

Getting Started Guide

Vectorworks Spotlight

2014

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Created using: Vectorworks Spotlight 2014

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Table of Contents

Document Setup	5
Resetting Preferences and Settings	5
Creating a New Document	5
Page Setup	5
Units	5
Organization	6
Theatre Architecture	7
Locus Points / Guides.....	7
Wall Tools	7
Creating a Stage.....	8
Door Tool	9
Soft Goods	9
Creating Borders	9
Curtains	11
Seating	11
Scenery	13
Creating a Round Ramp	13
Wall Sculpting	14
Column Tool.....	14
Drawing a Light Plot	15
Lighting Positions	15
Lighting Instruments	16
Numbering Instruments	19
Generating Paperwork.....	20
Presenting Your Drawing	20
Create Plot and Model View	20
Viewports and Sheet Layers.....	21
Creating Viewports	21
Editing Viewports	22
Working on the Sheet Layer	22
Placing Schedules	23
Creating Additional Sheets and Viewports.....	23
Section Viewports.....	24
Printing/Export	25
Event Planning Tools	26
Creating a Video Screen.....	26
Creating Stage Stairs and Lectern	27
Customizing Event Seating	27
Creating Event Views	29

Creating a custom Lighting Instrument	30
Creating the Symbol	30
Records Explained	32
Attaching the Parts Record.....	32
Attaching the Light Info Record	33
Addendum: Using the Lighting Pipe and Instrument Summary Tools.....	33

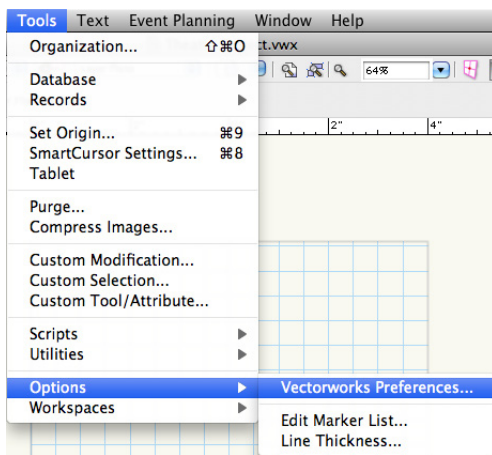
Getting Started with Vectorworks Spotlight

Document Setup

Resetting Preferences and Settings

Before starting, you will need to reset your Vectorworks Preferences and the SmartCursor Settings. Resetting these settings will guarantee you have the same settings used in this guide.

1. Select **Tools > Options > Vectorworks Preferences**



2. Click **Reset** in the bottom left corner and then click **Yes** to confirm the reset action
3. Select **Tools > SmartCursor Settings**
4. Click **OK** to the Did you know... dialog box
5. click **Reset** in the bottom left corner and then click Yes to confirm the reset action
6. Click **OK** to exit the SmartCursor Settings dialog box

Creating a New Document

When creating a new document (**File > New**), Vectorworks will ask if you want to create a blank document or use a document template. Vectorworks comes with a selection of template files.

A template file has various predetermined characteristics. It is a useful time saver to create and evolve your own template files. For this section we will start with a blank document.

1. Select **File > New**
2. Select Create blank document and click **OK**

Page Setup

Next we will go through the Page Setup options. The Page Setup options are accessible by going to **File > Page Setup**. Here you can establish the size of the page and select a printer. The printer does not need to be selected now, if you will be printing from a PDF, which is the recommended practice. You will want to set a sheet size that is the same as the size on which you plan to print. Let's establish an Architectural Size D sheet (24" x 36"). If you are not connected to a plotter, you will have to check "Choose size unavailable in printer setup" on the top right and then US Arch D from the list.

1. Select **File > Page Setup**
2. Check the box for **Choose Size Unavailable in Printer Setup**
3. In the **Size** list, choose US Arch D
4. Make sure **Show Page Boundary** is checked
5. Uncheck **Show Page Breaks**
6. Click **OK**

Showing breaks will clutter your drawing area with division markers, likely dividing the 24 x 36 inch pages into 8 1/2 x 11 inch chunks.

Units

This guide will show both imperial and metric units. You can set

your preferred units by going to: **File > Document Settings > Units**

1. Select **File > Document Settings > Units**
2. Choose either “Feet and Inches” or “Millimeters” from the Units list

Organization

To set up the Layer and Class structure for your document select **Tools > Organization**. In the Organization dialog box you will see multiple tabs allowing you to create and modify Classes, Design Layers, Sheet Layers, Viewports, Saved Views and References. Here we will only discuss Design Layers and Classes.

The Design Layer is the basic level of organization. Think of layers as sheets of vellum on a table; architects use layers to distinguish floors of a building. Many theatrical designers create layers for the theatre, the set, the light plot, and the sound plot. Each design layer can be set to different Z elevations. Follow the instructions below to setup the Design Layers needed for our file.

1. Select **Tools > Organization**
2. Select the Design Layers tab
3. Select the default Design Layer, Design Layer-1 and then click **Edit** at the bottom.
4. In the Edit Design Layers dialog box **Rename** Design Layer-1 “Theatre Architecture”
5. Click the **Scale** button, set the Scale to $\frac{1}{2}''=1'$ [1:24], and click **OK**
6. Now click **New** to create another Design Layer

Note: The Scale should automatically be set to $\frac{1}{2}''=1'$ [1:24] for the new layer. Make sure all layers are set to $\frac{1}{2}''=1'$ [1:24].

7. Name this Design Layer Audience and click **OK**
8. Now use the same procedure to create the following Design Layers:

- Soft Goods
- Scenery

- Light Plot

9. Leave the Organization dialog box open.

Classes are used to assign graphic attributes and to control visibility in drawing and when creating Viewports for presentation. Classes can be used for objects on different layers. Vectorworks starts by giving you two classes: Dimension and None. Classes truly allow full use of Vectorworks, and, as a best practice, no object should be drawn without having a class assigned. Now follow the instructions below to create some classes for our file.

1. Switch to the Classes tab in the Organization dialog box
2. Click **New** on the bottom left
3. Name the Class Theatre-Walls and click **OK**
4. Now use the same procedure to create the following Classes:

- Theatre-Proscenium
- Theatre-Stage Floor
- Theatre-Seats
- Scenery-Walls
- Scenery-Ramp
- Scenery-Columns
- Soft Goods-Main
- Lights-Instruments
- Lights-Positions
- Focus Point Objects

5. Finally, click **OK** to save the new Design Layers and Classes

Note: The Navigation Palette is a quick way to view, create, and modify Design Layers and Classes.

Theatre Architecture

We are now going to create the basic theatre structure. Let's assume that zero-zero is the intersection of the Plaster Line and the Center Line in a traditional Broadway-size proscenium theatre. We are not going to be concerned that our theatre may go off the page in the Design Layer.

Locus Points / Guides

There are **2D Locus** and **3D Locus** tools, located in the Basic Palette and 3D Modeling Tool set respectively. Locus Points/ Datum provide guides for drawing and reference points as needed. You can also convert Locus Points and other objects into Guides. This will move the objects into a Guides class, modify the attributes of the objects, and lock them in place. We will now create a couple of lines to represent the Center Line and Plaster Line. As well as, place a Locus Point, which will be used as a reference for the start of the Theatre walls. Then we will turn these objects into Guides.

1. In the View bar set the Active Layer to **Theatre Architecture**
2. Double-click the **Line** tool in Basic palette
3. Switch the **Entry** mode to **Length / Angle** in the **Create Object** dialog box
4. Set **L** to 80' [24.384m] and **A** to 90°
5. Uncheck **Position at Next Click**
6. Set the **Control Point** to **Center**, **X** and **Y** to 0' [0m], and click **OK**
7. Repeat Steps 1 – 4 with the **Angle** set to 0°
8. In the **Basic** palette, Double-click the **2D Locus** tool
9. Set **X** to -35' [-10.668 m] and **Y** to 0' [0m], click **OK**
10. Select **Edit > Select All**
11. Select **Modify > Guides > Make Guide**

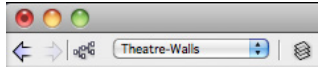
Note: As you can see the Lines and the Locus Point have been converted into Guides. You can control the Visibility of the guides via **Modify > Guides** or through the newly created Guides class.

You can also modify the attributes of the Guides by editing the

Guides class.

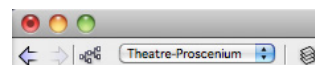
Wall Tools

There are two **Wall** tools: the **Wall** and the **Round Wall** in the Building Shell tool set. Each have similar drawing options available in the Tool bar. The Round Wall also has options similar to those seen associated with the **Circle**, **Arc** and **Oval** tools.

1. In the View Bar, set the Active Class to Theatre-Walls
 2. Select the **Wall** tool in the Building Shell tool set and set the **Right Control Line Mode** in the **Tool bar**
- 
3. Open the **Wall tool Preferences** dialog box by clicking on the **Preferences** icon in the **Tool Bar**
 4. Set the wall's **Overall Thickness** to 9" [228.6mm] and click **OK**
 5. Click once on the locus point to start the wall.
 6. Move the cursor up, then press the Tab key on your keyboard to enter the **Floating Data Bar (FDB)**
 7. Enter 30' [9.144m] for the **Length**, then press Tab, enter 90° for the **Angle**
 8. Press Return [Enter] to set the **Length** and **Angle** and click once on the page to draw the wall segment (You can also press **Enter** a second time to draw the segment)
 9. Move the cursor to the Right, Tab into the (FDB) Enter 70' [21.336m] for the **Length**, press Tab, and Enter 0° for the **Angle**
 10. Press Return [Enter] Twice to create the next segment
 11. Finally, Snap the cursor to the Horizontal Guide Line (Plaster Line). Make sure the Object / Vertical SmartCursor Cue appears and then Double-click to create the Walls

Now we will create the Proscenium wall.

1. With the **Wall** tool selected, set the **Left Control Line Mode** in the **Tool bar**



2. Go back to the Wall Preferences and change the Overall Thickness to 24" [.6096m]
3. Switch to the Theatre-Proscenium class
4. Click once on the Left Wall's Outside Edge and Move the cursor to the Right. Double-click on the Outside Edge of the Right Wall. Use the Zoom Loupe (Z key) if needed

Next we will adjust the height of the walls and add caps.

1. Select all of the Walls by using the **Select Similar** tool from the Basic palette. Activate the tool, click once on a Wall, and all of the walls will be selected.



2. In the Object Info Palette (OIP), set the **Height** to 50' [15.24m]
3. Set Caps to Both

Finally, let's adjust the fill color of the theatre walls to distinguish them from the Proscenium. We can modify attributes of all of the theatre walls at once by modify the class settings.

1. Select **Tools > Organization**
2. Switch to the Classes tab, select the Theatre-Walls class, and click Edit
3. Check the box in the top right corner for Use at Creation
4. Set the Fill Style to Solid and the Fill Color to Gray
5. Click **OK** and choose Yes to All in the Confirmation dialog box
6. Click **OK** on the bottom right of the Organization dialog box to save the changes

Creating a Stage

A stage can be created in multiple ways. In the Spotlight tool set

there is the **Stage** tool. This tool works similarly to the **Polyline** tool. It allows you to draw a stage using multiple vertex and arc modes. You can also convert an existing polyline to a stage by using the Create Stage command in the Event Planning menu. Here we will first create the shape of the stage and then convert it.

1. First, make the Theatre-Stage Floor class active in the View bar
2. Select the **Rectangle** tool from the Basic palette:



3. Click once on the Upper Stage Right Outside Corner of the wall structure and move the cursor to the Outside Corner of the Down Stage Left wall structure
4. Click once more to create the Rectangle
5. Next, Double-click on the **Rectangle** tool in the Basic Palette
6. In the Create Object dialog box, set the **Width** to 40' [12.192m] and set the **Height** to 3' [0.9144m]
7. Now set the Control Point of the Rectangle to Top Center, set the X to 0' [0m], and set Y to -2' [-0.6096m]
8. Make sure that **Position at Next click** is unchecked and click **OK** to create the Rectangle
9. Select both of the Rectangles, select **Modify > Add Surface** to combine the two rectangles
10. With the combined Polygon still selected, Select **Event Planning > Create Stage**
11. Set the **Height** to 36" [.9144m]
12. Leave the **Fill** and **Pen** color settings at their defaults then set the **Top** and **Side** textures to No Texture (if applicable)
13. With the Stage still selected, in the OIP set the **Z Height** to

-36" [-.9144m]

14. Select **Modify > Send > Send to Back**

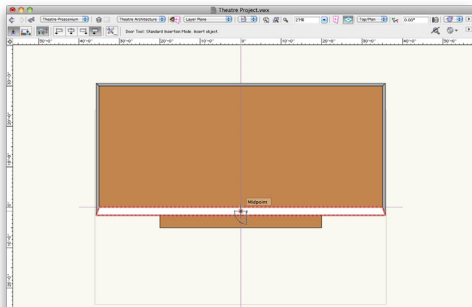
15. Finally, Right-click (Windows) / Ctrl-click (Mac) on the Stage and select Lock

Note: Setting the Z height to this negative value will place the top of stage at a zero elevation. This will make it easier to set the elevation of Lighting Devices, Positions, and Soft Good objects. Also, locking the stage in place will prevent it from being moved inadvertently later.

