

Description of Remote Telephone Indicator

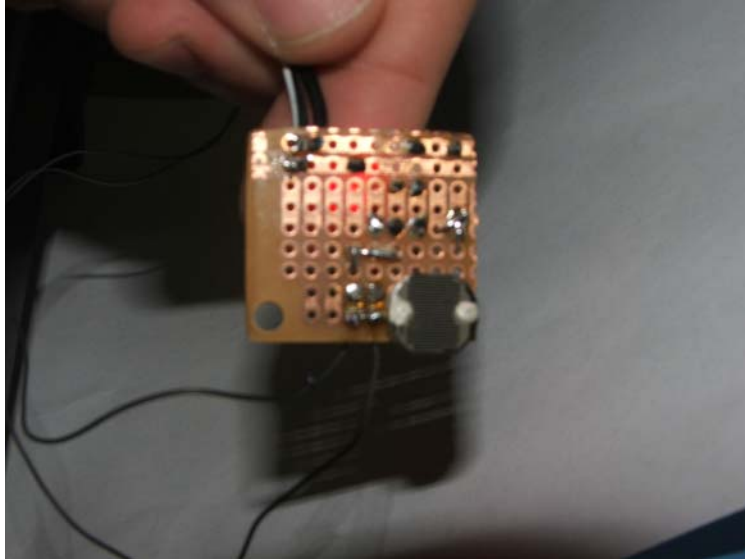
This project shows that even a simple circuit can sometimes be very effective. Where I work, most of the engineers reside in cubicles. Whenever I was near my cubicle, either in the lab or talking to another engineer and the phone rang, it was difficult to tell if it was my phone that was ringing because all of the phones have the same ring-tone. The Remote Telephone Indicator solves this problem by relaying the status light on my phone to an indicator placed above my cubicle on a pole. With the Remote Telephone Indicator in place, it is easy to see if my phone is ringing, or if I have a voicemail message waiting, even if I am not in my cubicle.

I didn't ask my employer, but I imagined that the company would not take too kindly to me opening up the phone and adding wires. The Remote Telephone Indicator is not connected to anything inside the telephone, and should be able to work with any phone that has an LED status indicator.

The circuit works as follows:

Light hitting CDS1 causes its resistance to decrease. CDS1 and R3 form a voltage divider. As the resistance of CDS1 decreases, the voltage at the gate of Q1 increases. When the voltage at the gate of Q1 reaches Q1's V_{GS} threshold, Q1 will start to turn on. When Q1 is on, the drain of Q1 will be pulled down near ground and LEDs D1 and D2 will light. D1 is needed to replace the LED status indicator on the telephone because it is blocked from view by CDS1. D2 is placed on a pole above the cubicle.

I built the Remote Telephone Indicator using a piece of proto board from Radio Shack. Mount CDS1 on the solder side of the board. The leads go through the board and are then bent and then fed through the board again so that they can be soldered to solder pads.



All other components are mounted on the other side of the board. Wire the components as shown in the schematic.

The remote indicator can be assembled as follows:

I used a foot long $5/32$ inch O.D. brass tube that I found in a local hobby shop for the light pole. First, solder a long wire to the anode of LED D2 and use heat shrink tubing to cover all of the exposed lead.



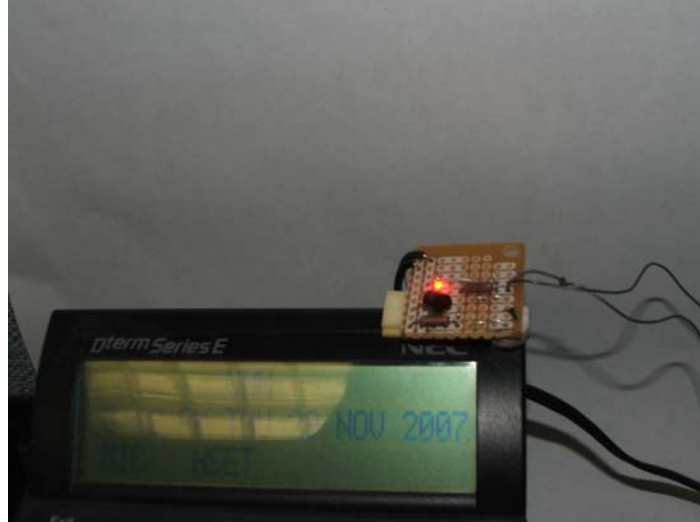
Slide the wire through the brass tube. The cathode of the LED is soldered to the outside of the tube. I used heat shrink tubing to cover up some of the tube. This helps to hide the brass, which is quite shiny, and increases the contrast when the LED is lit.



Solder another long wire to the bottom of the tube on the outside. Connect the wires to the proto board per the schematic.



Mount the board on top of the phone so that the CDS cell is directly above the indicator light. I used pieces of foam tape with adhesive on both sides to mount the board.



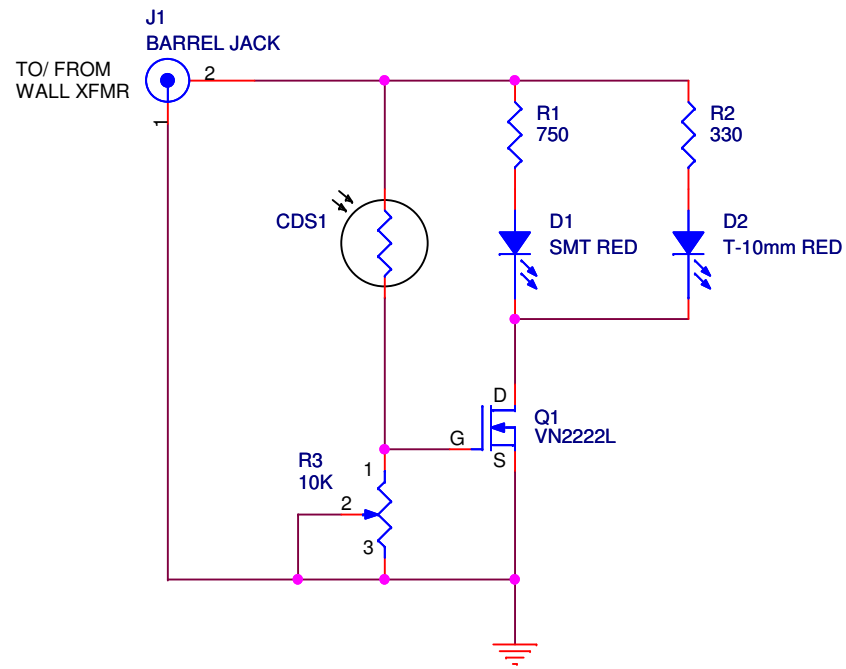
As you can see, the reason for LED D1 is because the indicator light on the phone is covered from view by the board.

Turn R3 fully counter-clockwise. Plug the wall transformer into an AC outlet. Have someone call the phone and leave a message. Gradually turn R3 clockwise until D1 lights. LED D2 should also light. Then turn R3 just a little further clockwise in order to add some margin.

Now, position the light pole in a suitable spot in your cubicle so that it extends above the cubicle wall. I used thin double tape with adhesive on both sides.



Now, you can see if it's actually your phone that's ringing, or if you have a message waiting, without being in your cubicle.



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| Drawn By | | ALAN VOGEL | |
| Title | | REMOTE TELEPHONE INDICATOR | |
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