7 Raster-to-Vector Conversion

Preview

In this lesson, you will learn how to:

- Set up the Vectorize for Advanced Conversion
- Use Themes in a Digitizing or Conversion Project
- Use the Vectorize Place Element Tool with the Raster Snap Feature
- Use the Vectorize Auto Convert Feature
- Use the Vectorize Convert Lines Tool
- Place and Delete Nodes
- Convert Cells and Text

Advanced Conversion Techniques

In MicroStation Descartes, four different methods are offered to you for document conversion.

- Conventional using *Place Element* tool and *Raster Snap*.
- Conventional using *Place Element* tool *Raster Snap* and *Auto Continue* feature.
- *Convert Lines* tool.
- Working with Nodes

You will get to digitize the same section of a drawing using these four methods.

➤ **Set up MicroStation Descartes**

1. From the MicroStation Manager dialog box, select Workspace > dcartes.

2. Open the LESSON7.DGN file supplied with the tutorial in the …\dcartes\tutorial directory.

3. From the MicroStation Tools menu, select Image and the following tool boxes:
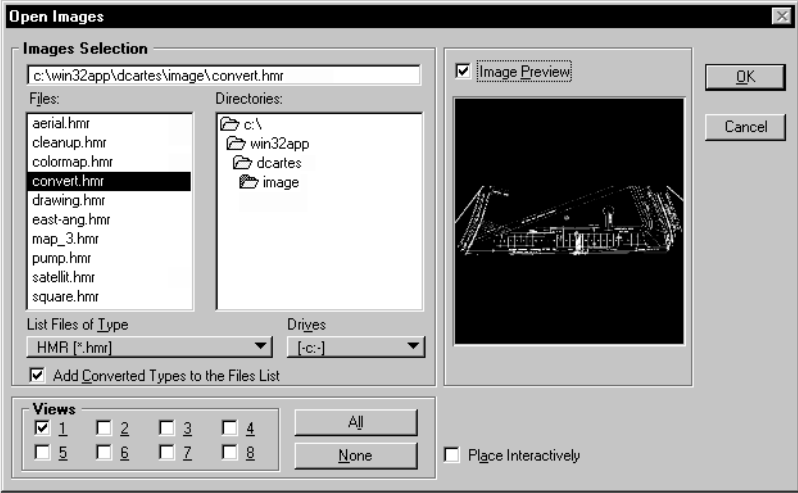
Image Control tool box
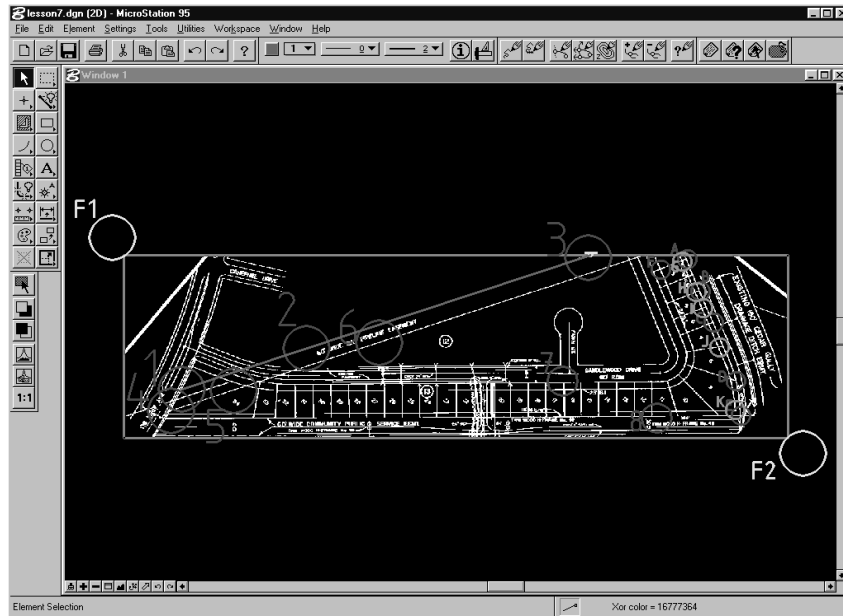
Theme tool box

Vectorize tool box

➤ **Open an image**

1. Find the CONVERT.HMR image that is supplied with the tutorial. The file is in the …\dcartes\tutorial directory. Highlight the image.

