
Pintar **VirtuaLab™** **Electronics**

Chapter Three

Electronics

Overview

Introduction

The Pinter **VirtuaLab™** Electronics module has certain features that are different from any other Pinter **VirtuaLab™** modules.

- If you are new to Pinter **VirtuaLab™** you might want to familiarize yourself with the components which are found in the interface.
- Next, the fastest way of using the Pinter **VirtuaLab™** is by doing an experiment. This manual will give you step-by-step instructions on conducting an experiment.

In this chapter

This chapter covers the following sections;

Section	Title	See page
A	Components of the Interface	
B	The Experiment	

Section A

Components of the Interface

Overview

Introduction

In order, to use the Pinter **VirtuaLab™**, you need to be familiar with the different components that you will be using in conducting your experiment.

In this section

This section covers the following topics;

Topic	See page
The Work Window	
The Types of Menus	
The Control Panel	

The Work Window

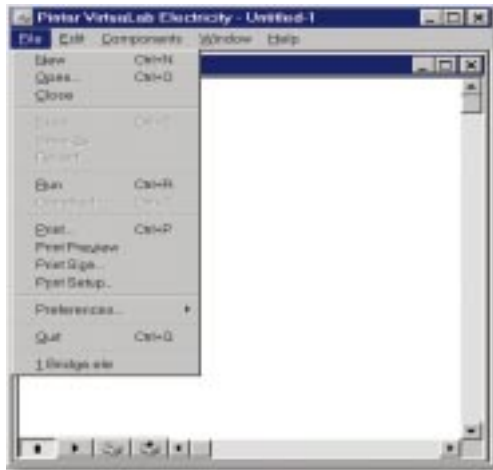
Introduction

The Work Window is

- A simulation of the real lab, so, you can create and conduct your experiments freely.
- The space where your electrical components are connected together to create an experiment.

The Types of Menus

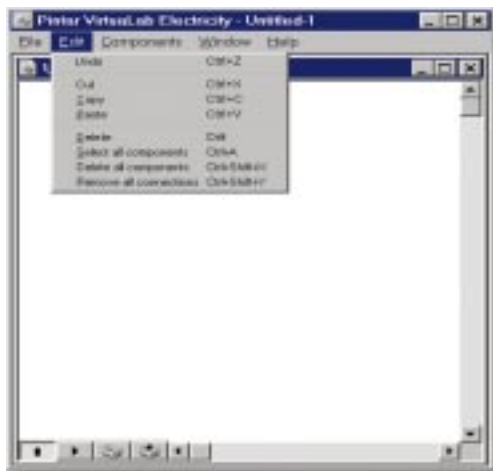
The File menu



It contains:

- Starting new experiment
- Opening a previously saved experiment
- Closing the active experiment
- Saving an experiment
- Saving a new experiment
- Undoing multiple changes
- Running/playing your project
- Stopping/editing your project
- Pausing your experiment
- Printing projects
- Setting preferences
- Ending work session

The Edit menu

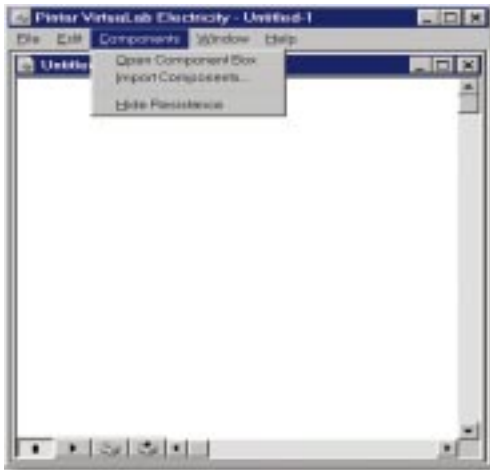


It contains:

- Undoing last action
- Editing an experiment
- Cut
- Copy
- Paste
- Deleting one, more or all components from the Work Window
- Selecting all components on the Work Window
- Removing all connections between the components

The Types of Menus (continued)

The Components menu



The Components menu houses all the components there are available for you to use in your experiments.