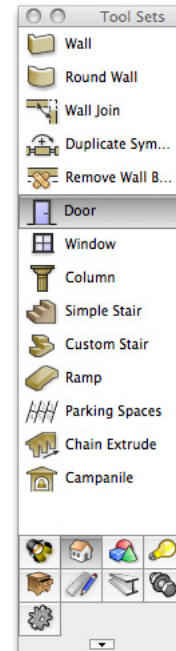
Door Tool

Now we are going to add a proscenium opening. We will use the **Door** tool from the Building Shell tool set to create the opening.

1. In the View bar, set the Active Class to Theatre-Proscenium
2. Activate the **Door** tool from the Building Shell tool set
3. Move your cursor over the Middle of the Down Stage wall. You will see a "Mid-Point" SmartCursor Cue and the wall will highlight in Red



4. Double-click to insert the Door into the Proscenium Wall



5. In the OIP, click the **Settings** button
6. Under General, set the **Width** to 40' [12.192m] and the **Height** to 18' [5.4864m] and set the Configuration to Cased Opening
7. Switch to the Jamb tab and set the **Width** to 0" [0mm]
8. Click **OK**

Note: Setting the Jamb width to 0" [0mm], creates a Proscenium opening the exact width of the apron.

Soft Goods

The **Soft Goods** tool inserts theater and event planning draperies such as curtains, borders, scrims, and pipe-and-drape assemblies. Soft Goods objects are drawn using the same vertex and arc modes as the **Polyline** tool. So you can create any configuration for total flexibility. The 3D appearance of Soft Goods objects can be set for a realistic appearance, or be displayed more schematically.

Creating Borders

The **Soft Goods** tool has multiple modes and settings for creating different types of objects. We are going to create a few

borders. First, we will need to place a 2D Locus Point to help align the borders.

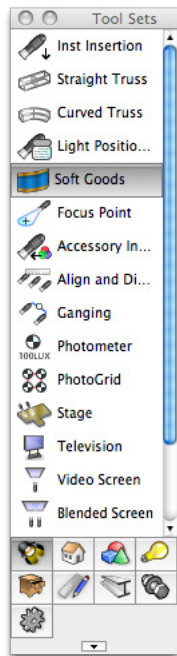
1. In the View bar choose Soft Goods-Main from the Class list and Soft Goods from the Layer list
2. Select **View > Layer Options > Show / Snap / Modify Others**
3. Double-click the **2D Locus Point** tool in the Basic Palette



4. Set X to -30' [-9.144m], Y to 5' [1.524m], and click **OK**
5. Convert the 2D Locus Point into a Guide (Modify > Guides > Make Guide)

We can now use this Locus Point to start our first Border.

1. Switch to the Spotlight tool set and select the **Soft Goods** tool



2. Select the **Preferences** button in the Tool bar, set the **Function** to Border, set the **Height** to 6'[1.8288m], and click

OK

3. Click once on the 2D Locus Point to start the curtain, move the cursor to the right, and press the Tab key to activate the FDB
4. Set the **Length** to 60' [18.288m], press the Tab key, set the Angle to 0°, and then press the Tab key again to set the angle
5. Double-click at the Intersection of the constrained length and angle indicated by the Dotted Red Lines to place the Border Soft Goods object

Note: If you do not have Renderworks, you will see a warning dialog box indicating that you will not be able to see images or textures.

6. In the OIP, with the Border Soft Goods object selected set the Z to 18' [5.4864m] and scroll down to Check Class Soft Good Parts. Leave the Class Set, set to Set 1

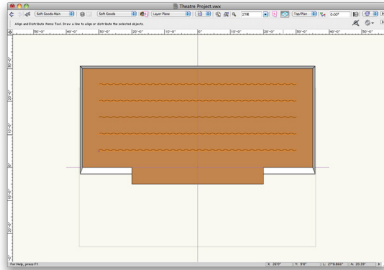
By checking the Class Soft Goods Parts option, Vectorworks will automatically create a class called Soft Goods-Set 1-Borders and place the Border in that class. This functionality will help you manage and organize Soft Goods objects. Next we will duplicate this Border a few times and then use the **Align and Distribute Items** tool to easily arrange the Borders.

1. With the Border selected, select **Edit > Duplicate** (Cmd + D [Mac] Ctrl + D [Windows])
2. Repeat 3 more times. You should have a total of 5 Border Soft Goods objects
3. Activate the **Select Similar** tool in the Basic Palette
4. Click once on one of the Borders to select them all
5. In the Spotlight tool set, activate the **Align and Distribute Items** tool
6. Hover over the 2D Locus Point until a Smart Point appears
7. Follow the Vertical, Dotted, Green, Extension Line down to the inside of the Proscenium wall
8. When the Object / Align H SmartCursor Cue appears, click once
9. Next, follow the Vertical, Dotted, Green, Extension Line up to the inside of the Rear Theatre wall
10. When the Vertical, Dotted, Green, Extension Line appears,

click once

11. In the Align and Distribute dialog box, select Distribute and Evenly Inside Points

12. Click **OK**



Curtains

Now we are going to create some curtains. We can convert the downstage Soft Goods object into a Curtain by simply modifying its settings in the Object Info Palette (OIP).

1. Select the downstage Soft Goods object
2. In the OIP, set the Z to 0' [0m], change the Function to Curtain, and the **Height** to 24' [7.3152m]
3. Finally, in the OIP set the Curtain Soft Goods object to Open From the Center and the open **Width** to 0' [0m]

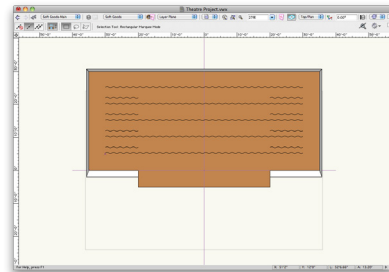
Note: After changing this Soft Goods object to a curtain, a new class was created (Soft Goods-Set 1-Curtains). This is because this Soft Goods object was set to Class Soft Good Parts. You can now control the visibility and class attributes of all of the Soft Goods objects (Soft Goods-Main) or the Borders (Soft Goods-Set 1-Borders) and Curtains (Soft Goods-Set 1-Curtains) individually.

Next we will create the rest of the curtains. We will use the **Move by Points** tool located in the Basic palette and the **Duplicate Array** command from the Edit menu, to quickly create these curtains.

1. With the Downstage Curtain still selected, activate the **Move by Points** tool from the Basic palette



2. In the Tool bar, activate the Move mode, the Object Retention mode, and set the Number of Duplicates to 1
3. Move your cursor to the Stage Right end of the downstage Curtain object
4. When the SmartCursor Cue Insertion Point appears click once and move the cursor Upstage
5. Press the Tab key to enter the FDB, set the **Length (L)** to 3' [0.9144m], press Tab, set the Angle (A) to -90°, and press Enter (Return) Twice
6. In the OIP, select Center from the Open From list. Set the open **Width** to 40' [12.192m] and Check Show Ghost Curtain
7. Next, with the open Curtain still selected, select **Edit > Duplicate Array**
8. Under Shape choose Linear Array, set the Number of Duplicates to 3, choose Cartesian Offset, set Y to -5' [-1.524m], Check Retain under Original Object, and click **OK**



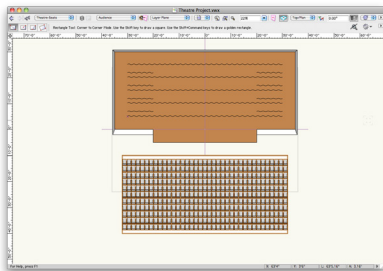
Note: When creating hybrid (2D/3D) objects in Vectorworks, it is a good idea to occasionally switch to a 3D view to check your work. It's possible to enter an incorrect height or Z elevation and not notice it while working only in a Top/Plan view. When working with multiple layers, before switching to a 3D view you should activate Unified View in the View menu. This command will align the layers with the active layer so they appear correct in 3D views.

Seating

In the Spotlight menu, under Architectural there is a Create Seating Layout command. This command converts a closed shape (Rectangle, Circle, Polygon...) into a Seating Layout. It will fill the space with a selected chair symbol. This symbol can be chosen from one of the defaults, or a custom symbol can be used. The resulting Seating layout object has several modifiable options, ranging from focus point, seat/row spacing, to height,

and rise per row. Follow the steps below to create a Seating Layout for the Theatre.

1. In the View bar choose **Theatre-Seats** from the Class list and **Audience** from the Layer list
2. Double-click on the **Rectangle** tool in the Basic Palette
3. In the Create Object dialog box, set the **Width** to 64' [19.5072m], the **Height** to 30' [9.144m], Uncheck Position At Next click, choose the Top Left Control Point, set X to -32' [-9.7536m], Y to -10' [-3.048m], click **OK**
4. With the Rectangle selected, select **Spotlight > Architecture > Create Seating Layout**
5. In the Create Seating Layout dialog box, choose Use an Existing Symbol, then Defaults under Symbol Folders, and click the Thumbnail Preview under Symbols
6. Select the Padded Theatre Seat and click **OK**



7. A Prompt to Pick focus point will appear, click **OK**, then click once on the Center of the Stage to set the Focus Point.

Note: After setting the Focus Point a Seating Count Worksheet will appear. This is automatically created and is accessible through the Resource Browser. Close the Worksheet and continue.

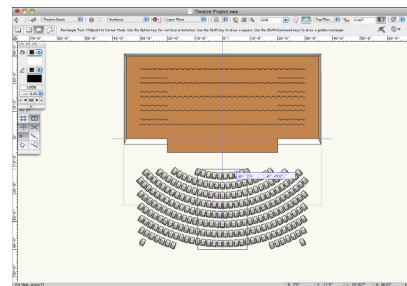
We now have a basic Seating Layout focused on the center of the stage. Next, we will modify the settings of the Seating Layout.

1. With the Seating Layout still selected, in the OIP, set the Seat Spacing to 2' [0.6096m] and the Row Spacing to 3'6" [1.0668m]
2. Check Concentric
3. Uncheck Draw Boundary Line

4. Check Show Seat Number

Finally, lets add a center aisle. To create an aisle or seating sections, you can either modify the shape of the base object used to create the seating layout or create additional Seating Layouts and arrange them. For our Theatre we will modify the base object. We are going to use the Clip Surface command from Modify menu to remove a center strip of seats. First, we will need to create a rectangle to use as the clipping object.

1. Activate the **Rectangle** tool in the Basic palette
2. Switch to the Midpoint to Corner mode (Third Mode)
3. Click once at the Bottom Most Point of the Center Guide Line (This point will be just below the Bottom Center of the Seating Layout. You may need to use the Zoom Loop [Z])
4. Move the cursor Up and then press the Tab key to enter the FDB



5. Set ΔX to 2' [0.6096m] press the Tab key, set ΔY to 29' [8.8392m], and press Enter [Return] Twice
6. Select Both the Rectangle and the Seating Layout
7. Select **Modify > Clip Surface**
8. Delete the Rectangle

Note: This process of clipping through a portion of the Seating Layout, but not completely through keeps the Seating Layout as one object. If you clip completely through the Seating Layout you will end up with two separate Seating Layout objects. In this situation one single Seating Layout is easier to control and modify. You can also use the **Reshape** tool, located in the Basic Palette to customize the shape of the Seating Layout even further.

Scenery

In this section we will use the **Wall** tool, the **Round Wall** tool, the Wall Recess command, and the Extrude command to create some basic scenery objects.

Creating a Round Ramp

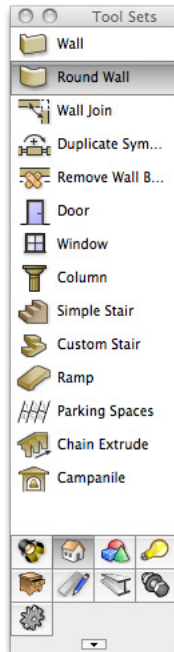
To create a round ramp we are going to use the **Round Wall** tool from the Building Shell tool set. The **Wall** tool and **Rounded Wall** tool, although intended just to create Walls, can be used to create other objects as well. First, let's turn off some Layers to make it easier to work.

