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The following changes have been made to DAT/EM products between Release 7.3 and Release 7.4. 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 call us with your requests.

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Operating Systems and Microsoft Updates

As of version 7.4, DAT/EM no longer supports or tests on 32-bit operating systems. If you attempt to install the software on a 32-bit operating system (OS), some parts may work, but DAT/EM will not guarantee that everything will work. DAT/EM will not fix any 32-bit OS-related problems. DAT/EM will not support any 32-bit OS at any time in the future.

Any reference to an OS in the remainder of this document refers to the 64-bit version of that OS only.

DAT/EM Release 7.4 is supported on the following operating systems:

- 64-bit Windows 7 Ultimate and Professional with all Windows Updates applied.

- 64-bit Windows 8.1 Professional and Enterprise with all Windows Updates applied.

  - Microsoft no longer supports Windows 8.0; therefore, DAT/EM does not support Windows 8.0. Microsoft recommends Windows 8.1 as a service pack for 8.0.

  - If you need to choose between Windows 8.1 and 10, DAT/EM recommends choosing 10.

- 64-bit Windows 10 Professional and Enterprise with all Windows Updates applied. Windows 10 notes:

  - DAT/EM software installs and works in Windows 10, but it is the client's responsibility to be sure that stereo can work in Windows 10.

  - Use a graphics card that has an OpenGL version 4.2 or higher. DAT/EM will not test Windows 10 with video cards that have an OpenGL version older than 4.2. (Hint: Even the lower-end nVidia K2200 and M2000 are far superior to the older cards such as the Quadro FX4800, so please replace these old cards. See our website for Tech Tip articles on this subject.)

  - For DAT/EM stereo applications, install the newest nVidia video driver bundle using the "custom" and "clean" installation choices. Turn off automatic video driver updates in Windows 10.

  - Always keep Windows 10 Updates current.

Hint: If you have Windows 8.1 or 10 and you miss the Windows 7 Start menu, DAT/EM highly recommends the third-party Classic Shell™ application, which installs a Windows 7-like start menu. DAT/EM uses it on all our Windows 8.1 and 10 computers: http://www.classicshell.net/

Hardware Locks/Dongles

Please install Microsoft Updates and OS Service Packs 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.

1. DAT/EM changed its hardware lock configuration with the release of version 7.1. If you have a hardware lock that was "written" by DAT/EM 13 August 2014 *or earlier* and you did not install version 7.1, 7.2, or 7.3, you will need to apply a WriteLock.exe to update the lock for v.7.4. This prepares the lock to work for version 7.1, 7.2, 7.3, or 7.4 created 14 August 2014 or later. The newly written lock is not backwards compatible with version 7.0 or earlier. If for any reason you want to return to v.7.0 or earlier, please ask DAT/EM for a v.7.0 WriteLock.

    Q: I have been using DAT/EM version 6.8 or 7.0. Do I need to apply a WriteLock?
    A: Yes! You need both a new WriteLock (from 7.1, 7.2, 7.3, or 7.4) and a 7.4 installation keycode.

    Q: I have a network lock that is currently running v.7.0 or earlier. Do I need to apply a WriteLock before I install version 7.4?
    A: Yes! You need both a new WriteLock (from 7.1, 7.2, 7.3, or 7.4) and a 7.4 installation keycode.

    Q: I am currently running the release version of 7.1, 7.2, or 7.3. Do I need to apply a WriteLock for 7.4?
    A: No. A lock that works for 7.1, 7.2, or 7.3 will still work for 7.4.

    Q: I have a softlock demo. Do I need to apply a WriteLock?
    A: No. The WriteLock does not apply to softlocks. You may upgrade to version 7.4 using a 7.4 installation keycode only. If you change to a hardware lock later, DAT/EM will pre-write your new hardware lock to work with version 7.4 or the older version of your choice.

2. The Safenet Sentinel driver version 7.6.8 is provided with DAT/EM version 7.4. It is the same version that was provided with 7.2 and 7.3. If version 7.2 or 7.3 dated after August 3, 2015 was not previously installed, then the first run of the DAT/EM prerequisites setup or the DAT/EM self-extracting executable will install or update the Sentinel driver. Please reboot when asked.

    If you have a network lock on a network server and it is not already running Sentinel v.7.6.8, install it on the server before you install DAT/EM v.7.4 on your DAT/EM workstations. The Sentinel driver version must match on the network lock server and all workstations that will access the lock. The following are choices for installing the driver on the network server (choose A or B):

    - **Choice A)** Run the DAT/EM "Datem_PreReqs_blt_01_31_2017.exe" file on the network server. This file does not require a password and is available from www.datem.com > Support > Downloads > Optional Items > Prerequisites…, or http://datemsystems.com/down/Datem_PreReqs_blt_01_31_2017.exe. It installs C++ redistribution files followed by the Sentinel driver. Answer "Yes" to the firewall question (shown below). Reboot if asked.

