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The following changes have been made to the **DAT/EM SUMMIT EVOLUTION PRODUCT** between Release 6.5 and Release 6.6. Please review these revisions made to the software and update your software to implement changes.

As always, DAT/EM welcomes comments and suggestions from you, our clients, so please don't hesitate to contact our support department at support@datem.com, or by calling in or faxing us with your requests.

Operating Systems

Release 6.6 is supported on Windows XP Professional and Windows 7 Ultimate or Professional operating systems. Testing no longer occurs for Windows 2000 or VISTA Ultimate. If you have a question, please contact Support.

CAD Versions

Release 6.6 has interfaces to the following 32-bit and 64-bit CAD versions:

- **AutoCAD:** Autodesk 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, and 2013 products. This is the first version to support AutoCAD 2013. DAT/EM software will install for multiple AutoCAD products of different year numbers on the same computer; however, it will not install for multiple same-year versions together. For example, it will not install for both 2012 and Map3D 2012.
BE ADVISED: Version 6.6 no longer supports AutoCAD 2000-2002 versions. If you use these old AutoCAD versions, please upgrade to AutoCAD 2004 or higher. AutoCAD version 2007 or higher is needed in order to use the new MAPEDITOR.
- **ArcGIS:** ArcMap 9.1, 9.2, 9.3 (service pack 1), 9.3.1(service pack 2) and 10.0 (service pack 4)
- **MicroStation:** MicroStation V8 and V8 2004 Edition, XM, V8i Select Series 1 and 2, and Bentley Map Select Series 1 and 2 are approved. Select Series 2 is recommended over Series 1.
 - **Note for Select Series 1-to-2 upgrades:** If you upgrade to MicroStation or Bentley Map from Select Series 1 to Select Series 2, you must reinstall any DAT/EM software after installing Select Series 2.
 - **DO NOT USE SELECT SERIES 3:** DAT/EM software does not install for Series 3..

Hardware Locks/Dongles



Please install Microsoft Updates and Service Packs for your operating system before applying lock reset programs. Network licensing should have the same Sentinel driver version on both the server and the local computers running the software.

Summit Evolution

The following changes have been made to Summit Evolution and the applications that are provided with it.

- There is a new **Groups** tab on the Project window for all stereo project types. Groups are subsets of the models in a project. They allow you to define groups of models so that the **Tools>Options>Project>Automatically load next model...** function will only open models from the same Group.
 - Groups are especially useful when the project contains multiple image sets from different times/sources, and you want a view each set in a different viewport. For example, you have imagery from every two years; create Groups for 2008, 2010, and 2012 so that each of three viewports can only open models from its assigned Group year.
 - Groups can only be used for stereo imagery in the same Summit project file. That is, all the images are from the same major image type (such as all aerial), and all have the same input coordinate systems.
 - Alternative: If your image sets must be in different .smtxml projects or can't contain model definitions, please use multiple Summit instances as described in 0 below. Examples of image sets that can't use Groups include: A combination of aerial and RPC satellite imagery (these require separate projects), any image sets that have different input coordinate systems (these require separate projects), and Orthophoto Collection projects (these are not stereo, so they can't define models).

To make groups, start with a Summit project that has models defined. Select the **Groups** tab on the Project window.

Select the  button, enter a name for the group, and select models to add to the group. Either highlight multiple models and press the  button or double click a single model to move it to the opposite list.

If all the model names to be selected have a similar string in their name, such as "6_4" in this example, enter the characters in **Regular Expression** and press the **Select** button to help highlight the models.

Select **OK** to finish the group. Repeat to build each group.

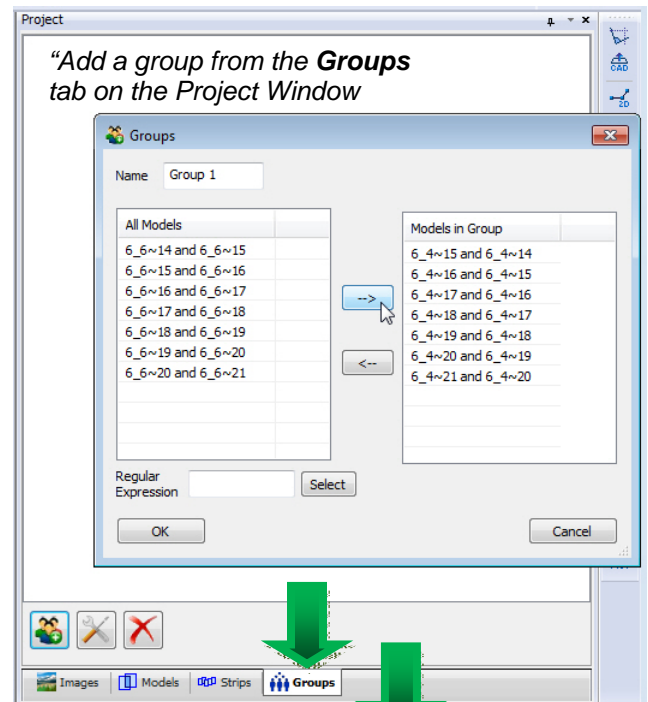
A model can belong to more than one group.

Use  to edit and  to delete a highlighted group.

To use Groups, open multiple viewports (**View > Viewports**). From the **Groups** tab, drag a group name or a model from within the group into a viewport. The viewport will show the model and group name in the viewport title. When this viewport has focus, it will only automatically load the next model if the next model is in its group.

A group may be open in more than one viewport.

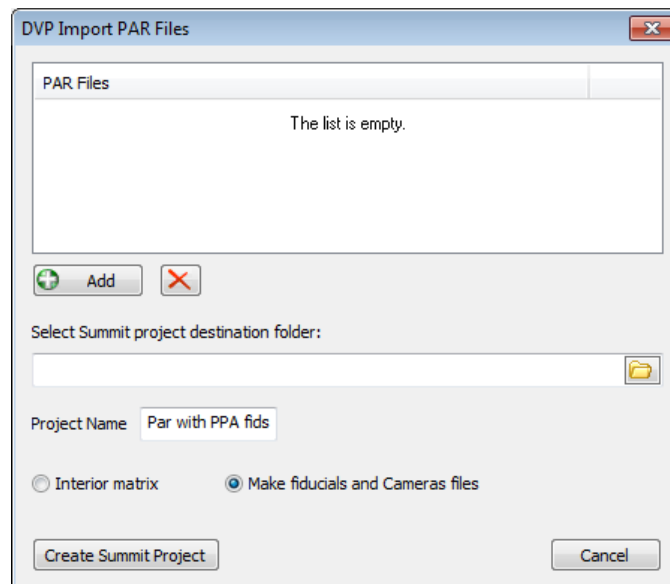
As always, non-group models may be opened at any time in any viewport by opening the model from the **Models** or **Images** tabs. Opening a model from the **Models** or **Images** tab cancels any group that might have been active in the viewport.



