7

Transforming Images

This chapter shows how you can use the Local Transform or the Image Transform tool boxes for quick transformations of raster objects, of image files or parts of image files in different geometric spaces.

Overview

Several tools of the Local Transform and Image Transform tool boxes have similar names, such as Move, Scale, Rotate, or Mirror. There are two basic differences between the two sets of tools:

- The Local Transform tools are normally applied to a part of an image referred to as an image area, and the result is always reflected within the same image file. No new image file is generated.

- The Image Transform tools are normally applied to an entire image.

The Local Transform tool box includes:

Tool	Description
Move Image Area	Interactively moves an image area within an image.
Scale Image Area	Interactively changes the scale of an image area within an image.
Rotate Image Area	Rotates an image area within an image.
Horizontal Mirror Image Area	Flips an image area around a horizontal axis within an image.
Vertical Mirror Image Area	Flips an image area around a vertical axis within an image.
Place Image Area	Warps an image area within an image by matching three or four points on the area with corresponding destination points.

The Image Transform tool box includes:

Tool	Description
Move Image	Moves an image to a new location.
Scale Image	Changes the proportionate rectangular dimension of an image.
Mirror Image	Transposes the source image using mirror.
Square Image	Rotates an image by squaring a horizontal or a vertical axis.
Warp Image	Modifies the geometry of an image with a few pairs of points.
Rotate Image	Rotates an image or a region of an image.
Merge Images	Copies and merges one or more images contained within a defined area.
Corridor	Copies a region of one or more images within a polygon.

Local Transform tool box

Local Transform tool box

The Local Transform tools are used to rotate, mirror, move, scale or warp an image area within the active image.

For two-color images, the transform operations are applied only to pixels with the foreground color inside the image area.

For images with more than two colors, the transform operations are applied only to pixels that satisfy the specified color filter inside the image area.

In both situations, other pixels are treated as transparent when an image area is reinserted into the image. The part left behind in the source area is replaced by the background color for two-color images, or by the color you specify for more than two colors.

In the following text, the part of the image area to which the transform operations are applied (pixels with the foreground color or pixels that satisfy the specified color filter) are referred to as raster objects.

There are four options to determine the image area:

- Block — you will be prompted to enter two opposite corners of a rectangular box.

- Element — you will be prompted to identify an existing closed element.

- Fence — you will be prompted to accept the present fence.

- Raster Object — you will be prompted to identify the raster object whose external boundary will be taken as the image area.

When Raster Object is chosen from the Area option menu, an additional option menu allows you to determine this object:

- For two-color images, choose either Foreground or Background.

- For images with more than two colors, select the appropriate color filter.

✍ To apply a transform operation to a specific raster object, use the same color or the same color filter to determine the image area and its content to transform. For two-color images, choose the foreground color. For images with more than two colors, choose the same color filter.

Move Image Area tool

Move Image Area tool

Select *Move Image Area* from the Local Transform tool box to change the location of raster objects within the active image.

➤ **To move raster objects**

1. Select the *Move Image Area* tool.

2. For images with more than two colors, choose the color filter to determine the pixels to be moved, and select the color to remain.

    For two-color images, the foreground pixels move, and the background color remains.

3. Select the Area option.

4. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

5. Follow the instructions to define, select, or accept the area.

6. Enter a data point to specify the origin of the translation.

7. Dynamically move the outline of the object over the image.

8. Enter a data point to drop the image area into its new location.

Scale Image Area tool

Scale Image Area tool

Select *Scale Image Area* from the Local Transform tool box to change the scale of raster objects within the active image. You can scale in one of three modes, which you can choose from the Tool Settings window: Fixed Scale, Fixed Distance, and Interactive.

The three main steps to scale raster objects within an image are:

•   Identify the objects to be scaled.

•   Enter an anchor point, that is the point where the area containing the objects is pinned to the image and which will not be displaced by the operation.

•   Specify the scale factor.

✎ The way the scale factor is specified is the only difference in the three modes.

In Fixed Scale mode, the scale factor is specified by entering a value in the Tool Settings window.

➤ **To scale an image area using Fixed Scale mode**

1. Select the *Scale Image Area* tool.

2. Choose Fixed Scale from the Mode option menu and specify the scale factor in the Value box.

3. For images with more than two colors, choose the color filter to determine the pixels to be scaled, and select the color to remain.

   For two-color images, the foreground pixels are scaled, and the background color remains.

4. Select the Area option.

5. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

6. Follow the instructions to define, select, or accept the area.

7. Enter a data point to pin the anchor point on the area.

   The image area is redrawn with a new scale.

