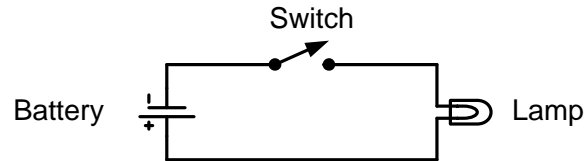




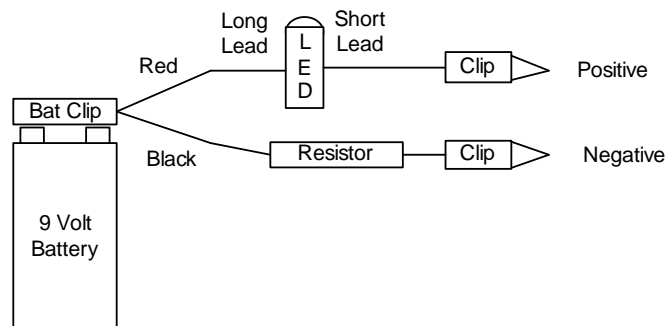
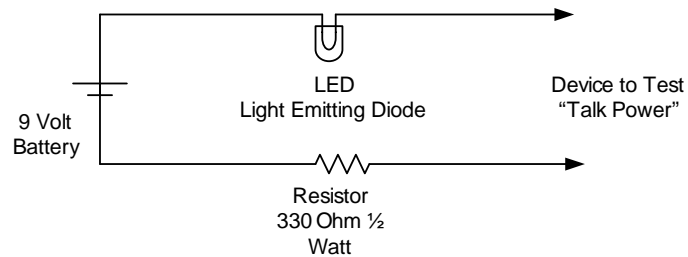
## Basic Electric Circuit

This basic circuit has a battery, switch and a light bulb. They are connected with wires. Current flows from the battery, thru the switch, into the light bulb and back.

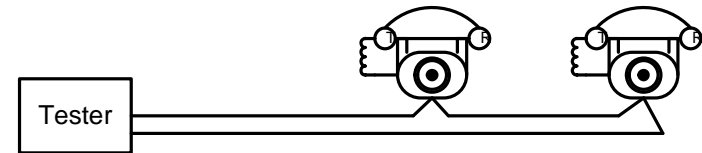


What you will build is very similar. The light bulb has been replaced by an LED (Light Emitting Diode) that uses less power and lasts for thousands of hours. The switch is a set of clip leads that will let you connect the tester to an old telephone or almost any type of electronic part and test it to see if there is a connection.

## The Simple Tester



Connect two telephones like this, talk between them, use Rotary Dial Telephones.



Telephone installers use a device similar to the one you just built, it also contains a tone generator and a short modular cord. Usually it is in a small yellow plastic case about 3"x 3" x 1 1/2". Look on e- Bay under "telephone tester or cable tester". An advantage of the little yellow box is that it also contains a tone generator that is used to trace cables. Sometimes paired with this in the same package (if you get a new one) is a small hand held amplifier to aid in the tracing of wires. The pair of them can be obtained for about \$35 to \$50. The original brand name was Progressive but now there are imports

This tester and an audio probe sells for about \$35 to \$50 on EBay. Many large hardware stores also sell these devices.



NOTE: All of these tests have been done without any connections to the telephone from the phone line. When you use this tester there should be NO source of electrical power. The battery on the tester should be the only source of electrical power.

[oldphoneguy.net](http://oldphoneguy.net)

February 15, 2009

## Other Things To Test

Capacitors – Capacitors charge and discharge and the LED will go bright and then go out when it charges, and if you reverse the leads and test again, the LED will get very bright and go out, as it discharges (the first charge) and then goes out as it charges in the opposite direction.

Diodes – Diodes conduct in one direction only. Connect the leads one way then reverse them.

Transformers – You will not be able to tell any difference in the resistance of different windings as most windings are low resistance and will not change the brightness of the LED. This also applies to Induction Coils.

