

Cell-Phone calling Actuator

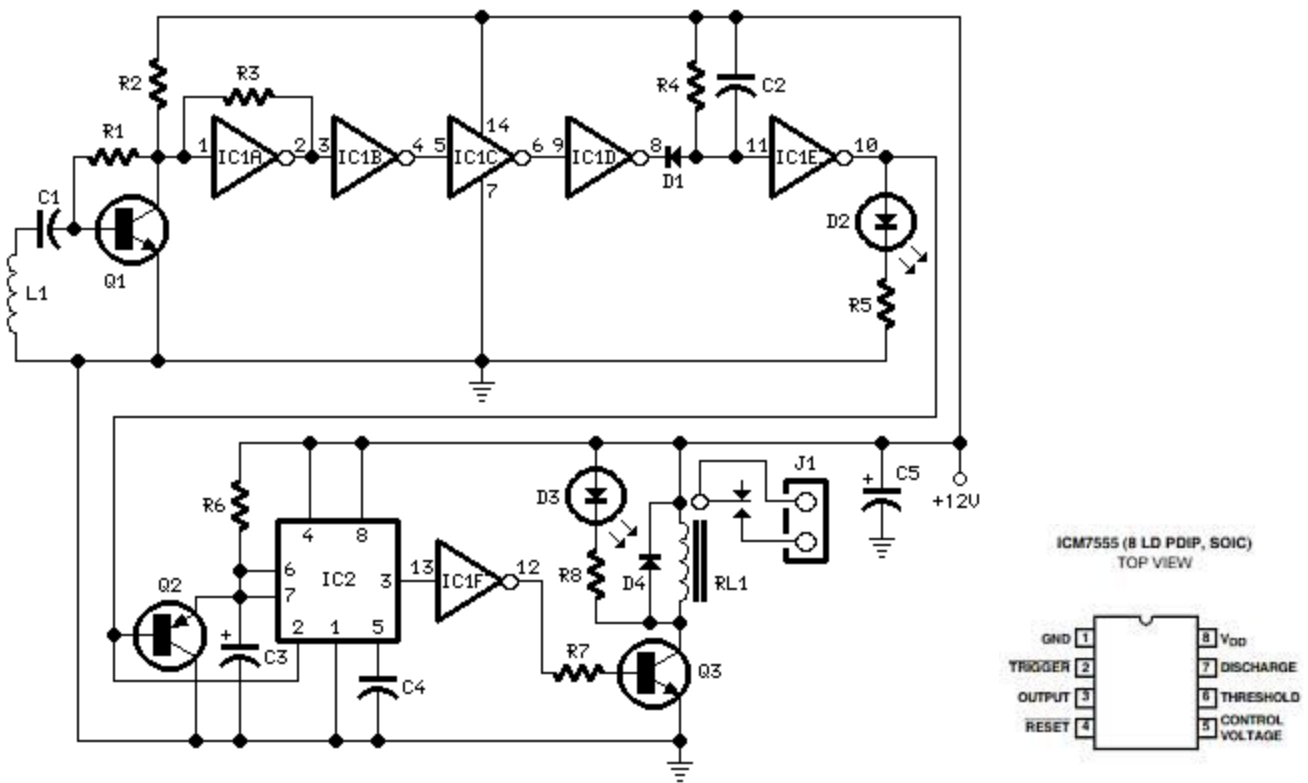
Source reference <http://www.redcircuits.com/Page151.htm>>

Edited by : [ChazTech](#) for local use

Drives a relay when an incoming call is detected

12V dc supply

Circuit diagram:



Parts:

R1,R3,R4,R6 _____ 1M 1/4W Resistors
R2 _____ 3K9 1/4W Resistor
R5,R8 _____ 1K 1/4W Resistors (Optional: see Text)
R7 _____ 10K 1/4W Resistor

C1 _____ 100nF 63V Polyester or Ceramic Capacitor
C2 _____ 1 μ F 63V Polyester or Electrolytic Capacitor
C3 _____ 10 μ F 25V Electrolytic Capacitor
C4 _____ 10nF 63V Polyester or Ceramic Capacitor
C5 _____ 470 μ F 25V Electrolytic Capacitor

D1,D4 _____ 1N4148 75V 150mA Diodes
D2,D3 _____ LEDs 3 or 5mm. (Optional: see Text)

Q1 _____ BC547 45V 100mA NPN Transistor
Q2 _____ BC557 45V 100mA PNP Transistor
Q3 _____ BC337 45V 800mA NPN Transistor

IC1 _____ 4069 Hex Inverter IC
IC2 _____ 7555 or TS555CN CMOS Timer IC

L1 _____ 10mH miniature inductor

RL1 _____ Relay with SPDT or DPDT switch
Coil Voltage 12V. Coil resistance 200-300 Ohm

J1 _____ Two ways output socket

Comments:

This design is a development of the well known [Cellular Phone calling Detector](#) circuit. Many correspondents required a circuit of this kind but capable of driving a relay and supplied at 12V.

The final circuit adds to the original pulse detector coil and transistor amplifier a further amplifier and squarer, a pulse to dc converter, a timer and the relay driver.

The timer was necessary to avoid false triggering: in this way the relay will be energized only after the cell-phone is ringing since at least 10 seconds.

IC2 : The "7555 IC" refers to the [ICM7555](#), a CMOS (Complementary Metal-Oxide-Semiconductor) version of the widely popular NE/SE555 timer IC. It functions as a precise timer, capable of generating accurate time delays or frequencies and is commonly used in astable (oscillator) and monostable (one-shot) modes for applications like waveform generation, measurement, and control systems. Key advantages of the ICM7555 over the standard 555 include significantly lower power consumption, higher operating frequencies, and a wider supply voltage range, making it ideal for battery-powered devices.

Circuit operation

Q1 amplifies the signal generated by the cell-phone during an incoming call and detected by L1. IC1A wired as an analog amplifier drives three inverters in series (IC1B, IC1C and IC1D) acting as square wave converters. IC1E and related components form the pulse to dc converter: when a train of pulses appears at IC1D output, a 12V steady positive voltage is present at the output of IC1E.

An optional LED (D2) can be useful to signal that a call is incoming, mainly when the cell-phone is muted.

Q2, IC2 and related components form a 10-seconds timer followed by the relay driver (IC1F and Q3).

When the output of IC1E is low, the output of IC2 is high: therefore the output of the inverter IC1F is low and Q3 is cut off. When the output of IC1E is high, C3 starts charging through R6 and after about 10 seconds IC2 will be triggered and its output voltage will fall to zero, forcing the output of IC1F to go high: this causes the transistor to conduct and the relay will be energized.

The LED D3 is optional and can be useful to signal when the relay is on.

Notes:

- A commercial 10mH miniature inductor, usually sold in the form of a tiny rectangular plastic box, was found useful as a detector coil in place of the self-made coil. Contrary to the Cellular Phone calling Detector circuit, a high sensitivity is not required here in order to avoid false triggering of the relay.
 - Place the cell-phone in close contact with L1.
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