In Interactive mode, the scale factor is specified by defining two vectors and comparing the length of the vectors. In the following procedure, the tails of both vectors are pinned with the anchor point in step 7, while the tips are defined in steps 8 and 9 respectively.

➤ **To scale an image area with Interactive mode**

1. Select the *Scale Image Area* tool.

2. Choose Interactive from the Mode option menu.

3. For images with more than two colors, choose the color filter to determine the pixels to be scaled, and select the color to remain.

   For two-color images, the foreground pixels are scaled, and the background color remains.

4. Select the Area option.

5. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

6. Follow the instructions to define, select, or accept the area.

7. Enter a data point to pin the anchor point on the area, and the tail of the two vectors at the same time.

8. Enter a data point to define the length of the first vector.

9. Rubber band the area extent with the cursor and enter a data point to define the length of the second vector.

   The image area is redrawn with a new scale.

In the Fixed Distance mode, the scale factor is set by entering the length, or the distance between two points on the image. Determine the distance by interactively entering two data points on the image. The length or distance entered in the Value box will be used to rescale the area.

➤ **To scale an image area with Fixed Distance mode**

1. Select the *Scale Image Area* tool.

2. Choose Fixed Distance from the Mode option menu and enter a distance in the Value box. That is the distance between the two points to be entered in step 8.

3. For images with more than two colors, choose the color filter to determine the pixels to be scaled, and select the color to remain.

    For two-color images, the foreground pixels are scaled, and the background color remains.

4. Select the Area option.

5. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

6. Follow the instructions to define, select, or accept the area.

7. Enter a data point to pin the anchor point on the area.

8. Enter two data points to specify the length or distance corresponding to Value.

    The image area is redrawn with the new scale.

✍ This mode is useful when you know the exact size of a feature on the image. For example, use this feature to redraw a raster circle with a diameter of exactly 20 units. In step 2, enter 20 in the Value box. In step 8, enter two data points to show the corresponding diameter. The circle is redrawn accordingly.

Rotate Image Area tool

Rotate Image Area tool

Select *Rotate Image Area* to redraw raster objects inside an area within the active image to a specified rotation.

Rotating raster objects consists of three main steps:

*   Identify the area.

*   Enter an anchor point.

*   Specify the rotation angle.

The rotation can be specified in either of two modes, Fixed or Interactive.

In Fixed mode, the angle is specified by entering a value in the Tool Settings window.

➤ **To rotate an image area using Fixed mode**

1. Select the *Rotate Image Area* tool.

2. Choose Fixed from the Mode option menu and specify the angle in the Value box, in degrees.

3. For images with more than two colors, choose the color filter to determine the pixels to be rotated, and select the color to remain.

    For two-color images, the foreground pixels are rotated, and the background color remains.

4. Select the Area option.

5. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

6. Follow the instructions to define, select, or accept the area.

7. Enter a data point to pin the anchor point.

The image area is redrawn with a rotation around the anchor point with the angle specified in the Value field, applied in degrees.

In Interactive mode, the rotation angle is specified by interactively defining two vectors and taking the angle between the vectors. In the following procedure, the tail of both vectors are pinned with the anchor point in step 7, while the tips are defined in steps 8 and 9 respectively.

➤ **To rotate a raster object using Interactive mode**

1. Select the *Rotate Image Area* tool.

2. Choose Interactive from the Mode option menu.

3. For images with more than two colors, choose the color filter to determine the pixels to be rotated, and select the color to remain.

    For two-color images, the foreground pixels are rotated, and the background color remains.

4. Select the Area option.

5. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

6. Follow the instructions to define, select, or accept the area.

7. Enter a data point to pin the anchor point on the object, and the tail of the two vectors at the same time.

8. Enter a data point to define the length of the first vector.

9. Interactively rotate the area extent with the cursor and enter a data point to define the direction of the second vector.

The image area is redrawn with a new orientation.

Horizontal Mirror Image Area tool

Horizontal Mirror Image Area tool

Select *Horizontal Mirror Image Area* to flip raster objects around a horizontal axis within the active image.

➤ **To mirror an image area around a horizontal axis**

1. Select the *Horizontal Mirror Image Area* tool.

2. For images with more than two colors, choose the color filter to determine the pixels to be mirrored, and select the color to remain.

   For two-color images, the foreground pixels are mirrored, and the background color remains.

3. Select the Area option.

4. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

5. Follow the instructions to define, select, or accept the area.

   The area is redrawn as seen in a horizontal mirror. The raster objects occupy the same extent and location on the same image.

Vertical Mirror Image Area tool

Vertical Mirror Image Area tool

Select *Vertical Mirror Image Area* to flip an image area around a vertical axis within the active image.