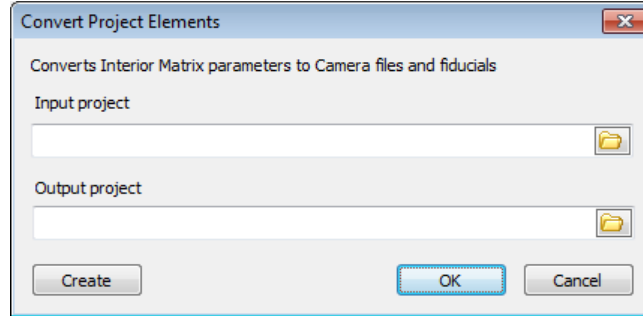
2. Multiple instances of Summit have changes and may be used as follows:
 - a. Any number of Summit instances can now automatically share the 3D input device. (Previously, only two instances could share it.)
 - b. The Summit instance that has current Windows focus automatically gains control of the 3D input device.
 - c. If a non-Summit application has current Windows focus, the Summit instance that most recently had focus retains control of the 3D input device.
 - d. The SUMMIT that controls the 3D input device can control the cursor in all the other Summit instances, as long as the projects have the same output coordinate system. For example, open an aerial project in one instance, and open an RPC satellite project of the same geographic area and the same output coordinate system in another instance; one instance can control the cursor position in the other instance. The instance that has control of the cursor will move the most smoothly.
 - e. Alternative: If there is only one .smtxml project file, it is better to use Groups in one Summit instance instead of opening the same project in multiple instances (see Groups in item 1 above).
3. Some imported project types, such as DVP and Socet Set SUP, import interior matrices and do not create camera files or fiducials. A .smtxml project that does not have a camera file cannot be imported by Trimble Inpho products. For this reason, two methods have been added to create virtual camera files and fiducials that result in the same orientation as the interior matrices. Please note:
 - The calculated fiducials will not match up visually with the actual fiducial marks on the image (if there are any), just as the virtual camera file is not the same as a camera file created with the actual camera calibration report. These are calculated fiducials and calculated camera files that produce the same orientation as the previously imported interior matrices.
 - DVP digital camera projects will most likely make only one camera file to be used by all the images, but other projects will most likely make a different camera file for each image.
 - The virtual camera file name(s) will match the image file name(s) unless only one camera file needs to be made.
 - Notes inside the new camera file(s) will say, "Virtual camera file."

The two new methods are as follows:

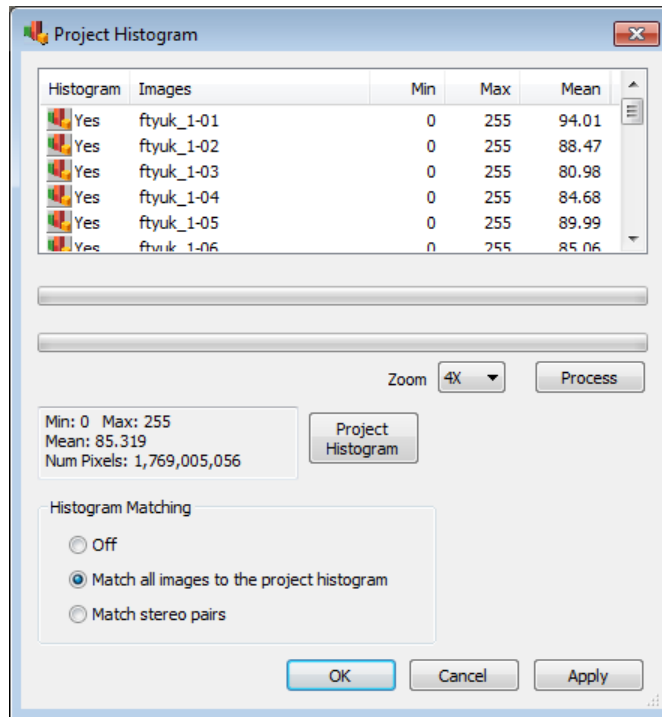
- a) When importing a DVP PAR files project, there is a new choice to create an interior matrix or fiducials and virtual camera files. The **Interior matrix** choice is the original functionality that imports an interior matrix, but does not create a camera file. **Make fiducials and camera files** is the new setting:



- b) For any existing project that has interior matrices without a camera file, select the new menu option, **File > Convert interior matrix**. Supply the input .smtxml project file and a new output project name. A new project with fiducials and one or more virtual camera files will be made.




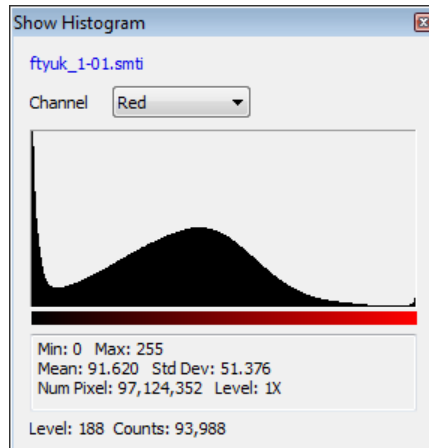
4. SUMMIT>**Imagery>Project Histogram** is a new option to generate histogram files for each image and apply histogram matching to the images in the SUMMIT view.



The first part of the dialog lets you generate histogram files. These are binary files that contain the images statistics. The file extension is ***.histohfa**. These files will be placed in the same folder as the image files. Note that they are a binary format, so you cannot view them with a text editor. Next to the **Process** button is a **Zoom** level selection. For most purposes this should be left at **1X**. You can generate them at higher levels, but this would mostly be for speed. Images that take 2 minutes to process at 1X might take less than two seconds at 8X. Once the histogram file is created, there is no need to process them again unless you want to use a different zoom level. For example, if you generate them at 8X and then switch to 2X and hit **Process**, it will generate new histograms; however, if you select 16x it will not generate new files, because the current files are already at a higher level. Please note that higher levels are better and there is usually no reason to decrease accuracy.

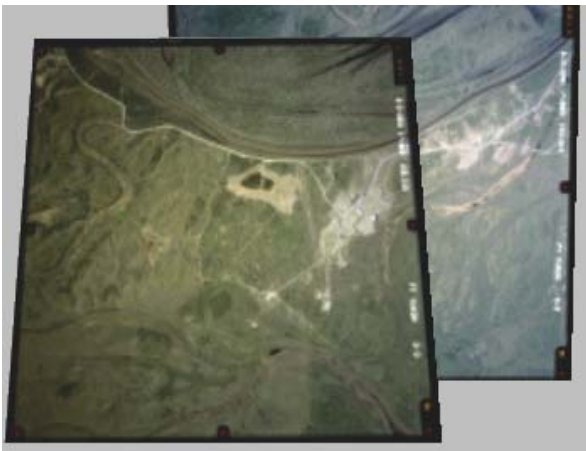
Note that 1X-level **.histohfa** files may also be generated by Image Creator. See item 16.b. on page 12.

After generation there will be a button, , for viewing the histograms for each image. For example:

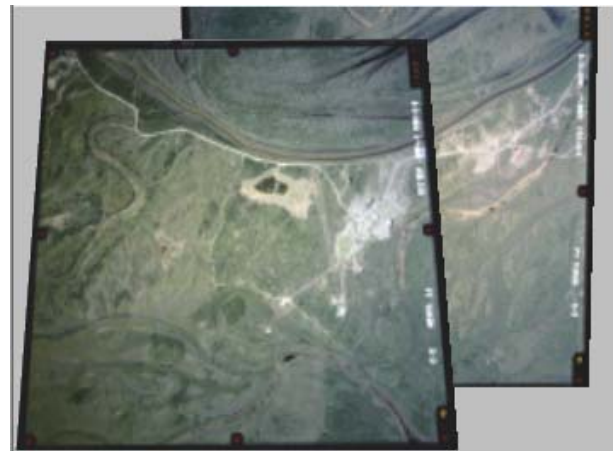


The next half of the dialog deals with Histogram Matching: **Off**, **Match all images to the project histogram**, and **Match stereo pairs**. These are project settings. The histogram files are required to use these settings. If the files are not there, nothing will happen. With a model open and using the **Apply** button, the effects for the matching can be viewed. Note that if all the images are similar it will be hard to notice the effects. This histogram adjustment happens before any other adjustment. The following is an example of this setting:

Off.