Just about anything electrical can be tested, as long as there is NO source of power in the device you are testing, such as a battery or it is being plugged in.

You can test a 1 ½ volt battery, one way as the 1 ½ volts adds to the 9 volts, the LED will be brighter compared to the other direction, where the 1 ½ volt battery will subtract from the 9 volts. Do not test any other types of batteries.

Test everything electrical you can think of, such as a toaster (without any power applied).

This is the tester to carry with you when you go to garage sales or swap meets to test any phone or electrical device you find. Does it work? If not, offer a lower price.

And when you are bored, get a Morse Code chart and learn the Morse Code by touching the clips together. A is one short and one long. S is three shorts and O is three longs.

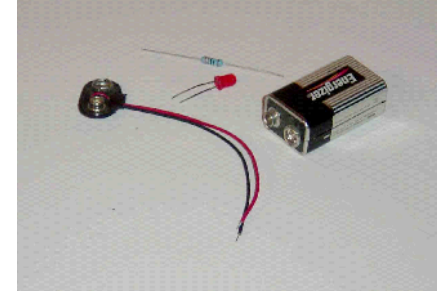
## Parts List

9 Volt Alkaline Battery and matching Battery Clip

LED – Any type of LED will work (Hi Brightness suggested)

Resistor – 330 Ohm ½ or ¼ watt (Orange, Orange, Brown, Gold)

Clip Leads – Buy a package of 10 (you will use them later)



## Complete Tester



Electrical tape is used for final assembly

## What You Built

This tester will indicate a connection between the two clip leads. If you touch the leads together, the LED will light. Current will flow in the device under test. A short circuit, touching the clips leads together or an on off switch will make the LED glow at maximum brilliance. If there is any resistance, such as with a telephone set or the coil of a ringer, the LED will still glow but it will not be as bright.

In the old days, a buzzer and a battery were used, Western Electric made a test set like this. Sometimes a small flash light bulb was used. This is the modern version, and the battery life is much longer.

This device will help you understand how electricity flows and how different devices behave when an electric current is applied to them.

## Getting Started

1. Touch the leads together, the LED will light.
2. Using a known good telephone set, such as a Western Electric 500, or AE 80, find the tip and ring or the green and red wires and attach the tester. Pick up the handset and the light will light but not as bright as in the first test above. Now talk and you should hear your voice.
3. If the set is a rotary dial set, dial some numbers, the LED will blink or go out once for each digit, so if you dial a 4 you will count 4 blinks. The dial is a switch and is turning on and off the circuit.
4. Yell into the transmitter and see if the LED gets dimmer or brighter. The transmitter is a variable resistor which varies the resistance depending on the sound pressure.

## Advanced Tests

1. Remove the receiver element from the handset, test it with the tester, you should hear a click in the receiver.
2. Remove the transmitter element from the handset, test it with the tester, the LED should light. As you sharply tap the transmitter with a pencil or bang it hard on the edge of the transmitter, not the front or back of it, on a table, the LED should vary slightly in brightness.
3. Find the wires on the bell, usually only two wires, remove one of them from where it is connected and test the bell by connecting to the two bell wires, the LED should be slightly dimmer compared to shorting the wires on the tester. The bell coils have resistance and the current will be lower in the LED and it will be dimmer.
4. Find the pulse contacts on the rotary dial (the contacts that open and close once per number dialed), remove one of the wires connected to the dial and attach the tester to the dial contacts, the LED should stay on and when you dial you get one blink for each number.

You soon see that a connection or short circuit or a piece of wire has continuity and if you test it the LED on your tester will show you the resistance (zero resistance on a piece of wire, perhaps 2,000 Ohms on a bell coil) by the brilliance of the LED.

If you test a Touch Tone® telephone, it may be necessary to reverse the leads of your tester to make the telephone “tone”. Some early models of this telephone did not contain a polarity guard. The current (power) that this tester applies to the telephone is limited, and you may not get full tone volume.