➤ **To mirror an image area around a vertical axis**

1. Select the *Vertical Mirror Image Area* tool*.*

2. For images with more than two colors, choose the color filter to determine the pixels to be mirrored, and select the color to remain.

   For two-color images, the foreground pixels are mirrored, and the background color remains.

3. Select the Area option.

4. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

5. Follow the instructions to define, select, or accept the area.

   The area is redrawn as seen in a vertical mirror. The raster objects occupy the same extent and location on the same image.

Place Image Area tool

Place Image Area tool

Select *Place Image Area* to redraw raster objects with a new geometry within the active image.

➤ **To place an image area using Source/Destination mode**

1. Select the *Place Image Area* tool.

2. Choose Source/Dest from the Mode option menu.

3. For images with more than two colors, choose the color filter to determine the pixels to be warped, and select the color to remain.

   For two-color images, the foreground pixels are warped, and the background color remains.

4. Select the Area option.

5. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

6. Follow the instructions to define, select, or accept the area.

7. Select an existing design polygon as the source.

8. Select an existing design polygon as the destination.

   The image area will be warped into the destination polygon, with the appropriate geometry. Both polygons must be the same shape. Normally, the destination polygon is a copy of the source polygon that you have moved and/or scaled and/or rotated.

➤ **To place an image area with Interactive mode**

1. Select the *Place Image Area* tool.

2. Choose Interactive from the Mode option menu.

3. For images with more than two colors, choose the color filter to determine the pixels to be warped, and select the color to remain.

   For two-color images, the foreground pixels are warped, and the background color remains.

4. Select the Area option.

5. If Raster Object is selected, determine this object with a color (two-color images) or a color filter (images with more than two colors).

6. Select 3 Points or 4 Points from the Use option menu.

7. Follow the instructions to define, select, or accept the area.

8. Pick three or four pairs of points, as specified in step 6.

   For each pair of points, the first point tells the source position and the second, the destination position.

9. After the specified number of pairs are picked, enter a data point to accept the model.

   The image area will be warped in a new location, with a new geometry determined by the transformation model derived from the pairs of points.

Image Transform tool box

The Image Transform tool box provides access to the Move Image, Scale Image, Rotate Image, Mirror Image, Merge Images, Corridor, Square Image and Warp Image tools. The Move and Scale operations just change a few parameters in the image file header. The image data remains unchanged. The other operations result in resampling the image.

*Image Transform
tool box*

✍ All of these transforms, except Merge Images and Corridor, apply to the target image.

Modify Image tool

This newly added Modify Image tool allows the user to interactively change the shape of an image (location, scale,

rotation, and affinity). Below are the *Modify Image* tool and the new Image Transform tool box layout.

Modify Image tool

Image Transform tool box layout

➤ **To modify an image with the Modify Image tool**

1. From the Image Transform tool box, select *Modify Image* tool.

2. Using the pointer, enter a data point on the image to modify.

✍ The data point also identifies the location of the Origin handle.

3. Use the handles to move, scale, and rotate the image, as well as to modify the affinity angle.

✍ New Key-ins are available for this tool. Refer to Appendix A for a complete list and descriptions of the new Key-ins.

Move Image tool

Use the *Move Image* tool to move an image to a new location. Move adjusts the origin (or placement) of the image. The pixel size, dimensions, and number of pixels remain unchanged.

Move Image tool

➤ **To move an image**

1. Select the *Move Image* tool.

2. Enter a data point at a known location on the image (anchor point). A rectangle outlining the image appears.

3. Move the cursor (the image outline follows) to the new location and enter a data point. This data point can be entered in any open view. If the image is not listed for the view, it is added to the list.

   All views where the image is listed update to reflect the changes.

Scale Image tool

Use the *Scale Image* tool to change the proportionate rectangular dimensions of an image. To scale an image, use an interactive method or specify a scale. The Scale tool adjusts the origin, pixel size, and dimensions of the image. However, the number of lines and pixels remain unchanged.

Scale Image tool

➤ **To scale an image interactively**

1. Select the *Scale Image* tool.

2. Choose Interactive (the default) from the Method option menu.

3. Enter a data point (anchor point) that remains at the same location, whatever the scale.

4. Enter a second data point at a known location on the image. A cursor is placed where the data point was entered and a dynamic rectangle outlining the image appears.

5. Move the cursor so that the image outline increases or decreases to reflect the scale factor. Enter a data point to confirm/accept the new scale. This data point can be entered in any open view. If the image is not listed for the view, it is added to the list. A scale factor equal to zero or a negative scale factor is not possible. When you move the cursor, observe that the image outline decreases until it reaches a minimum size and then increases again.

