Ahsanullah University of Science and Technology

Dept. of Electrical and Electronic Engineering

Mobile Phone Call Indicator

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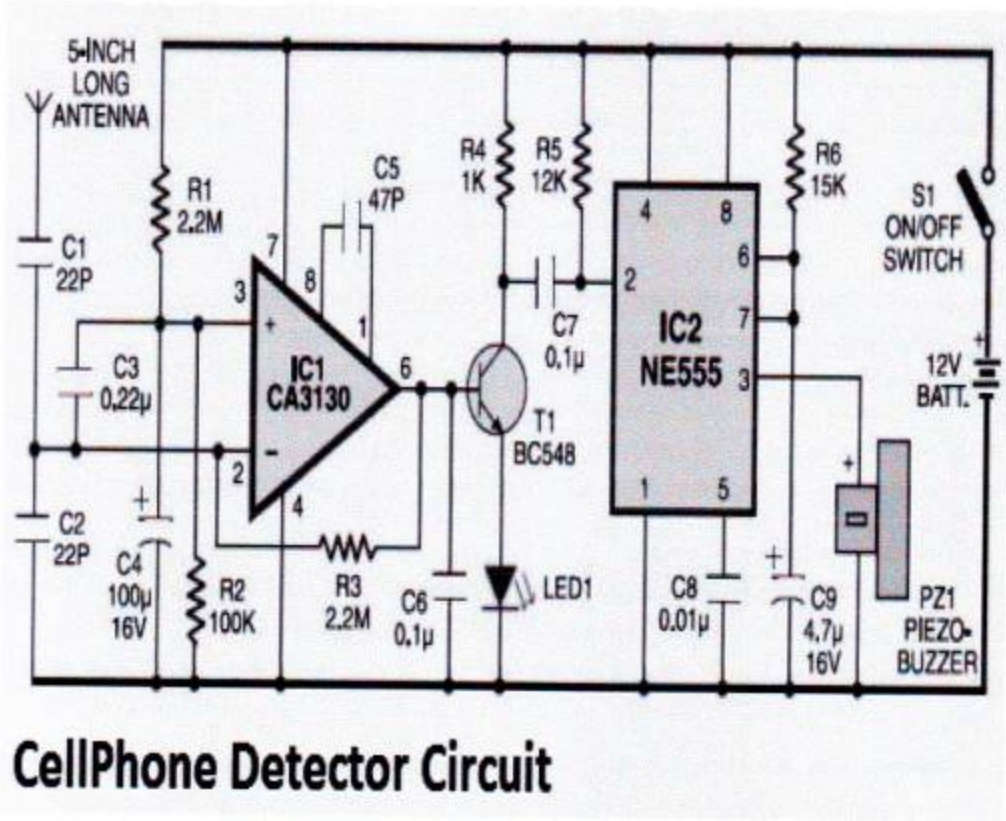
Mobile Phone Call Indicator

Equipments:

1. IC2 NE555
2. IC1 CA3130
3. BC548
4. LED-2 pieces
5. Resistance-2.2M-2 pieces
   100k, 1k, 15k, 12k-1 piece each
6. Capacitors-.22uf, 22pf, 100uf, 47pf, .1uf, .01uf, 4.7u-1 piece each
7. Piezobuzzer
8. Battery-12V

Circuit Diagram:



CellPhone Detector Circuit

Working Principle:

The circuit can detect both incoming and outgoing calls, SMS and video transmission even if the mobile phone is kept in the silent mode. The moment the bug detects RF transmission signal from an activated mobile phone, it starts sounding a beep alarm and the LED blinks.

An ordinary RF detector using tuned LC circuits is not suitable for detecting signals in the GHz frequency band used in mobile phones. The transmission frequency of mobile phones ranges from 0.9 to 3 GHz with a wavelength of 3.3 to 10 cm. So a circuit detecting gigahertz signals is required for a mobile bug.

Here the circuit uses a 0.22µF disk capacitor (C3) to capture the RF signals from the mobile phone. The lead length of the capacitor is fixed as 18 mm with a spacing of 8 mm between the leads to get the desired frequency. The disk capacitor along with the lead acts as a small gigahertz loop antenna to collect the RF signals from the mobile phone. Op-amp IC CA3130 (IC1) is used in the circuit as a current-to-voltage converter with capacitor C3 connected between its inverting and non-inverting inputs. Capacitor C3 in conjunction with the lead inductance acts as a transmission line that intercepts the signals from the mobile phone. This capacitor creates a field, stores energy and transfers the stored energy in the form of minute current to the inputs of IC1. This will upset the balanced input of IC1 and convert the current into the corresponding output voltage.

Capacitor C4 along with high-value resistor R1 keeps the non-inverting input stable for easy swing of the output to high state. Resistor R2 provides the discharge path for capacitor C4. Feedback resistor R3 makes the inverting input high when the output becomes high. Capacitor C5 (47pF) is connected across 'strobe' (pin 8) and 'null' inputs (pin 1) of IC1 for phase compensation and gain control to optimize the frequency response.

When the cell phone detector signal is detected by C3, the output of IC1 becomes high and low alternately according to the frequency of the signal as indicated by LED1. This triggers monostable timer IC2 through capacitor C7. Monostable timer is used here to get a pulse whenever pin 2 detects a pulse and the buzzer and LED is turned on. Capacitor C6 maintains the base bias of transistor T1 for fast switching action. Here, transistor BC548 is used for connecting pin 2 to the ground as while capacitor is discharged pin 2 is connected to the ground. The low-value timing components R6 and C9 produce very short time delay to avoid audio nuisance.

We have used the miniature 12V battery of a remote control and a small buzzer to make the gadget pocket-size. The unit will give the warning indication if someone uses mobile phone within a radius of 1.5 meters.