

Working with montaj GridKnit

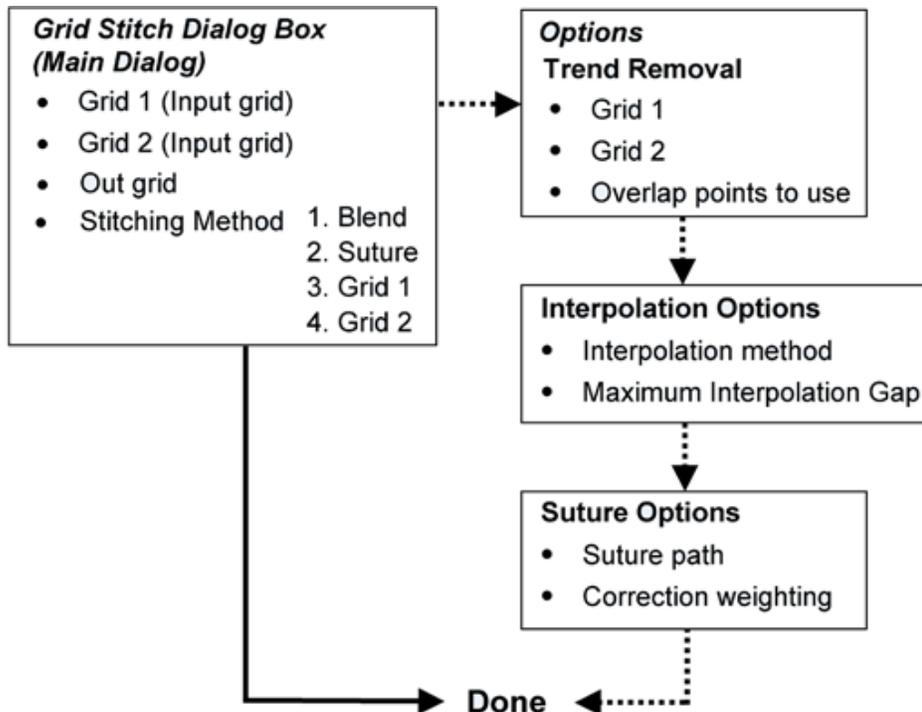
This How-To Guide walks you through the montaj GridKnit™ process and includes the following topics:

- Grid Stitching Using the Blend Method
- Grid Stitching Using the Suture Method
- Interactive Suturing Method
- Postage Stamp Grid Stitching
- Stitching Multiple Grids
- Provide a Strategy for Checking Results

For detailed information on the GridKnit process, read the *montaj GridKnit Overview* How-To Guide.

GridKnit Process

The grid stitching process is outlined in the diagram below.



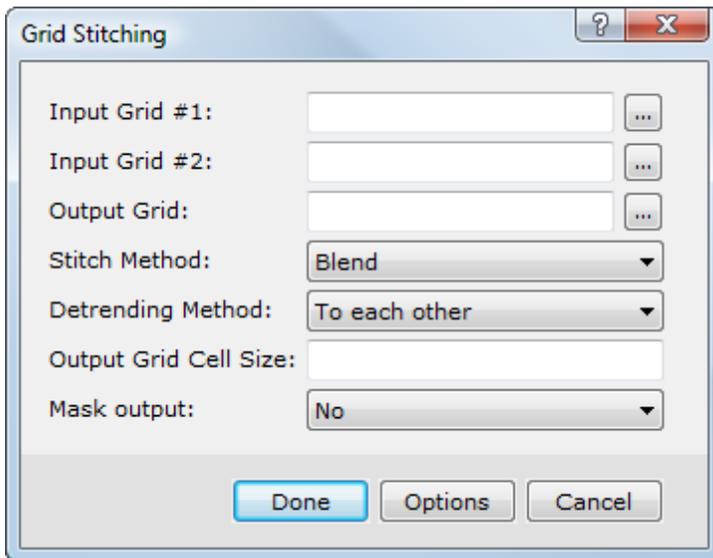
GridKnit consists of a series of dialog boxes. For one-step grid stitching, only the main dialog box is used. The rest of the dialogs are used to set pre-processing and suturing options.

Grid Stitching Using the Blend Method

The first stitching method we will cover in this *How-To Guide* is the Blend method. This method uses a blending function over the area of overlap so that transition from one to the other is smooth. Except for the optional removal of a static offset or trend, the grids beyond the overlap regions remain unchanged. The first step is to access the Grid Stitching dialog box from the main menu bar.