    - **Choice B)** Run the DAT/EM "Setup…exe" file *one or two times* on the network server. The first time it runs, it may install C++ redistribution files and may require a reboot; if so, run DAT/EM "Setup…exe" again. It will then install the Sentinel driver. Answer "Yes" to the firewall question. Reboot if asked.
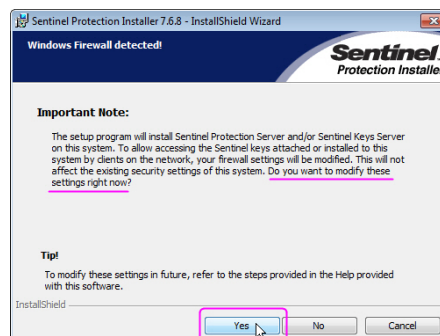
It is very important to answer "Yes" to this question

Stereo Viewing Devices

There are no newly available stereo viewing devices. The list of compatible devices is the same as for the last version. See www.datem.com for a list of compatible stereo viewing hardware.

Video Drivers

Please note our video driver installation/update recommendations:

- Always run Windows Updates first.

- DO NOT install the driver on media packaged with a video card. It will be too old.

- Get the latest driver for your video card and operating system from www.nVidia.com. During installation, turn on "Custom (Advanced)" and "Perform a clean installation".

Always choose "Custom" and "Clean" in nVidia driver setup

- For video driver settings, see our video driver installation video here: http://www.datem.com/training/ > How to Download and Install NVIDIA Graphics Drivers.

Software Installation, File Locations, and Installed Utilities

As of version 7.4, DAT/EM no longer supports or tests on 32-bit operating systems. If you attempt to install the software on a 32-bit operating system (OS), some parts may work, but DAT/EM will not guarantee that everything will work. DAT/EM will not fix any 32-bit OS-related problems. DAT/EM will not support any 32-bit OS at any time in the future.

Any reference to an OS in the remainder of this document refers to the 64-bit version of that OS only.

The following has changed for DAT/EM software installation or the location where DAT/EM applications store data:

Note: Blue Marble's Geographic Calculator ArcGIS plugin directly conflicts with DAT/EM's **CaptureArcInfo.2010.dll**. When DAT/EM software is installed, "Registration Failed" is reported near the end of installation. Run "C:\Program Files (x86)\Blue Marble Geo\Geographic Calculator\UnRegisterEsriPlugin.bat" before installing DAT/EM software. Contact DAT/EM for more information if you have Geographic Calculator and would like to use it in ArcGIS.

1. There is a new prerequisites file that may be run before DAT/EM setup. It takes the place of the Visual C++ Redistributables files installation and the Safenet Sentinel driver v.7.6.8 installation stages that may happen the first time you run DAT/EM setup. The prerequisites file may be used by anyone, but it is especially useful for silent installations and for updating the Sentinel driver on network lock servers.

   When the prerequisites file is run first, a subsequent run of DAT/EM setup will detect that the Visual C++ Redistributables and Sentinel driver are installed already, and will not attempt to re-run these installations.

In the last version, silent installation had trouble when the Sentinel driver installed and requested a reboot. Now, for silent installations, make one recording of the prerequisites installation and a second recording of the DAT/EM setup. See the updated silent installation instructions available for download from www.datem.com . (Jan. 31, 2017)

2. Visual C++ (VC) Redistributable files have been updated. They are installed by either the new DAT/EM prerequisites installation or by DAT/EM setup, whichever runs first. VC Redistributable files are Microsoft system files that are not necessarily installed by Microsoft Windows Updates, but are required to be on the system in order to run the Sentinel driver and DAT/EM software. (Jan. 31, 2017)

3. In Version 7.3 and 7.4, Capture for ArcGIS will no longer show a "Register" dialog. The Esri ArcGIS extension registration dialog is suppressed. This was done so that silent installation mode would work.

    Please note that in a certain percentage of cases, ArcGIS fails to register the DAT/EM extension properly at the end of DAT/EM software installation. This can happen in either regular or silent installation mode. Please contact DAT/EM if the three DAT/EM toolbars are not available in ArcMap after DAT/EM installation.

    In version 7.4, if the user login does not have Administrator permissions, the ArcGIS Registration process will give an error message to explain why the DAT/EM Capture application is not able to register.