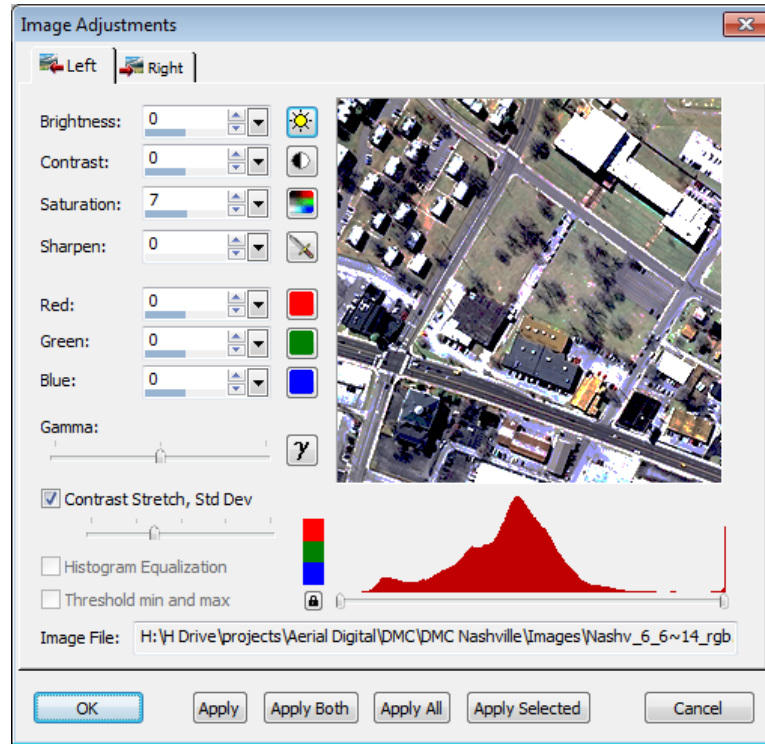
Match all images to project histogram:



Match stereo pairs (this is the average histogram of the two images):

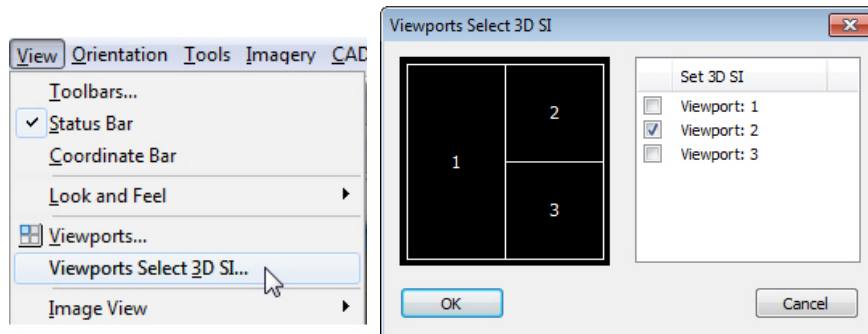


5. **Contrast Stretch** is a new adjustment option on the **Imagery>Image Adjustment** dialog. **Contrast Stretch** is a linear histogram equalization using the standard deviation locations as the new minimum and maximum. The slider bar is the number of standard deviations (StdDevs) from the mean. The range is from 1 to 3 with a default of 2 StdDevs. The larger the StdDev, the less effect of the stretch. The histogram is stretched from the number of StdDevs to the edges of the histogram. The images that would benefit the most have a histogram distribution bunched around the mean. The new distribution would be across the whole histogram.

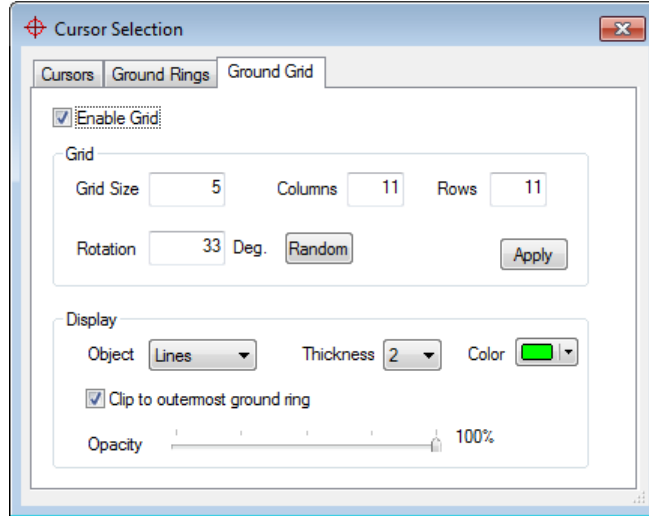


*New **Contrast Stretch** setting*

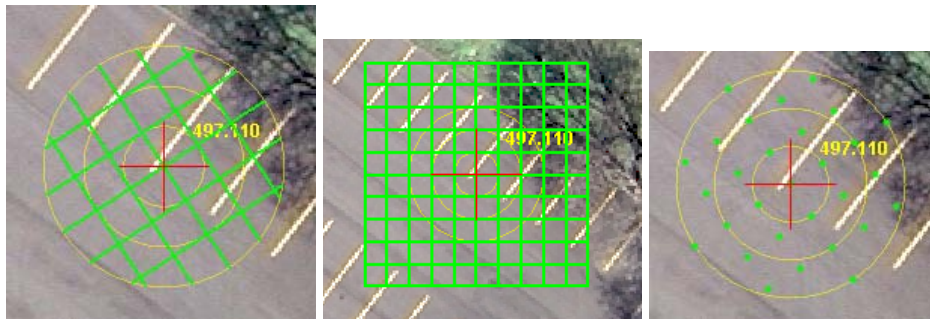
6. **View > Viewports Select 3D SI** is a new menu item that allows everyone – including system mouse-only users – to toggle the 3D SI-only view in any viewport. The 3D SI-only view was a new option for multiple viewports in version 6.5, but could not be set by system-mouse-only users, because it could only be accessed from the right click menu in the viewport. The right click menu does not appear if using a system mouse as a SUMMIT digitizer.



7. Summit's Cursor Selection dialog has a new **Ground Grid** tab to set a grid of lines or points around the cursor center. This grid can be clipped to the ground rings (set on the adjacent **Ground Rings** tab) area or not, and has other settings such as angle, color, ground size, and opacity.