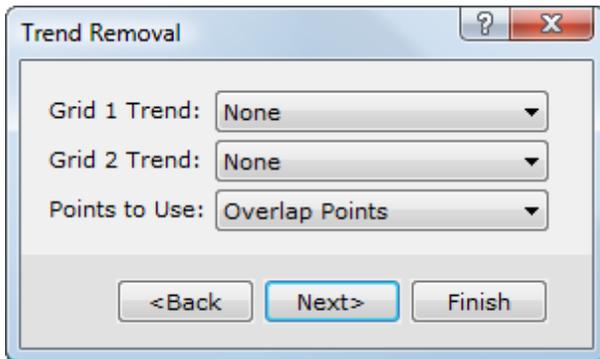
To Stitch Grids using Blending:

1. On the *Grid and Image* menu, select *Grid knitting* and then select **Knit two grids together**. The *Grid Stitching* dialog appears.

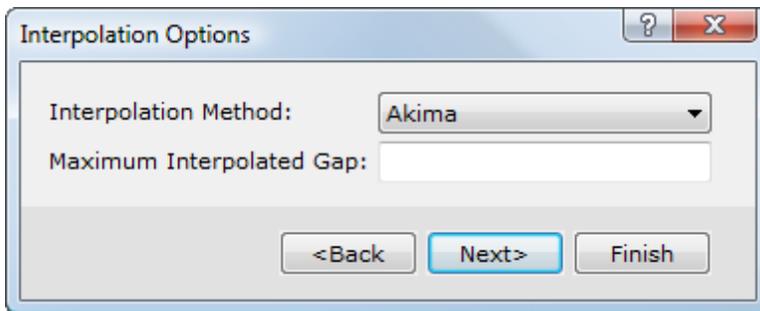


2. Using the  buttons, specify your *Input grid #1* and *Input Grid #2* from your project folder.
3. Specify a name for the *Output Grid*.
 -  *Note that, this will be a composite of the two input grids.*
4. From the *Stitch Method* dropdown list, select **Blend** and from the *Detrending Method* dropdown list, select **To each other**.
 -  *Note that, if you wanted to remove a regional trend and had a grid that overlapped the entire area of the grids to be stitched, you could select "To a regional grid".*
5. You can leave the *Output Grid Cell Size* box blank and the cell size will be taken from *Input Grid #1*.
6. For *Mask output*, select the default option **No** for when the output grid is the combined grids. Select either *Grid 1* or *Grid 2* for when the output is only the selected grid's area. For the blending method, this includes all points in the overlap region. In other words, the *No* method produces exactly the same as putting together the results of *Grid 1* and *Grid 2*.

- The next step is to set the pre-processing options. Click the **Options** button and the *Trend Removal* dialog appears.



- From the *Grid 1 Trend* and *Grid 2 Trend* dropdown lists, select **None** as the trend removal method.
- From the *Points to Use* dropdown list, select **Overlap Points**. This will shift the grid values for both grids in the overlapping areas so that the grids are at the same level. You may want to experiment with the trend settings on your own, since different trend removal methods provide different results.
- Click the **Next** button.
The *Interpolation Options* dialog appears.



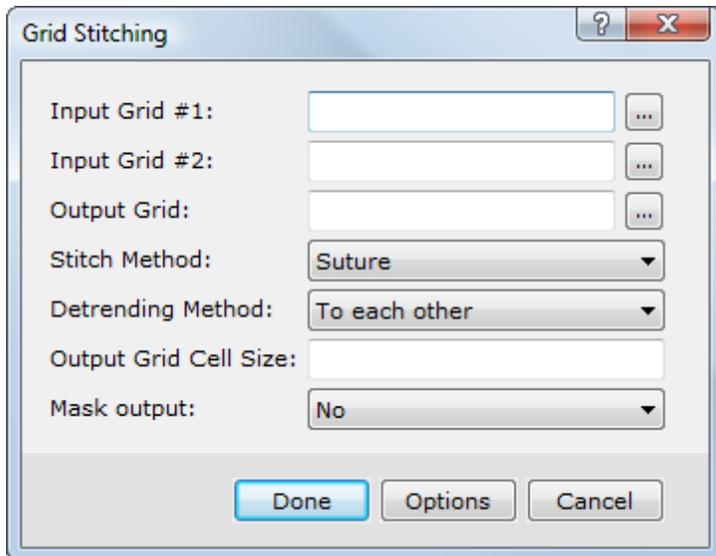
- Using the *Interpolation Method* dropdown list, select **Akima** as the spline method. Interpolation is used to fill gaps of data in the grids. The Akima spline is usually the best method to use as it provides the smoothest interpolation.
- Specify **0.0** in the *Maximum Interpolation Gap* box. This setting will interpolate all gaps, regardless of size.
- Click the **Next** button. The *Grid Stitching* dialog again appears.
- Click the **Done** button to finish the grid stitching process. The system will create the new grid and automatically display it in a temporary map, using default display options.

Grid Stitching Using the Suture Method

The suture method is the most common method of grid stitching. It is more effective than blending; especially on grids that have a narrow overlap area. This lesson covers the steps involved in the automatic and interactive suture processes.

