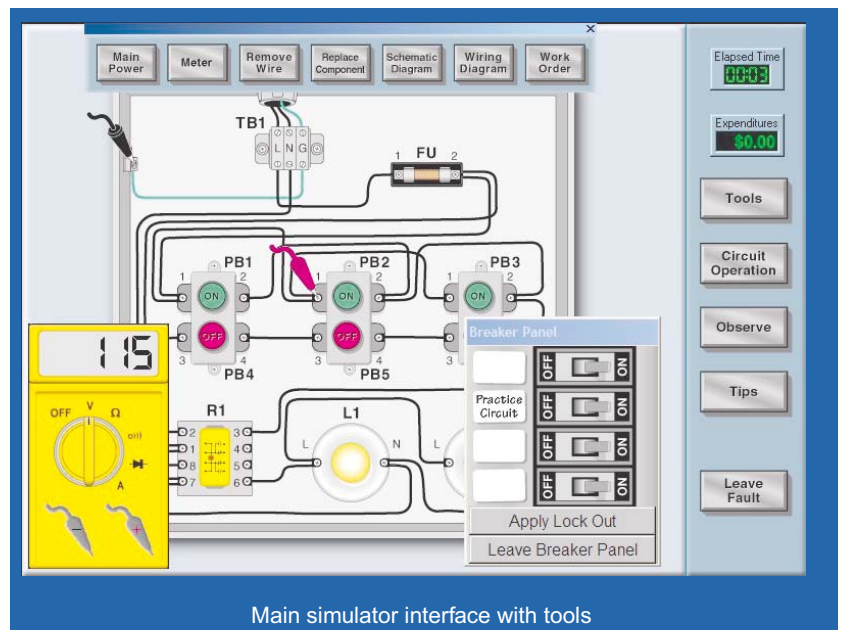


Troubleshooting

BASIC TECHNIQUES

This interactive Simulation Based training program is ideal for learning and practicing proven troubleshooting techniques in a safe environment.

This program teaches a systematic troubleshooting technique called the Five Step Troubleshooting Approach. This process, along with Testing Techniques is explained using animated graphics and text. Once familiar with the troubleshooting techniques, an "expert" guides the user through the troubleshooting process on a lighting circuit. You can then Test Your Skill by solving 20 faults of varying difficulty on the lighting circuit. Here, the time and dollars used to solve the fault is measured and evaluated. The program has a complete evaluation system which provides feedback as well as records all the steps the user performs to solve the fault, for later analysis of their troubleshooting approach.



Main simulator interface with tools



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Who Can Benefit

Anyone who wishes to improve their Troubleshooting Skills can use this program. Both college students and apprentices find this program increases both their skills and confidence when troubleshooting electrical circuits. This program also benefits seasoned electrical and maintenance personnel by providing a way to refine their reasoning process and provide a method to practice their skills thus increasing the effectiveness of their troubleshooting skills, resulting in reduced downtime of equipment.

Troubleshooting - Basic Techniques

Highlights

- Learn to Troubleshoot a lighting circuit in a safe environment
- Highly realistic interactive simulation of a lighting circuit
- Practical hands-on approach with 20 faults to solve
- Learn a systematic approach to Electrical Troubleshooting
- Apply an Expert's experience on sample faults
- See your troubleshooting score and review feedback on your troubleshooting skills
- Receive a Certificate when completed
- View and print reports of varying levels of detail

HOW THE CIRCUIT WORKS

When a normally open pushbutton such as PB1 is pressed, a circuit is completed through PB1, and the normally closed pushbuttons energizing relay R1. The relay's two contacts will close sealing in the relay and energizing the lights. The seal-in contact allows the relay to stay energized when the pushbutton is released. The circuit would behave in the same way if PB2 or PB3 were pressed instead.

Animated "How the Circuit Works" section

Simulator Features

- While troubleshooting faults you can do the following:
 - operate the circuit
 - lock out the circuit
 - take voltage and resistance readings
 - open connections
 - replace components
 - using the observe feature you can check for clues (visual and other) to help solve the fault
 - view schematic and wiring diagrams while troubleshooting the circuit.



BASIC TESTING TECHNIQUES

Using a Voltmeter

Voltmeters are the best tool to use for finding **open circuits** - if you can **safely turn the power on**. Once you know it is an open circuit and have determined the general area of the fault, get your voltmeter out and check that it is working on a known source.

Connect the negative lead to a known reference. The negative (neutral or ground if on AC) supply is preferable. Test through the affected circuit with your other lead, making sure all necessary switches are closed. The wire or device between the last point you test full voltage and the first place you don't get full voltage is where the open circuit is located.

Click the **Show Me** button for a demonstration of this technique.

"Basic Testing Techniques" section