The Components menu is a two-level hierarchical menu.

- The first level menu lists the 15 categories of electronic components.
- When you roll the cursor over these categories the second level menu items, which are the components within each category, appear.

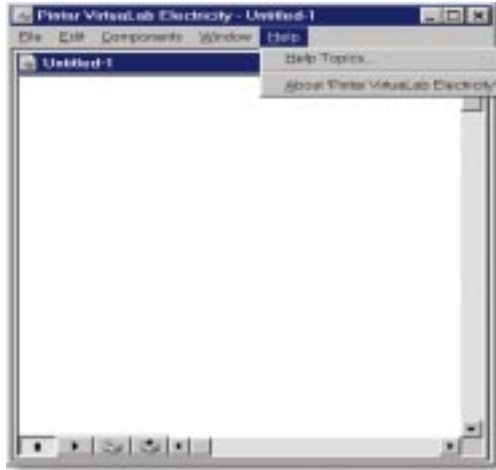
The Window menu

The Window menu offers the following commands for arranging multiple views of multiple documents in the application window:

Function	Description
Cascade	Arranges windows in an overlapped fashion
Tile	Arranges windows in non-overlapped tiles
Arrange Icons	Arranges icons of closed windows.
Window 1, 2, ...	Goes to specified window

The Types of Menus (continued)

The Help menu



It contains:

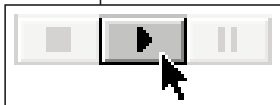


- Get Help
- About 'Pintar **VirtuaLab™** Electronics'

The Control Panel

What is the Control Panel

The Control Panel consists of the

- Run (or Play),
 - Construct (or Stop) and
 - Pause buttons.
-

Button	Function
<p>Run or Play</p> 	<p>Click on this button to 'run' the experiment. Alternatively, you may select Run from the File menu.</p> <p>Note: In the 'run' mode, an experiment would behave according to the parameters specified by the components. When the experiment is running, the experiment cannot be edited.</p>
<p>Construct or Stop</p> 	<ul style="list-style-type: none">• Click on the 'Construct' or 'Stop' button to return to the edit mode, that is, allowing the experiment to be added or deleted.• Alternatively, you may select Construct from the File menu.
<p>Pause</p> 	<ul style="list-style-type: none">• Click on this button to temporarily stop the experiment. <p>In this mode, the experiment cannot be edited.</p>

Section B

The Experiment

Overview

Introduction

The fastest way of using the Pinter VirtuaLab™ Electronics is by doing an experiment. With Pinter VirtuaLab™ Electronics, you can perform experiment by creating simple or complex circuits.

Section

This section will give you step-by-step instructions on conducting an experiment.

Topic	See page
Background	
Experiment Set-up	
Conclusion	
Troubleshooting	

Background

Experiment goal

Power supplies are an essential part of all electronics systems from the simplest to the most complex.

In this tutorial, the goal is to put together a simple experiment that would simulate the conversion of an AC source to DC.

Objective

To convert an AC voltage to a DC voltage (full-wave rectification).

Components

For this experiment, you would need the following components:

- a. Sine wave generator
- b. Connector
- c. Rectifier
- d. Resistor
- e. Capacitor
- f. Oscilloscope
- g. Text
- h. Switch

Experiment Set-Up

Creating a circuit

Follow these procedures to start your experiment

Step	Action
1	To start your experiment, double click on the TRON.EXE icon
2	To create a new project, select 'New' from the File menu
3	To place a component onto the Work Window, select the components from the Components Bar and drag it onto the work window.
4	To add more components, repeat step 2
5	To connect the components to form a circuit given below, roll the mouse over the end of the terminal of a component, and when cursor changes to a cross hair, click and drag to the desired component.
6	To rotate the component, select the specified component and hit the 'Spacebar' key.
7	To set the parameters for the components, double click on the specified component and change the parameter.
8	Set the parameter as below: <ul style="list-style-type: none">• sine wave generator :<ul style="list-style-type: none">• peak 10 V• frequency 100 Hz• resistor 200 ohm• capacitor 100 uF• oscilloscope :<ul style="list-style-type: none">• select both channels to measure voltage• select the checkbox visible

Experiment Set-Up (continued)

Step	Action
9	To annotate your experiment , <ul style="list-style-type: none">• select the text components• to start writing, double click on the text box and type in your text
10	To save your experiment, choose 'Save As' from the file menu.

