WireLab

Version 3.0

**By WireLab Services**
www.wirelabservices.com

A Residential Wiring Course

## The first program using both textbook and interactive software to teach Residential Wiring

WireLab consists of a student manual with 17 chapters, describing all aspects of house wiring, with software assignments for each chapter. The software is designed to help electrical instructors teach their students the proper methods of residential wiring per NEC 2011 using interactive computer tools. The software can be downloaded on computers at home or at school. It is only available as a site license for schools providing Technical Education. *WireLab* teaches the students at their own pace what to do, not how to do it. They will still need hands on experience in the classroom.

The *WireLab* Software

The following example Log screen allows the student to log in with individual passwords which are embedded in each file which the student saves on disk or jump drive. This prevents students from loading any other student's files. Instructors can preload the class names of all students. The student then selects his name from the list and enters in his password. He can also choose to enter *WireLab* as a guest.
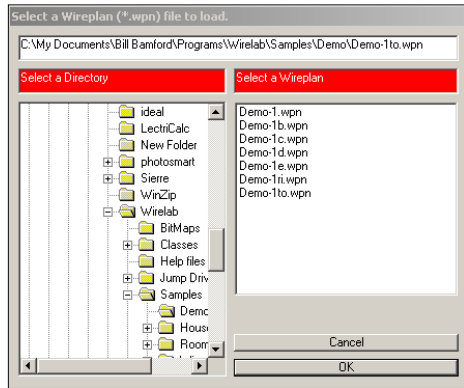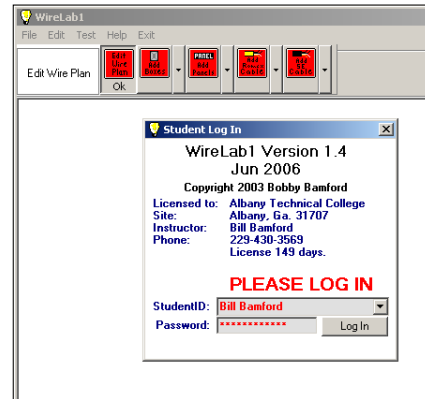
After logging in the student will load a floor plan from the disk or jump drive. Many floor plans are available. The floorplan below is House1.wpn. House1 is wired by the student as he works his way through the textbook. The floorplan on the left shows House1 before any boxes or cables are added. The blue lines on floorplan on the right shows where the NEC requires receptacle boxes in this dwelling.
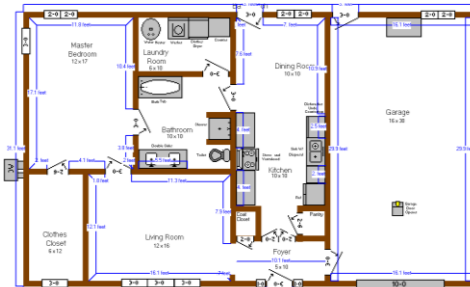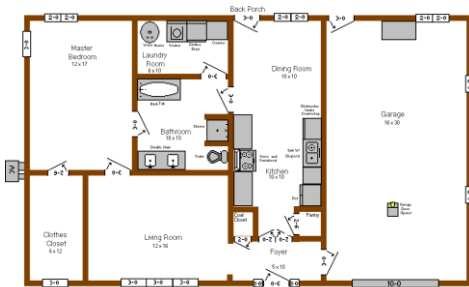
Each of the 17 chapters in the textbook has an assignment for House1 in the software. After the student completes each assignment, he requests an inspection. The software then tests the student's work to make sure that it meets all the requirements of the NEC and of the specifications.

