# Creating custom ARCAD symbols
3D Modeler

ARCAD includes a large number of predrawn symbols. For most designs and floorplans, these should be sufficient. For plans that require that special table, bed, fireplace, or any other symbol, you can create it from scratch using the 3D Modeler. You'll also be able to modify any of the symbols in the *ARCAD* libraries.

To open the 3D Modeler in Windows95, go to Start / Programs / ARCAD for Windows / Modeler. In Windows 3.1, open the ARCAD program group and double click the Modeler icon.

1.1 The Views

To properly assemble a symbol, you must look at it from three 2D vantage points as well as in a 3D rendering. Below is the Modeler drawing screen with a symbol already created.

The views are:
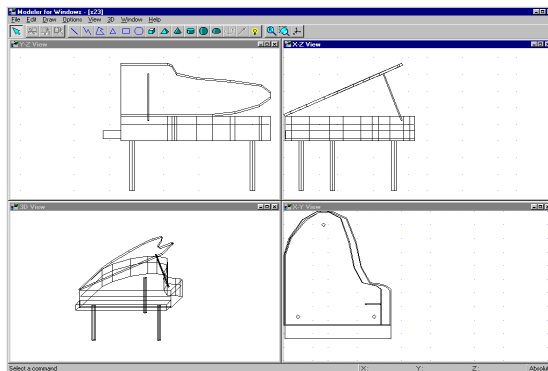
- · Y-Z View: The head-on view of the symbol.
- · X-Z View: The side view of the symbol.
- · X-Y View: The aerial view looking down on the top of the symbol.
- · 3D View: The 3D perspective drawing of the symbol.

In all the views, you see a line drawing without regard to the transparancy of the various lines and solids in the drawing. Also, individually, none of the 2D views offers any perspective with relation to the third dimension.

1.2 The Toolbar

Like the main program, Modeler contains a toolbar above the drawing screen. Each function is explained below. To see the name of any of the icons on the toolbar, position the cursor over that icon.

Select: Provides an arrow with which to select icons or parts of the drawing for modifying.

Cut: Cuts the selected object(s) to a special *ARCAD* clipboard.

Copy: Copies the selected object(s) to a special *ARCAD* clipboard.

Paste: Copies the contents of the clipboard to the Modeler drawing area.

The set of simple blue icons are used to create 2D elements that can be decorative, but have only length and width.
They are:

Line
Polyline
Polygon
Triangle
Rectangle
Circle

The 3D symbols are green symbols that have length, width, and height. These can be controlled to be a complete solid or open at the top and/or bottom.
The 3D symbols are:

Brick
Pyramid
Cone
Cylinder
Sphere
Hemisphere

In addition to the icons for drawing elements, the toolbar contains two advanced buttons used to transform 2D objects into 3D solids. An explanation of these two ocurrs later in this chapter. They are:

Solid of Revolution Axis

Prism Vector

The next two icons are functions that should be familiar to you from the *ARCAD* program. They are:

Redraw

Zoom Window

The remaining icon is used to generate a full-screen 3D view of the symbol you are creating.

Total 3D

1.3 The Menu

There is also a menu above the icons in Modeler. Below is an explanation of the menu choices that are new. The rest should be familiar to you from the *ARCAD* program or are explained previously in this chapter.

From the File Menu:

Open from Library: Use this function to open an existing symbol from an *ARCAD* library into Modeler for custom modification.

Insert to Library: Use this function to insert the symbol created in Modeler into *ARCAD*. You will be prompted to choose which library you want to insert the symbol. For best results, create a new library for all your custom symbols by entering a new file name when prompted. Then, give a description of the symbol and click "OK." The symbol will then be added to the library you created.

Delete from Library: Use this function to delete a symbol from one of the *ARCAD* libraries.

From the Options Menu:

      Default Values: Each drawing element (brick, cone, line, etc.) is given a default size and color. Use this function to change the default size or color of any of the building elements for accuracy when creating your new symbol.

Note: Select a surface texture for your new symbol from the symbol library in ARCAD.

1.4 Helpful Hints

Here are some hints to help in assembling your own symbol.

·   When an element is selected, you can move it with the arrow keys on the keyboard as well as the mouse. Use the arrow keys to move the element 1" at a time. Hold "Shift" down to move the element in 1' increments.

