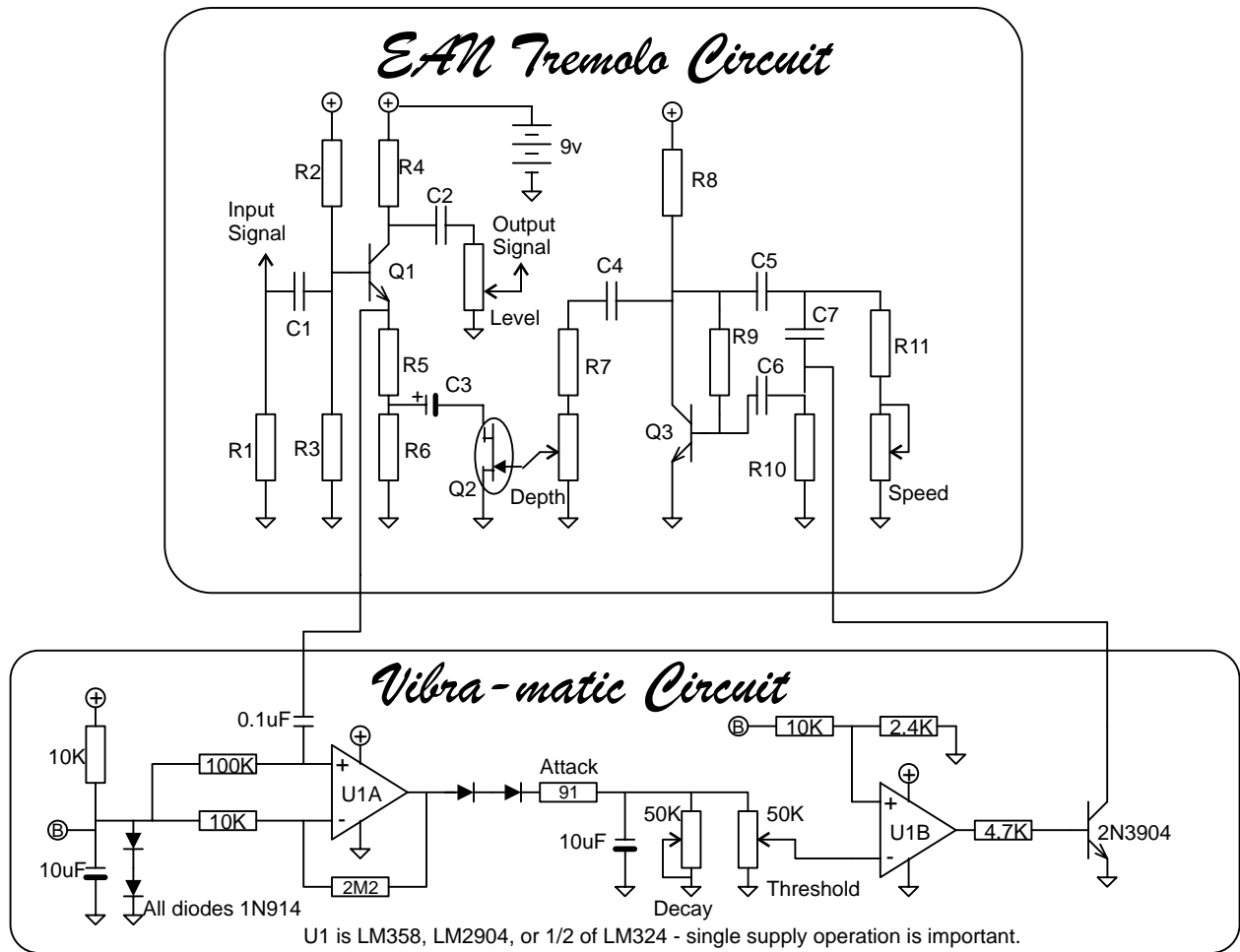


# Vibra-matic - Spiff up your EAN Tremolo

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The Vibra-Matic circuit adds some pazzaz to the EAN tremolo. The EAN Tremolo provides a buffered signal to the input of the Vibra-Matic through the 0.1uF capacitor attached to the emitter of Q1. This signal is amplified by U1A and rectified by the diodes on its output into the 10uF capacitor. This capacitor filters the signal to provide an envelope signal. The attack time of the envelope is controlled by the 91 ohm resistor, the decay time by the first 50K trimmer, and the switching threshold by the second 50K trimmer. When the signal is rectified and appears on the wiper of the Threshold pot, U1B compares it to a reference voltage derived from bias voltage "B". This sets a very low threshold of something under a diode drop. Whenever the signal's envelope is larger than this reference voltage, U1B switches its output low, turning off the 2N3904 at its output through the 4.7K resistor. When the signal is below this threshold, the 2N3904 is turned on.

The collector of the 2N3904 is connected to the junction of C6, C7 and R10 in the EAN trem. When the 2N3904 is on (that is, when the signal is too low to trip U1B), it kills the oscillation of Q3 by shunting all the feedback signal to ground. When the signal is large enough to trip U1B, the 2N3904 is turned off, and the feedback is allowed to reach Q3. Q3 therefore starts oscillating whenever the signal level is detected by U1B. However, Q3 cannot start up immediately into full oscillation. There is a short time where there is signal but the oscillation has not yet built up to a noticeable level.

Short notes will therefore have no tremolo applied, but longer notes will gradually have tremolo appear.

This circuit must be regarded as experimental until it's breadboarded. I've simulated it and it appears to work fine, but Mother Nature is sometimes picky about what happens in Her real world.