To Stitch Grids Using Automatic Suturing:

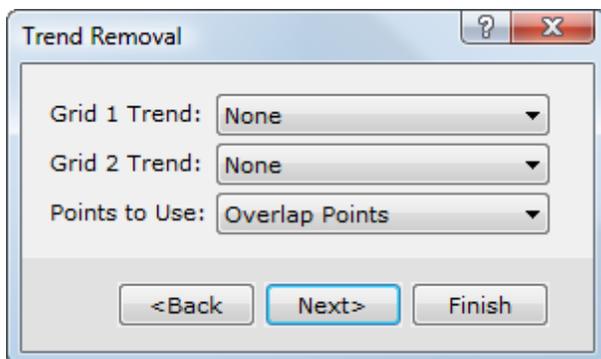
- On the *Grid and Image* menu, select *Grid knitting* and then select **Knit two grids together**.
The *Grid Stitching* dialog appears.



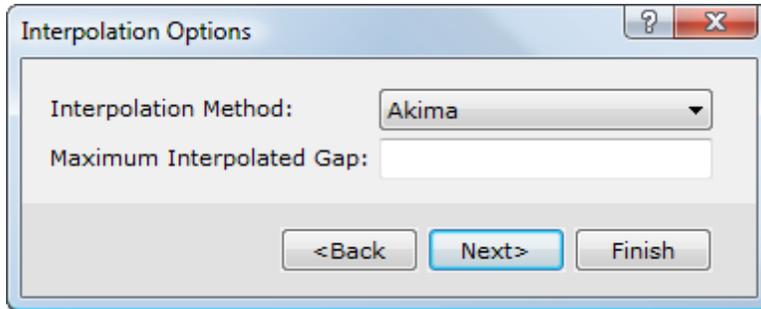
2. Using the  buttons, locate the *Input grid #1* and *Input Grid #2* grids from your project folder.
3. Specify a name for the *Output Grid*.

 *Note that, this will be a composite of the two input grids.*

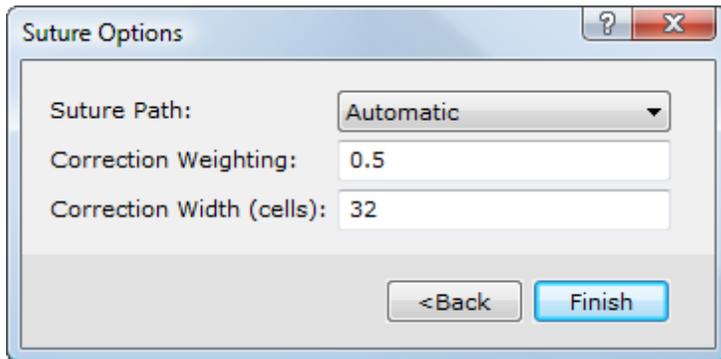
4. From the *Stitch Method* dropdown list, select **Suture** and from the *Detrending Method* dropdown list, select **To each other**. Leave the *Output Grid Cell Size* box blank; the cell size of the *Input Grid #1* will be used.
5. For *Mask output*, select the default option **No** for when the output grid is the combined grids. Select either *Grid 1* or *Grid 2* for when the output is only the specified grid's area. In the *Suture* method, this includes all points up to the suture path. In other words, the *No* method produces exactly the same as putting together the results of *Grid 1* and *Grid 2*.
6. The next step is to set the pre-processing options. Click the **Options** button and the *Trend Removal* dialog appears.



7. Select **Static** as the Trend Removal method for both *Grid Trend 1* and *Grid Trend 2*. Then, select **Overlap Points** as the *Points to use* for removing the trend.
8. Click the **Next** button.
The *Interpolation Options* dialog appears.



9. Select **Akima** spline as the interpolation method and input **0.0** as the *Maximum Interpolated Gap* distance.
10. Click the **Next** button. The *Suture Options* dialog appears.



11. From the *Suture Path* dropdown list, select **Automatic** as the suturing method. This setting will place a suture line equal distance from the edges of both grids.
12. In the *Correction Weighting* box, specify **0.5**. This value will weight the values from both grids equally during the grid stitching process.
13. In the *Correction width (cells)* box, specify **32**. For more information on the correction width, or any of the other GridKnit parameters, click the **Help** button on the appropriate dialog.
14. Click the **Finish** button. The *Grid Stitching* dialog will appear again.
15. Click the **Done** button to complete the grid stitching process. The system will create the new grid and automatically display it in a temporary map, using default display options.

Interactive Suturing Method

The Interactive grid stitching method is similar to the automatic grid stitching method except that the user defines the suture path. To define the suture line, the user must see where the existing grids overlap. For this reason, the process requires that you create a map that includes both grids prior to stitching. The interactive suturing process consists of three procedures:

- First, you must create a composite map that displays the two grids you want to stitch together. You will use this map to digitize the suture line.
- To make the edges of these grids more distinctive, you can add an outline of each grid to the map. This makes it easier to

identify the overlap region between the two grids.