2. Set the Image Preview setting to on.

   Notice the display of a thumbnail of the image in the Preview window.

3. Make sure that the setting for View **1** is set to on. Click OK to open the image.

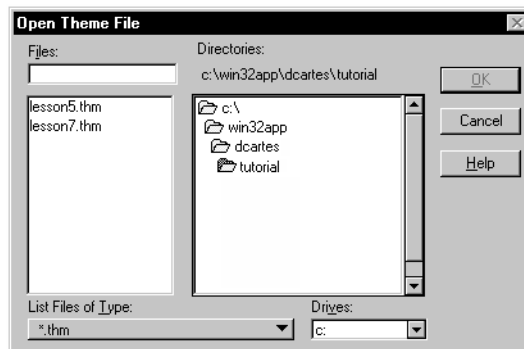4. Dock the tools and arrange the screen as shown below.

➤ **Set up a Theme file**

A Theme file has been created and attached to the project.

1. From the Theme tool box, select the *Theme Styler Dialog* tool.
   The Theme Styler dialog box opens.

2. From the File menu, select Open.
   The Open Theme File dialog box opens.

3. Find LESSON7.THM file that is supplied with the tutorial in the …\dcartes\tutorial directory. Select LESSON7.THM and click OK.

4. Set the Road theme to on.

    An X appears beside the Road name in the list box.

5. Close the Theme Styler dialog box.

➤ **Creating a Project File and attaching it to the design file**

1. From the MicroStation Settings menu, select Image > Project.

    The Project Settings dialog box opens.

2. Set Save & Attach Automatically to on.

    When on, a project is automatically created and saved each time you exit MicroStation Descartes.
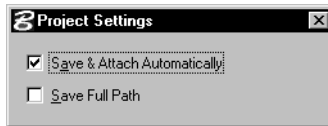
3. Close the Project Settings dialog box.

➤ **Setting up for document conversion**

1. From the Vectorize tool box, select the *Place Element* tool.

2. From the tool settings, set the following parameters:

    Raster Snap: On

    Auto Convert: Off

    Filter: Foreground

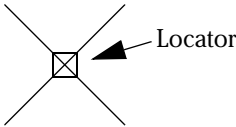   *Entity:* Line

   *Erase Raster:* Off

    Mode: Point

    Theme: Road

    Notice the box in the center of your pointer. This box serves as the foreground color locator. In order to Raster Snap to the

foreground color, this box MUST be over the foreground color of the image.
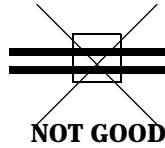
Locator

Depending on the scale and zoom factor in which you are working, you may need to adjust the size of the locate tolerance. The following shows appropriate and inappropriate locate tolerance sizes.
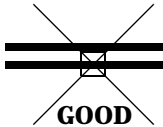
GOOD

The locator is over one line, snap occurs on this line.

GOOD

The locator is over one line, snap occurs on this line.

NOT GOOD
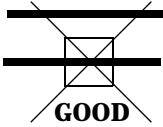
The locator is over two lines, snap occurs on the line closest to the center of the locator.

When the tolerance is too big, snap can occur on any raster line. Therefore, snap will not always occur on the line to which you are pointing.

Besides the zooming factor, you also have to consider the distance between the raster lines.

To adjust the locate tolerance, use the following key-in:

Key-in: SET LOCATE tolerance

OR

From the MicroStation Workspace menu, select Preferences. Then from the Category list, select Operation.

✍ For more information on the Locate Tolerance feature, consult the *MicroStation User's Guide* and/or *MicroStation Reference Guide*.

3. From the MicroStation Workspace menu, select Preferences.

   The Preferences dialog box opens.

4. From the Category list, select Operation.

5. Find the Locate Tolerance field, set the value to 10 and click OK.

6. From the Image Control tool box, select *Fit Images to View*.

7. Enter a data point in Window **1**.

   Note locations **1**, **2** and **3**. These locations highlight the 60' WIDE GAS PIPELINE EASEMENT. This pipeline is delimited by two raster lines. For the next exercise, you will work on the top raster line delimited by locations **1** to **3**.