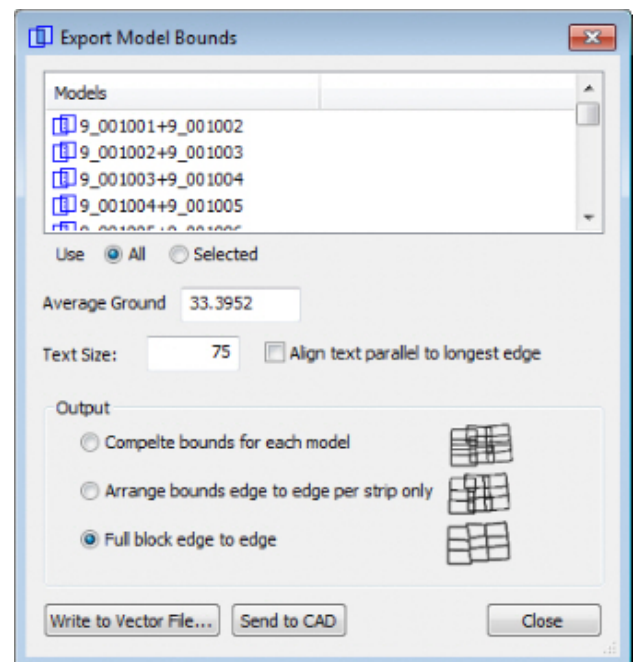


The new **Ground Grid** settings



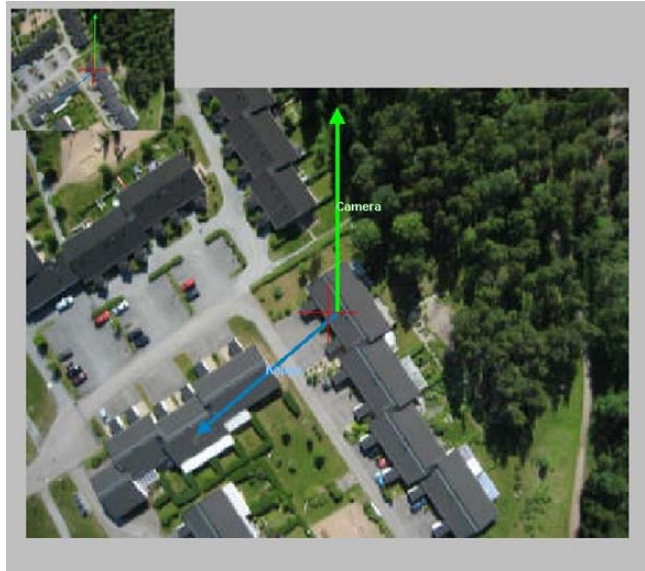
Examples of different **Ground Grid** settings results

8. SUMMIT's **File > Export > Export Model Bounds** has three new **Output** options:
- **Complete bounds for each model:** Draws a polygon around each models' entire stereo area, no matter how much it overlaps any other models.
 - **Arrange bounds edge to edge per strip only:** Draws model boundaries that do not overlap the stereo area of the adjoining images in the same strip, but may overlap stereo model areas from other strips.
 - **Full block edge to edge:** Draws completely non-overlapping polygons around stereo areas. In areas of multiple-model stereo overlaps, it splits the multiple overlap area among the overlapping models.



9. Summit's superimposition has the following updates:

- a. AutoCAD polyline closing "segments" that have an arc bulge factor now display correctly as arcs in superimposition .
- b. **Orientation > Show Camera/Kappa Direction** is new. It toggles camera direction and kappa angle arrows for one or two open images. The setting is off by default and is not a saved setting, so that it is off every time Summit starts. The arrows appear at the origin of each open image's center. For best viewing, zoom out so that one or both image centers are in the Main View.



Camera direction and kappa angle display for a single open image

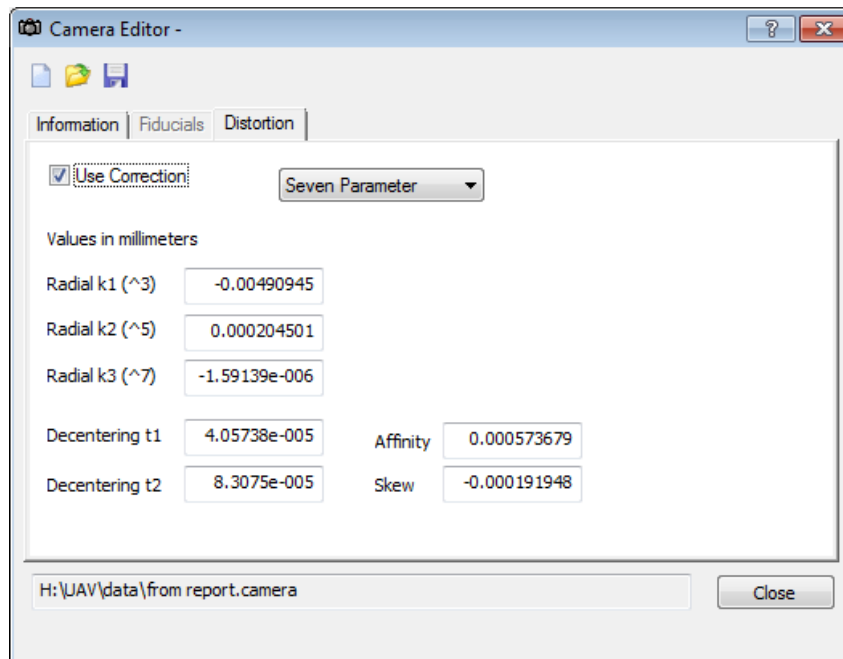


*Camera direction and kappa angle display for two end-overlapped images from different strips.
The camera angles are opposite each other, since the airplane was flying different directions for each image.
The origin for each arrow set is at the image center. Zoom out if this is not currently visible.*

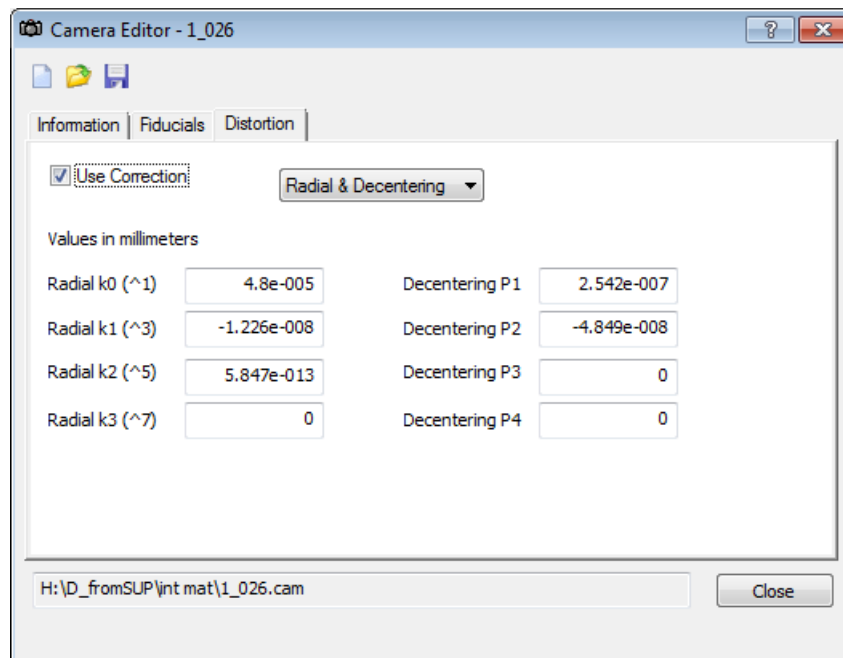
10. The Camera Editor (**Edit > Camera File**) has two new **Distortion** settings:

Important! The two new camera distortion methods are not backwards compatible with previous versions of DAT/EM software. If either of these distortions are present in the camera file, the project must be used with DAT/EM software version 6.6 or higher. Older versions will fail if they encounter the new distortions. Camera files that do not use either of the new distortions will be backwards compatible.