➤ **To scale an image by specifying a scale**

1. Select the *Scale Image* tool.

2. Choose Specified Scale from the Method option menu.

3. Specify the scale by entering a factor in the Scale input box.

4. Enter a data point (anchor point) that remains at the same location, whatever the scale.

   All views where the image is displayed update to reflect your scale adjustments.

Rotate Image tool

Use the *Rotate Image* tool to rotate an image or a region of an image.

Rotate Image tool

The source area can either be copied to a new file, replace the current file or use the transformation matrix to perform the operation. The default settings assume that you will use the transformation matrix, but it is possible to actually resample the image by checking the "Create New Image" toggle box which appears in the *Rotate* tool setting.

➤ **To interactively rotate an image using the transformation matrix**

1. From the Image Transform tool box, select the *Rotate Image* button.

   A dialog box appears.
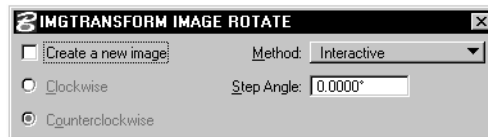
2. By default, the Create A New Image toggle is OFF. This allows you to take advantage of the speed of the transformation matrix. If you wish to resample the image at this time, select Create A New Image and it will be resampled using the old method.

✎ When the Create A New Image toggle is not checked, it is no longer possible to choose only a portion of the image to rotate. If you wish to rotate a portion of the image, you much select the Create A New Image toggle and proceed with resampling.

3. Select a data point on your image.

4. Select the rotation origin and hook point for interactive rotation or the angle and direction for rotation on a specified angle.

✎ Because the transformation matrix is a new addition to MicroStation Descartes Version 7, Rotate operations performed solely with the transformation matrix will not appear if the file is opened in MicroStation Descartes 6.0. If you plan to use an image

in a previous version of MicroStation Descartes and would like it rotated, you may wish to select Create A New Image and resample the image at this time.

✎ Only file formats which support a transformation matrix will maintain mirroring operations stored in the transformation matrix. For all file formats without a transformation matrix, such as standard TIFF or BMP files, MicroStation Descartes adds a sister file (hgr or worldfile). However, if this TIFF or BMP are opened in an application where worldfiles are not supported, the information in the transformation matrix will not be applied to the image. If you plan to use a file format which does not support a transformation matrix in another application, you may wish to select Create A New Image and resample the image at this time.

➤ **To rotate an image interactively to create a new image**

1. Select the *Rotate Image* tool.

2. Select Interactive (the default) from the Method option menu. Turn ON Create a New Image.

3. Set the step angle (zero is the default) in the Step Angle field. The angle is calculated from the design plane positive x-axis.

4. Enter a data point on the image. This point will be the anchor point for the rotation origin.

   The next three points determine the part of the image that will be rotated.

5. Enter a data point for the origin of the input area and stretch the rubber band to specify the base and the orientation of the rectangle.

   As you move the cursor, the rubber band moves in steps reflecting what you set in the Step Angle field. When you enter another data point, a dynamic rectangle appears, and the next one finishes determining the input area you want to rotate. The data points can be entered in any view.

6. Specify the angle by entering two more data points. When you enter the next point, the outline of the input area displays and can be rotated around the anchor point entered in step 4. As you move the cursor, the rectangle moves in steps as specified in the Step Angle field.

7. Enter a data point when you are satisfied with the rotation.

8. Set the resampling parameters in the displayed dialog box and click OK. (For more information see "Output Image Creation dialog box" on page 7-24.)

Only the data inside the input rectangle will be in the output image. The output image is added to the list for the view in which the origin was entered. The view then updates.

⋁⋁ In the Output Image Creation dialog box, if "Use Input File as Output" is on the original image is deleted. (For more information see "Output Image Creation dialog box" on page 7-24.)

➤ **To rotate an image to a specified angle creating a new image**

1. Select the *Rotate Image* tool*.*

2. Select Specified Angle from the Method option menu and enter the angle value.

   OR

   Select 90 degrees.

   OR

   Select 180 degrees.

3. Choose Clockwise or Counterclockwise.

   Turn ON Create a New Image.

4. Enter a data point on the image. This point will be the anchor point for the rotation origin.

   The next three points determine the part of the image that will be rotated.

5. Enter a data point for the origin of the input area and stretch the rubber band to specify the base and the orientation of the rectangle.

   As you move the cursor, the rubber band moves in steps reflecting what you set in the Step Angle field. When you enter another data point, a dynamic rectangle appears, and the next one finishes determining the input area you want to rotate. The data points can be entered in any view.

6. Set the resampling parameters in the dialog box which is displayed and click OK (For more information see "Output Image Creation dialog box" on page 7-24).

Only the data inside the input rectangle will be in the output image. The output image is added to the list of the view in which the origin was entered. The view then updates.