4. Installation for Bentley MicroStation products has the following changes:

    a. The v.7.4 installation process deletes **Datem.cfg** if it is present in the **…config\appl** folder. This file could be left over from a very old DAT/EM version, and together with the current **DatemConfig.cfg** file, could cause an attempt to double load the DAT/EM applications. (March 9, 2017)

    b. Installation for SelectSeries 3 and 4 (SS3 and SS4) is different from past versions. Up until now, DAT/EM software would install for all supported versions of MicroStation and MicroStation-based products found on the computer, installing to all the individual "C:\<Bentley Installation Folder>\<Bentley product name>\mdlapps\datem" folders. Bentley now has multiple products that mix SS3 and SS4 components, and it causes problems for our old method of installation. Installation remains the same for SS2, SS1, and earlier versions. For SS3 and SS4, DAT/EM software will now install its SS3 and SS4 files in a new common location instead of making the …mdlapps\datem installation folders:

        ▪ "C:\Program Files (x86)\Datem Software\MicroStation\SS3"

        ▪ "C:\Program Files (x86)\Datem Software\MicroStation\SS4"

DAT/EM Virtual Reality Products

1. DAT/EM Point Cloud VR™ is nearing its release date. It is available now as a beta demonstration to those who have an Oculus Rift$^{®}$ Virtual Reality headset with Touch controllers. Point Cloud VR is used for extremely fast stereo rendering of point cloud projects with billions of points. With Point Cloud VR, you are able to view the desktop and CAD or GIS window, snap to points and surfaces, and digitize 3D vectors while virtually flying around the points. If you are interested in being a beta tester with a demo of Point Cloud VR, please contact sales@datem.com.


This guy is beta testing DAT/EM Point Cloud VR, and you could, too!

2. Information only, not a change: DAT/EM Summit Evolution and Landscape can be run in the Oculus Rift virtual reality headset using the DAT/EM VR Desktop. Install the VR driver first, then install DAT/EM software. For more information about using DAT/EM applications with VR, please contact support@datem.com.

DAT/EM Keypad

The following changes have been made to the DAT/EM Keypad products:

1. The Keypad Controller > Tools > Minimize on Command setting was fixed to run the command first and then minimize the application dialog. Previously, it didn't run the command first. (Nov. 8, 2016)
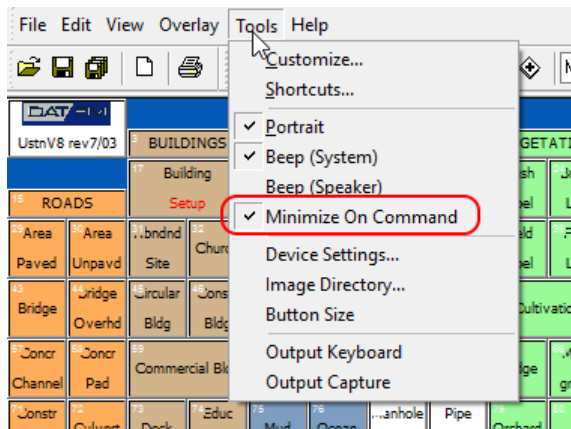
"Minimize on Command" in the Keypad Controller is now working properly

2. There is a new driver for the DAT/EM TouchPad and Keypad running on Windows 8.1 and Windows 10. It is available at www.datem.com > Support > Downloads > Drivers > **Windows 8/10 DAT/EM Touchpad and 252-Button Keypad**. Specific link: http://www.datemsystems.com/down/drivers/Win%208%20and%2010%20Keypad-Touchpad%20Driver.zip

Coordinate Transformations and Elevation Database

The following changes have been made to the DAT/EM-Blue Marble coordinate transformation selections and elevation database. All of the files to activate this are installed with the main DAT/EM self-extracting installation executable. There are no new elevation database installation files. If the elevation database has never been installed before, or if it has been installed for v.7.1 or lower, download and install this file:
http://datemsystems.com/down/SetupElevationModels%20blt%2003%2015%202015.exe.

