

# ArcGIS® 9.2

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## ArcGIS Schematics Tutorial



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# Exercise 1: Getting acquainted with ArcGIS Schematics tools

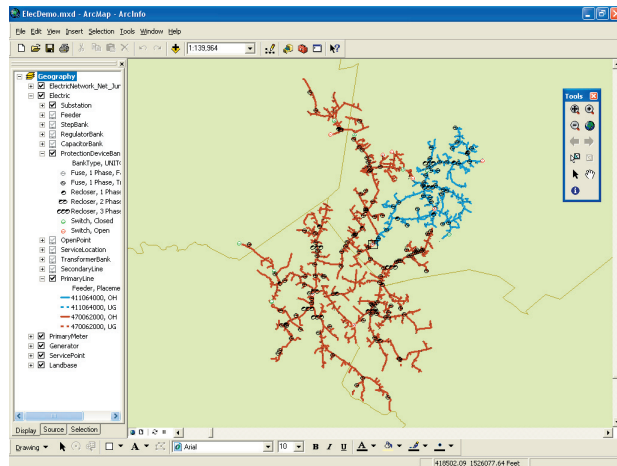
In this exercise, you will become familiar with the ArcGIS Schematics graphical user interface by using a variety of its tools.

## Enabling the extension in ArcCatalog

1. Start ArcCatalog by either double-clicking a shortcut installed on your desktop or using the Programs list on your Start menu.
2. Click Tools and click Extensions from the menu toolbar.
3. Check the Schematics check box and click Close.

## Loading the tutorial .mxd file

1. In ArcCatalog, navigate to the C:\arcgis\ArcTutor\Schematics\Schematics folder in the Catalog tree. (This is the default install location for this data.)
2. Double-click the ElecDemo.mxd file; your ArcMap window should appear as follows:




## Enabling the extension in ArcMap

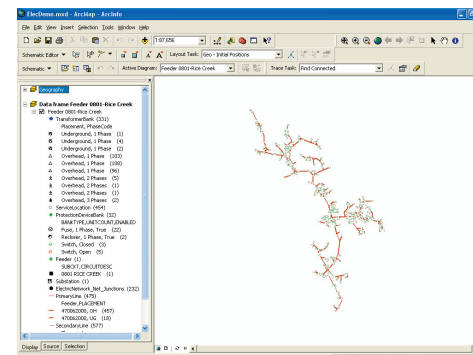
1. In ArcMap, click Tools and click Extensions from the menu toolbar.
2. Check the Schematics check box and click Close.

## Loading the extension toolbars

1. Click Tools and click Customize from the menu toolbar.
2. Check the Schematic, Schematic Editor and Schematic Network Analyst check boxes, and click Close.
4. Arrange the toolbars under the menu toolbar.

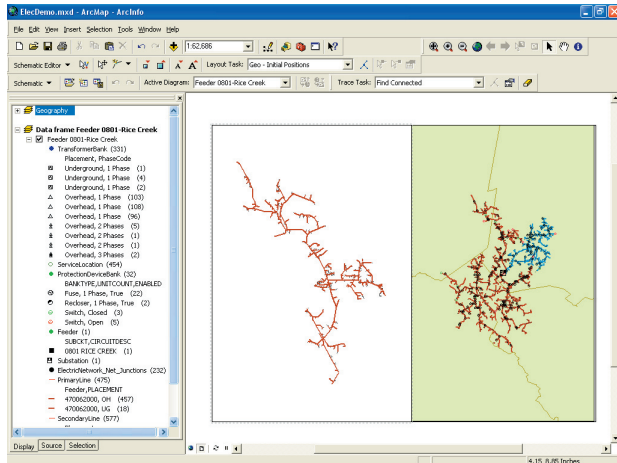
## Opening a saved diagram

1. Click the Open Schematic Diagrams button . The Select schematic diagrams to open dialog box appears.
2. Navigate to the C:\arcgis\ArcTutor\Schematics\Schematics\ElecDemo geodatabase and select the Feeders schematic subfolder.
3. Click Feeder 0801-Rice Creek in the diagram list and click Add.
4. The diagram opens in a new data frame under the Geography data frame. You can collapse the Geography data frame for a better view of the table of content (TOC).



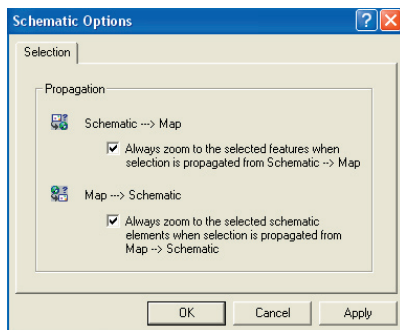
## Using the layout view



1. Click View and click Layout View from the menu toolbar.
2. Resize the diagram data frame next to the Geography data frame.

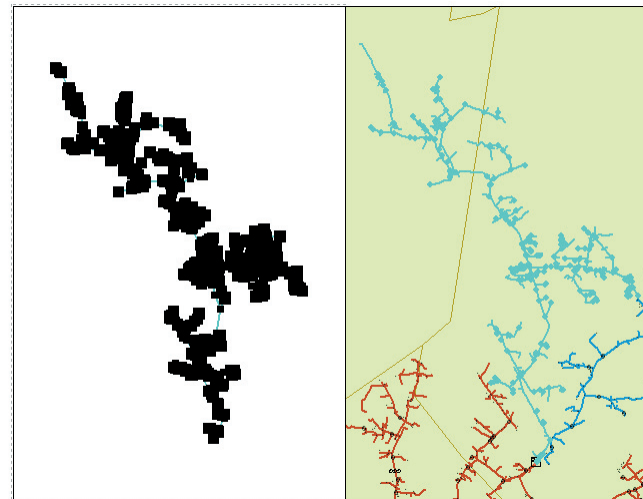


## Locating selected features

1. Click the Schematic drop-down menu on the Schematic toolbar and click Schematic Options.
2. Check the Schematic ---> Map and the Map ---> Schematic check boxes.




3. Click OK.
4. Click the Select Schematic Elements button  on the Schematic Editor toolbar and select the full feeder in the diagram data frame by drawing a box with the tool.
5. Click the Propagate Schematic Selection To Map button  to locate the selected features on the map. The selection set is automatically zoomed in on the map.

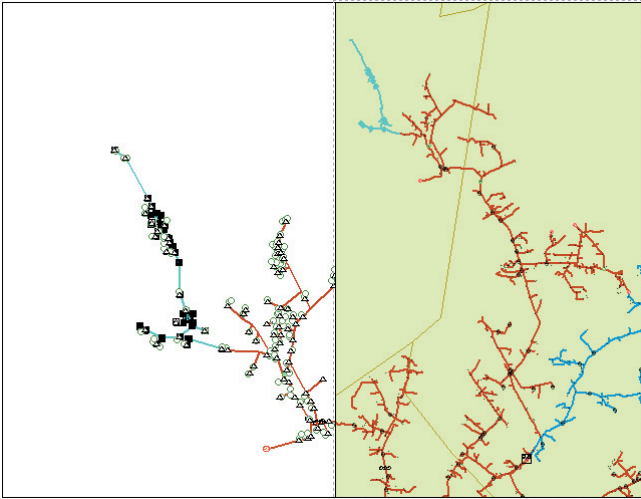



**Note:** This might take a few minutes as the selection contains a large amount of features.

6. Click the background of the diagram to deselect the schematic elements.
7. Click the Select Elements tool from the ArcMap Tools toolbar and click the map data frame.
8. Click Selection and click Clear selected Features from the menu toolbar to clear selected features on the map.
9. Using the Zoom In tool, zoom in on the map and use the Select Features tool to select a part of the network by drawing a box.