Working With Nodes

Nodes appear in your drawing each time you create an element with the following Vectorize tools:

- *Place Element*

- *Continue Element*

- *Convert Lines*

- *Convert All Connected Lines*

A *node* indicates the presence of a vertex on an element. The node is used to connect elements together so they can share the same UOR. When converting, a node connects all intersected lines by inserting a vertex on each crossing element.

Inserting nodes is most useful when using the *Convert All Connected Lines* tool. By default, this tool automatically converts all raster lines and when it comes to an intersection, starts converting in all directions. Inserting nodes at specific locations prevents the conversion of the whole document. This gives you better control over the automated process.

Nodes have precedence over a raster snap. When a data point is entered over a node, the inserted vertex is automatically connected to the node and not placed using the Raster Snap feature.

Nodes are not placed/created inside the design file. Nodes are stored in a node file. The node file is then read and each node is drawn on your screen. Therefore, nodes are not design elements.

➤ **Conventional Document Conversion**

1. *Fit View* in Window 1.
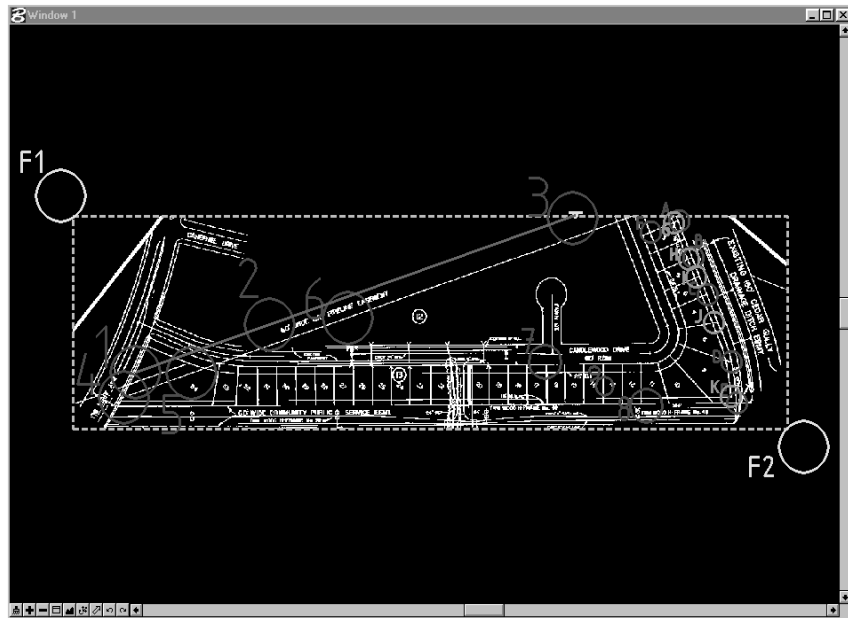
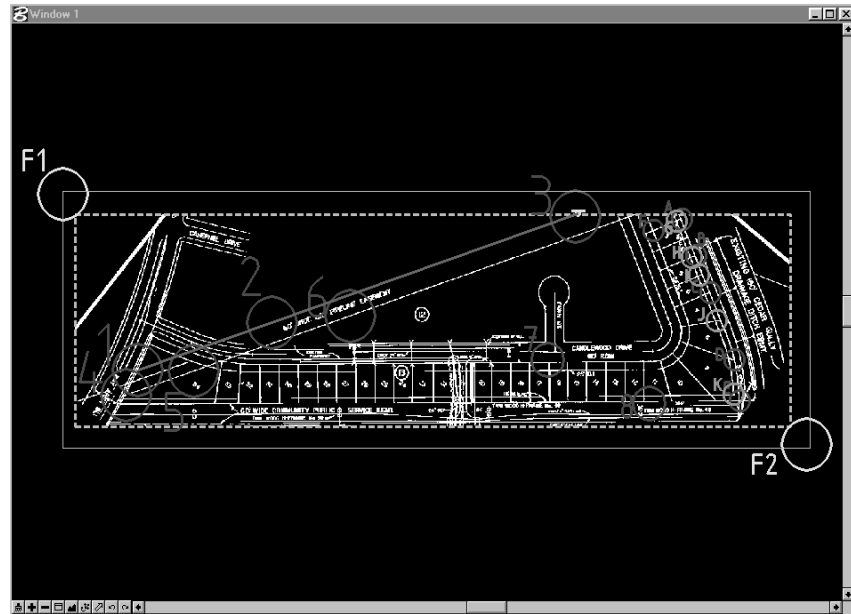2. From the Vectorize tool box, select the *Place Element* tool.