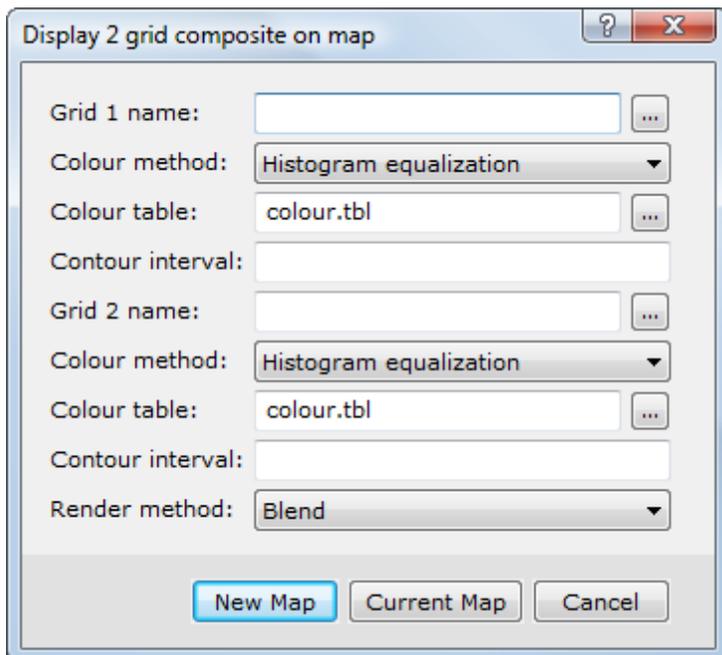
- The final step is to digitize a suture line and complete the suture process.

Creating a Composite Grid for Interactive Suturing

A composite grid consisting of a colour grid overlying a grey scale grid is used as a reference image for digitizing a suture line. Overlaying two grids with different colours enables you to see the overlapping area between the two grids. This way you can ensure that the suture line is within the overlap area.

To Create a Composite Grid for Interactive Suturing:

1. On the *Grid and Image* menu, select *Display* and then select **2-Grid Composite**.
The *Display 2 grid composite on map* dialog appears.



2. Using the  buttons, select the *Grid 1 name* and *Grid 2 name*.
3. For *Colour method* for both grids, select **Histogram equalization**.
4. Leave the *Contour internal* value blank.
5. In order to reproduce the overlapping area between the two areas, you need to specify different *Colour tables*. Select a colour table for Grid 1 and a grey scale colour table for Grid 2.
6. Click the **New Map** button. The map name defaults to the Grid 1 name. To avoid overwriting a map, click the **No** button on the *Map Exists* dialog and rename the map composite in the *New map name* dialog.
7. Click **OK** and the composite grid is created and displayed on the map.

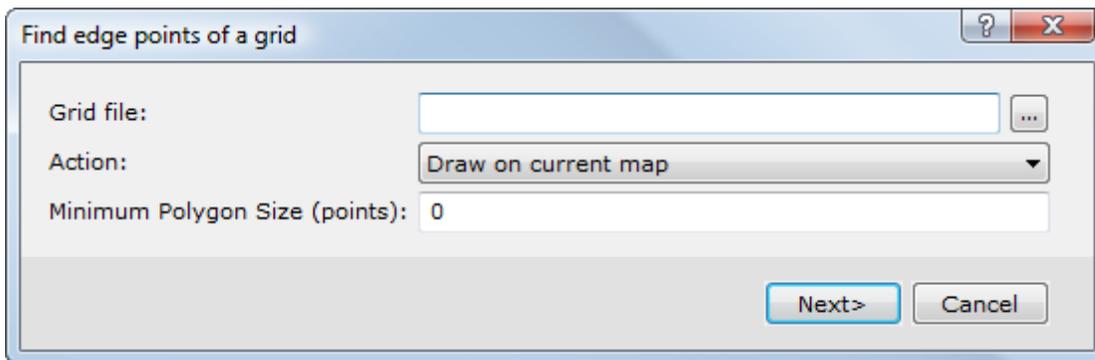
Outline Grid Edges

Adding an outline to each of the grids makes the edges more distinctive thus easier to identify the overlap region between the two grids.

 *Note that, only the outside edge of the first encountered non-dummy area of the grid is outlined. Holes and islands are not recognized.*

To Outline Grid Edges:

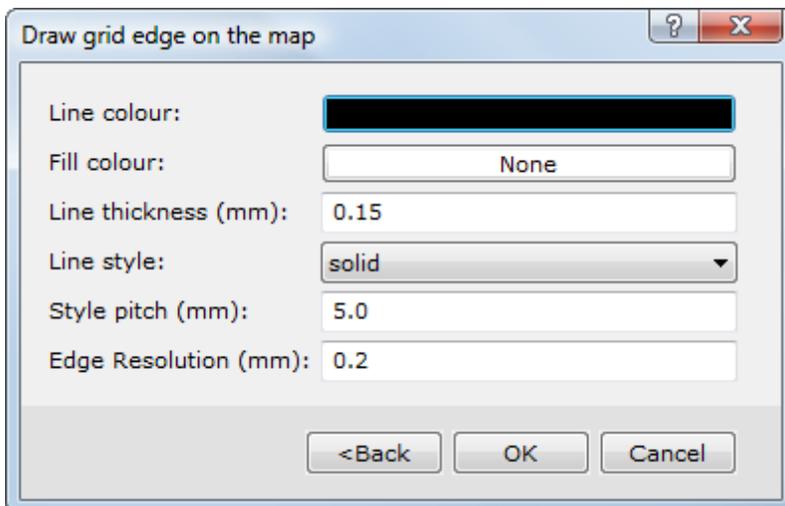
1. On the *Grid and Image* menu, select *Grid knitting* and then select **Grid Outline**. The *Find edge points of a grid* dialog appears.



2. Using the  button, locate the *Grid file* for the first grid you want to outline.
3. In the *Action* dropdown list, select **Draw on current map**. This option will draw a line around the grid (as a new group) on the currently displayed map. You can leave the *Minimum Polygon Size (points)* to the default.

 *The Minimum Polygon Size (points) option is used when saving the outline as a polygon file (*.ply). For more information, click the **Help** button.*

4. Click the **Next** button. The *Draw grid edge on the map* dialog appears.



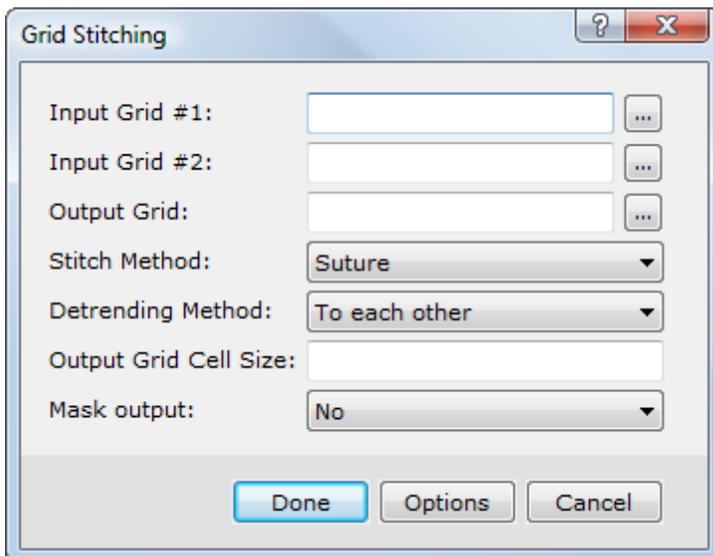
5. To specify line colour, click inside the *Line colour* box. The **Color** dialog appears. Select a colour and click the **OK** button to return to the *Draw grid edge on the map* dialog.
6. You can leave the *Fill colour* as the default (none).
7. Specify the *Line thickness (mm)* as **0.5**. Leave the remainder of the parameters to the default values. For more information on the parameters, click the **Help** button.
8. Click **OK**. A line with the colour you specified as the Line colour is drawn around the grid on composite map.
9. Repeat steps 1-8 using the other grid.

Performing Interactive Suturing

Before you perform this procedure, it is a good idea to use the Zoom tool () to enlarge the overlap area between the two grids. This will make it easier to digitize an accurate line on the map.

To Perform Interactive Suturing:

1. On the *Grid and Image* menu, select *Grid knitting* and then select **Knit two grids together**. The *Grid Stitching* dialog appears.



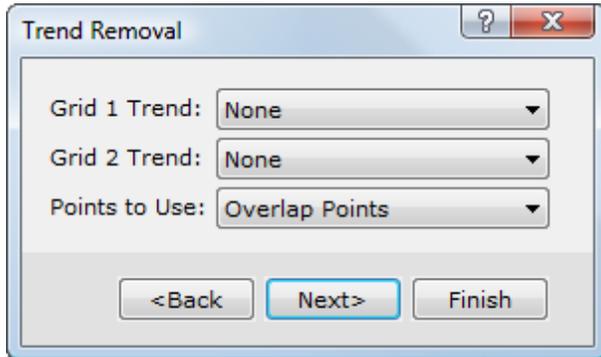
2. Using the  buttons, locate the *Input grid #1* and *Input Grid #2* grids from your project folder.
3. Specify a name for the *Output Grid*.