**Note:** Ensure the features you select are part of the network used to generate the schematic diagram.

10. Click the Propagate Map Selection To Schematic button . The selection set is automatically zoomed in on the diagram.



11. Click the Select Schematic Elements button  and click the background of the diagram to deselect features.
12. Click Selection and click Clear Selected Features from the menu toolbar to clear selected features on the map.
13. Use the Go Back To Previous Extent tool to go back to the map's previous extent.
14. Click View and click Data View from the menu toolbar.

### Removing a diagram data frame

1. Right-click the diagram data frame in the TOC.
2. Click Remove.
3. At the prompt Do you want to save the layout of the diagram 'Feeder 0801-Rice Creek'? click No.
4. Expand the Geography data frame in the TOC.
5. Click File and click Exit.

6. At the prompt Save changes to ElecDemo.mxd ? click No.



## Exercise 2: Generating your first diagrams

In this exercise, you will generate your first diagrams from the result of a manual selection, from a selection by attributes, and from a tracing result. You will also generate an inside plant diagram from an opened diagram.

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1. Start ArcCatalog by either double-clicking a shortcut installed on your desktop or using the Programs list on your Start menu.
2. Click Tools and click Extensions from the menu toolbar.
3. Check the Schematics check box and click Close.

### Loading the tutorial .mxd file

1. In ArcCatalog, navigate to the C:\arcgis\ArcTutor\Schematics\Schematics folder in the Catalog tree. (This is the default install location for this data.)
2. Double-click the ElecDemo.mxd file.

### Enabling the extension in ArcMap

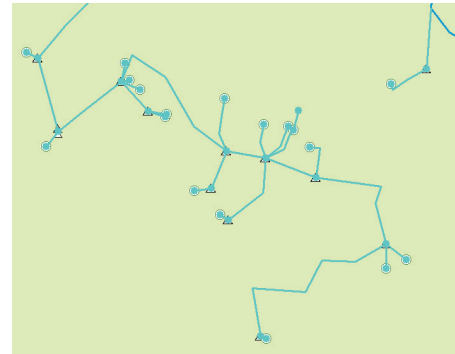
1. In ArcMap, click Tools and click Extensions from the menu toolbar.
2. Check the Schematics check box and click Close.


### Loading the extension toolbars

1. Click Tools and click Customize from the menu toolbar.
2. Check the Schematic, Schematic Editor, and Schematic Network Analyst check boxes.
3. Click Close.
4. Arrange the toolbars under the menu toolbar.

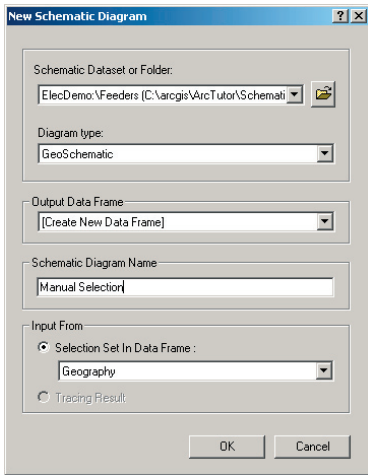
### Generating a diagram from a manual selection

1. Click View, point to Bookmarks, and click Manual Selection from the menu toolbar.
2. Use the Select Features tool to manually select a part of the network by drawing a box with the tool.

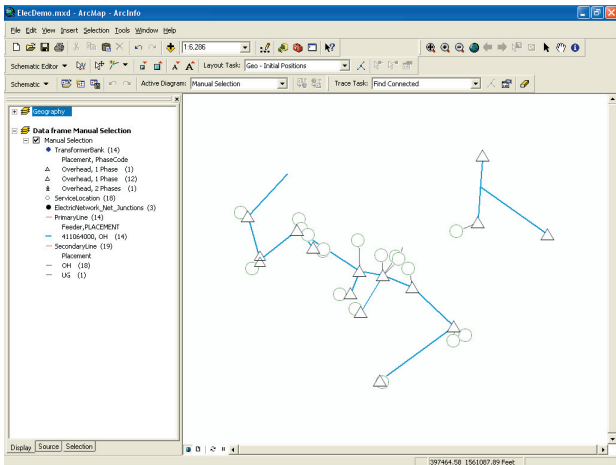




3. Click the Generate New Schematic Diagram button  to open the New Schematic Diagram dialog box.
4. Click the Browse button next to the Schematic Dataset or Folder field and browse to the ElecDemo dataset (in the ElecDemo geodatabase available from the C:\arcgis\ArcTutor\Schematics\Schematics folder), double-click ElecDemo, click Feeders, and click Add to store the diagram at this location.
5. Click the drop-down arrow next to the Diagram type field and select GeoSchematic from the list.
6. Keep the default [Create New Data Frame] option for the Output Data Frame field.  
**Note:** If you choose Geography from the list, the diagram will display in the Geography data frame on top of the map.
7. Type a name in the Schematic Diagram Name field for the diagram to be generated (for example, Manual Selection).
8. In the Input From area, keep the Selection Set In Data Frame option checked and make sure that the Geography data frame containing the selection set you have just created is the one selected in the drop-down list.







9. Click OK.
10. The diagram displays in a new data frame. You can collapse the Geography data frame for a better view of the TOC.

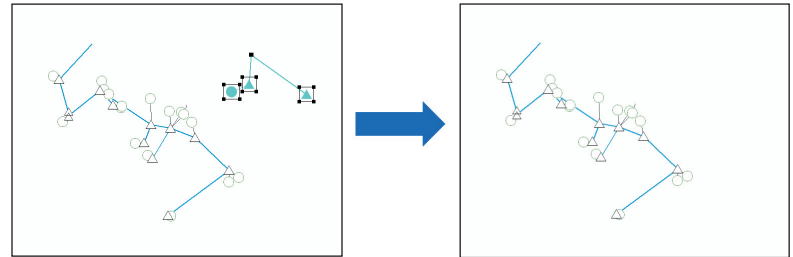


11. You can adjust the size of the symbols in the diagram when zooming in and out using the Decrease Symbol Sizes  and Increase Symbol Sizes  buttons.


## Removing schematic elements

1. Click the Select Schematic Elements button  and select a few elements on the diagram by drawing a box with the tool.
2. Click the Schematic Editor drop-down menu from the Schematic Editor toolbar and click Remove Schematic Elements .

**Note:** The Undo tool is not available in this case. If you want to get the removed elements back, you must update the diagram with the Persist manually removed or reduced elements option unchecked in the Update Diagram dialog box.



