Sound triggered alarm

This simple alarm will sound when triggered by a low level audio signal, such as that from a mobile phone or small travel alarm clock.

The microphone is a piezo element from a musical greeting card which produces a 20 - 90mV signal, and it is connected to Q1 wired in a self biasing configuration. The signal from the microphone is rectified and passes to Q2 which, with the 100k trim pot acting as a trigger level control, switches Q3 off. this allows the oscillator based around Q4 and the second piezo element to start producing a loud beeping tone in time with the triggering signal.

The oscillator in this circuit is quite interesting in that these three-lead piezo transducers have a section of the active surface insulated from the rest of the driven electrode, and the small voltage developed between this section and ground is used as feedback to the transistor, locking the oscillator into a frequency determined by the resonant frequency of the piezo transducer.

Powered by a 9V battery, the circuit draws 600uA standby current and 13mA when activated, giving an approximate three-month battery life when used with a mobile phone in normal business use.

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