1. Select **Tools > Organization**
2. Click on the Layers tab, turn off the Soft Goods and Audience Layers

3. Click **OK**

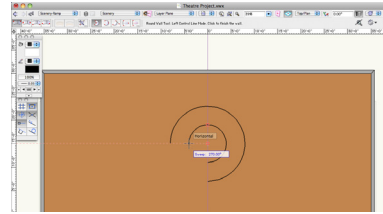
Now let's create the Round Wall.

1. In the View bar set the Class to Scenery-Ramp and the Layer to Scenery
2. Select the **Round Wall** tool from the Building Shell tool set



3. In the Tool bar, select the Left Control Line mode, then the Radius mode, and click on the Preferences button

4. Set the **Overall Thickness** of the Round Wall to 4' [1.219m] and click **OK**
5. Click once in the Center of the Stage, Move the cursor Straight Down
6. Press Tab to enter the Floating Data Bar
7. Set the **Length** to 4' [1.2192m], press Tab, set the Angle to 90° and press Enter [Return] Twice
8. Move your cursor in a Counter-Clockwise direction



9. Draw an Arc that is 270° (The Ramp end should face the audience)
10. Press **Enter** [Return] or click once to complete the wall
11. Set the **Height** to 3'6" [1.0668m] in the OIP.

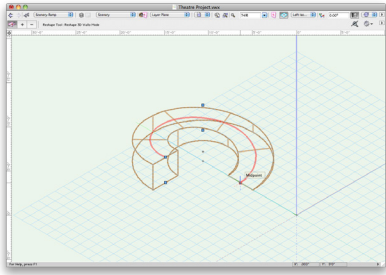
Next we are going to edit the wall with the **Reshape** tool from the Basic Palette. This will give the Ramp its shape.

1. Select **View > Standard Views > Left Isometric**
2. Select **Tools > Organization**, select the Design Layers tab, and turn off the **Theatre Architecture** layer (This will make it easier to reshape the Round Wall)
3. Activate the **Reshape** tool in the Basic palette



4. Grab the Top Blue Control Point on the Downstage Edge of the Wall

5. Drag it to the Ground



Now we will create a platform at the top of the Ramp.

6. Select **View > Standard Views > Top/Plan**

7. Activate the **Rectangle** tool, set it to Corner to Corner mode

8. Click once on the Left Point of the Wall Face that is Parallel to the Audience

9. Press the Tab key to enter the FDB.

10. Set ΔX to 4' [101.6mm] and ΔY to -6" [-152.4mm]

11. With the Rectangle selected, select **Model > Extrude**.

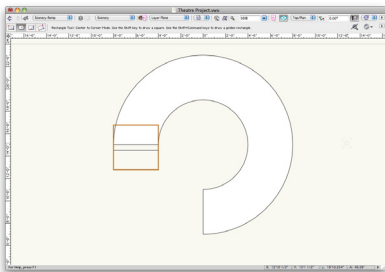
12. In the Create Extrude dialog box set the Extrusion to 3'6" [1.0668m]

13. Switch the **Rectangle** tool to Center to Corner mode, click once on the Center of the Extruded Rectangle you just created, and move the cursor Down and to the Right

14. Press Tab to enter the FDB, set the ΔX to 2' [0.6096], and ΔY to 2' [0.6096m]

15. Extrude this Rectangle to 6" [152.4mm]

16. In the OIP, set the Bot Z to 3'6" [1.0668m]



Wall Sculpting

We are now going to create a Wall behind the Ramp.

1. In the View bar set the Class to Scenery-Walls

2. Select the **Wall** tool from the Building Shell tool set

3. Upstage of the Ramp, Draw a Wall with a Thickness of 10" [254mm], Length of 24' [7.3152m], and Height of 20' [6.096m]

4. Select **Tools > Organization**, choose the Design Layers tab, and turn on all of the Layers

5. Center the Wall on the Stage and between the Ramp and the Back Upstage Curtain

To make this wall more interesting let's give it a few recesses.

6. Using the Center to Corner mode of the **Rectangle** tool, Create a Rectangle that is 1' [0.3048m] by 1' [0.3048m] on the middle of the Wall

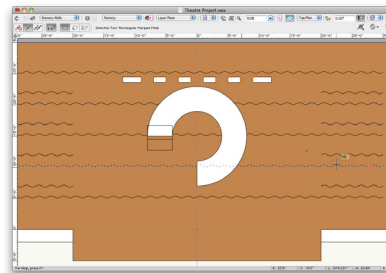
7. With the Rectangle selected, select **Model > Extrude**, and set the Extrusion to 7' [2.1336m]

8. In the OIP, set the Bot Z to 4' [1.2192m]

9. Make 4 Duplicates of this Extrude by going to the Edit menu and selecting Duplicate

10. Align the 5 Extrudes Along the Wall using the **Align and Distribute** tool in the Spotlight tool set (Use the Distribute and Evenly in between points modes)

11. With the 5 Extrudes and the Wall selected, select **Spotlight > Architectural > Create Wall Recess**, accept the default Cut Plane, and click **OK**

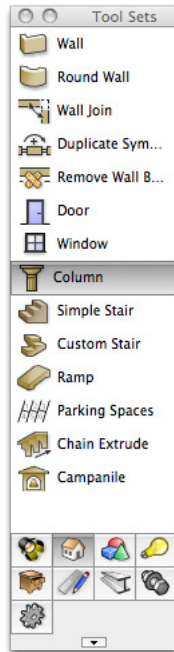


Column Tool

Finally, let's create a Column using the **Column** Tool.

1. First, set the Class to Scenery-Columns

2. In the Building Shell tool set select the **Column** tool



3. Double-click in Stage Left of Wing Two

4. The Column's Object Properties dialog will appear, Enter the following settings:

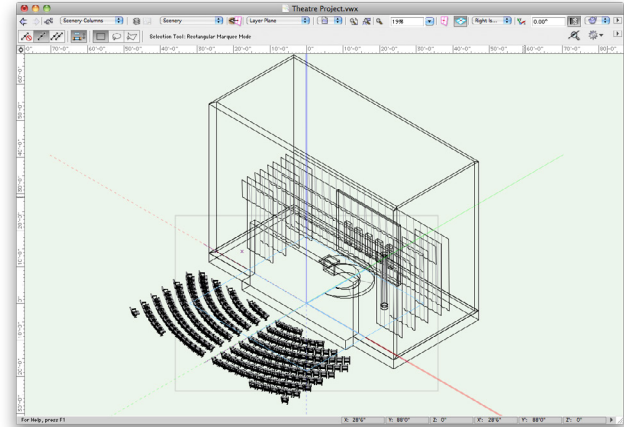
(If it does not automatically pop-up, you can enter the settings through the OIP)

- **Height** = 18' [5.4864m]
- **Shaft Type** = Oval
- **Shaft Taper** = Classic Taper
- **Capital Type** = Oval Mushroom
- **Base Type** = Oval

5. Click **OK**

We now have a Theatre with a Stage, Soft Goods objects, Seating, and Scenery. At this point, take a moment and use the **Flyover** tool located in the Basic Palette to take a look at your 3D

model.



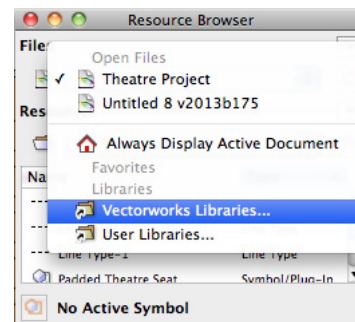
Drawing a Light Plot

In this chapter, we go through the process of creating a Light Plot. We will create Lighting Devices, Positions, and apply labels using Label Legends. We will start by placing a lighting position.

Lighting Positions

Lighting positions are the hanging points for instruments. They should normally be placed on the light plot before the instruments are added. Vectorworks Spotlight comes with many commonly used lighting positions symbols. They are accessible through the Resource Browser by going to Vectorworks Libraries / Objects-Entertainment / Lighting Positions (Imp / Metric). Let's start by placing a 50' Pipe.

1. In the Resource Browser, click on the Files menu, and select Vectorworks Libraries

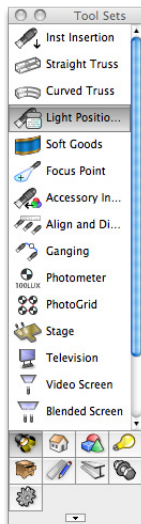


2. To access the Lighting Positions Imp file, click on the Object-Entertainment folder, select Lighting Positions Imp.vwx, and click Open

3. To more easily view resources in the Resource Browser click on the Disclosure Arrow Underneath the House icon and select

View As>Thumbnails

4. Select the 50' pipe symbol. Right-click (Ctrl+click on a Mac) and Select Import from the Contextual menu.
5. click **OK** in the Import Symbols dialog box to accept the defaults
6. Revert back to the Active Document in the Resource Browser by clicking the Home icon (The 50' Pipe Symbol will now show in this files resources)
7. Switch to the Lights-Positions Class and set the Layer to Light Plot
8. Double-click on the 50' pipe in the Resource Browser to make it the Active Symbol
9. Go to the Spotlight tool set and choose the **Light Position Obj** tool.



10. Click once between the Downstage Border and House Curtain (Front Curtain) on the Center Line Guide
11. Move your cursor to the Right to set a Horizontal Rotation and click once more to place the Position

Note: If this is the first time you have placed a Lighting Position the Object Properties dialog box will appear. Click **OK** to accept the defaults.

12. Set the **Z Height** to 24' [7.3152m] in the OIP and Name the Position 1st Electric

Now we are going to create a Vertical Position with a 20' pipe.

1. In the Resource Browser go back to the Lighting Position Imp. vwx resource file
2. Import the 20' Pipe symbol following the same procedure used to import the 50' Pipe
3. Switch the Resource Browser back to your Active Document by clicking on the House Icon in the Resource Browser
4. Double-click on the 20' Pipe symbol in the Resource Browser to make it the Active Symbol
5. Go to the Spotlight tool set and choose the **Light Position Obj** tool.
6. Click once in the Front of House (FOH) on the Stage Right side of the Seating Layout
7. Move your cursor up to set a Vertical Rotation and click once more to place the Position
8. Set the **Z Height** to 24' [7.3152m] in the OIP and Name the Position FOH Vert 1

We will place more positions later in this project. We will use only Pipe Symbols in this example project file however, Vectorworks also has Truss tools capable of making Straight and Curved Trusses that can be used as Lighting Positions. In addition the Vectorworks libraries also include many Truss symbols for many manufacturers.

Lighting Instruments

Light Instruments are made from symbols. Normally they should be Hybrid (2D/3D) symbols. These symbols have separate 2D and 3D components. This allows them to be displayed differently depending on your view. At the very least a Lighting Device symbol needs to consist of 2D screen objects. Creating Custom Lighting Instruments will be covered in another section of this guide. For our Theatre project we will use symbols from Vectorworks large symbol libraries. We will show inserting instruments, assigning them to a position, modify the instruments attributes, and setting focus points.

Let's start by inserting an ETC Source 4 26° light.

1. Switch to the Lights-Instruments Class
2. Turn Off the Soft Goods and Scenery Layer

3. In the Resource Browser, click on the Files menu, and select Vectorworks Libraries
4. In the Objects-Entertainment folder, select Lighting-ETC.vwx, and click Open
5. Select the ETC Source 4 26° symbol. Right+click (Ctrl+click on a Mac) and Select Import from the Contextual menu.
6. Click **OK** in the Import Symbols dialog box to accept the defaults
7. Revert back to the Active Document in the Resource Browser by clicking the Home icon (The ETC Source 4 26° symbol will now show in this files resources)
8. Double-click on the ETC Source 4 26° in the Resource Browser to make it the Active Symbol

Note: A properly configured Light symbol, when Double-clicked on in the Resource Browser, will automatically activate the **Instrument Insertion** tool. You will see a “Did you Know...” dialog box appear advising you of this action. Click **OK** to exit the dialog box.

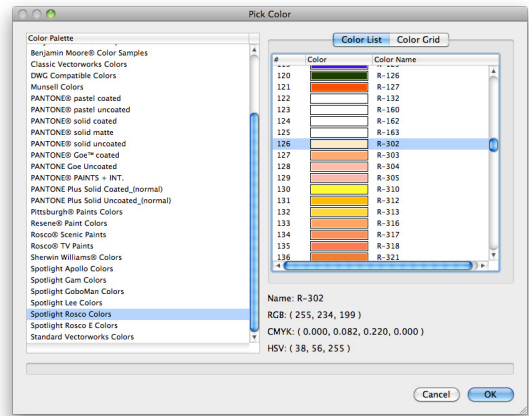
9. Click once at the intersection of the Center Guide Line and the 1st Electric Position to set the insertion point of the Lighting Instrument
10. Move the cursor to the Right Horizontally, click once more to set the Rotation of the instrument

Note: The Instrument is automatically assigned to the 1st Electric Position. This is a default Spotlight Preference setting.