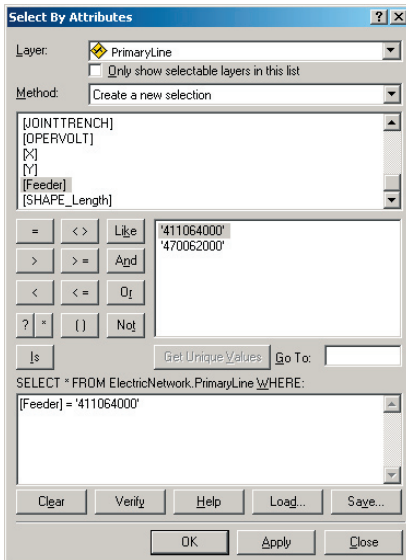
## Saving the diagram


1. Click the Save Diagram button .
- You can also save the diagram under a different name.
2. Click the Schematic drop-down menu from the Schematic toolbar and click Save Diagram As.
3. Type a name for the diagram in the Schematic Diagram Name field or keep the default name.
4. Keep the default [Create New Data Frame] option and click Save.
5. A new data frame is added to the TOC.
6. Right-click the new diagram data frame in the TOC and click Remove.
7. Remove the Manual Selection data frame.
8. Expand the Geography data frame and clear selected features.

## Generating a diagram from a selection by attributes

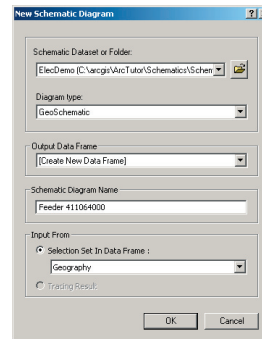
1. Click Selection and click Select By Attributes from the menu toolbar.
2. Click PrimaryLine from the Layer drop-down list.
3. Double-click [Feeder] from the fields list.
4. Click the Equals button **=**.
5. Click Get Unique Values.
6. Double-click 411064000 from the unique values list.



You should see the following query:

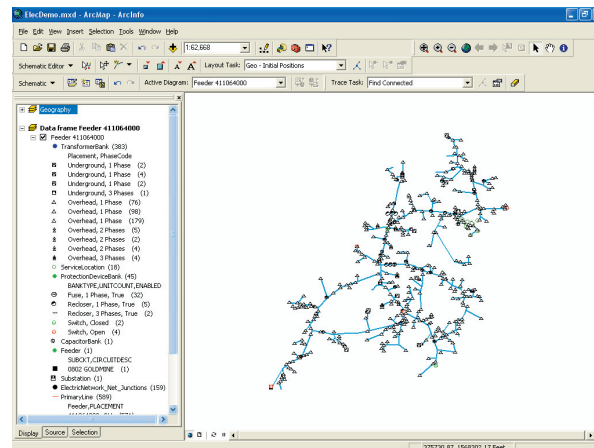


7. Click Apply, click Clear, then Close.
8. Click Selection and click Zoom To Selected Features from the menu toolbar.
9. Click the Generate New Schematic Diagram button  to open the New Schematic Diagram dialog box.
10. Click ElecDemo:\Feeders in the Schematic Dataset or Folder field so the generated diagram to be stored in the Feeders schematic folder.
11. Click the drop-down arrow next to the Diagram type field and select GeoSchematic from the list.



12. Keep the default [Create New Data Frame] option for the Output Data Frame field.
13. Type a name in the Schematic Diagram Name field for the diagram to be generated (for example, Feeder 411064000).
14. Make sure the Selection Set In Data Frame option is checked and the Geography data frame is the data frame currently selected in the drop-down list.

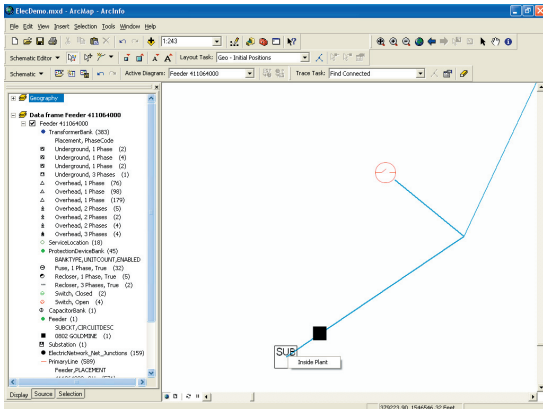


15. Click OK.
16. The diagram displays in a new data frame. You can collapse the Geography data frame for a better view of the TOC.
17. Click the Increase Symbol Sizes  or Decrease Symbol Sizes  button to change the size of the symbols.

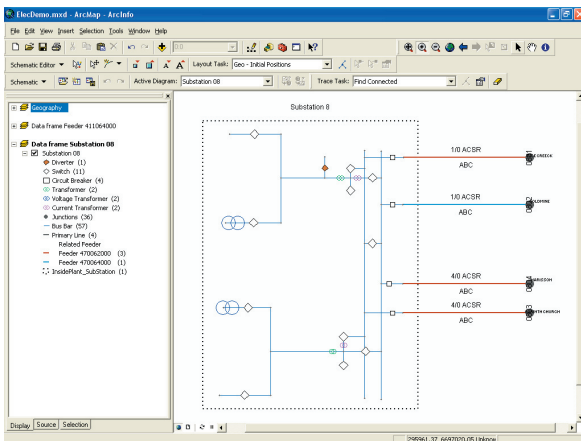


## Generating an inside plant diagram

1. Zoom in to the substation (it is situated at the end of the network at the bottom left corner of the diagram window).
2. Click the Decrease Symbol Sizes button  to change the size of the symbols for a better view of the network.
3. Click the Select Schematic Elements button  and right-click the substation to display the Inside Plant context menu.





4. Click the context menu.
5. The inside plant diagram opens in a new data frame.
6. You can collapse the Feeder 411064000 data frame in the TOC.



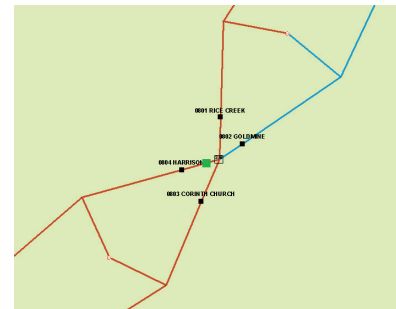
**Note:** You can identify elements in the inside plant diagram using the Identify tool.


Because the diagram elements are dynamically linked to the map, you can select an element in the diagram and locate it on the map.