3. From the tool settings box, set Raster Snap to on.

4. Enter a data point at location **1** and enter points until you reach location **3**.

5. Place your pointer so that the locator is touching the line work for each data point you enter.

☞ Use the Vectorize function key features to navigate in the image.

   • Use <F5> to center the view using the position of the pointer.

   • Use <F6> to center the view using the last entered point.

   • Use <F8> to use the Spy Window.

☞ If you make a mistake and place a point at the wrong location:

   • Use <F2> to undo data points.

   • Use <F3> to redo data points.

6. To see the effect of the Raster Snap feature, simply snap/data point at the Raster Snap test location.

   Press <F2> once.

   From the tool settings, set Raster Snap to off.

   Snap/data point at the same location.

   Note that the line is not snapped to the raster line.

The next step is to delete what you have just done.

➤ Deleting the elements and Nodes

1. *Fit View* in Window 1.

2. Place a fence from location **F1** to **F2**.

3. From the Fence tool box, select *Delete Fence Content* and enter a data point to confirm.
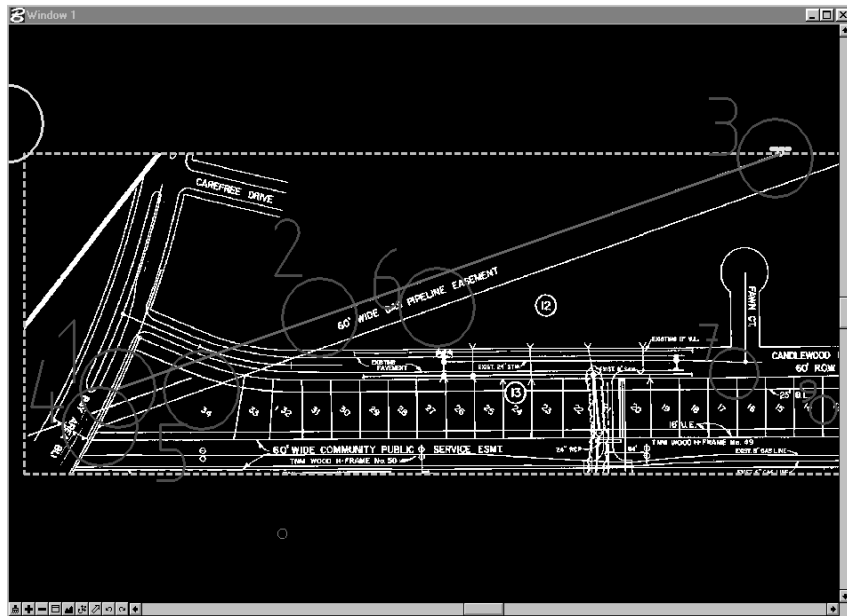

4. From the Vectorize tool box, select the *Delete Nodes* tool.

5. From the tool settings window, set Area to Fence and enter a data point to confirm.

Nodes are little red boxes that appear when you reset/ confirm the placement of an element with the *Place Element* tool.

In the next exercise, you will work on the raster lines delimiting the GAS PIPELINE.

➤ **Document Conversion with the Auto Convert feature**

1. *Window Area* around locations **3** and **4**.

2. From the Vectorize tool box, select the *Place Element* tool.

3. From the tool settings, set Raster Snap, Erase Raster and Auto Convert to on.

4. Snap/data point at location **1**.

    Note the message in the status bar, ENTER DIRECTION OR RESET TO COMPLETE.

    When using Place Element with Auto Convert, you must specify in which direction you wish to convert the current raster line.