Now let's modify this Lighting Instrument's attributes. The attributes for a Lighting Instrument can be modified through the OIP, clicking the edit button in the OIP, or by double-clicking directly on the instrument. The Unit Number, Channel, Dimmer, Circuit Number, Purpose, Color, Focus, Wattage, Beam/Field Angle, Shutter Depth/Angle, and many more attributes can be modified. Lighting Instruments can also be set to draw their beam in 2D and/or 3D. In this example we will set a color, adjust the shutter.

1. Double-click on the Instrument (Hit the X key Twice to deactivate the **Instrument Insertion** tool first)
2. In the Lighting Device dialog box, under the Instrument Properties click on the Color list

3. The Color menu will appear, in the Top Right Corner click on the Pick Color button
4. Choose the Spotlight Rosco Colors in the Color Palette section



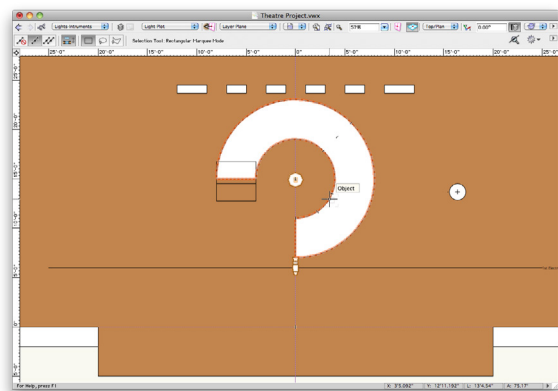
5. Under the Color List select R-302 and click **OK**

Note: The RGB value will be automatically displayed in the Color field. You can change this to R-302.

6. Click on the Shutters tab
7. Adjust the Top Shutter Depth to 25% at 0°
8. Click **OK** to save these adjustments

Next we will set a Focus Point for our light.

1. Turn on the Scenery Layer
2. Right click on the Instrument
3. Select Focus Instruments, select Next click, click **OK**, leave the Focus Point Name set to A and the **Height** to 5'0, and click **OK**
4. Click in the Center of the Ramp to set the Focus Point



Note: Focus Points can also be placed using the **Focus Point** tool in the Spotlight tool set. You can then assign a Focus Point to a Lighting Instrument in the OIP or Lighting Device dialog box.

Now let's create a Label Legend to display information about this Lighting Instrument. Label Legends will display information about an instrument around it on the design layer.

1. Select **Spotlight > Label Legend Manager**, click **Add**

2. Name the first Legend LL-1

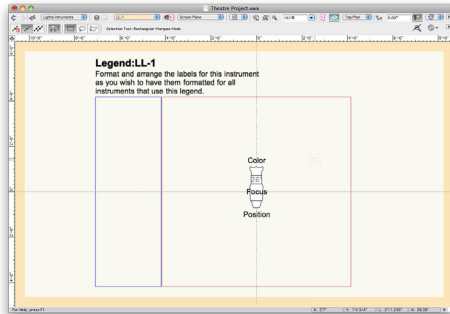
3. Select the following Attributes to display:

- Position
- Color
- Focus

4. Under Lighting Instrument Layout Symbol, select **Choose**, select the ETC Source 4 26° symbol, and click **OK**

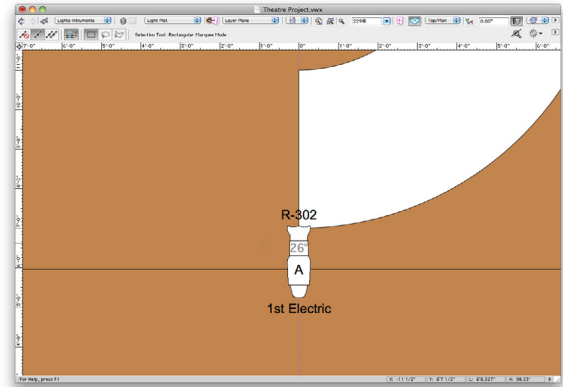
5. Select the LL-1 legend and click **Edit Layout**

6. Drag the Tags on Left and arrange them around the sample Lighting Instrument



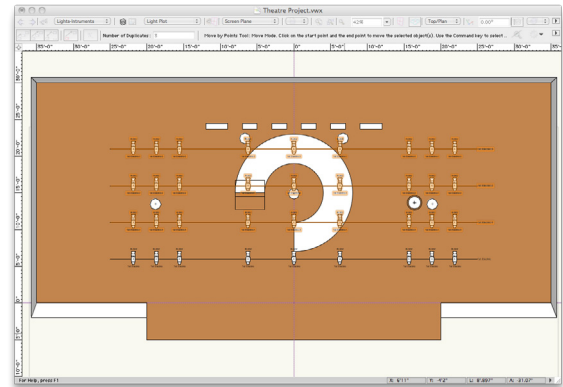
7. Click **Exit** Symbol in the Top Right Corner

8. Double-click on the Lighting Instrument, set the Label Legend to LL-1 under Instrument Properties, and click **OK**



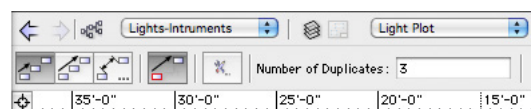
We now have a complete Lighting Instrument with a Label Legend. Using the methods discussed earlier, Create or Duplicate 8 more Instruments on this position and distribute them on the position. Also, create a few more Focus Points for the new instruments.

Note: Your file should look similar to this image:



We are going to use the 1st Electric Position to create the additional Positions. In this example we will duplicate the Position, change the Position names, and replace some lighting devices with others.

1. Select the 1st Electric and all of the Lights, activate the **Move by Points** tool in the Basic palette, in the Tool bar set the tool modes to Move and Object Retention, and set the Number of Duplicates to 3



2. Click once on the Stage Right end of the 1st Electric, move your cursor Up, press Tab to enter the FDB, set X to 5' [1.524m], and press Enter [Return] Twice

- Adjust the Position names in the OIP to display 2nd through 4th Electrics
- Select all the Instruments on the 2nd Electric, click Edit in the OIP, set the Position to 2nd Electric, click Apply to All, and then **OK**. Repeat for the Instruments on the 3rd and 4th Electrics

Note: It will be easier to select multiple instruments, if you turn off the Theatre Architecture and Scenery Layers, as well as the Focus Objects Class.

Next, let's switch some of the Instruments to another type.

- In the Resource Browser, click on the Files drop-down menu, and select Vectorworks Libraries
- In the Objects-Entertainment folder, select Lighting-ETC.vwx, and click Open
- Select the Source 4 PAR WFL symbol. Right-click (Ctrl+click on a Mac) and Select Import from the Contextual menu.
- Click **OK** in the Import Symbols dialog box to accept the defaults
- Revert back to the Active Document in the Resource Browser by clicking the Home icon (The Source 4 PAR WFL symbol will now show in this files resources)
- Select all of the Instruments on the 3rd and 4th Electric
- Select **Spotlight > Replace Instrument**, choose Replace Selected Instruments, under Symbols choose Source 4 PAR WFL, and click **OK**
- With the new Instruments still selected, set the Rotation to 180° in the OIP

Let's look at the Vertical Position in the Font of House. Vertical positions have Instruments on both sides representing lights that are stacked on top of each other. We will need two new Label Legends for the Vertical Position.

- Create two new Label Legends named LL-2 and LL-3
- Select the same attributes as LL-1. **Purpose, Color** and **Focus**
- Place all the Labels on the Left side of the symbol for LL-2 and on the Right side for LL-3

Now let place some Lighting Instruments on the FOH Vert 1 Position.

- Place another ETC Source 4 26° on the Left side of the Position towards the Top
- Double-click on the Instrument, make sure the Position is set to FOH Vert 1, set the Color to R-36, and the Focus to C
- In the OIP, set the Z Height to 24' [7.3152m]
- Make 4 duplicates of this Instrument and Align them along the Left side of the Position
- Select all 5 Instruments, activate the **Mirror** tool from the Basic palette



- Set the mirror line by clicking once at the Top of the Position and click a Second time at the Bottom of the Position
- Next, select all of the Instruments and the Position, use the **Mirror** tool to mirror this set of lights to the opposite side of the Theatre. Use the Center Guide Line to set the mirror line
- Select the New Position and Rename it FOH Vert 2
- Select all of the Instruments on FOH Vert 2 and set the Focus to B
- Assign Label Legend LL-2 to the Instruments on the Left and LL-3 to the Instruments on the Right of each of the two vertical positions

Numbering Instruments

- Select **Spotlight > Number Instruments**
- Set the Field Name to Unit Number, the Prefix to S-, and the

Start # to 1

3. Click **OK** and then **OK** again in the Number Instruments dialog
4. In order from Bottom Left to Top Right, click on all of the Stage Instruments, and then click in a Blank area to finish the numbering.

Note: Check in the OIP for a few of the Instruments to confirm they are numbered correctly.

5. Repeat this process for the Font of House instruments. Use the Prefix FOH-

Generating Paperwork

Vectorworks can generate instrument schedules, hook-ups and other paperwork. Select **Spotlight > Reports > Generate Paperwork**, to create paperwork. You can also create custom reports as well. First we will create a new design layer for our Paperwork.

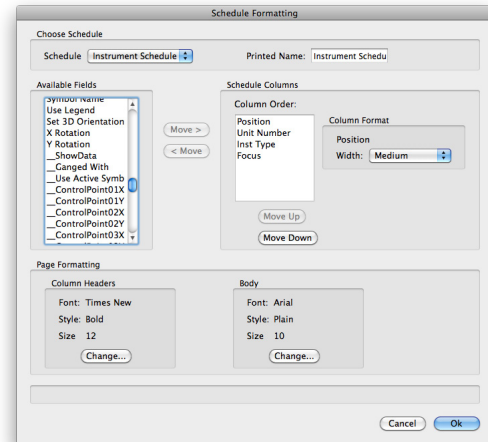
1. Select **Tools > Organization**
2. Under the Design Layers tab, click the **New** button
3. Name the Layer Paperwork and click **OK**
4. Set the Scale of the Layer to 1:1
5. Click **OK** to exit the Organization dialog box

You should now see the blank Paperwork design layer. If you still see objects from your other layers, make sure that the Paperwork layer is the active layer, select **View**, confirm that Unified View is checked and that in the Unified View Options, Ignore Layers with Different Scales is checked. Now let's use the Generate Paperwork command.

6. Select **Spotlight > Reports > Generate Paperwork**
7. In the Generate Paperwork dialog, under Schedules, select Instrument, and Color Schedule
8. Click **Setup**
9. Select all Fields under Column Order and click **Move Left** button

10. Now select and add the following Fields using the **Move Right** button

- Position
- Unit Number
- Inst Type
- Focus



11. Click **OK** and then **OK** again

Note: You will now see the Schedules in the Resource Browser.

12. Click and Drag the Instrument, Color, and Seating Count Schedules from the Resource Browser onto the design layer

You may want to edit the formatting of the schedules to adjust column width. To edit a schedule, Double-click on the placed schedule.

Presenting Your Drawing

Our Theatre project file is now complete. We have a 3D model of a set in a theatre with stage lighting in place. Now we need to create a Plot and Model View, and setup Sheet Layers and Viewports for export or printing.

Create Plot and Model View

This command is only necessary if you need to show Vertical Positions in a 3D view. If you are not using Vertical positions or

do not need to show the positions in a 3D view, this command is not need.

The Create Plot and Model View command will create a Definition Layer and Model Layer for the selected positions. The selected Positions will be moved to a Definition Layer and replaced with a Design Layer Viewport. A second Design Layer Viewport will be placed on the Model Layer. This allows you to rotate the design layer viewport on the Model Layer so vertical positions appear correct in 3D views.

1. Switch to the Light Plot layer
2. Select the Four Positions on the Stage
3. Select **Spotlight > Visualization > Create Plot and Model View**
4. Set the Name to Definition View-Stage and set Model Layer to New Model Layer
5. Make sure Separate Views and Vertical are unchecked and click **OK**
6. In the New Design Layer dialog box, check the box for Edit Properties After Creation and click **OK**
7. Set the Scale to $\frac{1}{2}''=1'$ [1:24] and click **OK**

Note: If you turn off all of the Layers and Toggle between the Definition-Stage, Model, and Light Plot Layers you will see that the physical Light Instruments and Positions have been moved to the Definition-Stage layer and that Design Layer Viewports have been placed on the Model and Light Plot Layers.

8. Make sure the Light Plot Layer is the Active Layer and that all other layers are turned off
9. Select both of the Vertical Positions
10. Select **Spotlight > Visualization > Create Plot and Model View**
11. Set the Name to Definition View-FOH and set Model Layer to Model Layer
12. Make sure Separate Views and Vertical are unchecked and click **OK**

Note: We are not using the Vertical option because we are converting two positions at once.