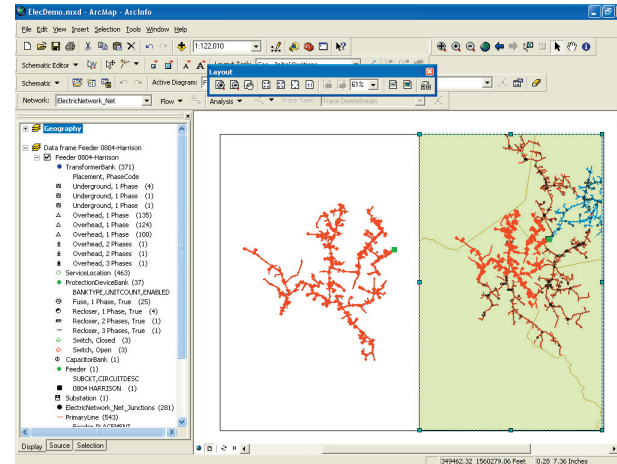
7. Click the Select Schematic Elements button  and click one of the primary lines on the right of the substation.
8. Click the Propagate Schematic Selection To Map button .
9. Right-click the Geography data frame in the TOC and click Activate.
10. Click View, point to Bookmarks, and click Substation 08 from the menu toolbar to locate the selected line.
11. Clear the selected features on the map.
12. Remove the Feeder 411064000 data frame. At the prompt Do you want to save the layout of the diagram Feeder 411064000 ? click No.
13. Remove the Substation 08 data frame.
14. Expand the Geography data frame in the TOC.

## Generating a diagram from a trace

1. Load the Utility Network Analyst toolbar (if it is not already displayed).
2. From the Utility Network Analyst toolbar, click the arrow button next to the Add Junction Flag Tool and click Add Edge Flag Tool.
3. Click the primary line between Feeder 0804 Harrison and the substation to add the flag.





- In the Trace Task field of the Utility Network Analyst toolbar, click Trace Downstream and click Solve.
- Click the Generate New Schematic Diagram button  to open the New Schematic Diagram dialog box.
- Click ElecDemo:\Feeders in the Schematic Dataset or Folder field.
- Click the drop-down arrow next to the Diagram type field and select GeoSchematic from the list.
- Keep the default [Create New Data Frame] option for the Output Data Frame field.
- Type a name in the Schematic Diagram Name field for the diagram to be generated (for example, Feeder 0804-Harrison).
- Make sure the Tracing Result option is checked.
- Click OK.  
The diagram displays in a new data frame.
- Collapse the Geography data frame.

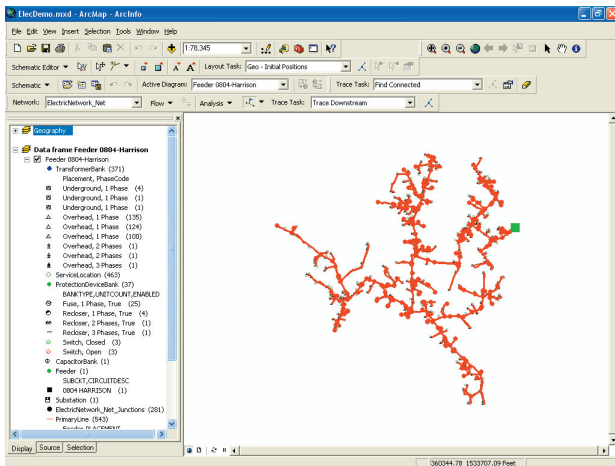


## Updating a diagram after modifying attributes


Notice that a part of the network was not returned from the trace because a switch is open.

Because you want to find all the features connected to the substation, you will close this switch. First, you will select the open switches on the map.

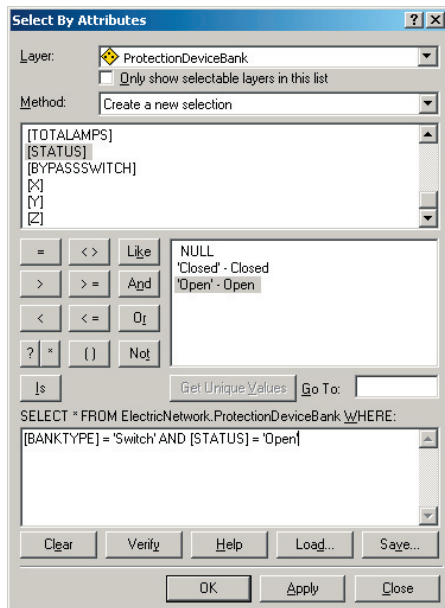
- Click View and click Data View from the menu toolbar.
- Right-click the Geography data frame in the TOC and click Activate.
- From the Utility Network Analyst toolbar, click the Analysis drop-down menu and click Clear Results.
- Click the Analysis drop-down menu again and click Clear Flags.
- Click Selection and click Select By Attributes from the menu toolbar.
- Click ProtectionDeviceBank from the Layer drop-down list.
- Double-click [BANKTYPE] from the Fields list.
- Click the Equals button .
- Click Get Unique Values.
- Double-click 'Switch' - Switch from the unique values list.
- Click the And button .



- Click View and click Layout View from the menu toolbar.
- Resize the diagram data frame next to the Geography data frame.
- Click the Select Elements tool and click the map data frame.
- Click View, point to Bookmarks, and click Feeder 0804-Harrison from the menu toolbar to see the full feeder.

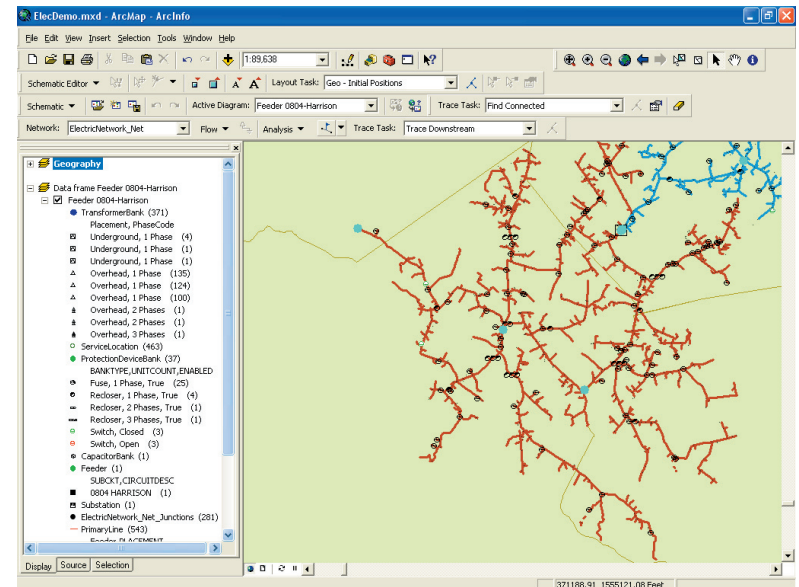
12. Double-click [STATUS] from the fields list.
13. Click the Equals button .
14. Click Get Unique Values.
15. Double-click 'Open' - Open from the unique values list.

You should see the following query:



16. Click Apply.
17. Click Clear, then click Close.

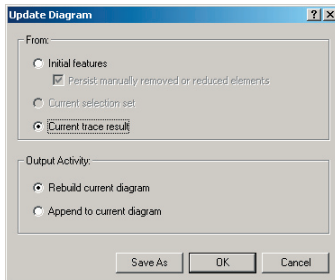
The switch that needs to be closed is the one in the middle of the network fed by Feeder 0804-Harrison.



