

Ring Frobnicator

The Ring Frobnicator design by John Hollis is another of John's spare, elegant designs. It delivers ring modulator like sounds or a tremolo sound with the flip of a switch. The speed and depth of the modulation is adjustable.

The audio path is a simple loop through U1, an Operational Transconductance Amplifier. The gain of OTA's is determined by the current into the bias input pin (pin 5 here). This pin is fed with a suitable range of current by impressing a varying voltage on R10, which converts the voltage to a current. The varying bias voltage is generated by the two sections of U2, a dual opamp. This circuit is a more-or-less common integrator and hysteresis trigger circuit.

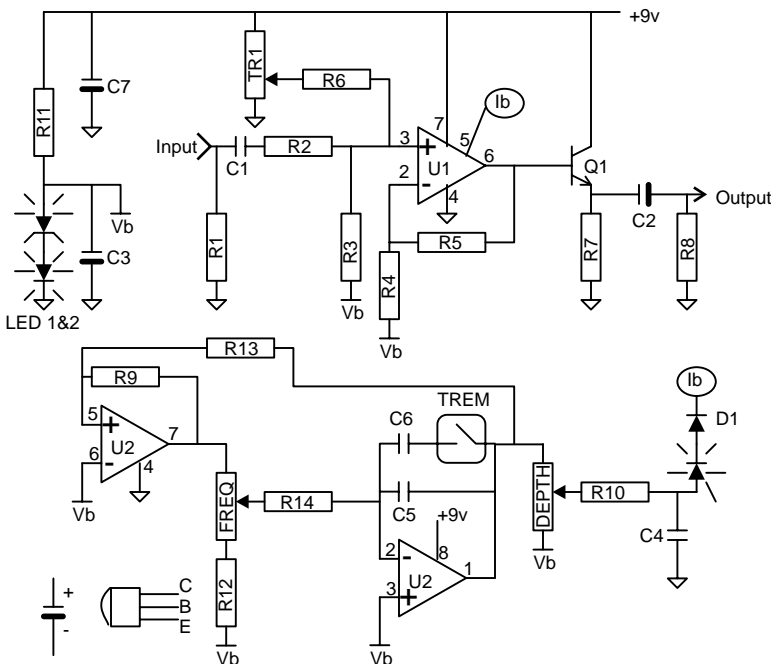
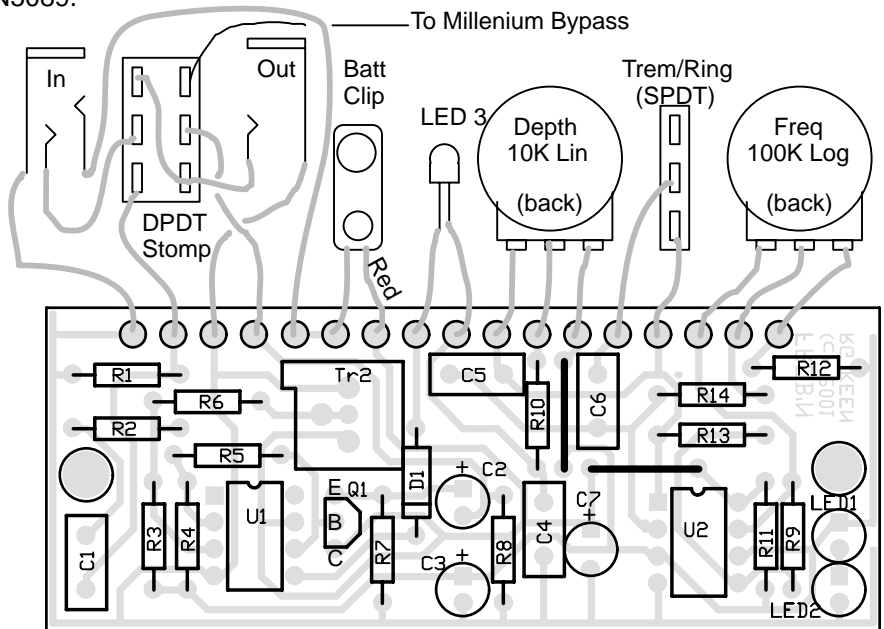
The circuit generates a true tremolo (amplitude modulation of the signal) at either sub-audio frequencies, or at much higher frequencies in the audio range. The selection of subaudio modulation gives tremolo. Selection of an audio range modulation gives a form of amplitude modulation that sounds much like a true ring modulator, but which is much easier to play in real musical situations.

John's design specifies the TL062 for low current draw. The TL072 will be a lower noise, although higher current substitute. You can use any high gain NPN transistor for Q1, although best results will likely be with a high gain low noise device like the MPSA18 or 2N5089.

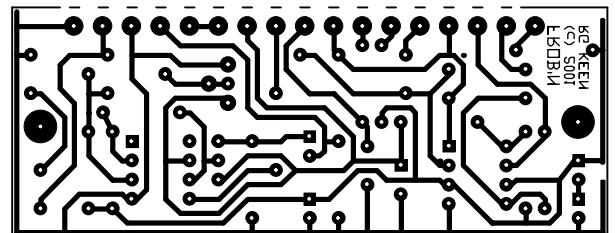
- R1 = 10M
- R2 = 330K
- R3 = 10K
- R4 = 10K
- R5 = 470K
- R6 = 10M
- R7 = 22K
- R8 = 100K
- R9 = 100K
- R10 = 10K
- R11 = 10K
- R12 = 4.7K (4K7)
- R13 = 47K
- R14 = 220K
- C1 = 0.047uF (47nF)
- C2 = 1uF electro
- C3 = 100uF electro
- C4 = 0.1uF (100nF)
- C5 = 0.0022uF (2N2)
- C6 = 0.1uF (100nF)
- C7 = 47uFelectro
- D1 = 1N4148/914
- Q1 = NPN transistor
- LED1,2,3 = red LED
- Tr2 = 100K trimpot
- FREQ = 100K log
- DEPTH = 10K lin
- U1 = CA3080/LM3080
- U2 = dual opamp (TL062 or TL072)

Errata

- Updated 10/07/01; added "R14=220K", reconnected R12 to Vb, not ground.



Adjust trimpot Tr2 for lowest modulation feedthrough with zero signal. You should be able to get the modulation to be almost inaudible.



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