

# TECHNICAL SOURCE GUIDE

## CABLE TESTER

By Thomas J. Blalock

The home-brew cable tester described in this article has two advantages over the commercially available ones: it costs less (if you count only the cost of materials), and it gives you the ability to do a pseudo load test on a cable, something not possible with an LED-based cable tester.

Construction of this cable tester is quite simple. Three octagonal junction boxes are arranged in a row, connected with 1/2" conduit. As indicated in Figures 2 and 3, the wires are arranged so that lamp A is connected to Hot (black wire) and Neutral (white wire), Lamp B is connected to Neutral and Ground (green wire), and lamp C is connected to Ground and Hot. A length of 12 gauge three-wire SO cable, terminated with a standard three-pin stage plug, is connected to the device as shown in Figure 2. The 120 volt power supply is wired with a normally closed push-button to lift (disconnect) the Ground.

To use the tester, plug one end of your cable into the power supply and the other end into the tester. Three equal-wattage lamps, typically 150W, must be used to be able to accurately read the cable condition based on the following table:

<u>Lamp A</u>	<u>Lamp B</u>	<u>Lamp C</u>	<u>Cable Condition</u>
bright	out	bright	OK
bright	bright	out	Hot and Neutral reversed
out	bright	bright	Hot and Ground Reversed
dim	dim	bright	Neutral Open
bright	dim	dim	Ground Open
dim	bright	dim	Hot on Neutral with Hot Open, or Hot on Ground with Hot Open

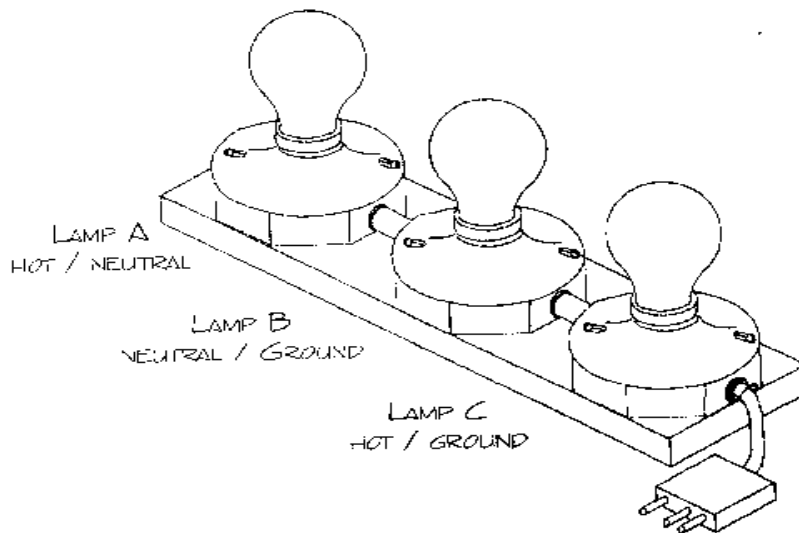
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Normally, it is difficult to determine whether Neutral and Ground are reversed, since the Neutral is always supposed to be grounded at the Service Entrance. In our tester, using the "ground lift" switch installed at the supply end of the cable will produce the following results:

<u>Lamp A</u>	<u>Lamp B</u>	<u>Lamp C</u>	<u>Cable Condition</u>
bright	dim	dim	OK
dim	dim	bright	Neutral and Ground Reversed