Experiment Set-Up (continued)

Running your experiment

Follow these procedures to start your experiment

Step	Action
1	<p>Click on the 'Run' button from the Control panel in the Work Window.</p> <p>Observe the curves generated of the oscilloscope. There is no output from Ch1, and the output from Ch2 equals the input directly from the sine wave generator (fig 2).</p> <p>Pay particular attention to the red curve (Ch1) which represents the resultant DC waveform. The blue curve (Ch2) represents the untreated waveform generated by the sine wave generator.</p>
2	<p>Close the portion of the circuit leading to the group of rectifiers by clicking on the switch K1. Observe again the curves generated in the display of the oscilloscope. Wait for the waveform to stabilize.</p>

Experiment Set-Up (continued)

Step	Action
3	In this step the goal is to add a filter to reduce the fluctuation and produce a nearly constant level DC output. This can be achieved by adding a capacitor. Close the switch K3 while switch K1 remains closed.
4	Finally to simulate the DC voltage in use, close the switch K2, all three switches are closed.
5	To stop your experiment, click on the 'Construct' button.
6	Re-edit your experiment by changing the parameter of the fixed resistor 10 ohm
7	Repeat step 1 to 5
8	Re-edit your experiment again, <ul style="list-style-type: none">• resistor :200 ohm• capacitor : 10 uF.
9	Repeat steps 1 to 5.
10	To end your work session, choose 'Quit' from the file menu.

Troubleshooting

Introduction

In the unlikely event, you encounter a problem with Pintar VirtualLab™, it may be helpful to see what are the common problems faced by users and the corresponding causes and suggested solutions.

Note:

In the event the problem that you are facing is not listed here, we will be happy to hear from you. Contact :

Customer Service Department:

info@pintarmedia.com

Technical Support Department:

help@pintarmedia.com

Problem

I cannot run Pintar VirtualLab Electronics.

Possible causes	Possible solutions
The Pintar VirtualLab Electronics program file is damaged	Reload the Pintar VirtualLab Electronics program file from the original program disk
The operating system in your PC computer is not Windows 95 or Windows NT.	Pintar VirtualLab Electronics will not run on Windows 3.1 or Windows for workgroup 3.11, because this product is a full 32-bits program which runs only on 32-bits operating system like Windows 95 or Windows NT.

Problem

When I run the experiment, nothing seems to happen.

Possible causes	Possible solutions
The circuit may not be closed. This could be caused by an improperly connected circuit, or there may be a blown bulb or fuse	Make sure that the circuit is properly closed

Troubleshooting

Problem

I can't hear any sound while playing Pintar VirtualLab Electronics.

Possible causes	Possible solutions
Your computer is not equipped to handle sound	Install a [SoundBlaster compatible] sound card. You would also need pair of powered speakers
Your speakers are not connected properly, or they are not switched on.	Check the cables connecting the speakers to your computer, as well as the power cord. Make sure that the current is turned on.
The driver for your sound card is incorrect or missing.	Make sure you have the correct driver installed in your system.
The particular sound file is damaged or missing	Re-install the Pintar VirtualLab Electronics from the original program disk

Problem

When I rotate a component on the Work Window, the image disappears.

Possible causes	Possible solutions
The image file for the component is damaged or missing.	Re-install the Pintar VirtualLab Electronics from the original program disk.

Problem

There is a discrepancy between the readings shown in the experiment and the theoretical values that I calculated.

Possible causes	Possible solutions
The components used in the circuit are 'real' models, which are different from theoretical models	When performing calculations involving amplifiers, use feedback