⋁⋁ In the Output Image Creation dialog box, if "Use Input File as Output" is on the original image is deleted (For more information see "Output Image Creation dialog box" on page 7-24).

  ✎ When an output file is created with the Image Transform tools, the background color displays in all areas not occupied by the target input region. If you do not wish the background color display in a given view, turn on the Transparent toggle in the Output Settings dialog box and the Transparency toggle in the View Image Attributes dialog box for this view.

Mirror Image tool

Use the *Mirror Image* tool to flip the source image using a horizontal, vertical, or diagonal mirror. The image is transformed and can either replace the current file or be copied to a new file.

Mirror Image tool

➤ To mirror an image using the transformation matrix

1. From the Image Transform tool box, select the *Mirror Image* tool.

   A dialog box appears.

2. By default, the *Create A New Image* toggle is OFF. This allows you to take advantage of the speed of the transformation matrix. If you wish to resample the image at this time, select *Create A New Image* and it will be resampled using the old method.

3. Choose a data point on the image to mirror.

  ✎ Because the transformation matrix is a new addition to MicroStation Descartes Version 7, Mirror operations performed solely with the transformation matrix will not appear if the file is opened in MicroStation Descartes 6.0. If you plan to use an image in a previous version of MicroStation Descartes and would like it mirrored, you may wish to click Create A New Image and resample the image at this time.

✍ Only file formats which support a transformation matrix will maintain mirroring operations stored in the transformation matrix. For all file formats without a transformation matrix, such as standard TIFF or BMP files, MicroStation Descartes adds a sister file (hgr or worldfile). However, if this TIFF or BMP are opened in an application where worldfiles are not supported, the information in the transformation matrix will not be applied to the image. If you plan to use a file format which does not support a transformation matrix in another application, you may wish to select *Create A New Image* and resample the image at this time.

➤ **To reverse an image using a mirror creating a new output image**

1. Select the *Mirror Image* tool.

   Turn ON Create a New Image.

2. Check the appropriate check box to select the mirroring direction: Horizontal, Vertical, Diagonal Down/Up (/), or Diagonal Up/Down (\).

3. Enter a data point on the image.

4. Set the resampling parameters in the displayed dialog box and click OK. (For more information see "Output Image Creation dialog box" on page 7-24.)

〰 In the Output Image Creation dialog box, if "Use Input File as Output" is on, the original image is deleted. (For more information see "Output Image Creation dialog box" on page 7-24.)

Square Image tool

Select *Square Image* to rotate a raster image by squaring a horizontal or vertical axis.The squaring may be applied by creating a new image, overwriting the existing image or you may use the transformation matrix to perform the operation.

Square Image tool

The default settings assumes you will use the transformation matrix, but it is possible to resample the image by checking the "Create New Image" toggle box which appears in the *Square* tool setting.

➤ **To square an image**

1. From the Image Transform tool box, select the *Square Image* tool.

   A dialog box appears.

2. By default, the Create A New Image toggle is OFF. This allows you to take advantage of the speed of the transformation matrix. If you wish to resample the image at this time, select Create A New Image and it will be resampled using the old method.

3. Select a data point on your image.

4. Choose two points on the appropriate axis and the image will be squared.

✎ Because the transformation matrix is a new addition to MicroStation Descartes Version 7, Square operations performed solely with the transformation matrix will not appear if the file is opened in MicroStation Descartes 6.0. If you plan to use an image in a previous version of MicroStation Descartes and would like it squared, you may wish to select Create A New Image and resample the image at this time.

✎ Only file formats which support a transformation matrix will maintain mirroring operations stored in the transformation matrix. For all file formats without a transformation matrix, such as standard TIFF or BMP files, MicroStation Descartes adds a sister file (hgr or worldfile). However, if this TIFF or BMP are opened in an application where worldfiles are not supported, the information in the transformation matrix will not be applied to the image. If you plan to use a file format which does not support a transformation matrix in another application, you may wish to select *Create A New Image* and resample the image at this time.

➤ **To square an image by resampling it**

1. Select the *Square Image* tool*.*

2. Select Horizontal or Vertical from the Axis option menu.

3. Turn ON Create a New Image.

4. Pick two points along an axis that will become horizontal or vertical, as specified in step 2.

5. Set the resampling parameters in the dialog box which is displayed after the two points are picked, and click OK. (For more information see "Output Image Creation dialog box" on page 7-24).

The image rotates around the first entered point, with an angle derived from the position of the second point with respect to the specified axis.

The output image is added to the list of the view in which the origin was entered. The view then updates.