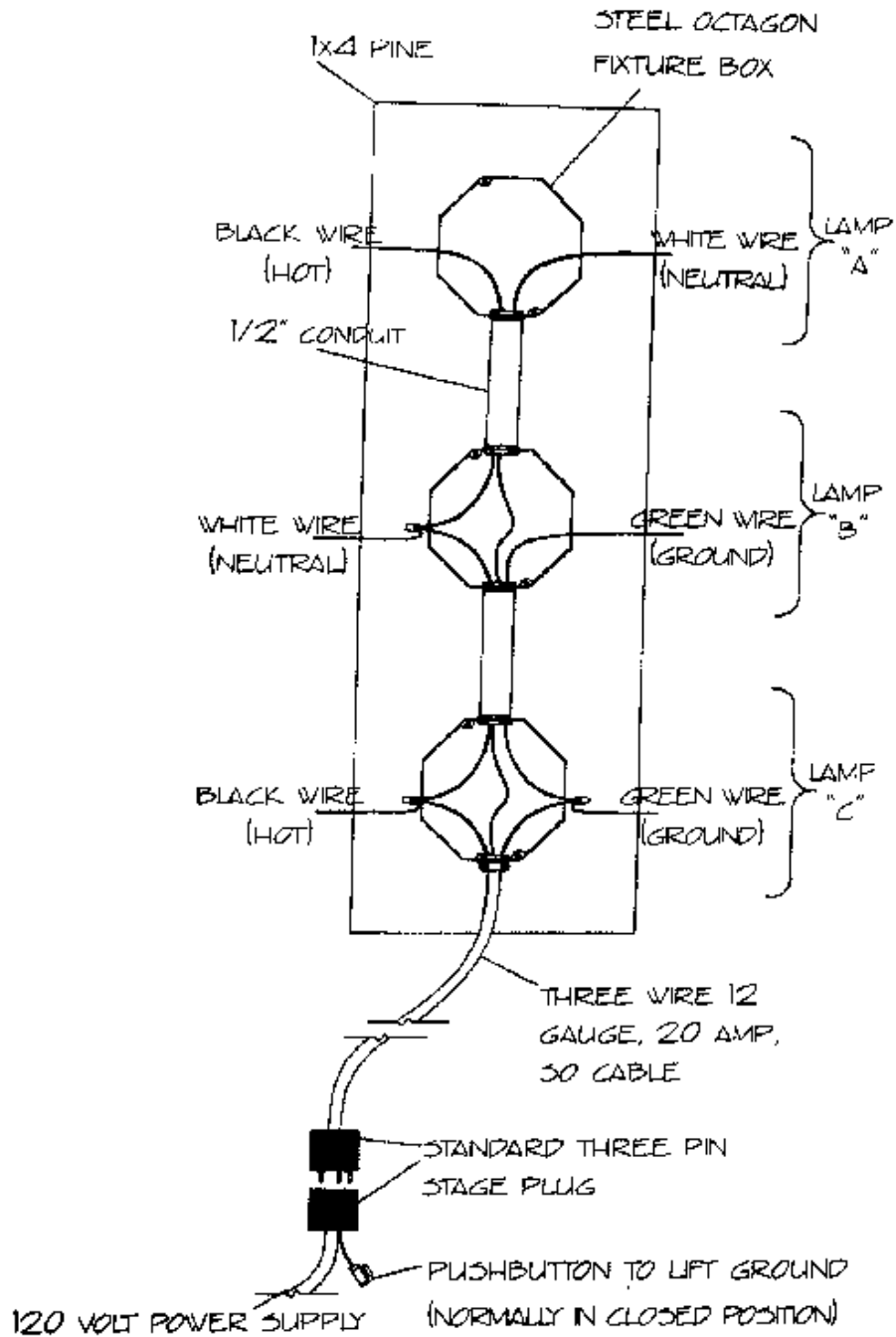
Our cable tester, using 150W lamps, will typically pull one or two amps through the cable rather than the very tiny amount of current drawn when using LED or neon testers. This can show connection problems because the brightness of the lamps will be affected due to the resistance drop in bad connections. To effectively load test a cable, use three 1200W lamps instead of the normal 150W ones. It is important to note that this lamping-up, to create a pseudo load tester, will only test load on the Hot line.

The cable tester described in this article is inexpensive and simple enough for just about any theatre technician to build. It has worked well in actual use, and if properly constructed, using code- appropriate materials and safe wiring practices, this circuit tester will be a valuable addition to the tools of any theatre.



**FIGURE #1**

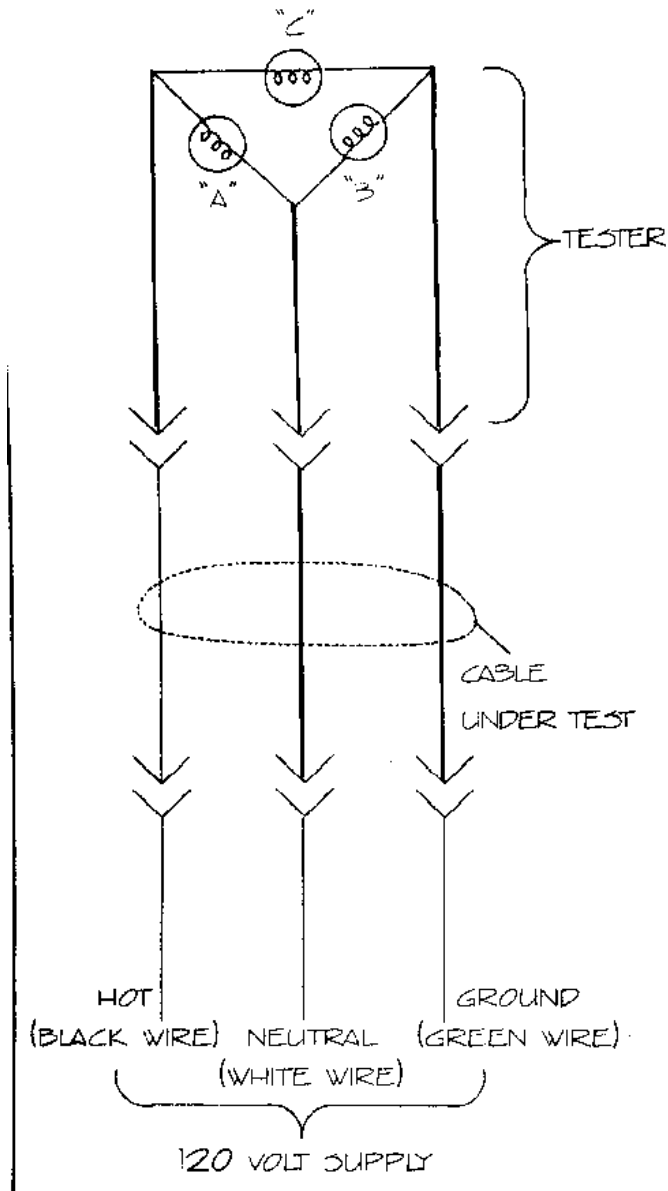
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**FIGURE #2 CONSTRUCTION DETAILS**

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**FIGURE #3 WIRING SCHEMATIC**

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