13. Make the Model Layer Active
14. Select the Viewport of the Vertical FOH Positions
15. Go to View > Standard Views > Left
16. With the Viewport still selected, go to Modify > Rotate > Rotate, set the Angle to 90°, and Click OK

Now we have vertical trusses that display correctly in 3D. Switch back to a Top/Plan View and turn on the following Layers:

- Light Plot
 - Scenery
 - Soft Goods
 - Audience
 - Theatre Architecture
17. Turn off all other Layers.

Viewports and Sheet Layers

Viewports are windows into models with the display of information controlled by class and layer visibilities. Sheet Layers are used to assemble Viewports and create sets of drawings for export or printing. While Design Layers can have different scales, Sheet Layers are always in 1:1 scale. Viewports also only have one scale per Viewport, but there can be many Viewports, each with a different scale on any given Sheet Layer. Viewports placed on Sheet Layers, can be modified, annotated, dimensioned, and cropped. First, we will review the process of creating Viewports and Sheet Layers, and then we will create a set of drawings from the Theatre Project.

Creating Viewports

1. Select **View > Create Viewport**
2. In the Create Viewport dialog box, name the Viewport **Plot**, enter **Light Plot** for the Drawing Title, and select New Sheet Layer from the Create on Layer list
3. In the New Sheet Layer dialog box, set the Sheet Title to 01-Light Plot and click **OK**
4. Leave the rest of the settings in the Create Viewport dialog box

default and click **OK**

Note: You can completely customize the Viewport during the creation process. You can also modify the viewport through the OIP after creation. We will show this next.

Editing Viewports

Let's start by turning off the layers we do not want to show in this viewport.

1. In the OIP, click on the Layers button
2. Set All Layers Except, Light Plot and Theatre Architecture to Invisible
3. Set the Theatre Architecture layer to Gray and click **OK**

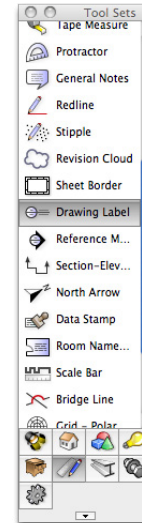
Next, we will set the scale of the viewport so it will fit on our page. You can set the viewport to any of the standard scale presets or a custom scale in the Object Info Palette. We will set a custom scale for the Light Plot viewport and arrange it on the page.

1. In the OIP, click on the Scale list, Select Custom, and set the Scale to 1:40
2. Move the Viewport so that it fits within the page area
3. Place it on the Left Side of the Page

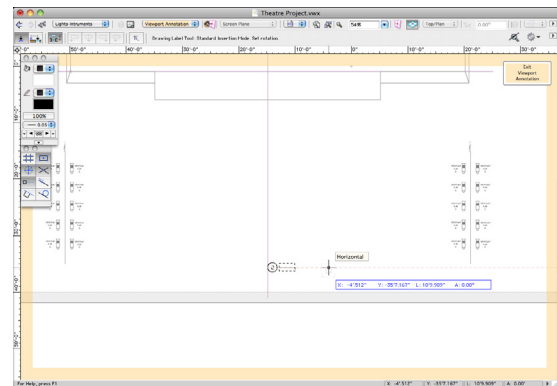
Finally, let's add a Drawing Title in the Annotations of this Viewport.

1. Double-click on the Viewport
2. In the Edit Viewport dialog box, select Annotations, and click **OK**

3. Switch to the Dims/Notes Tool Set and Activate the **Drawing Label** tool



4. On the Bottom Center of the Viewport click once to place the Label, then Move the cursor to the Right, and click a Second time to set the Rotation of the Drawing Label



5. The Drawing Label Object Properties dialog will appear if this is the first time you have placed a Drawing Label. Click **OK** to accept the defaults
6. Click Exit Viewport Annotation in the Top Right Corner of the Drawing Window

As you can see the Drawing Label is auto-numbered and displays both the Drawing Title and Scale of the Viewport. The Annotations section of a Viewport can be used to place Labels, Notes, Dimensions, and other 2D Annotations.

Working on the Sheet Layer

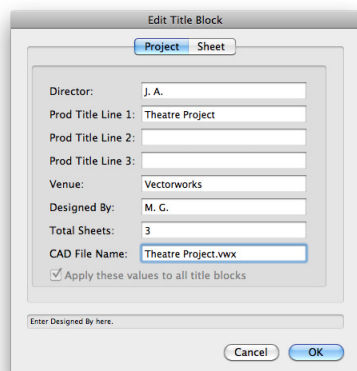
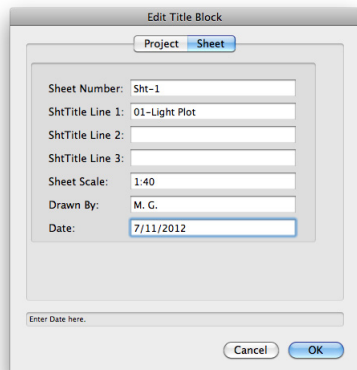
In addition to placing Viewports on Sheet Layers, you can also place Drawing Borders and Title Blocks. In this section we will place a Sheet Border and Title Block on our Sheet Layer.

1. In the Dims/Notes Tool Set, Activate the **Sheet Border** tool, and Double-click anywhere on the Sheet. (The Sheet Border will automatically snap to the Page Border)

Note: The Sheet Border Preferences Dialog will pop-up if this is the first time you have placed a Sheet Border.

2. If the dialog box does not pop-up, all settings can be modified in the OIP
3. Click on the button to the right of **Title Block**
4. In the Import Title Block dialog box, Choose Defaults, then Click on the Symbol thumbnail, choose the Spotlight Title Block, and click **OK**
5. Click **OK** again to place the Sheet Border and Title Block
6. Double-click on the Title Block to edit the fields
7. Edit the fields as shown

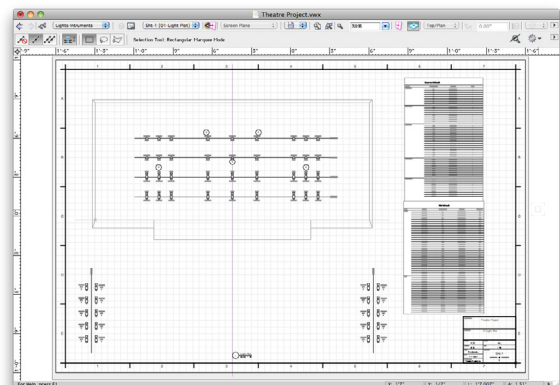
Note: There are two sections for this Title Block, Project and Sheet. The labels under Project will show on every sheet. The labels under Sheet will only show on this sheet.



Placing Schedules

You can place a schedule directly on the sheet layer or you can create viewport of the schedules we placed earlier on the design layers. Creating a viewport of a schedule will give you easier control of the size of the schedule. You will be able to adjust the scale of the schedule viewports in the same way as we adjusted the scale of the Light Plot viewport. We will show placing cropped viewports of the schedules.

1. Switch to the Paperwork design layer
2. Activate the **Rectangle** tool from the Basic palette
3. Draw a Rectangle around the Instrument Schedule
4. With the Rectangle selected, select View > Create Viewport.
5. Click Yes in the Prompt dialog box to use the Rectangle as the Viewport's Crop
6. Select **Sht-1 [01-Light Plot]** from the Create on Layer list and click **OK**
7. Move the Viewport to the Right Side of the sheet
8. Repeat this process to place a Viewport of the Color Schedule on Light Plot sheet as well
9. Select both of the Schedule Viewports and give them a Custom Scale of 1:1.5 in the OIP
10. Arrange the Schedules on the sheet



Creating Additional Sheets and Viewports

We can use the first Light Plot Viewport to create additional Viewports and place them on different sheets.

1. click and Drag the Light Plot Viewport to the Right while

holding the Alt key (Windows) or Option key (Mac)

2. You will see a Plus sign appear above your cursor
3. With the Alt/Option key still pressed release the Mouse button

We now have a duplicate of the Viewport. Next, we will create a new Sheet Layer and move the new Viewport onto it.

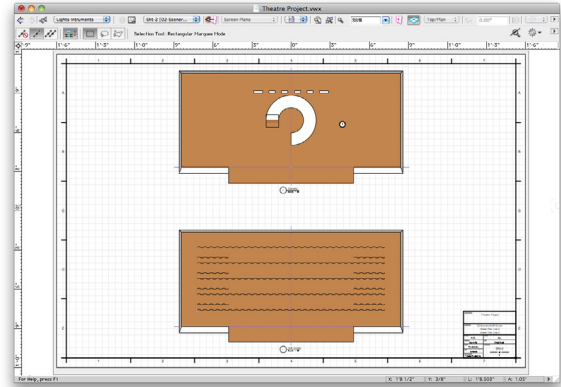
4. Select **Tools > Organization**, under the Sheet Layers tab click **New**
5. Name the Sheet Layer 02-Scenery/Soft Goods and click **OK**
6. Switch back to Sht-1, select the new Viewport, and in the OIP set the Layer to Sht-2
7. Switch back to Sht-2
8. Select the Viewport and set the Drawing Title to Scenery in the OIP

Next we can modify this new viewport. Let's crop it, change the layer visibility, and adjust the scale.

9. Double-click on the Viewport and select to edit the Crop
10. In the Edit Crop view, select the **Rectangle** tool and draw a Rectangle around the just the Theatre walls and stage
11. Click Exit Viewport Crop in the Top Right Corner
12. Double-click on the Viewport and select to edit the Annotations
13. Move the Drawing Label Up so that it is Centered under the Stage
14. click Exit Viewport Annotations
15. In the OIP, click on the Layers button, set the Theatre Architecture and Scenery Layers to Visible
16. Set All Other Layers to Invisible and click **OK**
17. In the OIP, set a Custom Scale of 1:50

Using the method shown previously, Duplicate this viewport, Set the Drawing Title to Soft Goods, and set it to show the Soft Goods and Theatre Architecture layers. You will need change the

Drawing Label to show Drawing Number 2 in the Annotations section. Add a Sheet Border and Title block to finish the sheet.

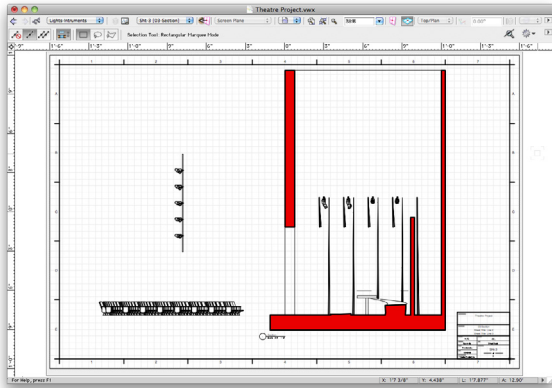


Section Viewports

Section Viewports create cross-section views of your model. We will create a Section Viewport on a new Sheet Layer.

1. Make the Model Layer the Active Layer and switch to a Top/Plan view
 2. In the Navigation Palette, turn off the Two Definition Layers, the Paperwork, and Light Plot Layers. Turn All Other Layers On
 3. Select **View > Create Section Viewport**
 4. Click once Outside of the Rear Theatre wall and to the Right of the Center Line
 5. Move the cursor Down Vertically until it is passed the Seating Layout, click once to set the Section Line Length, Move the cursor to the Left and Double-click to set the direction
- Note: Make sure your Section Line does not cut through any Lighting Instruments.
6. In the Create Section Viewport dialog box, Set Create on Layer to New Sheet Layer
 7. Set the Sheet Title to 03-Section in the New Sheet Layer dialog and click **OK**
 8. Set the Drawing Title to Section and the Scale to 3/8"=1"0" [1:32]
 9. Click **OK**

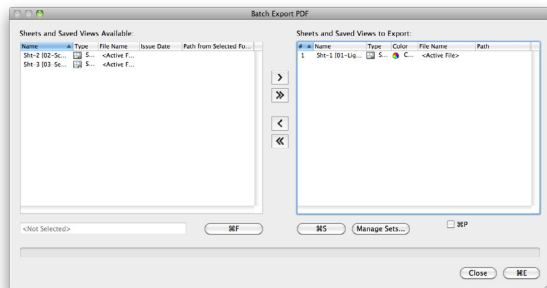
Finally, Add a Sheet Border and a Title Block



Printing/Export

Now that our Theatre project is complete, we need to Print or Export the file. To print each sheet, make it the active sheet and select **File > Print**. For most projects you will want to Export to a PDF first. Exporting to PDF allows you to have file that can be sent to a Print Shop or transferred to client. To Export to PDF, select **File > Export > Export to PDF**.

If you would like to Export all of your sheets in one PDF, use **Export PDF (Batch)**. This option allows you to choose the sheets you would like to export.