 *Note that, this will be a composite of the two input grids.*

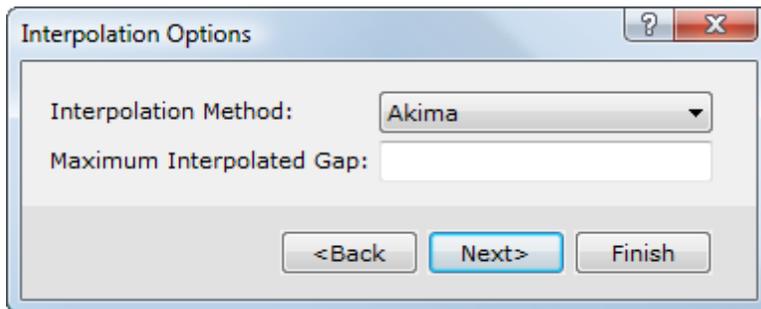
4. From the *Stitch Method* dropdown list, select **Suture** and from the *Detrending Method* dropdown list, select **To each other**. Leave the *Output Grid Cell Size* box blank; the cell size of the Input Grid #1 will be used.
5. For *Mask output*, select the default option **No** for when the output grid is the combined grids. Select either *Grid 1* or *Grid 2* for when the output is only the specified grid's area. In the Suture method, this includes all points up to the suture path. In other words, the *No* method produces exactly the same as putting together the results of *Grid 1* and

Grid 2.

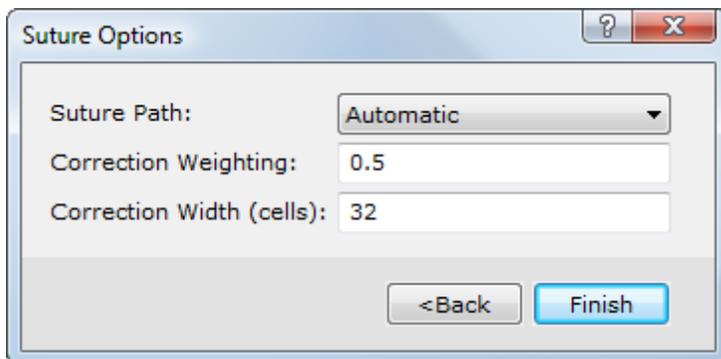
- Click the **Options** button. The *Trend Removal* dialog appears.



- Using the *Grid 1 Trend* and *Grid 2 Trend* dropdown lists, select **Static** as the trend removal method for both grids and select **Overlap Points** as the *Points to Use* for removing the trend.
- Click the **Next** button. The *Interpolation Options* dialog appears.

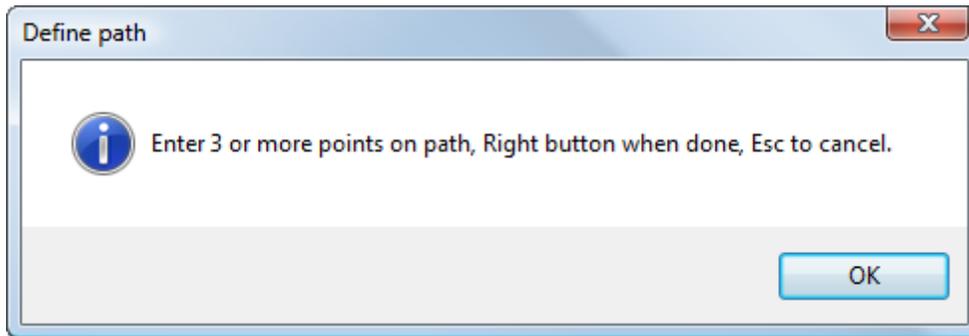


- Select **Akima** spline as the *Interpolation Method* and select **0.0** as the *Maximum Interpolated Gap* distance.
- Click the **Next** button. The *Suture Options* dialog appears.



- Using the *Suture Path* dropdown list, select **Interactive**. This selection will enable you to define your own suture line.
- In the *Correction weighting* box, specify **0.5**. This value will weight the values from both grids equally during the grid stitching process.
- In the *Correction width* box, leave the default value of **32**.

14. Click the **Finish** button. The *Grid Stitching* dialog again appears.
15. Click the **Done** button and the *Define path* dialog appears.



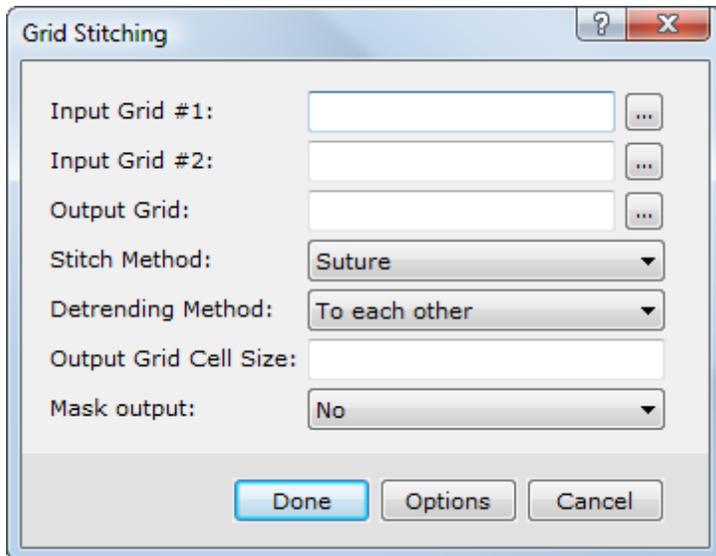
16. This dialog prompts you to digitize three or more points on a suture path. Click the **OK** button and your cursor will change to a crosshair () .
17. Define the suture path points by clicking the left mouse button along the overlap area. When you are finished digitizing the path, click the right mouse button and from the popup menu, select **Done**.
 *Note that, this popup menu also enables you to undo last point, pan, zoom and redraw the map while digitizing.*
18. The system performs the grid stitching operation and displays the new grid on a temporary map.