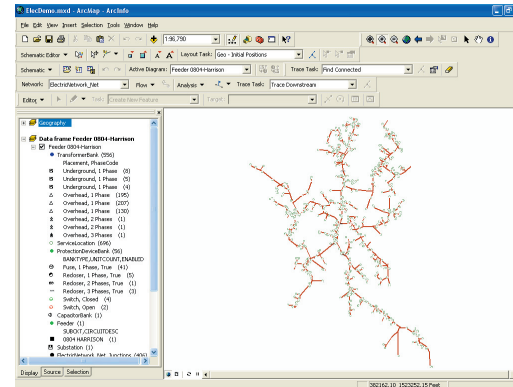
18. Click Tools and click Customize from the menu toolbar.
19. Check the Editor check box and click Close.
20. Arrange the toolbar under the menu toolbar.
21. Click the Editor drop-down menu and click Start Editing.
22. Use the Zoom In tool from the ArcMap Tools toolbar to zoom in to the switch, and clear selected features.
23. Use the Edit tool to select the switch.
24. Click the Attributes button from the Editor toolbar to open the Attributes table.
25. Change the Enabled field from False to True and the Status field from Open to Closed.

Property	Value
OBJECTID	3831
FACILITYID	<489044020
Bank-Type	Switch
PhaseCode	ABC
PIM	<Null>
Enabled	False
COMMENTS	<Null>
AncillaryRole	<Null>
ROTATION	175.127
NETWORKID	PD_249
STATIONID	(D7F9B656-7496-4EB6-8363-D040C5EAD47A)
UID	(768EBC36-4E59-4B44-B36E-8F9BDF424CD4)
SESSIONID	(3581066A-FFB4-4109-AC74-E16E429A82B5)
OperVolt	<Null>
UNITCOUNT	1
POLEUID	{FCD90B69-D8C6-4DB0-A05F-A36D4E9F1999}
TOTALAMPS	<Null>
Status	Open
ByPassSwitch	<Null>
X	367035.64
Y	1536393.42
Z	805

26. Close the Attributes window.
27. Click the Editor drop-down menu and click Save Edits.
28. Click the Editor drop-down menu again and click Stop Editing.
29. Click View, point to Bookmarks, and click Substation 08 from the menu toolbar.
30. From the Utility Network Analyst toolbar, click the arrow button next to the Add Junction Flag tool and click the Add Edge Flag Tool
31. Click the primary line between Feeder 0804 Harrison and the substation to add the flag.
32. In the Trace Task field of the Utility Network Analyst toolbar, click Trace Downstream and click Solve.
33. Activate the diagram data frame.
34. Click the Schematic drop-down menu on the Schematic toolbar and click Update Diagram.
35. In the Update Diagram dialog box that appears, keep the default Current trace result and Rebuild current diagram options checked.



36. Click OK.
37. From the Utility Network Analyst toolbar, click the Analysis drop-down menu and click Clear Results.
38. Click the Analysis drop-down menu again and click Clear Flags. The diagram is updated.

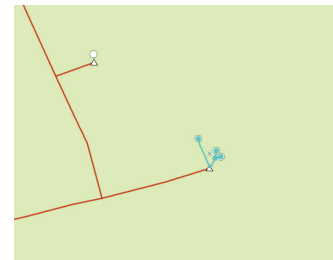




39. Remove the diagram data frame.

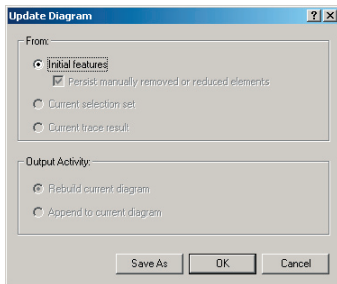
**Note:** The Update Diagram dialog box also opens when right-clicking the the schematic diagram entry in the TOC and clicking the Update Diagram context menu.

## Updating a diagram after deleting features

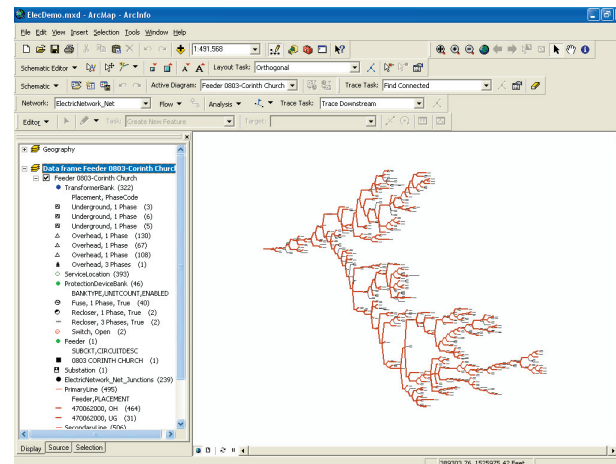
1. Click View, point to Bookmarks, and click Delete Features from the menu toolbar.
2. Start editing.
3. Manually select service locations and secondary lines as in the following example:



4. Click the Open Schematic Diagrams button . The Select schematic diagrams to open dialog box appears.
5. Navigate to the Feeders schematic subfolder of the ElecDemo schematic dataset in the C:\arcgis\ArcTutor\Schematics\Schematics\ElecDemo geodatabase.
6. Click Feeder 0803-Corinth Church in the diagram list and click Add. The diagram appears in a new data frame.
7. Activate the Geography data frame.
8. Click the Propagate Map Selection To Schematic button .
9. Activate the diagram data frame to locate the selected features.
10. Activate the Geography data frame.
11. Click Edit and click Delete from the menu toolbar.
12. Save your edits and stop editing.
13. Click the Schematic menu on the Schematic toolbar and select Update Diagram.
14. At the prompt Do you want to save the schematic diagram before updating? click No.
15. The Update Diagram dialog box appears. The Initial features option should be checked.



16. Click OK.
17. Activate the diagram data frame. The features are removed, and the diagram is updated.



18. Right-click the diagram data frame in the TOC.
19. Click Remove.
20. Expand the Geography data frame in the TOC.
21. Click File and click Exit.
22. At the prompt Save changes to ElecDemo.mxd? click No.

## Exercise 3: Using the refinement tools

In this exercise, you will use the diagram refinement tools of ArcGIS Schematics.

### Enabling the extension in ArcCatalog

1. Start ArcCatalog by either double-clicking a shortcut installed on your desktop or using the Programs list on your Start menu.
2. Click Tools and click Extensions from the menu toolbar.
3. Check the Schematics check box and click Close.

### Loading the tutorial .mxd file

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
### Enabling the extension in ArcMap

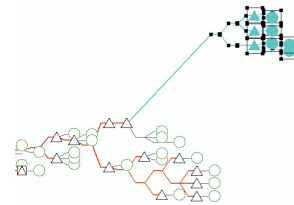
1. In ArcMap, click Tools and click Extensions from the menu toolbar.
2. Check the Schematics check box and click Close.


### Loading the extension toolbars

1. Click Tools and click Customize from the menu toolbar.
2. Check the Schematic, Schematic Editor, and Schematic Network Analyst check boxes.
3. Click Close.
4. Arrange the toolbars under the menu toolbar.