Event Planning

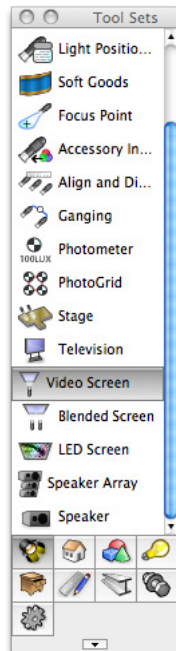
Event Planning Tools

Some of the tutorials described below require the Renderworks module to function at their full potential. If you do not have Renderworks, you may not be able to follow along with or complete these guides. Here we will cover some of the topics that were not detailed in the above steps, but can be exceedingly useful in creating any sort of entertainment or theatre venue.

Creating a Video Screen

Video Screen objects give you an easy way to add customizable LED or front/rear projections displays to your plan.

1. Select the **Video Screen** tool from the Spotlight toolset and then click the **Video Screen Preferences** button in the View bar.



2. Set the **Screen Type** to LED

3. Set **Screen Aspect** to 4:3
4. Set **Stock Size** to 9'x12', then click **OK**.
5. To place the object, hover over the left locus point on the front Soft Goods object until a Smart Point is acquired.
6. Move the cursor down until your extension line intersects with the horizontal guide line
7. Click once to set the location, then press the Tab key 4 times to highlight the **Angle** field. Enter 15 degrees, then click to place the screen
8. Select the Video Screen object, then activate the **Mirror** tool
9. With the **Mirror** tool in the second mode, Duplicate, click and draw a vertical mirror line along the center point where the two guide lines intersect. This gives us an identical video screen on the opposite side of the stage.
10. With both screens selected, check the box for "Show Coverage Zone" and we can see that these two screens at their current size are more than adequate for the seating areas. This option is useful not only for making sure you have enough coverage, but to avoid making the opposite mistake of placing too many.
11. Since this coverage is fine, we can uncheck "Show Coverage Zone"
12. Now we can set our custom texture that will be displayed as a lit image on both screens.
13. With both Video Screens selected, click **Edit Screen Image** in the Object Info Palette
14. From the textures list at the top left, select the "SilenceCellPhones" texture, make sure Tile Image is unchecked and that the Scale is set to 100%
15. You'll see that the image sits at the bottom of the screen, to

line this up properly, set the **Vertical Shift** to 30%, make sure Tile Image is unchecked and click **OK**.

16. With one of the screens selected, go to a Right Isometric view via the Standard Views menu.
17. If your view does not show the Video Screen, click **Fit to Objects** in the View Bar.
18. To view the completed object, go to the Rendering menu in the view bar and select **OpenGL**.

Creating Stage Stairs and Lectern

The create Lectern commands quickly creates an object with basic attributes and textures commonly used in conjunction with a stage. These objects are simple representations that when created, automatically acknowledge a Stage object and adjust their heights accordingly so that they don't have to be manually moved into place.

To create a Stair,

1. If not already in Top/Plan view, switch to it now in the View Bar.
2. Select the Stage with the **Selection** tool.
3. Select **Event Planning > Create Stairs**.
4. In the Create Stair dialogue box, set the **Width** to 3' [0.9144m]
5. Select the Flooring Bamboo Vert Horizontal texture, then click **OK**.
6. Click the point on the Stage you want the stairs to attach at. Then move the cursor away from the stage in the direction you wish the stairs to travel.
7. Click a second time to complete the stair creation.
8. Finally, set the **Z** value to -3'6" [-1.0668m] in the Object Info palette.

This creates the same object as the **Simple Stair** tool, however the difference is that if you first select the Stage, then use the Create Stair command, it will automatically set the height of the stairs to match the stage. If you do not have a stage selected, the stair will be created at whatever height the last stair was created at.

To create a Lectern,

1. Select the Stage with the selection tool.
2. Select **Event Planning > Create Lectern**.
3. Once configured to your liking, click on the location upon the stage you wish the lectern to be placed.

You'll see that the height of the lectern is automatically lined up with the top of the stage at the location you selected.

Customizing Event Seating

This command was covered earlier in the guide, however the symbol used in the creation of the layout is completely open to customization. We will cover this in more detail here. In this example, we already have a seating layout similar to the one you created previously. However we will now modify the symbol used and replace the single chair layout with a banquet table and chairs along one side, without having to change the shape and area of the seating layout object itself.

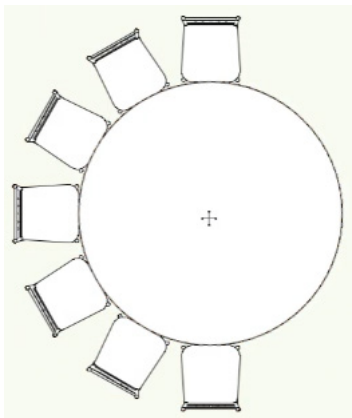
There are a few symbols already located in the default libraries of Vectorworks that contain tables surrounded by chairs, but these can be easily and quickly customized for your specific needs.

1. Activate the **Circle** tool from the Basic Tool Palette,
2. Click once in a blank area of the document (It does not matter where, the object we are creating now will be relocated shortly) then press Tab once to enter the **Length** field.
3. Enter a value of 3' [0.9144m] and then click once to create a Circle with a 6' [1.8288m] diameter.
4. This will be the guide for the edge of the table and the object we align and array our chairs around. This object is simply a guide for creating our chairs; it can be deleted once we have completed working with it.
5. Double click on the "Chair 1" symbol from the Resource Browser to activate it for symbol insertion, then double click off to the left of the existing geometry to place it.
6. Use the selection tool (and the rotate tool if necessary) to align the chair so that it is facing the bottom of the screen and so that the front edge of the seat is snapped to the top center of the circle.

7. Select the chair symbol.
8. Select **Edit > Duplicate Array**.
9. Here we will be selecting Circular Array from the **Shape** menu.
The circle we created will allow us to easily select the desired center of the array.
10. Set the **Number of Duplicates** to 6

Many users think that they need to then manually calculate the angle in order to array the symbols as needed, however there is a much easier way of inputting this information. We can simply enter the number of degrees we wish the array to cover, divided by the number of duplicates. (So for instance, if i wanted to evenly distribute 6 duplicates around the table, I would enter $360/6$)

11. In this case since we only want the 6 chairs to distribute around one half of the table, so enter $180/6$.
12. So that all the chairs face the center of the table without having to be manually rotated one at a time, enable **Rotate Duplicates** and choose "Use Duplication Angle". This means that any duplicates created will be rotated the exact angle around the center of the array that they are placed. In a circular array, this means they will all be rotated automatically to face the center of the circle.
13. Select **Next Mouse Click** and then click OK.
14. Since we have a circle already lined up, all we have to do is click the center of the circle and the array will be created around it.



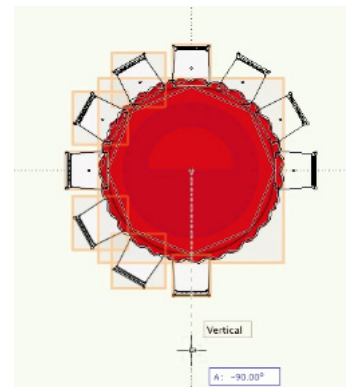
15. Now we can select the "Table - 72" Round" symbol from the resource browser, then drop it into place.
16. The table symbol will be above the circle, so right click on the

edge of the symbol and select **Send to Back**.

17. Delete the circle, then right-click on the table symbol again and select **Send to Front**.
18. Select all the chairs along with the table, then select **Modify > Create Symbol**. Name the symbol "Table and Chairs Custom"
19. Now we can go back over to the already created seating layout, Select it, then click **Select Symbol** from the Object Info Palette.
20. Choose Top Level on the left, then select the newly created symbol from the list on the right

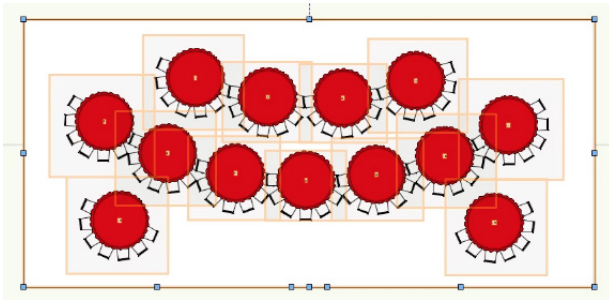
You'll see here our chairs are replaced with the Table and Chairs symbol we just created. However, the tables are not facing the correct direction. This is easily fixed.

21. In the resource browser, right click on the "Table and Chairs Custom" symbol, then choose **Edit**.
22. Select **Edit 2D Component** then click **OK**.
23. Select all of the geometry in the symbol, then click on the "Center" snapping point of the table and drag it over so that it is exactly placed on the 0,0 Locus center of the symbol editing mode.
24. With all objects still selected, activate the rotate tool and click on the center of the table.
25. Move the cursor to the right until you see the "Horizontal" cursor cue, then click once.
26. Move the cursor down and to the left until you see the "Vertical" cursor cue, click again to complete the rotation. Our tables will now face the correct direction in the Seating Layout.



You'll see however that a large area of the seating is left empty. This is because of the custom cutout we used to create an aisle for the previous seating arrangement. Since for a setup with tables and chairs this is unnecessary, we will modify the layout's Boundary Line to one more appropriate for the symbol we are now going to use.

1. Select the seating layout with the Selection tool and then check the **Draw Boundary Line** box in the object info palette, so that we can manipulate the boundary directly.
2. Double click the seating layout's boundary line. Then in the mode bar, make sure the 4th mode; Delete Vertex Mode, is selected.
3. Click on the two interior vertices at the center front of the seating layout. You'll see these vertices vanish and the seating layout returns to a solid rectangle.



4. Now to complete the setup, we will select the seating layout and make sure that the **Seat Spacing** is 9'6" [2.8956m] and the **Row Spacing** is 8' [2.4384m].

We've now readjusted the venue for banquet seating without having to redrawn and realign the seating layout. Even the focal point and seat numberings have translated automatically.

Creating Event Views

The Create Views command will automatically create two sheet layers with one viewport each of your event plan. One sheet layer will be titled "Plan View" and will have a Top/Plan viewport, the other Sheet Layer will be titled "Rendered View" and will create a Left Isometric viewport rendered in OpenGL.

In addition to the two sheet layers and viewports, this command will also generate a seating count worksheet on the Plan View sheet layer.

Make sure you have no objects selected, then select **Event Planning > Create Views**. The sheet layers and viewports will be

automatically generated for you.

This tool, similar to Create Views command will create a number of viewports, however this version of the command will create them on separate sheet layers without the need to manually move them to separate locations afterwards.

Custom Lighting Instrument

Creating a custom Lighting Instrument

Not every object can be directly converted into a working Lighting Instrument. This guide will explain start to finish how to properly create 2D/3D hybrid geometry and then correctly convert those objects into a functioning Lighting Instrument.

Creating the Symbol

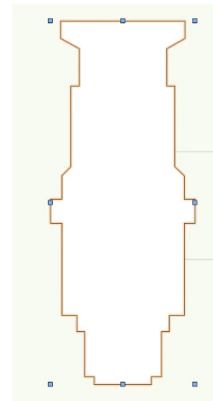
The first thing we will create is the symbol the Lighting Instrument will use. A symbol for a lighting instrument can be 2D-only, however in this guide we will create a full 2D and 3D representation of our light, so that it can be used in 3D renderings. When creating your own symbol, keep in mind that the 2D representation should be as simple as possible. Lighting Instruments are often repeated dozens or even hundreds of times within the same document and every component of the symbol, no matter how small, increases the amount of work that Vectorworks will have to do each time you add, modify or view one of these objects. The simpler the object is at creation, the faster your document will be when using it.

In this guide, to save time, we have provided a few starting points for your geometry.

1. Open the file "Gsg-2014-s09-custom-lighting-instrument01.vwx"
2. You will see a simple polygon that represents half of the 2D appearance of the lighting instrument. Why only half of it has been created will be explained shortly.
3. Select one of the polygons, then copy and paste a copy of it off to the side, we will use this later to create the 3D portion.
4. Activate the **Mirror** tool in the basic tool palette, with the tool set to the 2nd mode (Duplicate Mode)
5. Click once on the top left of the polygon we will be using to create the 2D component, then a second time on the bottom

left. This will create an exact duplicate of the first half lined up perfectly with the second half.

6. Select both the original and the duplicated halves, select **Modify > Add Surface** to combine them into one simple polygon. This will be our 2D component for the symbol.



Now we'll move over to the copy of the half polygon we created earlier. The reason we only created half, in addition to making it easy to create a perfectly symmetrical 2D component, is so that we can use the Sweep command on this half to create the 3D component rapidly, without having to model individual pieces one at a time.