Postage Stamp Grid Stitching

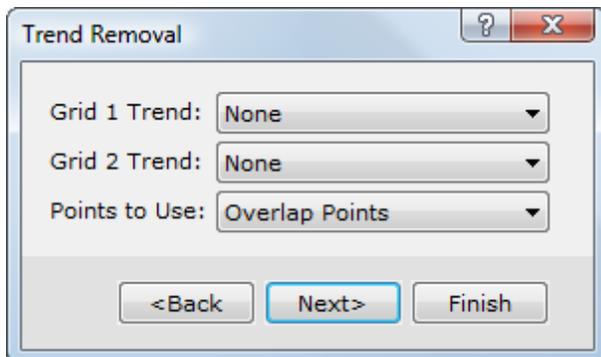
Postage stamp grid stitching is a method where the suture path is the edge of one of the grids being stitched together. This method is commonly used either to place a small grid entirely inside a large grid or to stitch two grids using the boundary of one grid as the suture path.

To Perform Postage Stamp Grid Stitching:

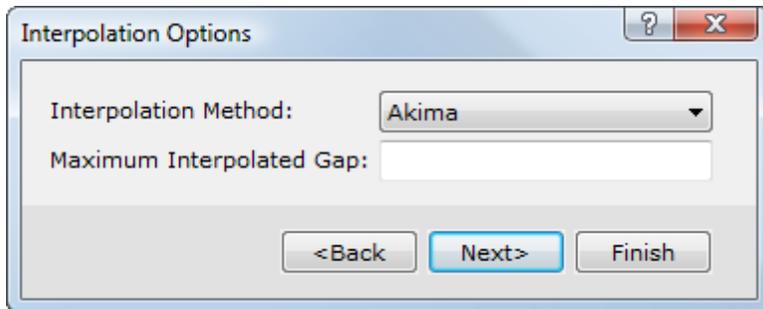
1. On the *Grid and Image* menu, select *Grid knitting* and then select **Knit two grids together**. The *Grid Stitching* dialog appears.



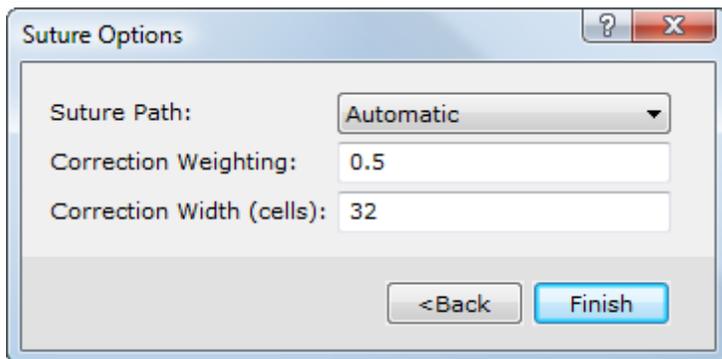
2. Using the  buttons, locate the *Input grid #1* and *Input Grid #2* grids from your project folder.
3. Specify a name for the *Output Grid*.
4. From the *Stitch Method* dropdown list, select **Suture** and from the *Detrending Method* dropdown list, select **To each other**. Leave the *Output Grid Cell Size* box blank; the cell size of the *Input Grid #1* will be used.
5. For *Mask output*, select the default option **No** for when the output grid is the combined grids.
6. Click the **Options** button. The *Trend Removal* dialog appears.



7. Using the *Grid 1 Trend* and *Grid 2 Trend* dropdown lists, select **Static** as the trend removal method and select **Overlap Points** as the *Points to Use* for removing the trend.
8. Click the **Next** button. The *Interpolation Options* dialog appears.



9. Select **Akima** spline as the *Interpolation Method* and select **0.0** as the *Maximum Interpolated Gap* distance.
10. Click the **Next** button. The *Suture Options* dialog appears.



11. From the *Suture Path* dropdown list, select **Grid 1 Edges** as the suturing method. Choosing this option will force the program to use the border of Grid 1 as the suture path.
12. In the *Correction weighting* box, specify **0.5**. This value will weight the values from both grids equally during the grid stitching process.
13. In the *Correction width* box, specify **32**.
14. Click the **Finish** button. The *Grid Stitching* dialog will again appear.
15. Click the **Done** button. The system performs the grid stitching operation and displays the new grid on a temporary map.