### Moving schematic elements

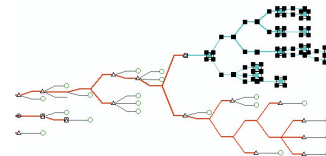
1. Click the Open Schematic Diagrams button . The Select schematic diagrams to open dialog box appears.
2. Navigate to the Feeders schematic folder of the ElecDemo schematic dataset in the C:\arcgis\ArcTutor\Schematics\Schematics\ElecDemo geodatabase.
3. Click Feeder 0803-Corinth Church in the diagram list and click Add. The diagram appears in a new data frame.
4. Zoom in on the diagram to a set of elements. Click the Edit/Move Schematic Elements button  and select elements by drawing a box with the tool.
5. Move the selected set.



6. You can click the Undo tool  to reverse the action.
7. Click the background of the diagram to deselect features.

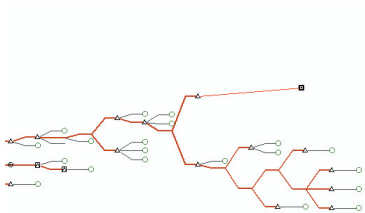
### Collapsing a selection set

1. Click the Select Schematic Elements button  and select a part of the network by drawing a box with the tool.

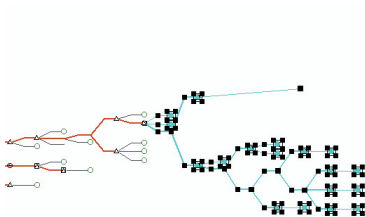




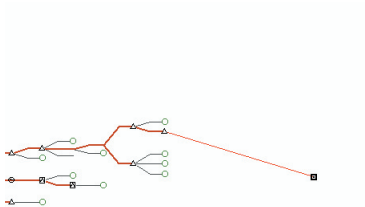
- Click the Schematic Editor drop-down menu, point to Collapse/Expand, and click Collapse Selected Set.



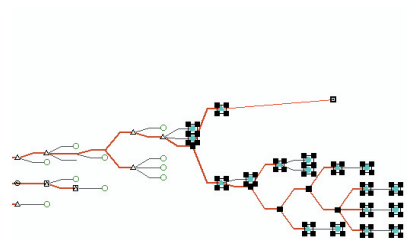
- Select another set of elements by drawing a box with the Select Schematic Elements tool, including the first set.



- Select the selected set by drawing a box, click the Schematic Editor drop-down menu, point to Collapse/Expand, and click Collapse Selected Set.




- You can expand all the collapsed sets one after the other by drawing a box around them, clicking the Schematic Editor drop-down menu, pointing to Collapse/Expand, and clicking Expand By Level.

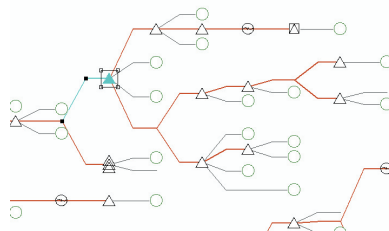


**Note:** You can expand the sets at once by clicking the Schematic Editor drop-down menu, pointing to Collapse/Expand, and clicking Expand All.

- Click the background of the diagram to deselect features.

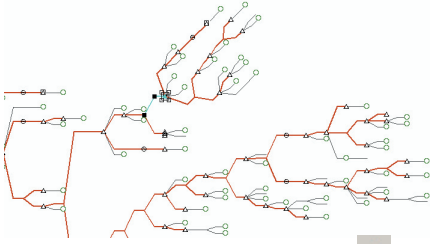
## Rotating a tree


- Click the Select Schematic Elements button  and click a TransformerBank node at the root of a network branch. This node will be considered as the root of the tree.
- Hold down the Shift key on your keyboard and click the primary line to the left of the TransformerBank node to select it and isolate the branch, as in the following screen shot:



- Click the Schematic Editor drop-down menu and click Rotate Tree.

**Note:** The default rotation angle is 45°. You can set the rotation angle by clicking Editing Properties from the Schematic Editor drop-down menu. Click the Rotate Tree tab and type a number in the Angle (degrees) field.

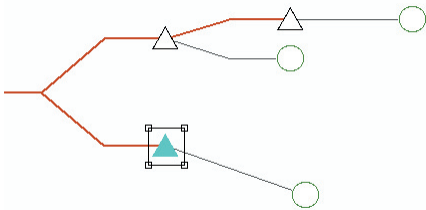


4. You can click the Undo tool  to reverse the action.
5. Click the background of the diagram to deselect features.

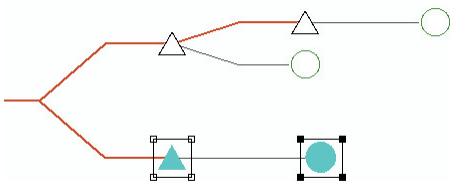
## Using the alignment tools


Selected nodes can be automatically aligned horizontally, vertically, or by angle using the Align Nodes tool.

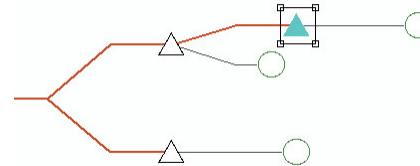
1. Click the Select Schematic Elements button  and click a node to be used as the origin node.



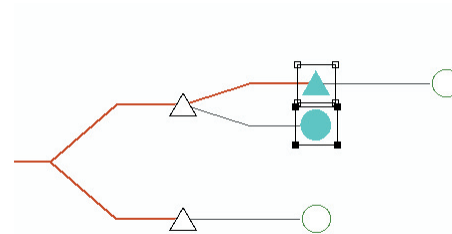
2. Hold down the Shift key and click a second node to be aligned horizontally with the first one.




3. Click the Schematic Editor drop-down menu, point to Align Nodes, and click Align Horizontally.
4. You can click the Undo tool  to reverse the action.
5. Click a node to be used as the origin node.





6. Hold down the Shift key and click a second node to be aligned vertically with the first one.

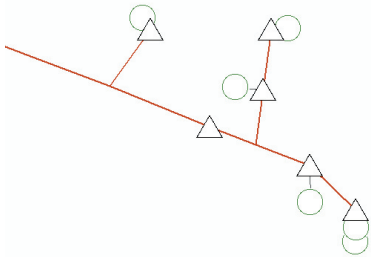



7. Click the Schematic Editor drop-down menu, point to Align Nodes, and click Align Vertically.
8. You can use the Undo tool  to reverse the action.
9. Remove the diagram data frame. At the prompt Do you want to save the layout of the diagram 'Feeder 0803-Corinth Church'? click No.

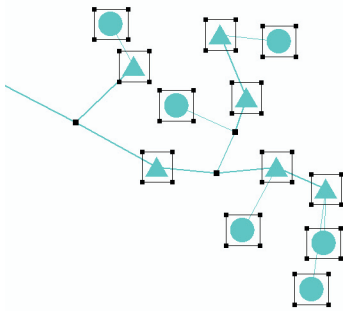
## Separate overlapping nodes


1. Click the Open Schematic Diagrams button . The Select schematic diagrams to open dialog box appears.

2. Navigate to the Feeders schematic folder of the ElecDemo schematic dataset in the C:\arcgis\ArcTutor\Schematics\Schematics\ElecDemo geodatabase.
3. Click Feeder 0801-Rice Creek in the diagram list and click Add.
4. Zoom in to a part of the network where elements overlap.
5. Click the Select Schematic Elements button  and select overlapping elements by drawing a box with the tool.