- a. **Distortion > Seven Parameter:** This has been added for UAV (Unmanned Aerial Vehicle) projects.

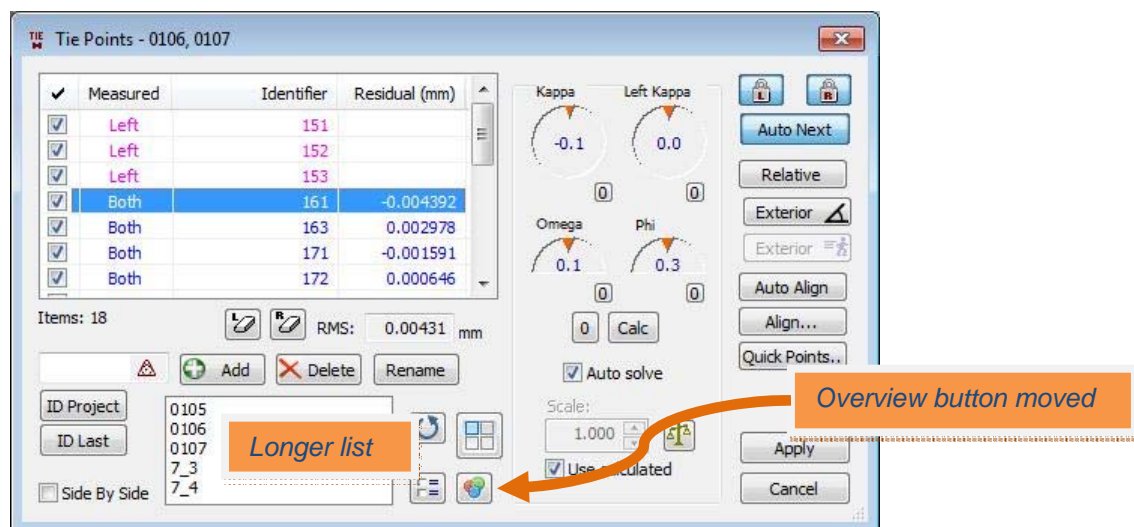


- b. **Distortion > Radial & [and] Decentering:** This is an eight-parameter version that is mostly used when importing SUP file distortions.

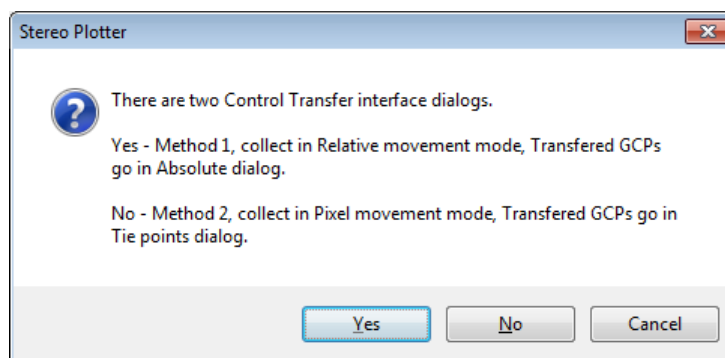


11. Aerial projects have the following orientation and orientation-related changes:

- Scanned images from a single frame film camera at different scan scales are now supported. Previously, frame aerial images that were scanned at different micron levels did not produce good stereo. Summit's epipolar adjustment now corrects properly for scan scale.
- In previous versions, if an UltraCam camera's project had no EO (exterior orientation) values, **Tools>Reports** placed "Focal Length = 0" in the report file. Now the focal length is reported correctly.
- The **Tie Points Relative Orientation** dialog has two changes: The **Overview** button has moved to prevent accidental activation; the list of models where a point is found has expanded to show more models before the gaining a scroll bar.



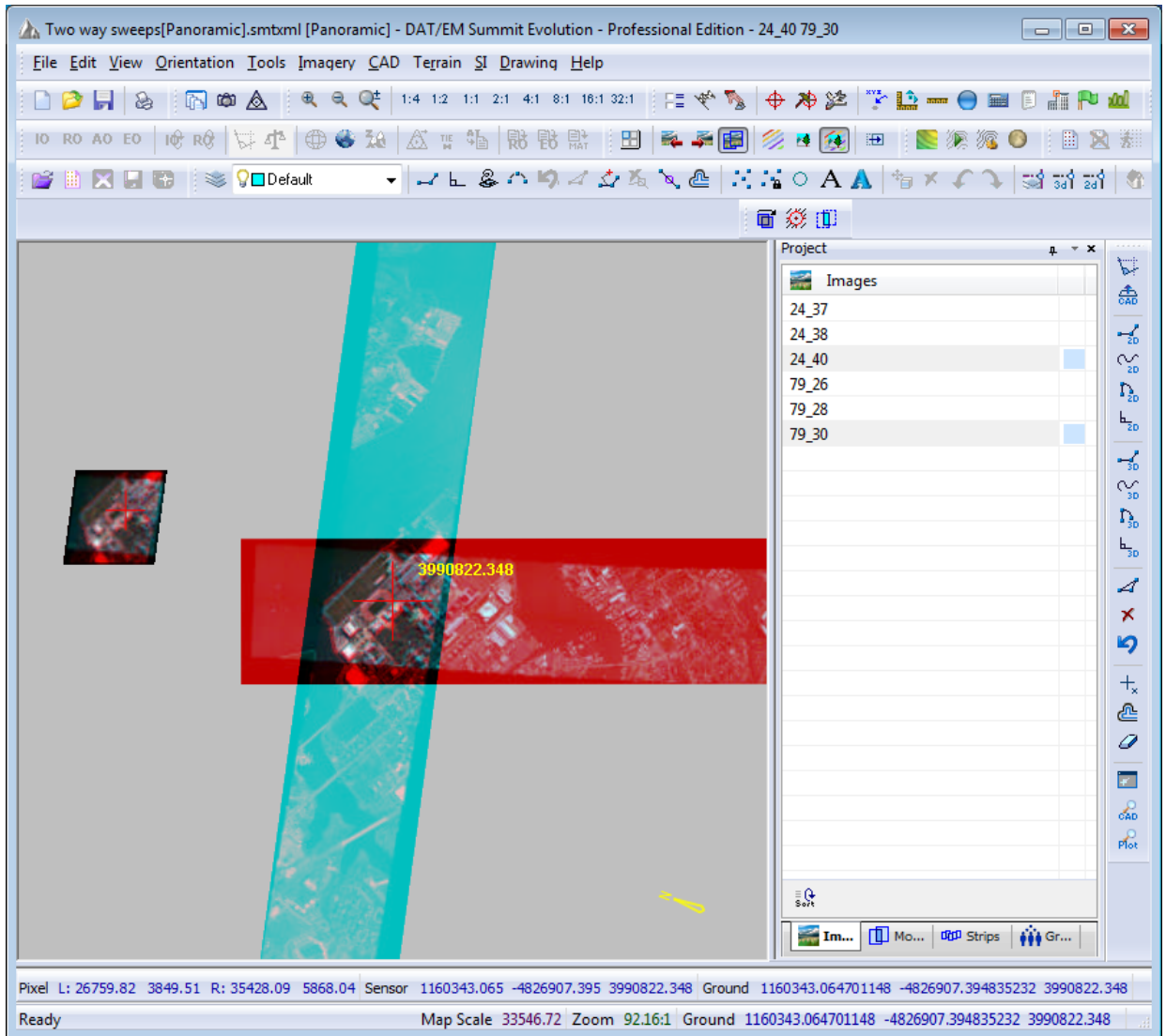
- Control Transfer for aerial projects has two methods now. Control Transfer changed in version 6.5 to allow more project types and to make it work for single images. The new method does not require a relative orientation and does not move in relative mode. However, some users missed the aerial project method that was available in version 6.4 and lower, because they liked the relative movement mode and seeing the points in the Absolute Orientation dialog. Both methods are available now in 6.6. When **Orientation>Control Transfer** is started in an aerial project with relative orientation, a question appears:



- Yes-Method 1** is the method from version 6.4 and lower that shows the points in the Absolute Orientation dialog. This method requires a relative orientation and it moves in relative mode.
- No-Method 2** is the new method that shows the control points in the Tie Points dialog. A relative orientation is not required. It moves in pixel mode.
- This is completely the user's choice. The method makes no difference to the resulting orientation.