In the Output Image Creation dialog box, if "Use Input File as Output" is on, the original image is deleted. (For more information see "Output Image Creation dialog box" on page 7-24.)

Warp Image Tool

Select *Warp Image* to modify the geometry of an image by entering a few pairs of source/destination points. You can choose to create a new output image, overwrite the existing image or you may use the transformation matrix to perform the operation.

Warp Image tool

The default settings assume that you will use the transformation matrix, but it is possible to actually resample the image by checking the "Create New Image" toggle box which appears in the *Warp* tool setting.

➤ **To warp an image**

1. From the Image Transform tool box, select *Warp Image*.

   A dialog box appears.

2. By default, the Create A New Image toggle is OFF. This allows you to take advantage of the speed of the transformation matrix. If you wish to resample the image at this time, select

Create A New Image and it will be resampled using the old method.

✎ When the Create A New Image toggle is not checked, the Projective (4 pts) option is disabled, since this option is only available with image resampling.

3. Select a data point on your image.

4. Select data points as appropriate for your model and accept the model for warping.

✎ Because the transformation matrix is a new addition to MicroStation Descartes Version 7, Warp operations performed solely with the transformation matrix will not appear if the file is opened in MicroStation Descartes 6.0. If you plan to use an image in a previous version of MicroStation Descartes and would like it warped, you may wish to select *Create A New Image* and resample the image at this time.

✎ Only file formats which support a transformation matrix will maintain mirroring operations stored in the transformation matrix. For all file formats without a transformation matrix, such as standard TIFF or BMP files, MicroStation Descartes adds a sister file (hgr or worldfile). However, if this TIFF or BMP are opened in an application where worldfiles are not supported, the information in the transformation matrix will not be applied to the image. If you plan to use a file format which does not support a transformation matrix in another application, you may wish to select *Create A New Image* and resample the image at this time.

➤ **To warp an image by resampling it**

1. Select the *Warp Image* tool.

2. Choose the actual warping method from the Method option.

3. Turn ON Create a New Image.

4. Pick two, three or four pairs of points, according to the option chosen in step 2. For each pair of points, the first point tells the source position and the second, the destination position.

5. Set the resampling parameters in the dialog box which is displayed after the specified number of pairs are picked, and click OK. (For more information see "Output Image Creation dialog box" on page 7-24.)

The image will be warped with a new geometry determined by the transformation model derived from the pairs of points.

The output image is added to the list of the view in which the origin was entered. The view then updates.

⋁⋁ In the Output Image Creation dialog box, if "Use Input File as Output" is on, the original image is deleted. (For more information see "Output Image Creation dialog box" on page 7-24.)

Merge Images tool

Use the *Merge Images* tool to copy and merge one or more images contained within a defined area.

Merge Images tool

If images included in the input area are displayed in a mosaic where Transparency has been used, the output file contains all pixels visible in the input area. Therefore, the output file will be one uniform file that no longer requires the Transparency settings to display the mosaic area.

✎ When an output file is created with the Image Transform tools, the background color displays in all areas not occupied by the target input region. If you do not wish the background color to be displayed in a given view, turn on the Transparent toggle in the Output Settings dialog box and turn on the Transparency toggle in the View Image Attributes dialog box for this view.

➤ **To merge images contained within a rectangle**

1. Select the *Merge Images* tool.

2. Select Block (the default) from the Method option menu.

3. Enter a data point to fix the origin of the input area (block).

   As you move the cursor, a dynamic rectangle appears.

4. Enter a data point to fix the opposite corner.

   You can enter the data point in any view. If there is not an image in the area defined by the rectangle, an error message displays. Otherwise, a dialog box displays to permit you to set the resampling parameters and select the name of the

output file (For more information see "Output Image Creation dialog box" on page 7-24).

The output image is added to the list for the view in which the origin was entered. The view then updates.

➤ **To merge images contained within an oriented rectangle**

1. Select the *Merge Images* tool.

2. Select Oriented Block from the Method option menu.

3. Set the Step Angle field.

4. Enter a data point to fix the origin of the area (block). A rubber band appears as you move the cursor.

5. Set the orientation of the input area (the resampling rectangle) by entering a data point in the appropriate direction. The rubber band moves in steps which can be set in the Step Angle field. The orientation is defined by an angle calculated from the design plane positive x-axis. As you move the cursor, a dynamic rectangle appears.

6. Enter a data point to fix the opposite corner. You can enter the data point in any view. If there is not an image in the area defined by the rectangle, an error message displays. Otherwise, a dialog box displays to permit you to set the resampling parameters and select the name of the output file (For more information see "Output Image Creation dialog box" on page 7-24).

The output image is added to the list of the view in which the origin was entered. The view then updates.

