Sustain for Electric Guitar

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I believe this must be one of the simplest and cheapest sustainers for electric guitars around. IC1a and IC1b are both CMOS inverters, wired to act as op-amps. Any inverter will do the trick, such as 4009, 4049, 4069 or 4007.

The gain of IC1a is determined by the collector-emitter resistance of Q1 plus R2. If the output level is to remain constant while the guitar note decays away, the gain of IC1a must be increased by a corresponding amount. This is achieved by rectifying the output of IC1a through IC1b and D1 and passing the resultant DC voltage, which is smoothed by C4 and R7, to the base of Q1. This forces the collector-emitter resistance of Q1 to increase in proportion to the input level from the guitar. RV2 can be set to any desired level and when set high can easily overdrive the input stage of the guitar amplifier giving a tube-type of distortion.