12. VisionMap A3 projects have the following changes:

- a. When a VisionMap A3 projects was open, the north arrow display pointed to the negative of the actual north angle. For example, if north was 15°, it would point to -15°. This was a display issue only and had no effect on the A3 project.
- b. If two A3 images that are not from the same model are opened, Summit will perform an automatic kappa rotation for each image separately in the view. This makes it possible to view two images that “don’t go together” for possible stereo viewing. If the images overlap the same ground area, there may or may not be good stereo in some parts of the overlap. Summit cannot epipolarize A3 imagery, which means that any scaling and skew differences are not corrected. This new kappa rotation may be of some limited use in some projects. It is always best to open two adjoining flight line images for a “real model”.



VisionMap A3 images that “don’t go together” displayed at their kappas for possible stereo viewing

13. Orthophoto Collection projects (Summit projects made of orthophoto images, *not* for orthophoto creation) have the following changes:

- a. Coordinate transformation is now available. Note that this makes orthophotos more useful for use with multiple SUMMIT instances that need to control each other's cursor position, since all such projects need to have the same output coordinate system (see item 2 on page 3 above).
- b. The Project Edit dialog now allows you to select multiple orthophoto image files to add to the project. Previously, only one image could be selected at a time.

14. Satellite RPC projects can now use Astrium© Pléiades satellite imagery. Order the Pléiades Level 1A stereo or tristereo imagery in either TIF or JPEG2000 format. JPEG2000 may be preferable due to Windows 7 large TIF problems. Create the project with Summit's RPC satellite project type.

Note that Pléiades imagery is offered in either TIF or JPG2000. Use the Image Creator for either format:

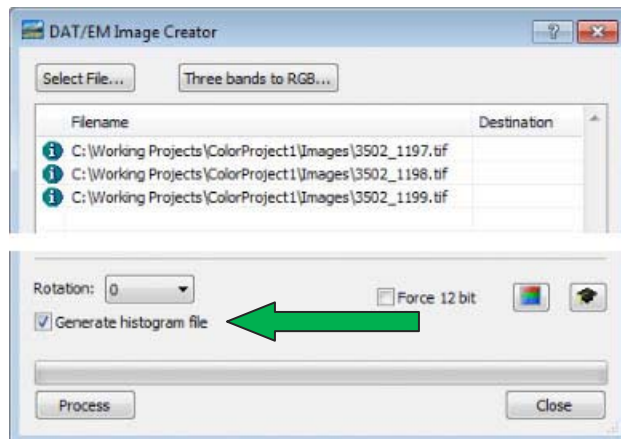
- Pléiades TIF is not tiled and does not contain image pyramids, so it must be processed with DAT/EM Image Creator with a recommended setting of **New TIF and PYR**. "New TIF" tiles the 1X image and "PYR" makes the zoom level pyramids. Microsoft Windows 7 has known problems dealing with large TIF files; be sure your original TIFs are not located in the same folder as the "New TIF" destination. Use a different destination folder in Image Creator. If the folder is the same, Windows will fail to rename the new file "_new" to differentiate it from the old file, and the original file may disappear. Windows 7 can also lock up when copying or moving Pleiades TIF files; this is not DAT/EM's problem, but rather Microsoft's.
- Pléiades JPG2000 may be opened as-is, but be aware that JPG2000 is slower to load and tile than TIF. DAT/EM strongly recommends processing JPG2000 with the Image Creator set to **New TIF and PYR**.

Note that once a Pléiades RPC project is made, it must be used with DAT/EM version 6.6 or higher; it is not backwards compatible due to Pléiades' new RPC file format and new JPG2000 format.

15. Contour Creator has no changes. Please note that Contour Creator can trigger a MicroStation crash when writing contours directly into MicroStation V8i Select Series 2. This problem is in DAT/EM Capture for MicroStation, not Contour Creator. The problem was identified too late to be completely fixed for version 6.6. If you experience this problem, please contact DAT/EM Support and ask to be notified when an update is available.

16. Image Creator has the following changes:

- a. It can now process the new JPEG2000 image format changes as seen in Astrium Pléiades satellite imagery. This file format compatibility applies to Image Creator, Summit Evolution, and any other DAT/EM product that reads images.
- b. **Generate histogram file** is a new setting to create 1X-level histogram **.histohfa** files. These may be used in Summit's new **Imagery>Project Histogram** tool shown above in item 4 on page 4.