➤ **To merge images inside a polygon**

1. Select the *Merge Images* tool.

2. Select Element from the Method option menu.

3. Click on the target polygon. Enter a data point to accept the element. If there is not an image in the region defined by the polygon, an error message displays. Otherwise, a dialog box displays to permit you to set the resampling parameters and select the name of the output file (For more information see "Output Image Creation dialog box" on page 7-24).

Corridor tool

Use the *Corridor* tool to copy the regions of one or more images contained within a polygon to an output polygon of the same shape.

Corridor tool

The copied regions of the source images are merged into a new image and then copied to the output space defined by the polygon. Design elements (from the design file and associated reference files) that occupy the region contained within the polygon can also be copied to the output polygon.

When you use Corridor, both the input (source) and output (destination) polygon must be the same shape (usually a copy of the same element). However, the output polygon can be rotated, scaled, and moved to reflect the desired output result.

If the images in the input area are displayed with transparency to make a mosaic, the output file will contain all of the pixels that you can see, not the transparent parts. Therefore, the output file will be one uniform file that no longer requires the transparency settings in order to display the mosaicked area.

➤ **To use Corridor**

1. Create a source and destination polygon.

2. Place the source polygon on the target region that you want to copy.

3. Select the *Corridor* tool.

4. Click on the source polygon and enter a data point to accept the element.

5. Click on the destination polygon. Enter a data point to accept the element. A dialog box displays to permit you to set the resampling parameters and select the name of the output file (See "Output Image Creation dialog box" on page 7-24).

    The output image is added to the list for the view where you select the output destination polygon. The view then updates.

✍ The polygon must be a shape or complex shape which contains only lines and line strings. If a complex shape is used and it contains more than 100 points, then the Copy Design Elements feature is disabled.

☞ When an output file is created with the Image Transform tools, the background color displays in all areas not occupied by the target input region. If you do not wish the background color to be displayed in a given view, turn on the Transparent toggle in the Output Settings dialog box and the Transparency toggle in the View Image Attributes dialog box for this view.

Output Image Creation dialog box

The Output Image Creation dialog box is used with the Rotate Image, Mirror Image, Square Image, Warp Image, Merge Images, and Corridor tools. It opens after the desired transformation action has been specified so that you can determine the characteristics of your output file.

Output Image Creation dialog box
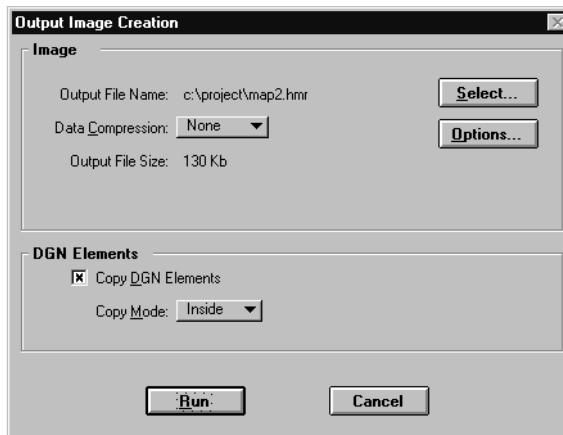
Use Input File as Output

Use this toggle to indicate that you want to apply the operation directly to the source file and not create a new file. When on, the Output File field displays the name of the source image. When off, the output file name can be defined using the file selection dialog box.

☞ Not available with Merge and Corridor.

Output File Name

The name of the active design file followed by a suffix number is the default output file name. The suffix number (#) starts at 1 and increases by one each time a new, unnamed file is created with the Image Transform tools in the same session of MicroStation

Descartes. To enter a specific name, click the Select button and use the File Selection dialog box.

Data Compression

Use the Data Compression option menu to choose among the following data compression options:

None	Choose None to create an output file without compression. The exact file size is provided by the File Size indicator.
Deflate	Applies the Deflate compression algorithm to the output image. No data is lost in this compression. The Deflate option is available for 8 bit format images.
PackBits	PackBits is available only for 1 bit format images. The output file is compressed without data loss. The File Size indicator displays the maximum size of the output file.
CCITT3	CCITT3, often spoken of as Group III compression, is available only for 1 bit format images. The output file is compressed without data loss. The File Size indicator displays the maximum size of the output file.
CCITT4	CCITT4, often spoken of as Group IV compression, is available only for 1 bit format images. The output file is compressed without data loss. The File Size indicator displays the maximum size of the output file.

Output File Size

Displays an approximation of the size, in Kilobytes, of the output image.