1. Select the remaining polygon half, then select **Model > Sweep**.
1. The default values should be correct for what we are doing, making sure the **Arc Angle** is set to 360, click **OK**.
2. We now have a Sweep object selected. In the attributes palette, set the **Fill** and **Pen** colors to a dark grey.

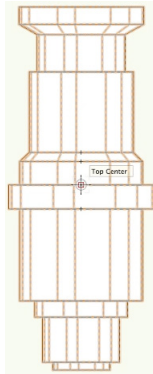
This is a very simple way of creating a 3D lighting instrument component. You can create additional custom geometry if you would like when creating your own custom symbols in the future, but this will give you a good 3D representation while taking very little time and use a minimum of Vectorworks' resources.

1. Activate the **Selection** tool in the basic tool palette, then hover over the top center of the 2D polygon until you see the Midpoint cue appear.

2. Click and drag the polygon overtop of the sweep we just created, so that you align your clicked midpoint with the sweeps Top Center cue.
3. Select both objects, then select **Modify > Create Symbol**.
4. Name it "Custom Light 01"
5. Select **Next Mouse Click** for the insertion point.
6. Make sure **Leave Instance In Place** is checked, then click **OK**.

Our next click, which determines the insertion point of the symbol, also determines the hanging point for the lighting instrument, or the point at which it will connect to other hardware.

7. Click on the center of the symbol, where the Top Center cue appears along the top of the thickest point of the light.



A final change must be made to the symbols geometry itself so that the 3D component of the symbol will face the proper direction in a 3D view.

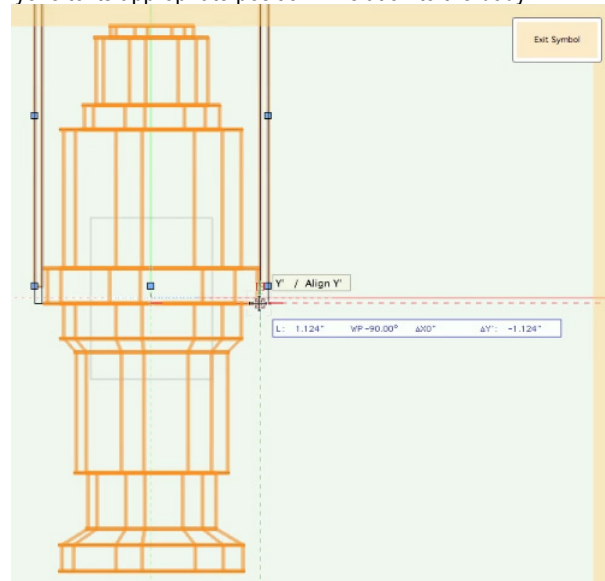
The 3D component should always be aligned so that the light is pointing straight down by default. If not, the 3D component of the lighting instrument will be randomly offset in its tilt and pan angle, as well as facing a different direction than the light emitting from it.

8. Double click to edit the symbol, then choose **3D Component** and click **OK**.
9. Go to the **Left** view in the Views drop down menu, then select the sweep.
10. Select **Modify > Rotate > Rotate Left 90 degrees**.
11. Exit the symbol editing mode.

So far we have created the Body component of the lighting

instrument. Now, in 3D only, we will add a simple Yoke and Clamp component. These two objects have been provided for use in this guide, however as with the body, any geometry can be used for these parts.

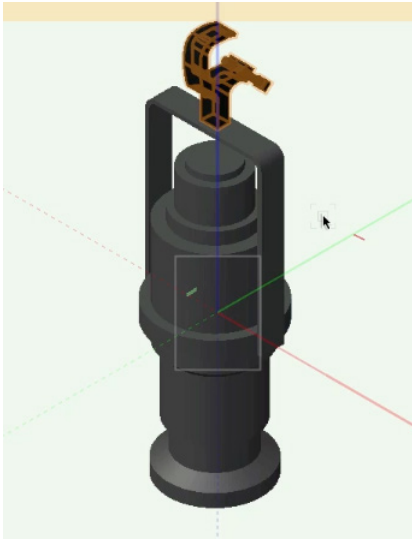
1. First, edit the symbol again choosing **3D component**, then click OK.
2. Enter **Top** view from the View dropdown menu.
3. Double click the "Custom Light Yoke" symbol from the resource browser, then double click on the center of the light body. This will place the object we are going to use for our instruments Yoke.
4. Change to a front view, you will most likely see that the yoke is too far down. Select the yoke object if it is not already selected.
5. While holding down the **Shift** key, we will click and drag the yoke to its appropriate position in relation to the body.



6. Change back to a **Top** view, then double click the "Custom Light Clamp" symbol in the resource browser.
7. Double click on the center locus point to place the clamp geometry. Change to the **Left** view.
8. Activate the selection tool, then while holding down **Shift**, click and drag the clamp upwards to align it with the top of the yoke.
9. While holding **Shift** again, click and drag the clamp until it snaps to the center of the top of the yoke object.

The 3 objects should now be aligned as they would be in real life, with the light aiming at the floor. To verify this, you can change to

an isometric view and set the Rendering mode to OpenGL.



Now to ensure that the object will insert at the correct position, as well as rotate around the point at which the yoke connects to the body.

10. Go to the Left view, then select all the geometry inside the symbol.
11. Click on the top of the clamp, then hold the **Shift** key and drag all the objects so that the center of the clamps grip is aligned with the "Locus" of the symbol editing mode.
12. Return to a Top/Plan view.
13. Click on the **3D Locus** tool in the 3D Modeling tool set.
14. Click the center locus of the 3D editing mode to place the 3D Loci.
15. Activate the **Selection** tool, then switch to the **Front** view.
16. Select the 3D Loci. Click and hold shift while dragging to bring the 3D Loci in alignment with where the yoke connects to the body, as shown.

XXX Screenshot of aligned object with 3D loci highlighted XXX

This will indicate to Vectorworks where you want the body and yoke to pivot around. If you do not add a 3D Loci, they will pivot around the insertion point of 0,0,0 instead as the clamp does.

17. The final steps are to select **Edit > Invert Selection**, so that everything other than the 3D Loci inside of the 3D component of the symbol is selected.

18. In the Object Info palette, under the Render tab, choose "Default Instrument Texture" for the objects **Texture**. This will allow light beams and lit fog to function properly in 3D renderings.

Records Explained

When creating your own custom lighting instrument, you will need to import 2 records into your working document. These records can be found in any of the pre-created light object library files, these are located in the Objects-Entertainment folder and have a prefix of "Lighting-". For this guide, we have already imported them into the resource browser for you.

- **Parts**

This record controls the 3 parts we just created, Body, Yoke and Clamp. Since these parts need to move independently from each other, this record provides them with the correct alignment information based on the parameters set for the overall lighting instrument.

- **Light Info Record**

This contains all of the field values you wish to assign to a particular lighting instrument. Not all of the fields are required, but you will need to make sure all fields you wish to see have been filled out. It is also recommended that you fill the Instrument Type field with the manufacturers name as well as the model name for each particular instrument.

- **Light Info Record M**

This record is not required, however it contains the metric parameters, so that a document can be easily switched from one to the other with a minimum of effort. If you are going to be working in both Metric and Imperial units back and forth, you should attach this record as well.

Attaching the Parts Record

If you are not still in the editing mode for the 3D component of the symbol, double click it and choose to edit the **3D component**.

1. Select the clamp object.
2. In the Object Info Palette, click on the Data tab, then click the box to the left of Parts in the record formats section so that an X appears in it.

3. In Record Fields, highlight Base and in the **Record Info** field, replace False with True.
4. Select the Yoke, In the Data tab, again attach the Parts Record by clicking the box to the left of Parts.
5. Highlight Yoke in the **Record info** field, and again replace False with True.
6. Do the same for the Body, select it, attach the parts record, and set body to True.

Attaching the Light Info Record

1. Now, click with the selection tool in a blank area of the editing mode, so that no objects are selected.
2. In the Object Info Palette, click the box to the left of **Light Info Record** so that an X appears in it.
3. Click again in a blank area of the editing mode, then in the Object Info Palette, click again on the box to the left of **Light Info Record M**, so that it too will be attached to the symbol.

You'll see in the Data tab of the Object Info Palette that the second set of data is now **Record Field Defaults**. This area lists all of the possible default values for this particular symbol. You do not need to edit these fields here, they can be done after inserting out custom light as a Lighting Instrument, but if you fill the known values out now, you save yourself having to do it manually each time later.

4. Exit the symbol editing mode when you've added the desired data.

Attaching these two records in the editing mode of the symbol, with no objects selected, attaches the records directly to the entire symbol and is necessary to create a functional lighting instrument.

You have now created a properly configured Custom Lighting Instrument symbol that can be used with Instrument Insertion in your document in exactly the same way as the default library symbols.

Addendum: Using the Lighting Pipe and Instrument Summary Tools

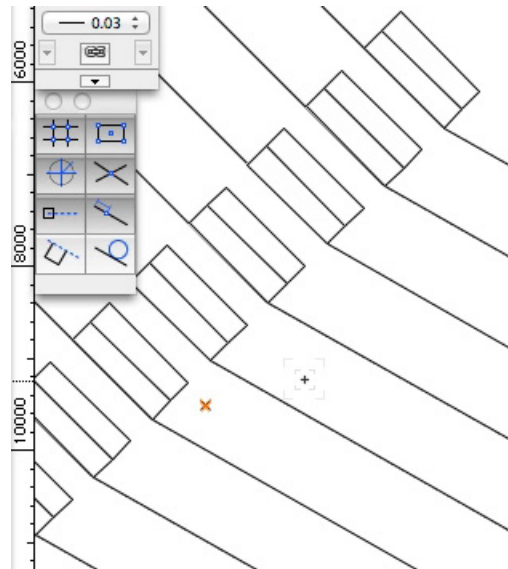
In the previous project for this Getting Started Guide, we used lighting pipe symbols to create lighting positions. For this project, we'll use an alternative method called the **Lighting Pipe** tool to create lighting positions. Once we do this, we will use the **Instrument Summary** tool to create a symbol for our lighting plot.

This time, instead, of going through each document setting, we'll just use the attached exercise file (Gsg-2014-s-lightingpipes-start).

1. Download or copy this file to your desktop. In Vectorworks, go to **File > Open**.
2. Then select the exercise file from your desktop and click the **Open** button.

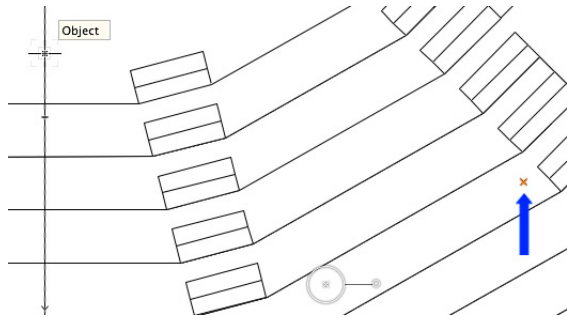
Once you open the file, you should see that the units are set to millimeters, and the drawing is zoomed to the front of the stage and the seating area. We're going to create a curved lighting position above this seating area with a few lighting devices.

3. To begin, select the **2D Locus** tool from the Basic palette. Then click near the far left set of stairs in the 6th row from the front.



4. Next, select the **Mirror** tool in the Basic palette. Also, choose the second mode in the **Tool** bar called **Duplicate** mode.
5. Now click anywhere along the vertical line at the center of the drawing.

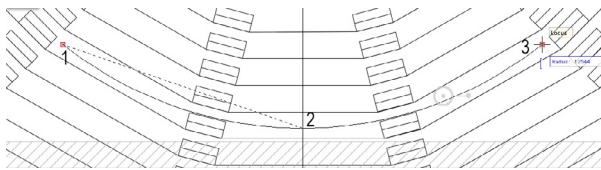
6. Then move your cursor downward along this same line, and click again to create the mirror axis and duplicate 2D locus on the right side of the seating area.



We'll use these locus points as guides to create the curved lighting position.

7. Next, select the **Lighting Pipe** tool from the Spotlight tool set palette. Also, select the fifth mode in the **Tool** bar, **Point on Arc** mode.

8. Click these three points, and double-click the last point to complete the curve and create the lighting pipe.



9. By default, the lighting pipe is placed at 0 on the layer plane. To elevate the lighting pipe, set the **Z** field to 7925mm and press Enter.

10. Additionally, change the **Position Name** field to 2nd FOH.

We can now convert this lighting pipe into a lighting position.

11. With the lighting pipe still selected, go to **Spotlight > Object Conversion > Convert to Light Position**.

Notice in the Object Info palette that this object is now a light position. Also, the Z Height and Position Names fields are set to the data we input earlier. Additionally, you should now see the position name displayed in the drawing area by the light position. Let's make this label a little more legible.