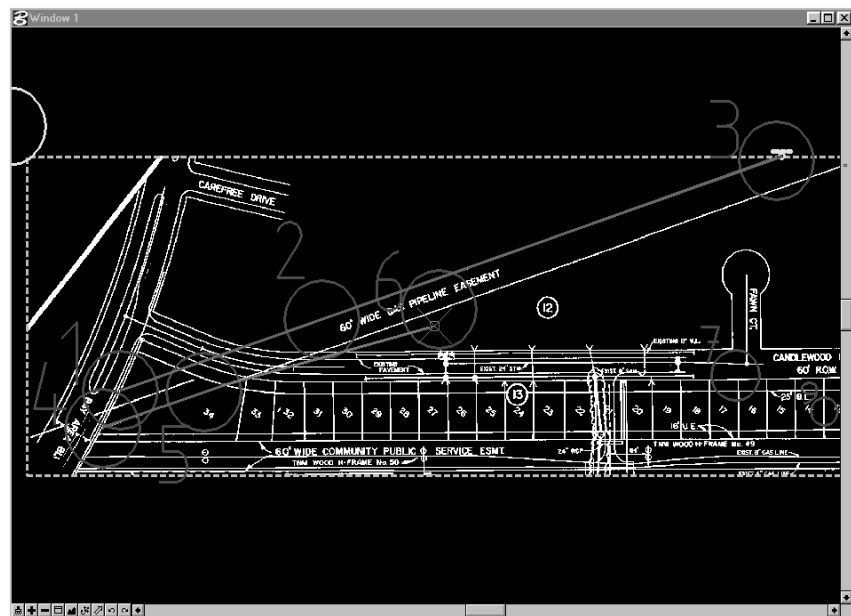5. Enter a data point at location **2**.

    This informs the Auto Convert feature to convert the line in this upper-right direction.

    The entire raster line is converted.

6. Reset to terminate/confirm placement of the element.

    Notice that the raster line under the vector has been erased.

7. Snap/data point at location **4** and then at location **5**. See what happens when the conversion process runs over an intersection.
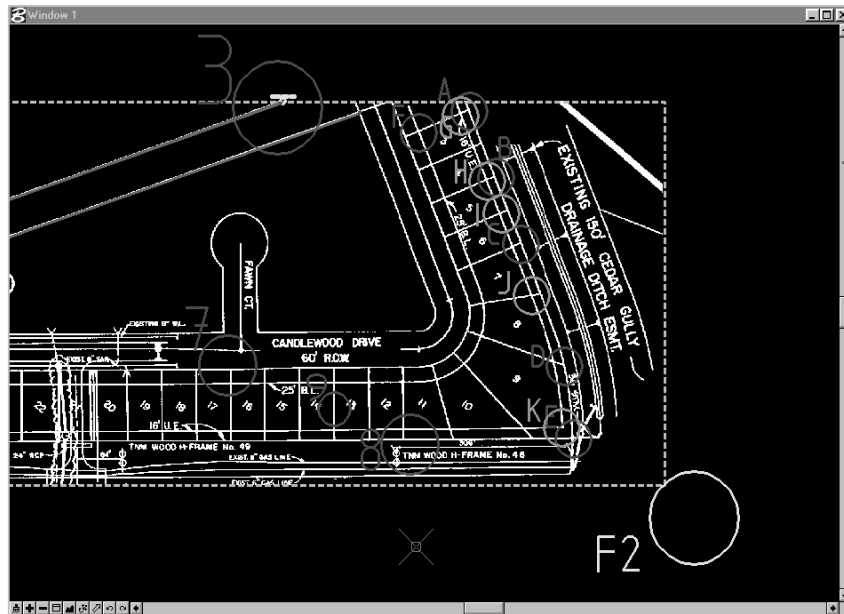

You are asked again to choose a direction in order to continue the conversion process.

8. Snap/data point at location **6**.

   The entire raster line is converted.

   If necessary, use the <F6> (*Center on Last Point*) to see the end of the line.

9. Reset to complete placement of this line.

➤ **Document Conversion Using Convert Lines tool**

1. *Window Area* around locations **3** and **F2**.

   Note that each location is exactly positioned at an intersection.

2. From the Vectorize tool box, select the *Convert Lines* tool.

3. From the tool settings, set Auto Continue and Erase Raster to OFF.

4. Snap/data point to location **A** through **E.**

   Note that no direction is required here. The process is executed in all directions. Using an intersection enables us to

simultaneously convert at least three different raster line segments.