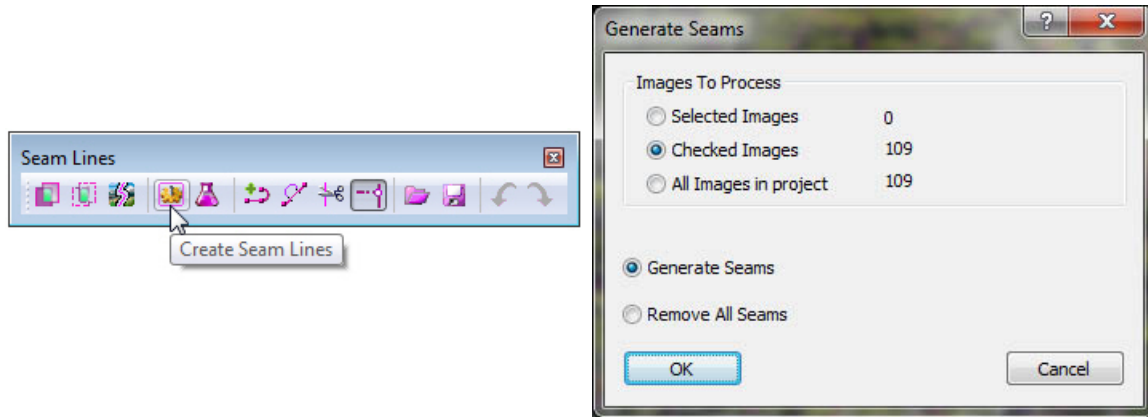


*Image Creator's new **Generate Histogram File** setting*

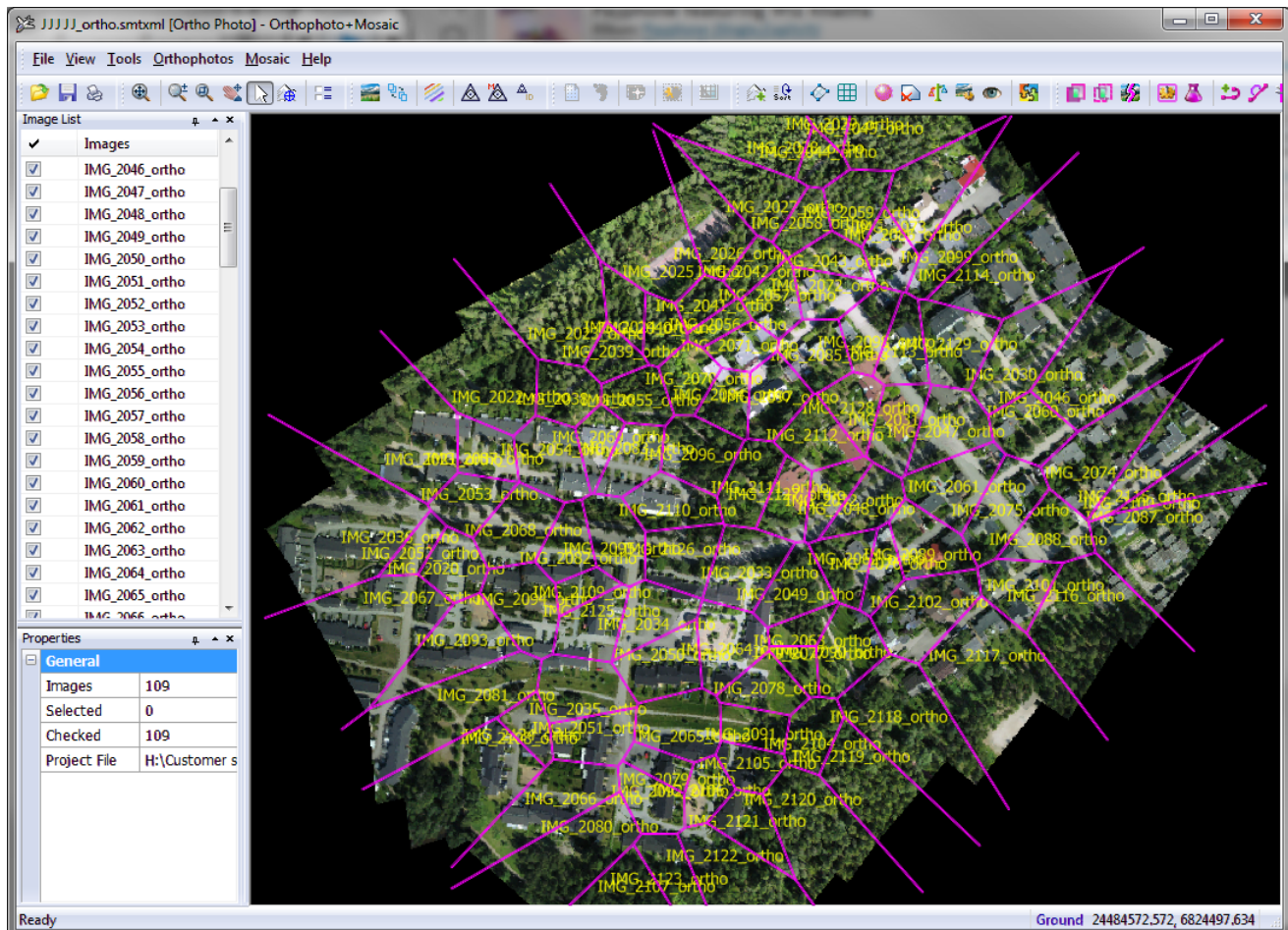
17. Project Viewer / Ortho+Mosaic has the following changes:

- a. Both the straight seam line and optimized seam line generators have been rewritten. They now create joined seams, no matter how many image overlaps and kappa angles are present.

The Generate Seams dialog is simplified to only ask to generate or remove seams:

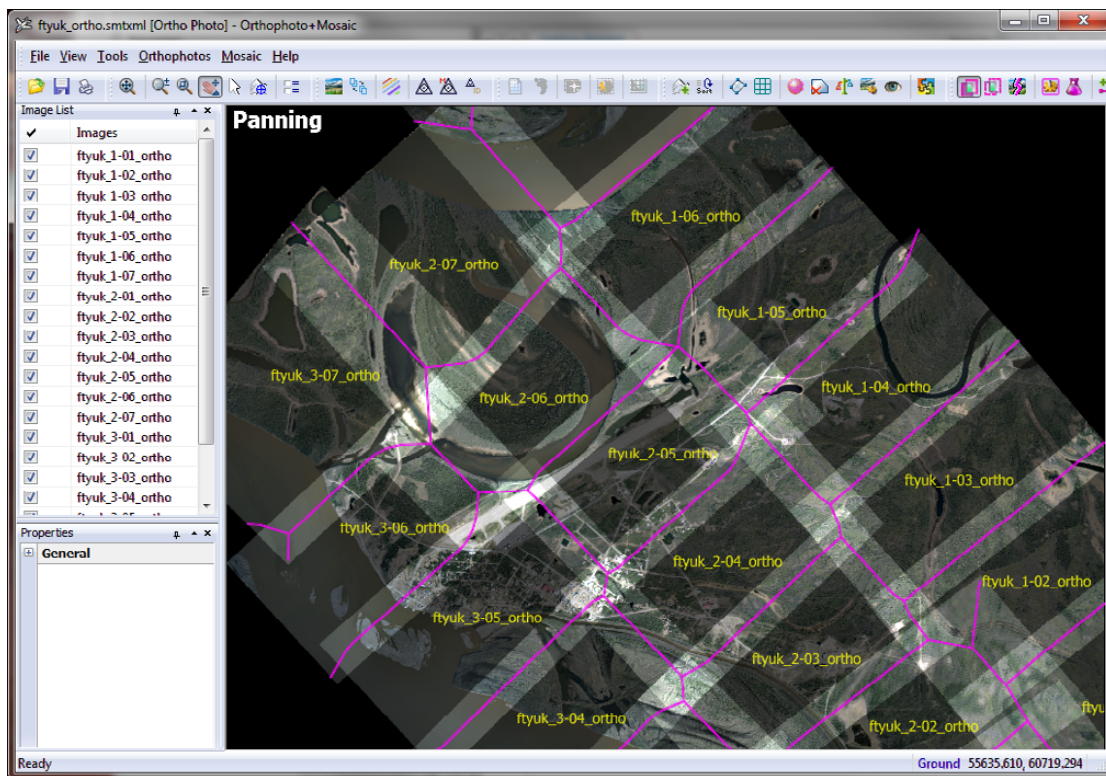


New version of dialog for straight line seams



This example shows the seams generated for 109 greatly overlapping images with many different flight line angles

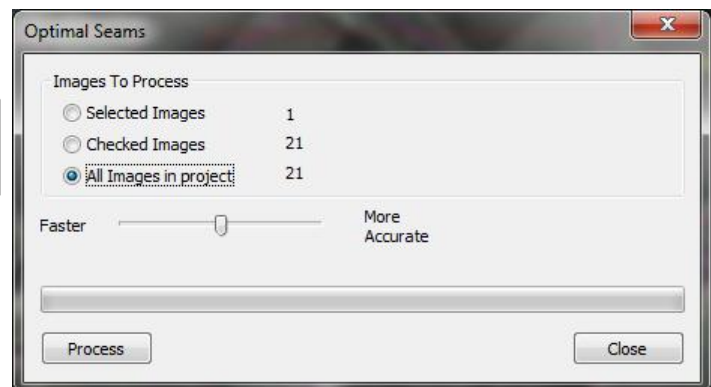
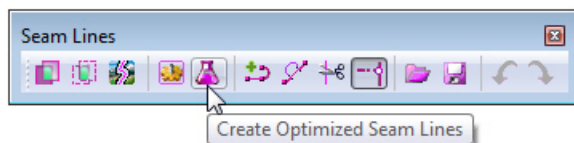
Project Viewer / Ortho+Mosaic changes, Continued.



