

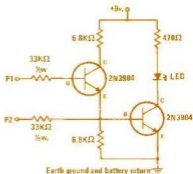
4 110-volt detector

Here's a small, portable *leakage detector* you can use to spot potentially lethal voltages on appliances and power tools. The detector consists of just two NPN transistors, an LED and five resistors—all standard junkbox variety. Although 2N3904 transistors are specified, just about any small signal NPN type should work.

The detector requires the use of a good electrical earth ground. Your best bet is a cold water pipe, if your home has metal pipes. If you're in a modern home, it may have plastic pipes, which won't work in this application.

If you don't have a metallic cold water pipe available, you can attach the ground lead to the screw holding the wallplate onto any 110-volt convenience outlet. If, in loosening the screw, the plate comes loose, be careful. The voltages behind the plate are lethal.

The entire circuit can be built into a small container. For your safety, it should be made of plastic. A standard nine-volt battery will provide working power for the detector.



Two probes are provided, in addition to a grounding lead. To use the detector, attach the ground lead to the cold water pipe or other electrical earth ground. Then touch the device to be tested with the probe P1. If the LED turns on, there is enough leakage for you to consider the device potentially dangerous. Then touch probe P2 to the device.

If the LED lights with P2, the leakage is high enough to be considered dangerous, even lethal. If this is the case, disconnect its ac power immediately. Don't reconnect the power until you've found the fault.