5. Continue with locations **F** through **K**. but this time, from the tools settings, turn ON Erase Raster.
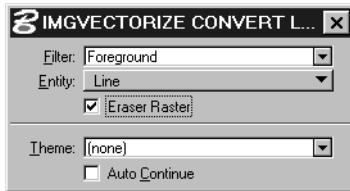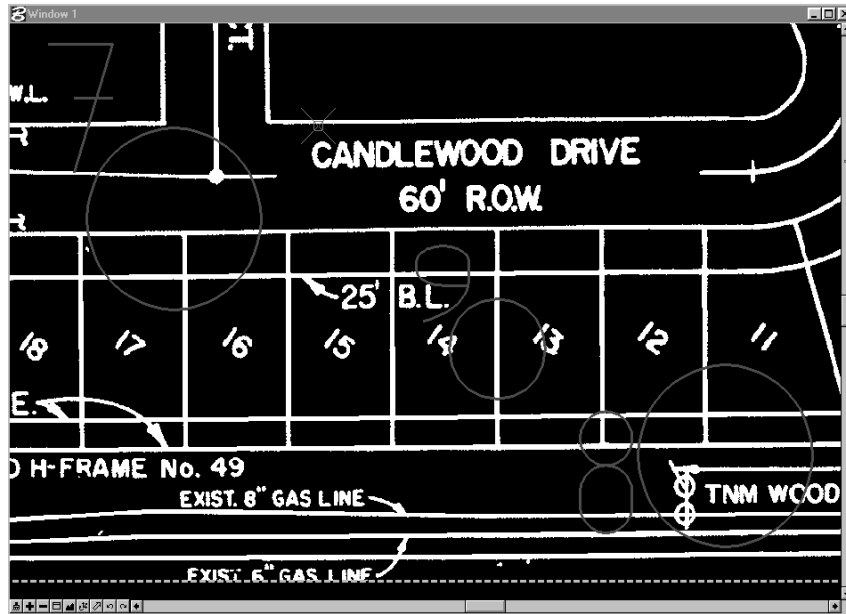

Notice that converted raster lines are automatically deleted (erased).

➤ **Adding Nodes for Automated Processing**

1. *Window Area* around locations 7 and 8.

2. From the Vectorize tool box, select the *Place Nodes* tool.

3. From the tool settings, set Boundary to Block.

   This instructs the node to raster snap the element and also to connect it with any other intersected elements by inserting a vertex so that all intersected elements on that node can share the same UOR.

4. Snap/data point to location **7** and then **8**.

   Nodes are added to raster lines along the boundaries of the block. This prevents the *Convert All Connected Lines* tool to exceed the limit set by the nodes.

➤ **Document Conversion using Convert All Connected Lines**

1. From the Vectorize tool box, select the *Convert All Connected Lines* tool.

2. From the tool settings, set as follows:

   Filter: Foreground
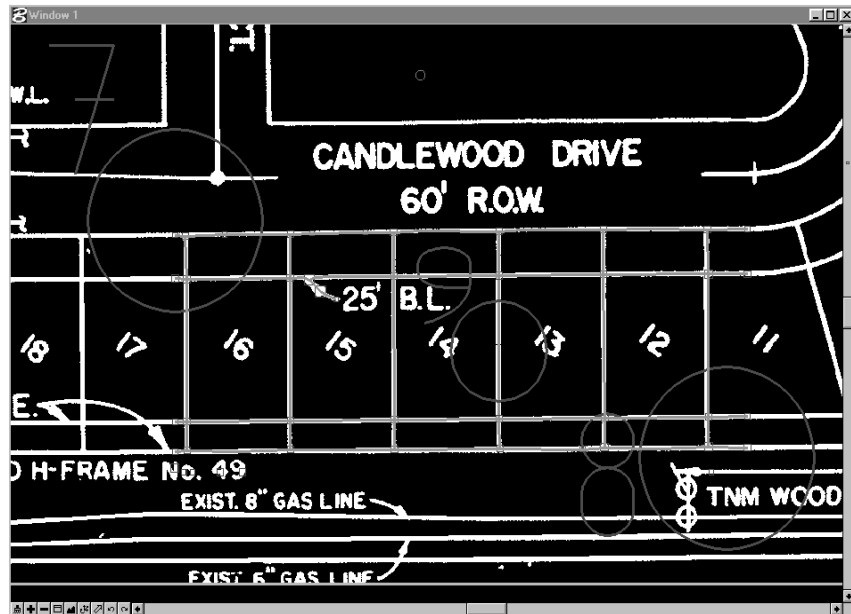
   Theme: Road

   Erase Raster: Off

3. Snap/data point at location **9**.

   The conversion process begins. You can see the lines appear as they are created.