Chapters 1-10 cover the roughing-in of House1. Using pull down menus, the student selects and installs boxes, appliances and panels onto the building floorplan. He can save his work and return at any point. The floorplan on the right shows all enclosures installed for House1.
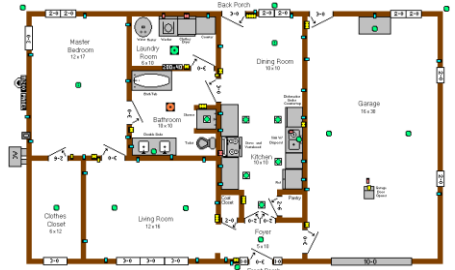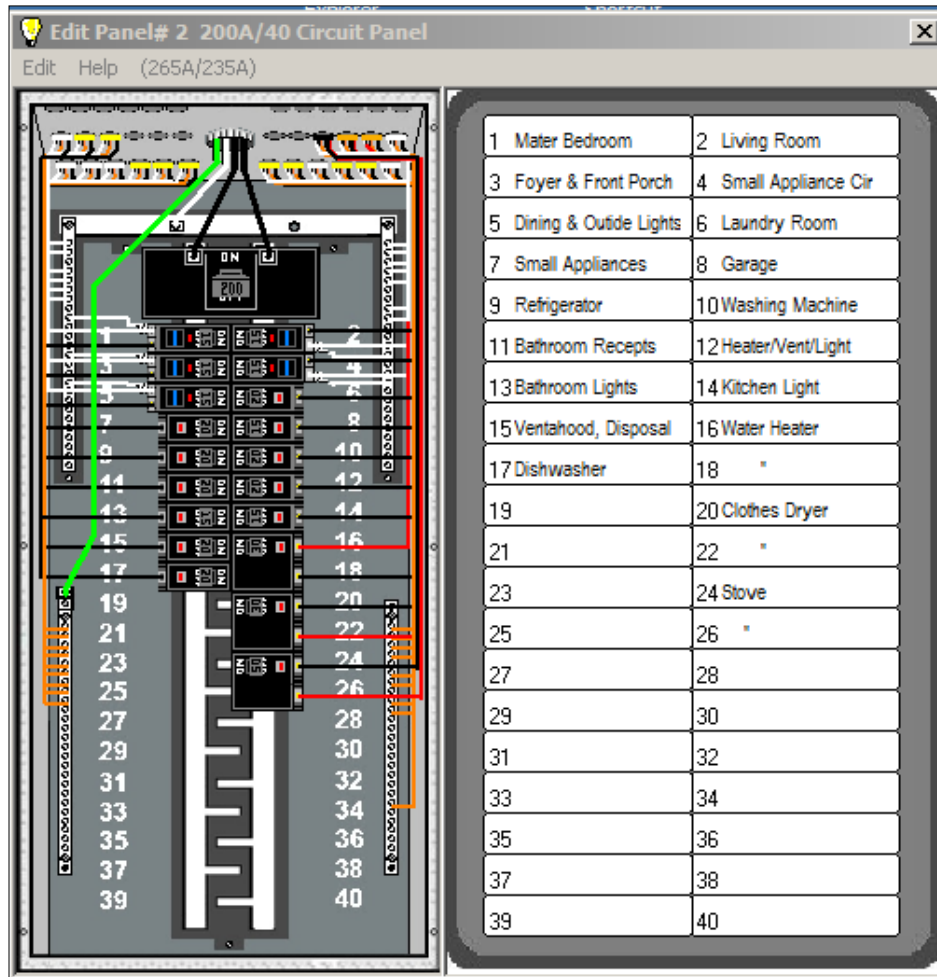
After all boxes and panels are installed, the student then selects and drags cables between boxes and panels. The floorplan on the right shows all cables installed. At this point he has completed chapters 1-10 of the textbook and all rough-in tests in the software.
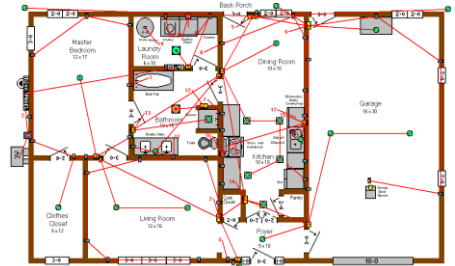