This example shows the seams generated for a set of traditional left-right/right-left flight lines. It is no longer necessary to edit separate seam lines to meet at the higher-overlap-level corners; this is done automatically. Edit manually only if you would like the seams to follow a different path.

The Optimized Seam Line generator additionally processes the seams to find the best path through areas of most similarity. For example, forests, water, and buildings tend to be dissimilar between orthophotos, so the paths tend to avoid these. Roads tend to be similar, so the paths tend to follow them.

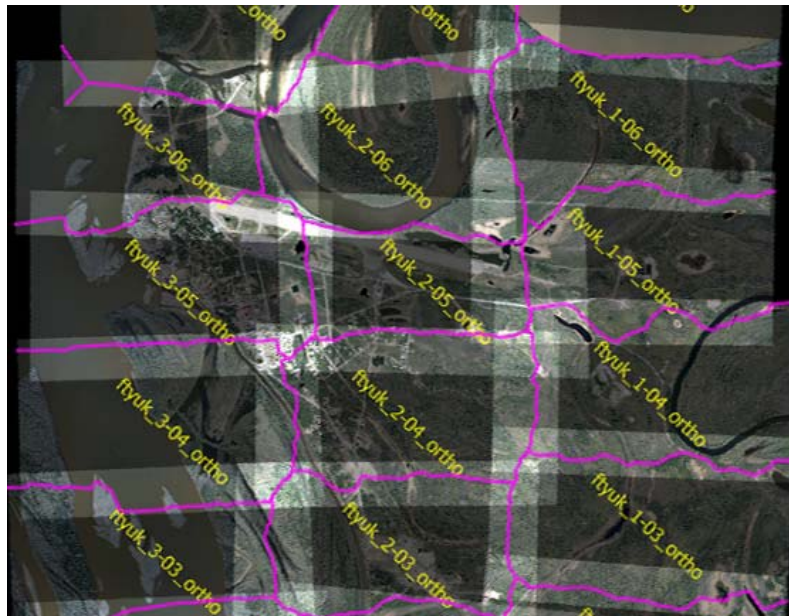
The Optimal Seam Line dialog has a slider with three states. The leftmost setting will generate the fastest, but will have result in less defined paths. The rightmost setting will generate the slowest, but will result in better defined paths. The middle setting is often the best choice and is always the default. The generator is multithreaded and will use up to 5 background threads, depending on the computer. This processes much faster than the older version.



New version of the dialog for optimized seams

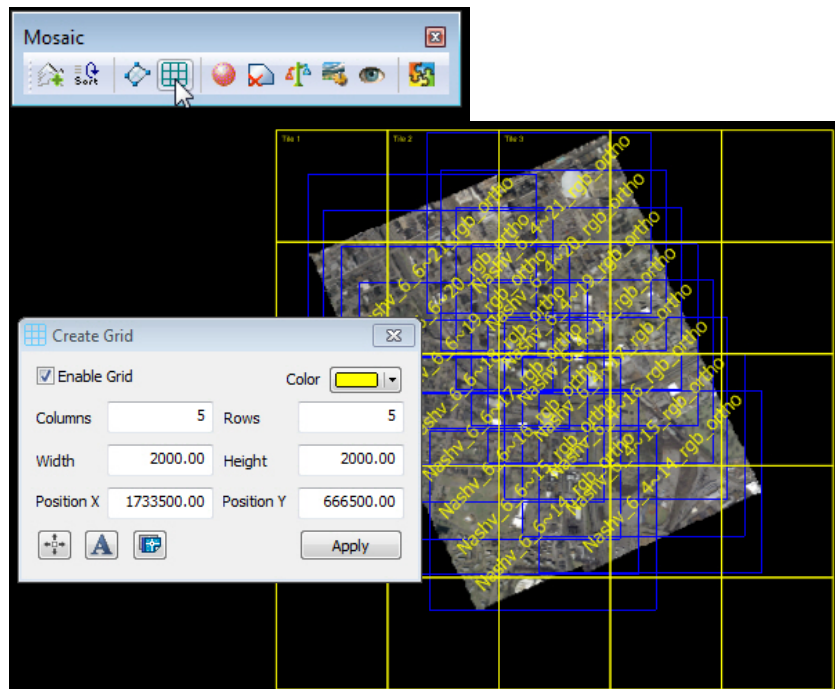
Project Viewer / Ortho+Mosaic changes, Continued.

The only points that are not optimized or moved are the join locations where multiple seam lines meet. The join point may not be on an optimal path, but it is the best join location in the overlap area. If desired, view each join and manually edit only if necessary.






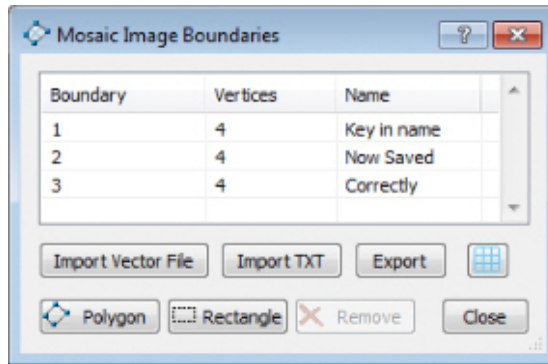
Example of optimized seam lines generated at the default (middle slider bar) setting

- b. Defined mosaic boundaries that are not positioned over any input orthophoto will be written out as 100% background pixel color. Previously, the image would not be created if it didn't have any image pixel colors in it. Now DAT/EM assumes that if the user creates a mosaic boundary, then the image should always be created. It is up to the user to use or discard all-background-color images if they are not wanted.
- c. Boundary Grid is a new interactive method to create a grid of named mosaic boundaries:
 - Select the **Grid Boundaries** icon on the **Mosaic** toolbar and make settings:



Project Viewer / Ortho+Mosaic changes, Continued.

- Either key in exact coordinates or move the grid interactively on screen using the  button.
 - Use the  button to label each grid location. Mosaic files will be named according to these labels.
 - Use the  button to export the grid boundaries to a CAD/GIS file.
 - The new boundary grid will not have a 1-pixel overlap. It is made to use with the *overlapped* boundary processing method, which will always be used automatically.
 - A boundary grid may be combined with any other boundaries, if necessary.
 - If a boundary grid is in use with other boundaries, *all* boundaries are treated as *overlapped* regardless of the **Inclusive/Overlapped** setting that is made on the **Main** tab of the Create Mosaic dialog.
 - If a boundary grid is not active, then any other boundaries may use either **Inclusive** or **Overlapped** on the **Main** tab of the Create Mosaic dialog. (Note that these settings were added in version 6.5. Use the context-sensitive “?” dialog help for information on these settings.)
- d. Mosaic boundary names keyed in to the Mosaic Image Boundaries dialog were not being saved. The names would be blank the next time the dialog was viewed, and the names would not be used to name the output files. This has been fixed.



“Name” column contents now saved correctly