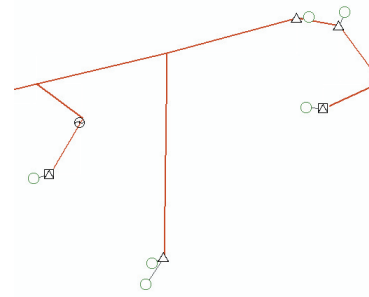
6. Click Geo-Spatial Dispatch from the Layout Task drop-down list in the Schematic Editor toolbar.
7. Click the Layout Properties button  and type 5 in the Iterations number field.
8. Click OK.



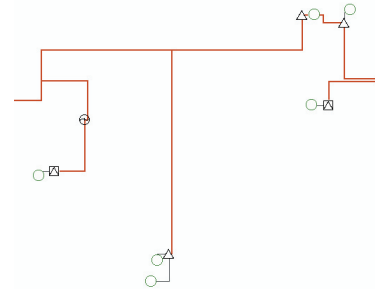
9. Click the background of the diagram to deselect elements.
10. You can click the Undo tool  to reverse the action.


## Squaring links

1. Select a part of the network by drawing a box with the tool.





2. Click the Schematic Editor menu and click Square Links.

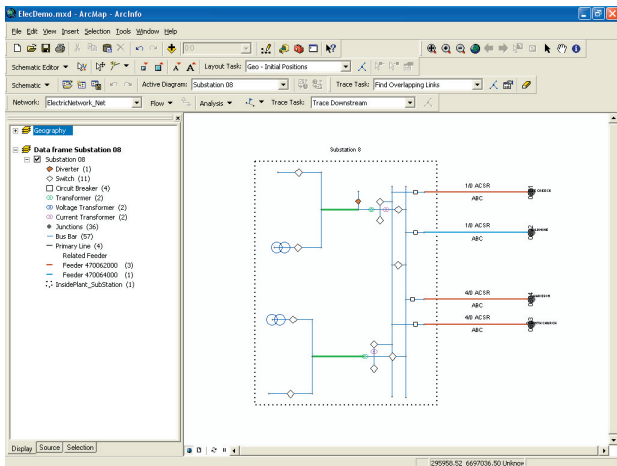


3. Click the background of the diagram to deselect elements.
4. You can click the Undo tool  to reverse the action.
5. Remove the diagram data frame. At the prompt Do you want to save the layout of the diagram 'Feeder 0801-Rice Creek'? click No.


## Finding overlapping links

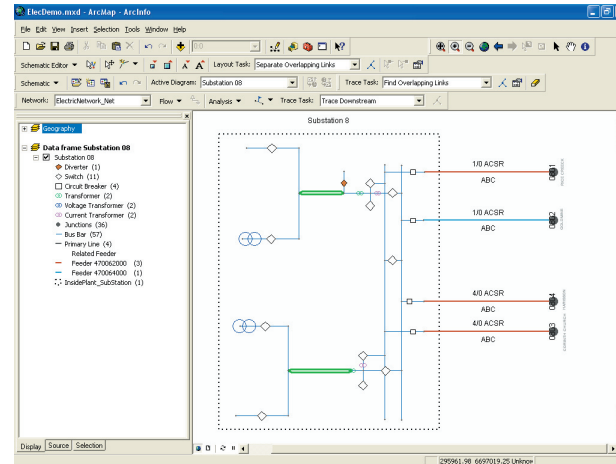
1. Click the Open Schematic Diagrams button .
2. Navigate to the Inside Plant schematic folder of the ElecDemo schematic dataset in the C:\arcgis\ArcTutor\Schematics\Schematics\ElecDemo geodatabase.



- Click Substation 08 and click Add. Collapse the Geography data frame.
- Select Find Overlapping Links from the Trace Task drop-down list in the Schematic Network Analyst toolbar.
- Click the Network Analyst Trace Properties button  to open the Schematic Trace Properties dialog box.
- In the Find Overlapping Links tab, uncheck the Select links checkbox.
- Click the Highlight tab, select a line color and type a line width that will be taken into account to highlight the loop (for example, green and 3).
- Click OK.



## Separate overlapping links

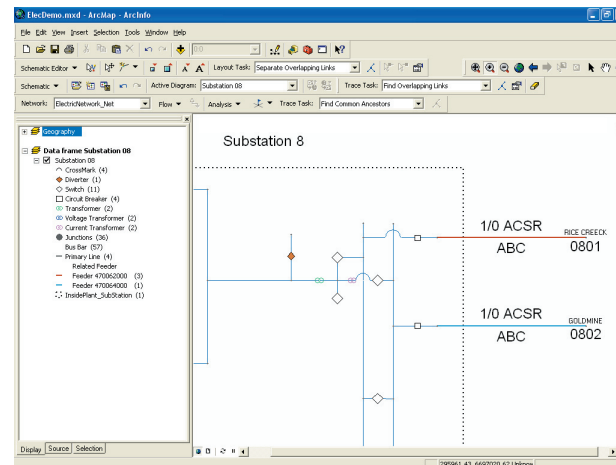
- Click Separate Overlapping Links from the Layout Task list.
- Click the Apply Layout Task button .



- You can click the Undo tool  to reverse the action.
- Click the Clear Trace Task Result tool  to remove the highlight.

## Marking crossing links

- Click Schematic Editor and click Mark Crossing.
- Zoom in on the right part of the diagram where the crossing marks have been added.



3. Click Schematic Editor and click Editing Properties. Activate the Mark Crossings tab and increase the Crossing symbol size value. Click OK.
4. You can uncheck the Mark Crossing menu to remove the crossing marks.
5. Remove the diagram data frame. At the prompt Do you want to save the layout of the diagram 'Substation 08'? click No.
6. Expand the Geography data frame in the TOC.
7. Click File and click Exit.
8. At the prompt Save changes to ElecDemo.mxd? click No.

## Exercise 4: Using layout algorithms

In this exercise, you will use the layout algorithms to automatically change the position of elements in the diagrams.

### Enabling the extension in ArcCatalog

1. Start ArcCatalog by either double-clicking a shortcut installed on your desktop or using the Programs list on your Start menu.
2. Click Tools and click Extensions from the menu toolbar.
3. Check the Schematics check box and click Close.

### Loading the tutorial .mxd file

1. In ArcCatalog, navigate to the C:\arcgis\ArcTutor\Schematics\Schematics folder in the Catalog tree. (This is the default install location for this data.)
2. Double-click the ElecDemo.mxd file.