Options

Selecting Options from the Output Image dialog box opens the Output Settings dialog box.
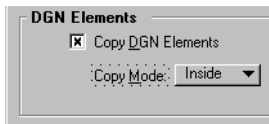
Copy Design Elements

Design Elements feature

Turn On Copy Design Elements to copy the design elements contained within the source polygon to the destination polygon. The Copy Design Elements feature is only available if the source polygon has less than 100 points.

✎ Only available with Corridor.

Copy Mode

Use the Copy Mode option menu to select one of the following
options for the Copy Design Elements feature:

- Inside — Choose Inside to copy only the design elements that
  are completely inside the source polygon.

- Overlap — Choose Overlap to copy the design elements that
  are inside or overlap the source polygon.

- Clip — Choose Clip to copy only the design elements that are
  completely inside the source polygon and to copy only the
  inside part of the elements that overlap the source polygon.

☞ Only available with Corridor.

Run

Click Run to create the output image. While the image is being
created, a Progress indicator displays.

If there is not enough space on the destination disk to contain a
file that will be compressed, you are warned and permitted to
cancel the process. If you chose not to compress the output file
and if there is not enough space on the destination disk, you are
warned that the process cannot be performed.

Cancel

If you decide not to use the present parameters, click Cancel. The
dialog box then closes.

Output Settings dialog box

*Output Settings
dialog box*
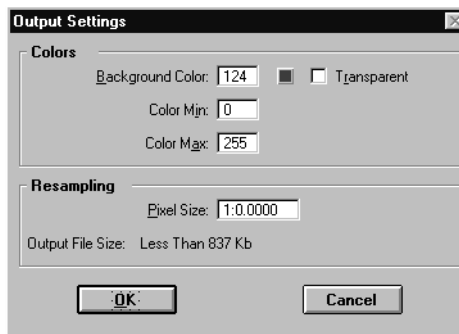
Output File Type

The Output File Type option menu displays only for image
merges that contain 1 bit files exclusively. Choose between Color
Table (default) or 1 Bit options.

✍ Only available with Merge Images and Corridor.

Output Color Table

Use the Output Color Table option menu to choose among the following options:

• Gray Scale — Choose Gray Scale to produce an output file in gray scale.

• Active Image (not accessible when no active image)
  Choose Active image to produce an output file with the color palette of the active image.

• Optimized Colors (accessible only when no active image and no selected images)
  Choose Optimized Colors to produce an output file with a color palette that is optimized for the displayed images.

The Output Color Table option menu is dimmed if the output file type selected is 1 bit.

✍ Only available with Merge Images and Corridor.

Background Color

The background color is a color number or index used to initialize the Output Image File prior to resampling. Therefore, any part of the output image which is not covered by resampled pixels remains this color. You can enter the background color index into the Background Color field. The actual color corresponding to this number displays on a color button next to this field. You can also select the color with the color picker that pops up when you click the color button.
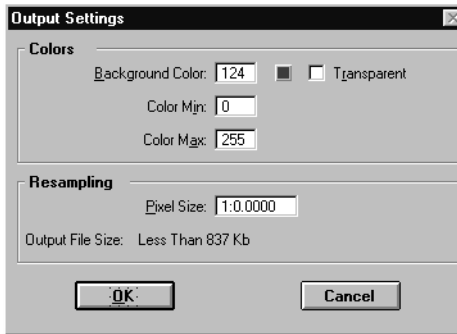
Transparent

If on, the background color will be transparent in the View where you are working.

Color Min/Max

With the Merge Images and Corridor tools, the Color Min and Color Max fields are only available if the Output File Type was

Color Table and if the active image was selected as the Output Color Table option.

Output Settings

Colors

Background Color: 124 ☐ Transparent

Color Min: 0

Color Max: 255

Resampling

Pixel Size: 1:0.0000

Output File Size: Less Than 837 Kb

[OK]   [Cancel]

The Color Min (0 is the default) and Color Max (default 255) values restrict the resampled pixels colors to fall within a specific interval. For each resampled pixel, a color number smaller than the minimum receives the minimum color value and a color greater than the maximum receives the maximum color value. If the maximum value is less than 1, then 255 is used as a default value. If the maximum value is smaller or equal to the minimum, then the OK button is dimmed.

If the input image is 1 bit, the Color Min/Max fields is dimmed for the Rotate Image and Mirror Image tools.

Pixel Size
Use the Pixel Size field to enter the size of pixels for the output image. Only square pixels are supported; the entered value is taken as the X and Y dimensions of the pixels.

Number of Gray Levels
The Number of Gray Levels field is dimmed if the Output File Type selected was 1 bit. If Color Table was selected as the output file type, the Number of Gray Levels will be available only if Gray Scale was selected as Output Color Table option. The default value displayed in this field is 255.

To change the default value, type a new number into the field.

✍ Only available with Merge Images and Corridor.