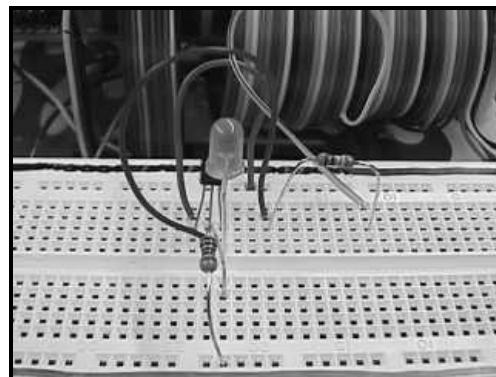


This application note explains how to attach an LED (light emitting diode) indicator to the encoder sensor signal. As the drive wheel turns the LED will turn on and off. On the ARobot controller board, this signal goes to the coprocessor which increments a counter every time one of teeth on the encoder wheel travels through the encoder sensor. The distance traveled is determined from the number of teeth counted. In addition to being a simple project for ARobot, it's also very instructive.



### Assumptions

It is assumed that you have mounted a breadboard or proto board to ARobot, that you have made an expansion cable, and that you understand how to use these parts. See the breadboard application note for more information.

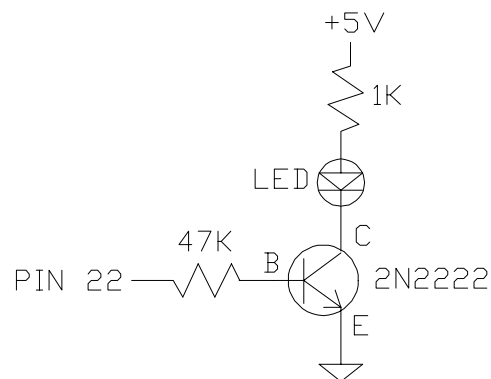
### Parts

The parts you'll need can be purchased at most electronic supply stores including Radio Shack <http://www.radioshack.com> , Mouser Electronics <http://www.mouser.com> , and DigiKey <http://www.digikey.com>. The resistors and LED also come in assorted packs. For a little more money, you can get a lot more parts. Just about any NPN transistor will work in place of the 2N2222. Just about any LED will work except an IR LED which you can't see. The example picture shows a green LED.

Part	RS Part #	Price
2N2222 NPN transistor	#276-2009	\$0.59
47k ohm resistor	#271-1342	\$0.49
1k ohm resistor	#271-1321	\$0.49
Red LED	#276-041	\$0.99

### Schematic

The transistor on the schematic has its pins labeled E, B, and C. These pins are located on the transistor from left to right (E, B, C) as you are reading the face of the transistor with the legs down. If the LED is hooked up backwards it will not work but won't harm it. Pin # 22 on the expansion cable is used to control the LED.



The transistor in this circuit acts like an electronic switch. A voltage applied to the Base (B) of the transistor allows current to flow through it which turns on the LED. This particular transistor can allow about 200 ma to safely flow through it.



## Software

```
'edled.bs2    www.robotics.com
'This routine simply turns on the dc motor which makes 'encoder
wheel turn, which makes the LED blink.

charn  var    byte           'input variable.

net    con    8              'coprocessor network pin.
baud   con    396           'network baud rate.

speaker con    9            'speaker pin.

setup
  low  speaker           'turn off speaker.

main
  serout net,baud,["!1M111FFFF"]    'turn on motor.
  serin net,baud,[charn]            'get ack from coprocessor.
  if charn<>"A" then main          'keep trying if no good.

done
  goto  main                'loop forever.
```

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See our web site at:

<http://www.robotics.com/arobot>

for additional application information.

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