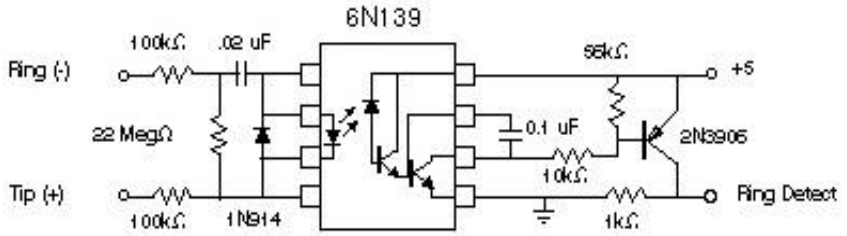
Telephone Ring Detector Circuit

When used with a home automation system that has digital inputs, this circuit will indicate when a phone line is ringing. For multiple phone lines, build one of these circuits for each phone line to indicate WHICH line is ringing.

Using the 'ringing/not ringing' state information provided by this circuit, your home automation interface can mute the stereo when your phone is ringing, play customized answering machine greetings based on which line is ringing, etc.



Circuit Description

When ringing voltage (a 90 Volt/20 Hertz signal sometimes called 'Jingle Juice') is detected on the line, a small amount of current, limited by the 100K resistors, and coupled through the .02 uF capacitor, causes the infrared LED inside the 6N139 to turn on. The 1N914 diode protects the IR LED from being fried by the high reverse voltage during the negative half of the AC cycle. When the infrared light from the LED hits the photodiode, it conducts a small amount of current (on the order of 10 millionths of an amp). The first transistor in the IC amplifies that current, and then uses it to saturate the 2nd transistor, which pulls to ground. Finally, the external 2N3906 does the last stage of amplification and pulls "ring detect out" high. The .1 uF capacitor filters the pulses of AC so the output is a clean transition "high'. This circuit outputs a high signal when the phone is ringing, but does not draw enough current from the phone line to 'pick up' the phone.