·   Don't worry about where you start building your object. By default, the first object you insert is in the approximate center of the drawing field, allowing you plenty of room to build in any direction.

·   Rotate an element in the desired view with the "+" and "-" keys on your keyboard. The element will rotate in increments of 5 degrees.

·   When you are done with your symbol and it has been inserted into a library, you can modify its entire dimensions before placing it into your design, just like any other predrawn *ARCAD* symbol.

·   Whenever possible, modify an existing symbol. That way, some of the work will already be done for you.

·   Resize an element by moving the cursor to the red or green corners until the cursor becomes a two-headed arrow. Hold the left mouse button down and drag the cursor to resize the element.

·   If elements overlap, you can select an element by clicking on it and pressing "Ctrl" and "N" at the same time as necessary to select the appropriate element.

·   If you have multiple occurrences of the same object (such as table legs), create the first one and use the Modeler copy and paste commands to replicate it. With this approach, the table legs will be exactly the same size.

· As you move the cursor between the three 2D views, you will see where the element is placed in the other views, including the 3D view. To make it easier to visualize the placement, one corner of the object is green and the opposite corner is red. The green corner corresponds to the same point in all three of the 2D views.

1.5 Creating a Symbol

This section is a tutorial which will take you step by step through the creation of a desk. When you are done, the desk will look like this:
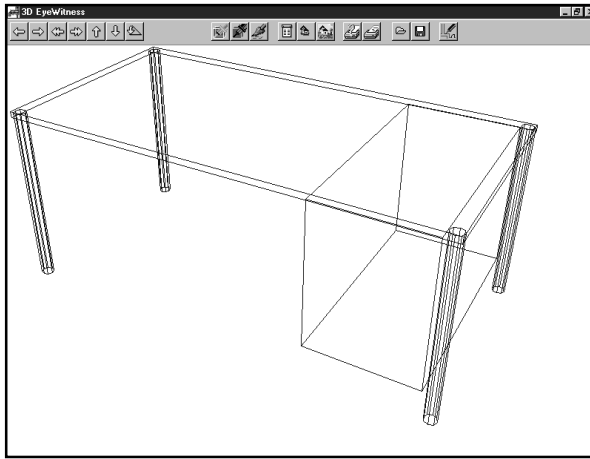

1. Start by creating the desktop. Select **Default Values** from the **Options** menu and drag to the right to select **Brick**. The Brick Setup dialog box appears. Enter these values and click "OK."

     X Size: 6'-0"
     Y Size: 3'-0"
     Z Size: 1"

You can also select a color for your desktop by clicking the color tile next to the word "Surface."

2. Select the Brick icon and place the large rectangle in the center of the X-Y view so that it looks like the picture below. To do this, you may need to rotate the rectangle in the Y-Z view.
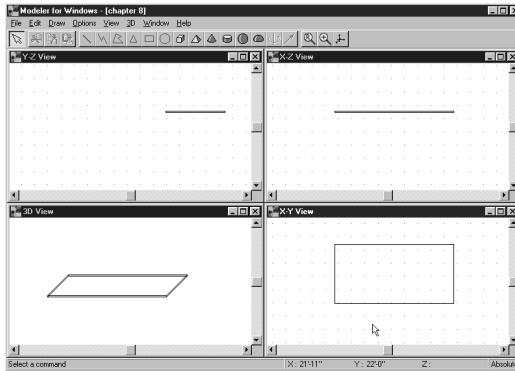
3.   Next, create the legs of the desk. Select **Default Values** from the **Options** menu and drag to the right to select **Cylinder**. Make the following changes to Cylinder Setup dialog box.

Radius: 1"
Height: 30"

Leave the other values as they are and click "OK."

4.   Select the Cylinder icon and place the cylinder in the X-Z view below the desktop. You will need to rotate the cylinder by pressing the "+" or "-" keys on your keyboard so that it looks like the picture on the next page.

5.   Once one leg has been placed, use the Copy and Paste command to create the three other table legs and position them as they are shown below. Or, repeat step 4.

