

# A \$9 PL TONE ENCODER

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With many of the 2-meter FM repeaters in the state going to the same PL tone (100.0 Hz), there may be some older transceivers that could be given a new life with the addition of an inexpensive PL tone generator. Figure-1 illustrates an easy circuit that can be constructed with mostly Radio Shack parts for less than \$10.

The heart of the circuit is the NE567 tone and frequency decoder chip that provides a highly stable precision oscillator. The output on pin 6 is an exponential triangle of 1 volt peak-to-peak. The only rigid requirement is that capacitor C1 be stable over a wide temperature range. Use only Mylar, polyester or metal film for capacitor C1. The frequency is determined by the following formula:

$$F=1/R1C1$$

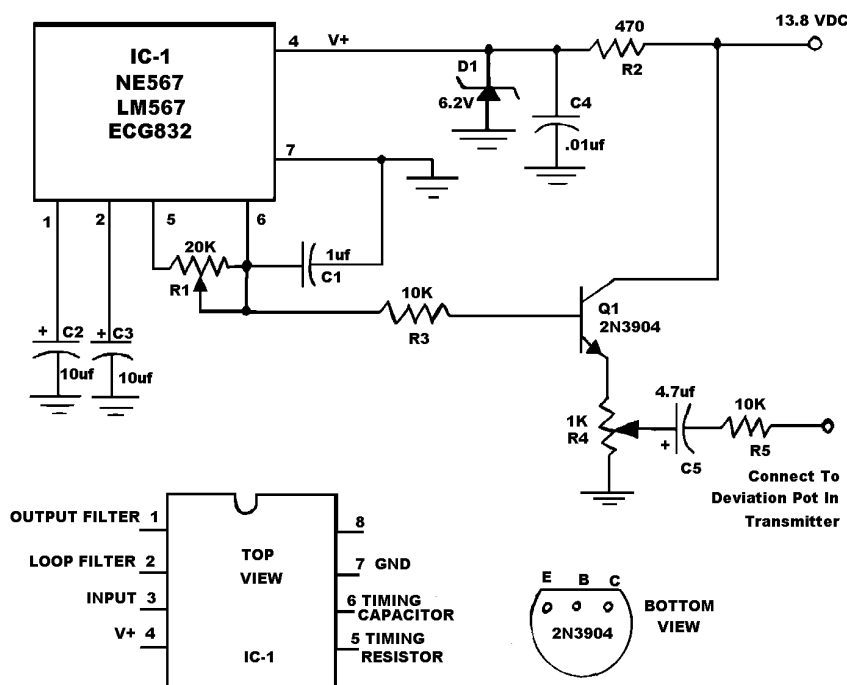
The specified values should allow any tone between 50 to 300 Hz.

The NE567 (ECG832) is available from JDR Micro Devices (1-800-538-5000) or Ocean State Electronics (1-800-866-6626).

The output of this PL tone generator should be connected to the deviation potentiometer in the transmitter circuit and not the microphone input. (Check schematic diagram of transceiver.)

To align the frequency of the tone generator, use another transceiver with CTCSS decode capability for the desired PL tone frequency. Attach a dummy load to the transmitter and key down the transmitter while turning potentiometer R1 slowly. As soon as the correct PL frequency is obtained, the squelch will open on the transceiver with CTCSS decode. Now adjust R4 for a tone level just high enough for the other receiver to decode the tone and not loud enough for others to hear it. R5 is used to prevent the tone generator from reducing the transmitter audio. Use a value in the range of 1K to 10K depending on what yields the best results.

(FIGURE-1)



## PARTS LIST

- R1 20K 15 turn trimmer pot (RSU 10524205)
- R2 470 ohm ¼ watt
- R3 10K ohm ¼ watt
- R4 1K ohm trimmer pot (271-280)
- R5 10K ohm ¼ watt
- C1 1uF Mylar, polyester or metal film capacitor (272-1055)

- C2, C3 10uF electrolytic capacitor (272-1025)
- C4 .01uF ceramic capacitor (272-131)
- C5 4.7uF electrolytic capacitor (272-1024)
- D1 1N4735 6.2 volt zener diode (276-561)
- Q1 2N3904 transistor (276-2016)
- BD General purpose IC PC board (276-159B)
- IC-1 LM567 (RSU 11391968)