Chapters 11-17 cover the trimming-out of House1. All receptacles, switches, fixtures, and appliances are wired. This is done by double clicking on each box on the floor plan to bring up a box edit window. Then each wire is pulled from the cable ends to the device, fixture or appliance terminals.
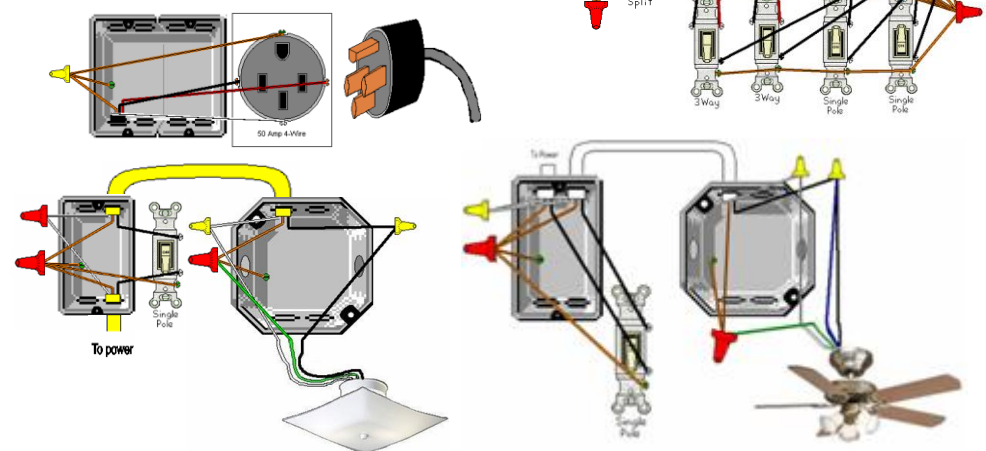
Chapters 16-17 cover the wiring of panels and finishing up trimming out the dwelling. Students wire the panel by pulling wires from the cable ends to the appropriate ground or neutral bar or to breaker terminals. If a main bonding jumper is required, the student must install it. Then the panel must be properly labeled.
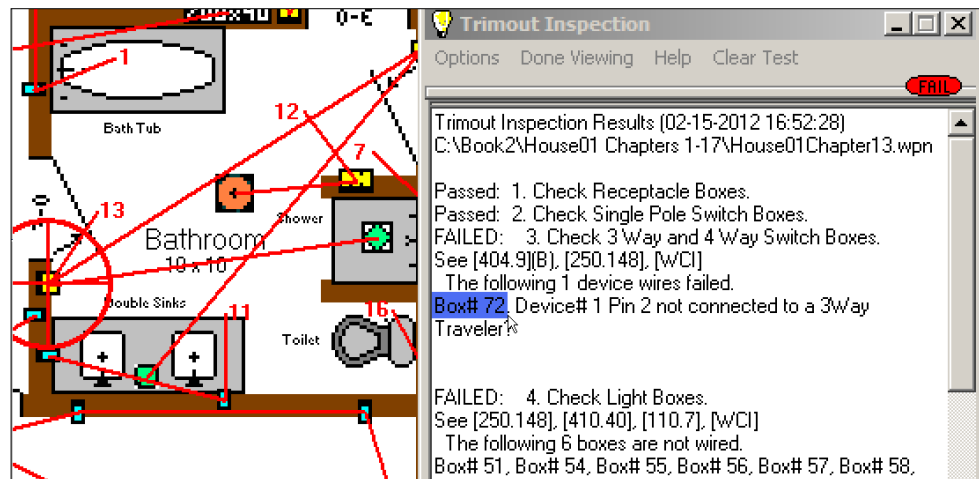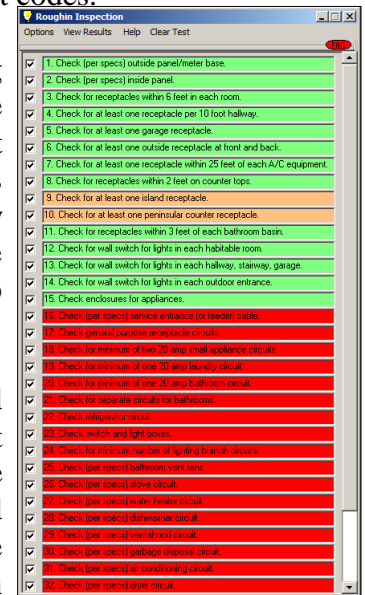