Note: For greater accurracy in placement of the table legs, you can zoom in on the area.
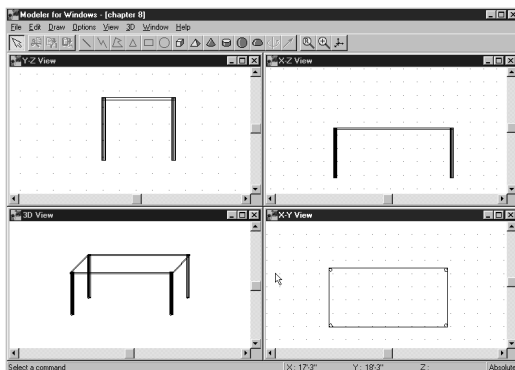
6.   Next, we will create some drawers for the desk. Select **Default Values** from the **Options** menu and drag to the right to select **Brick**. The Brick Setup dialog box will appear. Enter these values and click "OK."

    X Size: 1'-6"
    Y Size: 3'-0"
    Z Size: 2'-0"

7.   Select the Brick icon and place the rectangle under the desktop in the X-Z view and position it so the edges of the rectangle meet the edges of the desktop in the X-Y view. The resulting desk should look like the picture on the next page.

8.   Save your new symbol. Select Save As from the File menu. Give the symbol a filename and click "OK."

9.   Insert your desk to a new library for placement into your *ARCAD* plan. Select **Insert to Library** from the **File** menu. Modeler will ask if you want to modify the 2D and 3D views. Click "NO" for now. You can experiment with this later.
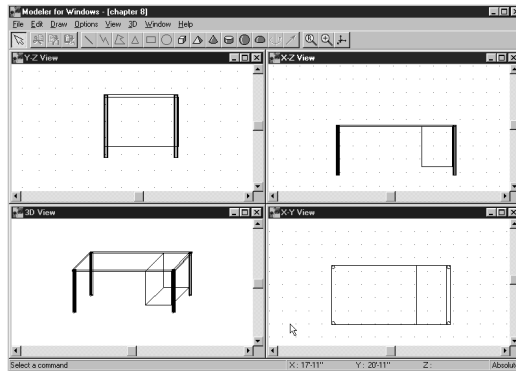
The Insert to Library dialog box will appear prompting you for a file name. For best results, enter a file name such as "Personal" or "New" or "Custom" or anything other than one of the names of the current libraries. Click "Open" after entering the file name.

The Symbol Settings dialog box will appear. Enter a symbol description and click "OK." The symbol is now in your new library in the *ARCAD* program.

10. Now we will place your new symbol in a design. Open *ARCAD* and open the plan you need. Click the Symbols icon and then open any one of the symbol libraries by clicking an icon on the secondary toolbar. That library will open. To open the library you just created, click the down arrow next to the library name to bring up the list of libraries and click the name of the library you just created to open that library. Your custom symbol should be in that library ready for you to modify, rotate, and place like any other *ARCAD* symbol.

1.6 Advanced Techniques

Solid of Revolution Axis and **Prism Vector** provide the tools needed to give a 2D element depth. Use **Prism Vector** to give elements basic thickness. This could be very handy when creating a deck with irregular sides. **Solid of Revolution Axis** gives elements cylindrical thickness. Both features work in similar fashion.

For example, using the deck example, draw a 2D polygon in the X-Y view and select it with a left mouse click. Select the Prism Vector icon. In the other two views, you will see a small green box and a dashed line connected to the 2D polygon. The Prism Vector icon has also changed to a Prism icon.

Control the amount of thickness to give the element by moving the green box with the mouse or arrow keys and then click the Prism icon. Modeler will transform the 2D element into one with three dimensions.

Prism icon

To create exotic figures with curves, use Solid of Revolution Axis. For example, start by placing a 2D triangle into the X-Z view and select it with the left mouse button. Select the Solid of Revolution Axis icon. A dashed line with green and red boxes will appear and the Solid of Revolution Axis icon has changed to a Vase icon.

Anchor this dashed line with a single mouse click. Control the amount of thickness to give the element with a single mouse click on either the red or green end of the line and adjust with the mouse or keyboard arrows. Select the Solid of Revolution Axis icon which now looks like a vase to transform the 2D element into a curve-based 3D element.

Solid of Revolution Axis icons