Stitching Multiple Grids

GridKnit enables users to stitch up to 10 grids together (or up to 20 using a script) in a single operation.

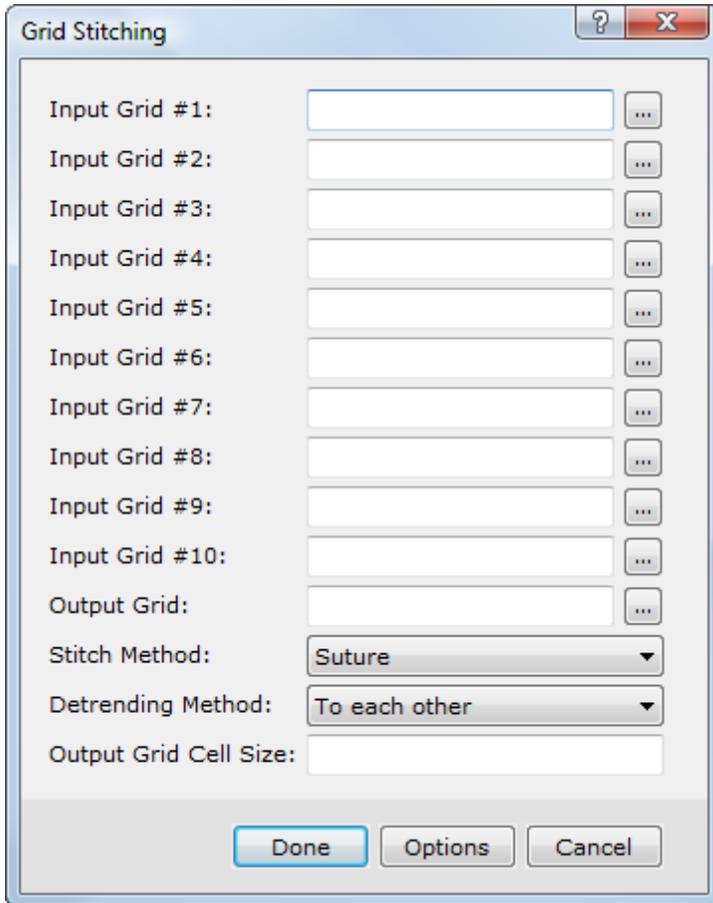
The first grid acts as the "master grid". Its projection and cell size determine the projection and cell size used in the output grid (except when a different cell size is specified). The remainder of the grids to be stitched must be selected in the dialog in the order they are to be added. Grids are stitched, one at a time, onto the growing final grid. Each successive grid must overlap the previously stitched grids. No "gaps" in specified grids are allowed; i.e. you cannot specify grid #1, grid #2 and grid #5, and leave #3 and #4 blank; only the first two would be stitched together.

Stitching Multiple Grids

The *Knit Multiple Grids Together* menu option enables you to stitch up to 10 grids together.

To Stitch Multiple Grids:

1. On the *Grid and Image* menu, select *Grid knitting* and then select, **Knit Multiple Grids Together**. The *Grid Stitching* dialog appears.



2. Using the  buttons, select the *Input Grids* you want to stitch together.
3. Specify the name of the *Output Grid*.
4. For *Stitch Method*, select **Suture**.
5. For *Detrending Method*, select **To each other**.
6. Click the **Done** button.
7. The system performs the multiple grids stitching operation and displays the new grid on a temporary map.

Using Scripts to Automate Grid Stitching

You can create scripts to further automate the grid stitching process. Scripts are automated batch files you can use to automate repetitive tasks such as performing multiple grid stitching operations without using the wizard interface. When using a script, up to 20 input grids can be specified.

To Record a Script and Automate Grid Stitching:

1. To begin recording a script, just turn on the script recorder by pressing the script record () button.
2. The system will prompt you to enter a filename for your script. This is the file you will run to use your script in the future.
3. Next, stitch two grids (using blending or suturing) as you normally would. The system will record all the commands you perform.
4. To stop recording, click the stop () button.
5. Edit the script file by opening the file in a text editor (such as Notepad). Edit the lines containing the GX commands you would like to repeat. To stitch multiple grids, copy the script text and paste it at the bottom, substituting the filenames.
6. Run the script by pressing the play () button.

For more information on using scripts, refer to the [Creating Scripts in Oasis montaj](#) Technical Note available online in PDF format.

A Quick Strategy for Checking Results

The following provides a brief overview of a simple procedure for checking your results.

To Check your Results:

1. Extract profiles from both grids before running GridKnit.
2. Display and evaluate overlapping portions of the grids.
3. Run **GridKnit**.
4. Extract a profile from the resulting grid.
5. Display the grid and evaluate the smoothness of the joint.
6. If required, change parameters and re-peat steps 1 to 5.

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