Edit Panel# 2 200A/40 Circuit Panel
Edit   Help   (265A/235A)

1 Mater Bedroom	2 Living Room
3 Foyer & Front Porch	4 Small Appliance Cir
5 Dining & Outide Lights	6 Laundry Room
7 Small Appliances	8 Garage
9 Refrigerator	10 Washing Machine
11 Bathroom Recepts	12 Heater/Vent/Light
13 Bathroom Lights	14 Kitchen Light
15 Ventahood, Disposal	16 Water Heater
17 Dishwasher	18 "
19	20 Clothes Dryer
21	22 "
23	24 Stove
25	26 "
27	28
29	30
31	32
33	34
35	36
37	38
39	40

WireLab's chapter 17 assignment checks all boxes to verify that the selected box size is appropriate for all installed components. Any white wires, used as hot wires, must be identified. Also, in 2011, a neutral wire is required in every switch box. When the student passes chapter 17's assignment, he has wired House1 according to code.

WireLab's **Inspections**. As the student completes each chapter's assignment, he calls for an inspection. *WireLab* checks his work with either a rough-in or trim-out inspection. Upon successful completion, he advances to the next chapter. If any test for a chapter's assignment fails, *WireLab* will turn the test that failed red as shown below. *WireLab* shows the student his mistake using an interactive report which gives details of the violation with links to all relevant codes.

When a rough-in test is run, any area missing a receptacle outlet is highlighted with blue lines on the floorplan. The interactive report (as shown below) is provided to list all faults found, explain the fault and list any applicable NEC codes. The NEC code can be highlighted with the cursor to bring up a help screen describing the NEC code requirements.

Highlighting a box in the report which failed will instruct *WireLab* to place a bulls-eye on it on the floorplan (see Box# 72 below). The student can double left click on the specified box to bring up the edit box window where the fault can be corrected. Then the student can rerun the test. When all tests pass, the student advances to the next chapter.

Trimout Inspection
Options   Done Viewing   Help   Clear Test   FAIL

Trimout Inspection Results (02-15-2012 16:52:28)
C:\Book2\House01 Chapters 1-17\House01Chapter13.wpn

Passed: 1. Check Receptacle Boxes.
Passed: 2. Check Single Pole Switch Boxes.
FAILED: 3. Check 3 Way and 4 Way Switch Boxes.
See [404.9](B), [250.148], [WCI]
   The following 1 device wires failed.
Box# 72, Device# 1 Pin 2 not connected to a 3Way Traveler

FAILED: 4. Check Light Boxes.
See [250.148], [410.40], [110.7], [WCI]
   The following 6 boxes are not wired.
Box# 51, Box# 54, Box# 55, Box# 56, Box# 57, Box# 58,

The **WireLab** software provides a fun way for students to learn the difficult processes and codes for wiring a house. Many tools are provided in the software including interactive reports, interactive help screens, and sample drawings. Power can be turned on at any time so that the student can test his connections to see lights, fans, receptacles and appliances turn on and off. Help screens with samples of receptacle and switch connections are available to help the new electrician to be able understand the way that complex connections are made. For example, the drawings show the various ways that three way and four way switches can be connected together. Many floor plans are available for the student to wire. Also, tools are provided which allow the student or instructor to create new floor plans to wire.

The software has many tools for the instructor. A class list can easily be created. Students cannot copy any other student's files. The instructor can see what time the student started the software and how long he worked on it, how many keystrokes he made, how many boxes, cables and wires he installed, etc. The instructor can retrieve a student's password when he forgets it. The *WireLab* software can easily be dragged onto a student's jump drive so that he can run it on nearly any computer he has access to. The student runs the software from the jump drive and saves his work to the jump drive. The instructor can run the student's *WireLab* software directly from his jump drive to see his work and help him with problem areas.

The *WireLab* Textbook

The textbook has over 350 pages with more than 700 illustrations. Seventeen chapters step the student through the process of wiring a house from start to finish. An introduction is given to the electrical field with an introduction to codes, safety, electrical organizations, and to using the *WireLab* software. The following is the table of contents:

I. Roughing-in the House
II. Trimming-out the House
III. Appendix (Extra help for new electricians)

For purchasing information or for more information contact either:

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