   Note that the creation of lines does not exceed the limits set by the nodes you have previously placed.

   The final result looks as follows.

4. Close LESSON7.DGN and CONVERT.HMR.

Converting Cells and Text

Text and symbols appearing on an image can be converted into lines. But it is more useful to convert symbols into cells and raster text into text elements (type 17). The following exercises show you how to easily replace raster symbols with MicroStation cells and raster text with MicroStation text elements.

➤ Converting Cells

1. Open the LESSON7B.DGN file supplied with the tutorial in the …\dcartes\tutorial directory.

2. Find the DRAWING.HMR image that is supplied with the tutorial. The file is in the …\dcartes\tutorial directory. Highlight the image and open it.

3. *Window Area* around location **A**.

   The Window **1** area should look as follows.
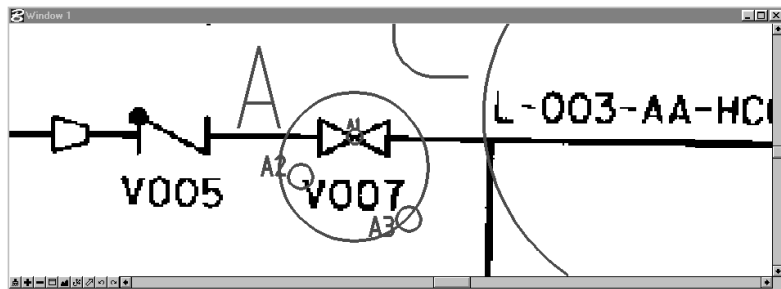
4. From the MicroStation Element menu, select Cells.

   The Cell Library dialog box opens.

5. From the File menu, select Attach.

   The Attach Cell Library dialog box opens.

6. From the …\dcartes\tutorial directory, select LESSON7.CEL and click OK.

7. Select the LES5 cell from the list box.

8. From the Active Cells option group, click the following buttons:

   Placement

   Terminator

   Point

   Pattern

9. Close the Cell Library dialog box.

10. From the MicroStation Tools menu, select Image > Text/Cells.

    The Text/Cells tool box opens.

11. From the Text/Cells tool box, select the *Convert Cell* tool and set the tool settings as follows:
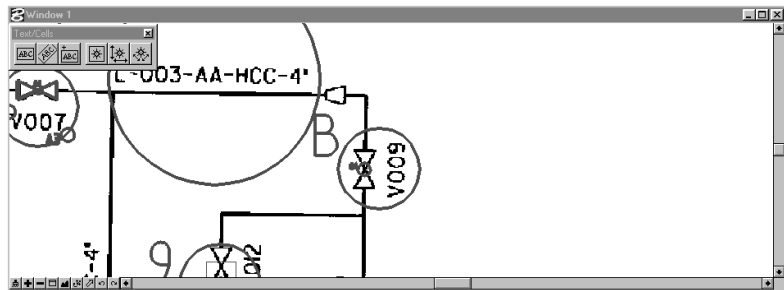
    Theme: None

    Erase Raster: OFF

12. Snap/data point at location **A1**.

    The cell is automatically placed.

13. Delete the cell.

14. *Update View* and try it again with the *Erase Raster* tool setting set to on.

    The raster symbol is erased.

15. *Window Area* around location **B**.

    The Window **1** area should look as follows.

16. From the Text/Cells tool box, select the *Convert Oriented Cell* tool.

17. Snap/data point at location **B1**.

18. Move the pointer to set the orientation and reset.

    The cell is automatically placed and the raster symbol erased.