### Enabling the extension in ArcMap


1. In ArcMap, click Tools and click Extensions from the menu toolbar.
2. Check the Schematics check box and click Close.

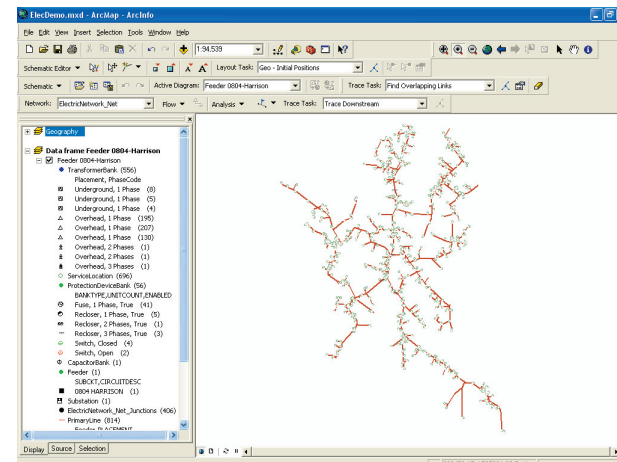
### Loading the extension toolbars


1. Click Tools and click Customize from the menu toolbar.
2. Check the Schematic, Schematic Editor, and Schematic Network Analyst check boxes.
3. Click Close.
4. Arrange the toolbars under the menu toolbar.

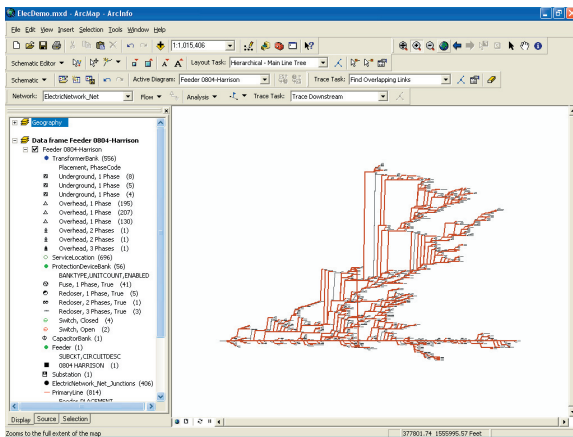
### Using the Hierarchical-Main Line Tree algorithm

The Main Line Tree layout hierarchically arranges all the nodes and links in the active schematic diagram along the detected main line.

1. Click the Open Schematic Diagrams button . The Select schematic diagrams to open dialog box appears.
2. Navigate to the Feeders schematic folder of the ElecDemo schematic dataset in the C:\arcgis\ArcTutor\Schematics\Schematics\ElecDemo geodatabase, and select Feeder 0804-Harrison. Collapse the Geography data frame.






3. Click Hierarchical-Main Line Tree from the Layout Task drop-down list.
4. You can change direction, spacing and branch placement options from the Schematic Algorithm Properties dialog box by clicking the Layout Properties button . Type 6 for the spacing between nodes perpendicular to the direction, and type 20 for the spacing between nodes along the direction.
5. Click OK.
6. Click the Full Extent tool to center the diagram in the view.




7. Click the Undo button  to revert to the former layout.

## Setting the root and end nodes of the tree

1. Click Hierarchical-Main Line Tree from the Layout Task drop-down list.
2. Zoom in, click the Set Schematic Root button , and click a node to be set as the root of the tree (for example, the substation).
3. You can set the end node by clicking the Set Schematic End button  and clicking a node on the diagram (for example, a service location).
4. Click the Apply Layout Task button .
5. Click the Full Extent tool to center the diagram in the view.
6. Click the background of the diagram to clear the feature selection.



## Using the Geo-Initial Positions algorithm

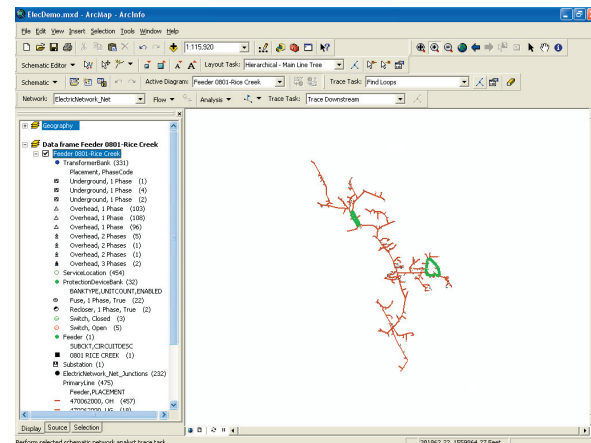
1. You can get back to the geoschematic layout of the features by selecting Geo-Initial Positions from the Layout Task drop-down list and clicking the Apply Layout Task button .
2. Click the Full Extent tool to center the diagram in the view.


3. Remove the Feeder 0804-Harrison data frame. At the prompt Do you want to save the layout of the diagram ‘Feeder 0804-Harrison’? click No.

## Using the Find Loops tool

You can identify loops on your network using the Find Loops tool.


1. Click the Open Schematic Diagrams button . The Select schematic diagrams to open dialog box appears. Navigate to the Feeders schematic folder of the ElecDemo schematic dataset in the C:\arcgis\ArcTutor\Schematics\Schematics\ElecDemo gedoatbase and select Feeder 0801-Rice Creek.
2. Select Find Loops from the Trace Task drop-down list in the Schematic Network Analyst toolbar.
3. Click the Network Analyst Trace Properties button  to open the Schematic Trace Properties dialog box.
4. In the Find Loops tab, uncheck the Select nodes and Select links check-boxes.
5. Click the Highlight tab, select a line color and enter a line width that will be taken into account to highlight the loop (for example, green and 5).
6. Click OK.

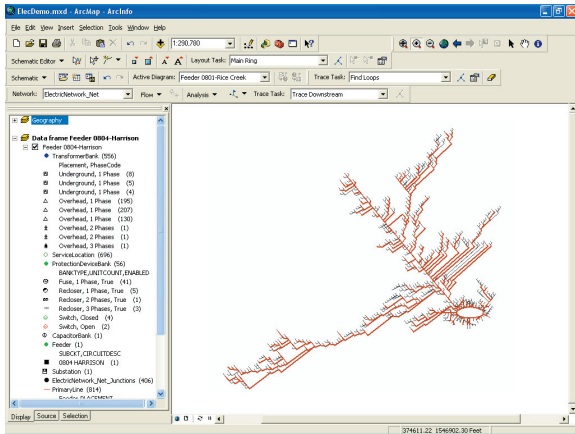



7. Click the Clear Trace Task Result tool  to remove the highlight.

## Using the Main Ring algorithm

Once a loop is detected, you can lay out the network around the loop.

1. Click Main Ring from the Layout Task drop-down list.
2. Click the Apply Layout Task button .
3. Click the Full Extent tool to center the diagram in the view.





**Note:** You can change the ring type from Ellipse to Rectangle from the Schematic Algorithm Properties dialog box by clicking the Layout Properties button .



4. Click the Undo button  to revert to the former layout.

## Using the Hierarchical-Smart Tree algorithm

The Smart Tree layout hierarchically arranges all the nodes and links in the active schematic diagram and places them as a smart tree.

1. Click Hierarchical-Smart Tree from the Layout Task drop-down list.
2. You can select a node to be set as the root of the tree. Click the Set Schematic Root button  and click a node.

**Note:** You can change direction and spacing options from the Schematic Algorithm Properties dialog box by clicking the Layout Properties button .

3. Click the Apply Layout Task button .
4. Click the Full Extent tool to center the diagram in the view.
5. Click the Undo button  to revert to the former layout.
6. Save the diagram and remove the data frame.
7. Close ArcMap without saving the changes.