12. Select the light position and **Go to Text > Size > 24** to increase the label's font size.

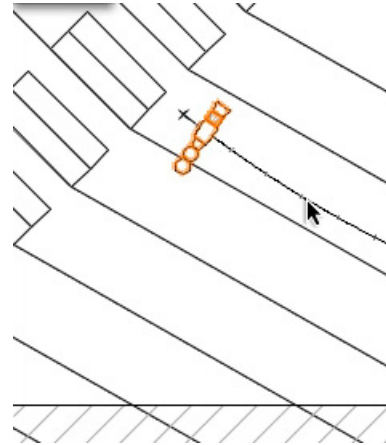
Next, we'll add lights to our newly created light position.

13. To do this, go to the **Resource Browser** and the **Home** icon

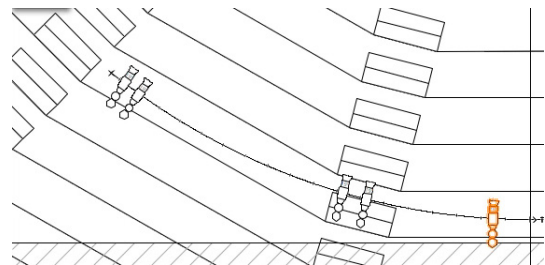
to view the resource for your current document.

14. Then, double-click the symbol **Etc Source 4 19°** to activate the Instrument Insertion tool.

15. Now click the left side of the light position by the locus point. Rotate the light toward the stage as shown here.



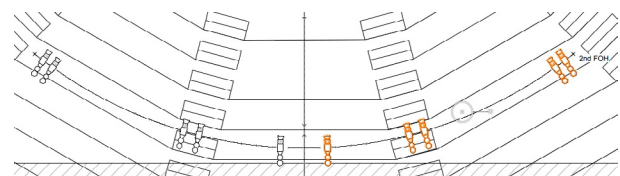
16. Then click again to set the lighting device. Repeat these steps to place four more lights along the light position as shown here.



17. To create the remaining lights, press **X** to switch to the **Selection** tool. Then hold the **Shift** key and click on each lighting device until they are all highlighted.

18. In the Basic palette, select the **Mirror** tool and verify that the second mode, **Duplicate** mode, is activated.

19. Just as we did previously, click anywhere along the vertical line at the center of the drawing. Then move your cursor down this line. Click again to set the mirror axis line, and create the remaining lights.



Now we need to add data to these lights. Notice the lights have been placed in pairs. In each pair, the lights on the left will have

the same channel and color. Instead of inputting the same data multiple times, we'll create the data for one pair of lights.

20. Switch to the **Selection** tool.

21. Select the leftmost lighting device, and set the **Channel** field to **21**, the **Color** field to **R65** and the **Purpose** field to **Area A Front Cool** in the Object Info palette.

22. Then select the light just to the right of the currently selected light.

23. This time, set the **Channel** field to **41**, the **Color** field to **R33** and the Purpose field to Area A Front Warm in the Object Info palette.

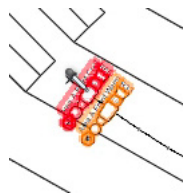
Now we can just transfer the data from these two lights to the remaining lights.

24. To do this, select the **Eyedropper** tool in the Basic palette and click the **Preferences** button in **Tool** bar.

25. In Eyedropper Preferences dialog box, check the option **Plug-in Parameter** in the **Other** section and click **OK**.

This option will allow you to transfer the data we just entered for the lights.

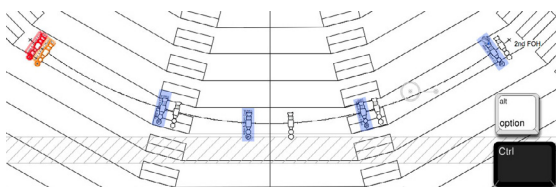
26. Now, click the leftmost lighting device. Notice the cursor is an eyedropper, meaning the tool is in **Pickup Attributes** mode.



We've picked up the parameters from this light and need to transfer it to the left light in the remaining pairs.

27. To do this, hold the **Option** (Macintosh) or **Control** (Windows) key to change the tool to **Apply Attributes** mode.

28. Now click the left light in each of remaining pairs of lights.

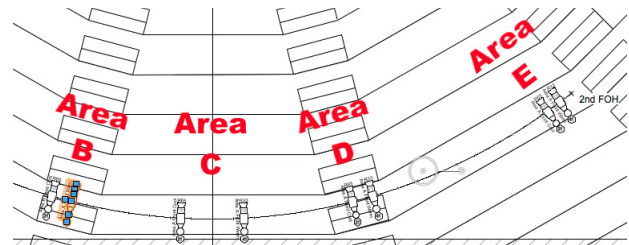


29. Release the **Option** or **Control** key to switch back to **Pickup Attributes** mode, and click the right light from the leftmost pair.

30. Once again, hold the **Option** (Macintosh) or **Control** (Windows) key, and click the right light in the remaining pairs of lights.

Now each pair of lights has the same data; however, there is one parameter that will be slightly different, the **Purpose** field.

31. Switch to the **Selection** tool and change the Area letter in the **Purpose** field for each of the sets of lights as shown here.

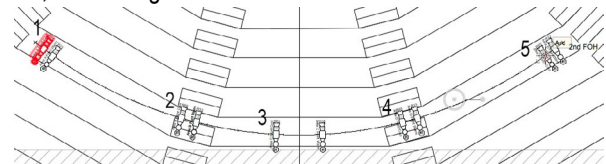


32. Next, let's use the **Number Instruments** command to add the channel number to these lights quickly.

33. To do this, go to **Spotlight > Number Instruments**.

34. In the dialog box, choose **Channel** from the **Field Name** menu and set the **Start #** field to **21**. Then click **OK**.

35. As the resulting dialog box reveals, we're going to click each left lights from the pairs in the order we want them numbered. So, click the lights in the same order as shown here.



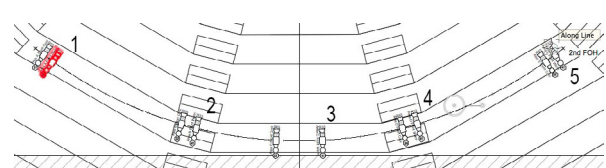
36. Then, click an empty space to see the numbering.

We need to do this one more time for the right lights in the pair.

37. **Go to Spotlight > Number Instruments**.

38. This time, set the **Start #** field to **41** and click **OK**.

39. Click OK to the resulting dialog box, and click the right lights from the pairs in the same order as shown here.



40. Don't forget to click in a blank area to stop the numbering.

Now, if you were to select these instruments individually, you would see the channel numbers are in sequential order based on the order in which we selected the lights.

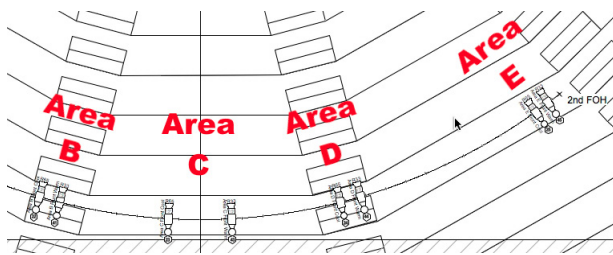
We've finished entering data for these lights; now we need to focus them.

41. With the **Selection** tool, select leftmost pair of lights.

42. Then right click one of the selected lights, select **Focus Instruments** and choose **A** from the list of focus points. Then click **OK**.

These lights are focused on the focus point labeled A.

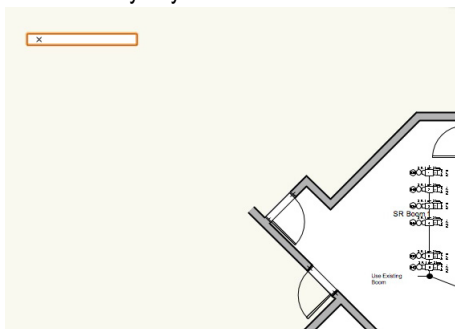
43. Now do the same for the remaining pairs, but choose the focus point that corresponds to the light's area that we previously set in the **Purpose** field.



OK. Our light plot is complete. The next step is to create a symbol key for the lighting devices in the drawing.

44. In the Spotlight tool set, select the **Instrument Summary** tool.

45. Now pan to the left portion of light plot, and place the Instrument Summary at your desired located.



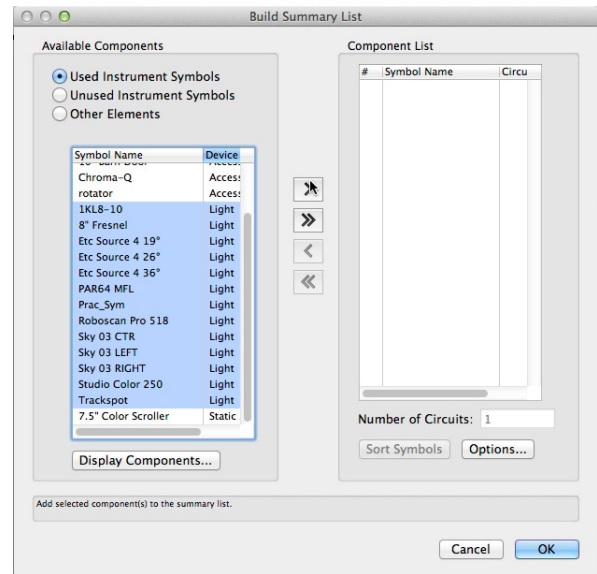
46. At the moment, there is no summary shown. To fix this, click the **Build List** button in the Object Info palette.

47. Since we want to create a symbol key showing the lights in the drawing, make sure the option **Use Instrument Symbols** is selected.

48. Then click the column header **Device Type** to sort by this category.

49. If you scroll down the list, you should see all the lights in one section. Hold the **Shift** key and select the first and last lights in the list of lights to select them all.

50. Then click the single right arrow to add the lights to the instrument summary.

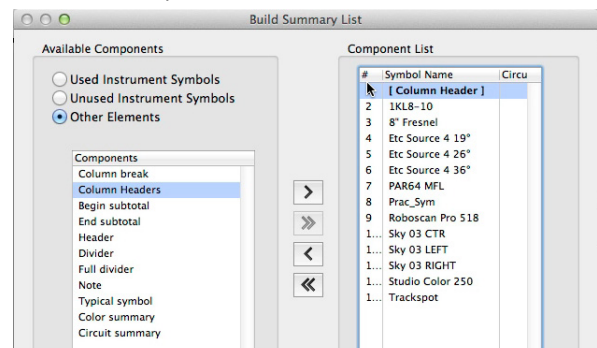


Now let's add some other visual elements to the Instrument Summary.

51. Select **Other Elements** from the **Available Components** section.

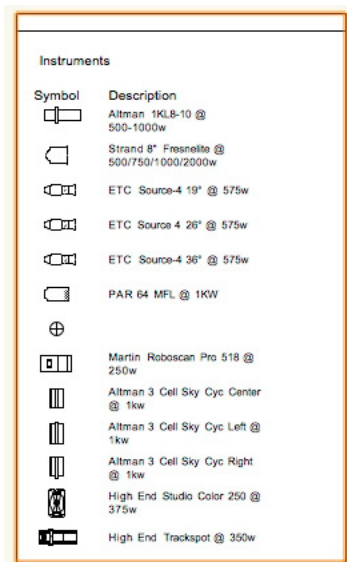
52. Then choose **Column Header** from the list, and click the single arrow pointing to the right to add it to the instrument summary.

53. The header is placed at the bottom of the list, but we want the header to show at the top. So click and drag the column header to the top of the list.



54. Next, choose **Full Divider** from the **Components** list on the left, and click the right arrow to add it to the instrument key on the right.
55. Click and drag the **Full Divider** element in the component list on the right, so that it sits directly above the column header.
56. Finally, select the **Header** from the component list on the left and click the right arrow to add it to the Instrument Summary.
57. Drag this element, so that it is between the header column and the full divider.
58. Now select the **Header**, and click the **Options** button in the bottom right corner of this dialog box.
59. In the resulting dialog box, type **Instruments**, and click **OK** twice to return to the drawing area.

Notice the Instrument Summary now shows all the lights in the document, and it also has the divider and header we set up.



Now let's add a title to this summary.

60. First, in the Object Info palette, check the option **Show Title**.
61. Then, in the **Text** field below, input **Symbol Key** and press **Enter**.
62. Set the Position drop-down menu to **Below**.
63. Also, set the **Size** drop-down menu to **28** and set the **Style** menu to **Bold**.

Last, we'll check the text for the column header.

64. In the Object Info palette, set the **Section Align** drop-down menu to **Center** and the **Size** drop-down menu to **20**.
65. Now reposition your instrument summary if necessary, and you're done.