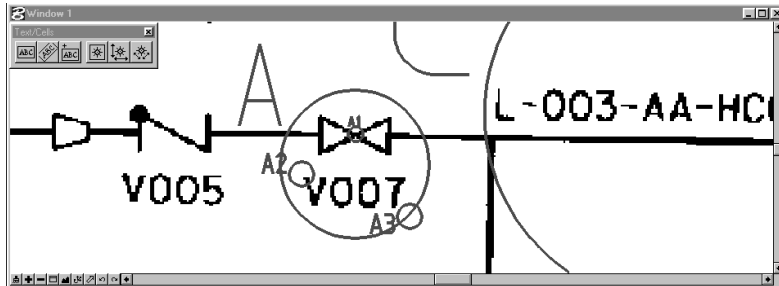19. Move the pointer to size the cell, then enter a data point and press Reset.

20. *Fit View* in Window 1.

➤ **To convert text**

1. *Window Area* around location **A**.

   The Window **1** area should look as follows.

2. From the MicroStation Tools menu, select Image > Text/Cells.

   The Text/Cells tool box opens.

3. From the Text/Cells tool box, select the *Select Horizontal Text* tool and set the tool settings as follows:

   Convert Now: ON

   Shrink Selection To Text: ON

   Filter: Foreground

4. Select the raster text by entering a data point at location **A2** and location **A3**.

   Note that the selection is automatically shrunken to fit the extent of the raster text.
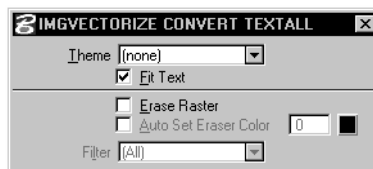
5. Set the tool settings as follows:

   Theme: None

   Fit Text: ON

   *Erase Raster:* OFF

   Text Editor: V007

6. Click Done.

   The text is pasted to fit the raster text.

7. Repeat steps 3 to 6 and set the *Erase Raster* tool settings to on.

8. Click Done.

   The raster text is erased.

   When several raster text entries have to be converted, you may want to do it in a batch.

9. *Fit View* in Window 1.

➤ **Converting Multiple Raster Text**

1. *Window Area* around location **C**.

   Window **1** should look as follows.
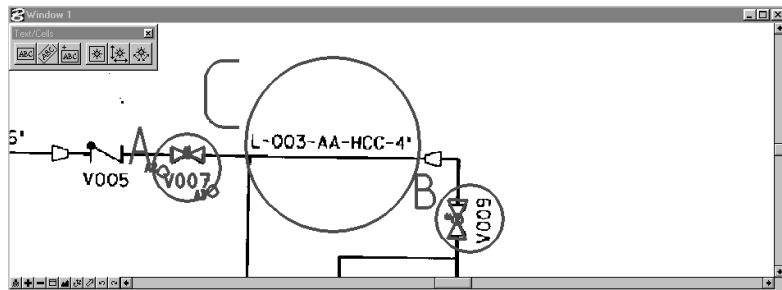
2. From the Text/Cells tool box, select the *Select Horizontal Text* tool and set the tool settings as follows:

   Convert Now: OFF

   Shrink Selection To Text: ON

   Filter: Foreground

3. Select the raster text in three distinct groups as follows.

   Notice that the selections are automatically shrunken to fit the extent of the raster text.

4. From the Text/Cells tool box, select the *Convert Text* tool and
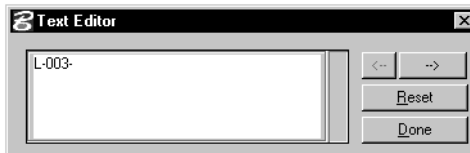   set the tool settings as follows:

   Theme: None

   Fit Text: ON

   Erase Raster: OFF

   Notice that the first text selection "L -003-" is highlighted.

5. From the Text Editor box, proceed as follows:

   TEXT: *L -003* — Click the right arrow button.

   TEXT: *AA* — Click the right arrow button.

   TEXT: *HCC-4″* — Click the End button.

6. *Update View* for Window **1**.

   The text is pasted to fit the raster text.

Practice

This lesson does not cover all of the functions related to
Advanced Conversion Techniques. You should explore other
functions by reviewing chapter 11 "Preparing Theme Symbology"
and chapter 12 "Vectorizing" of the *MicroStation Descartes User's
Guide*.

Here are a few of the functions you should explore:

- Convert Lines with the Auto Continue feature

- Converting Contours

- Managing Node Files