1. Version 7.4 has an update of the Blue Marble coordinate translation libraries, which include Geoid 12b selections. These changes are provided in the general DAT/EM setup file, which means the changes will be installed with v.7.4. As noted above, the elevation database installation file has not changed for this version. (September 2016)

Summit Evolution

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

General Summit Evolution Subjects

1. Summit Evolution is now compatible with the 2016 v.6.7 version of the Leica/Intergraph Topomouse driver. This enables the use of the USB version of the Topomouse only. To implement this: (January 26, 2017)

   a. Close all other applications. Be aware you will need to reboot soon.

   b. Install the Topomouse driver available here: http://www.silabs.com/products/interface/Pages/direct-access-drivers.aspx.

   c. Reboot.

   d. Install a DAT/EM software version build dated 26 January 2017 or later.

   e. Set the Topomouse on in Summit > Tools > Options >
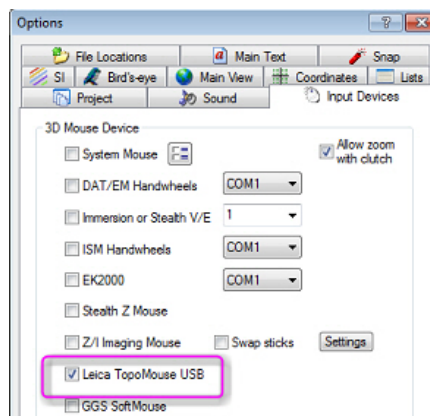
Summit may use the Leica Topomouse USB with Topomouse driver v.6.7

2. Cyan-yellow has been added to the anaglyph color combination choices. (August 15, 2016)

3. The Summit > Tools > Options > SI tab > "2D – objects elevations at cursor" setting will now operate on DAT/EM Drawing Objects (the vector objects that can be loaded and drawn in the Summit environment independently of Capture). For example, if a file with all objects at Z=0 is loaded from a DWG, DGN, or SHP, the setting will activate 2D superimposition to display them at the cursor elevation. This setting previously only worked on superimposed vectors originating in Capture for CAD/GIS. (Sept. 19, 2016)

4. Terrain Following had been changed in v.7.3 to read more points (this was omitted from the v.7.3 Release Notes). As a result of reading more points, loading a Terrain Following file took over twice as long in v.7.3. By popular demand, the point density has been reduced again. Note that for terrain files that cover a larger area than the Summit project, DAT/EM recommends to use Point Translator to tile it into smaller areas or to cut out an area based on a polygon around the Summit project area. This way, you can filter out entire areas of points that are not needed, resulting in a faster load times for Terrain Following. (Oct. 24, 2016)

5. Summit's Tools > Shortcuts dialog has a new report type. The existing report writes a list of all currently set shortcuts. The new report writes a list of all options, whether set to a shortcut or not. (Nov. 28, 2016)

6. The 2D SI setting will now apply to the DAT/EM Drawing Tools in the same way that it already did for superimposed DAT/EM Capture vectors. (Oct 16, 2016)

7. The "-edition" setting in Summit-launching shortcuts was not being applied in version 7.3. For example, if there was a network lock with both Summit Professional and Feature Collection available, but Summit Professional had been run first, it would always run Summit Professional, even if the shortcut called for Feature Collection with "-edition 1". DAT/EM shortcuts will now run the correct edition. (Dec. 19, 2016)

Aerial, Close Range, and Generated Stereo Projects

8. Aerial, Close Range, and Generated Stereo Projects. No changes.

Imported Projects

9. Imported Projects:

   a. The Pix4D import tool was modified to import the exterior values correctly in more cases. (Sept. 8, 2016)

   b. The Z/I import tool has a change as follows:

      ➢ It creates the proper rotation in the resulting Summit camera. There is a possibility that this will cause some old Z/I projects to create an improperly rotated Summit camera. There was a change to the Z/I project format over time, and DAT/EM chose to support the newer format. If your older-version Z/I project creates an incorrectly rotated camera, you can fix it by setting a different rotation in Summit > Edit > Camera > Mount Rotation. (Sept. 9, 2016)

      ➢ The wording for the Z/I import option and its dialog has changed to "Hexagon or Z/I" to include the newer branding for that product. (Dec. 6, 2016)

      ➢ The photo to pixel coordinate converter that is used for the relative and control point measurements was off by a pixel. This would have affected the project only if Summit's "Use measured control" (Absolute Orientation) setting was turned on. Note that "Use measured control" is NOT recommended, because it deactivates the ISAT aerotriangulation results. This caused a visual problem with the calculated and measured marks in Summit's Move To Ground tool; since the measured marks were in the wrong place, it appeared that the calculated mark was far from the measurement. In reality, it was the measured mark that was wrong, while the calculated mark was right. (March 21, 2017)

   c. The Agisoft PhotoScan Camera XML importer was updated to attempt to detect both the newer and older Agisoft camera XML contents. Agisoft had changed the XML contents for the focal length and the units for the principal point. (Dec. 21, 2016)

10. Button Manager has the following changes:

    a. Type=Plotter, Action=**Terrain Vis Toggle** is a new button to toggle the Terrain Visualization display from a button. It has the same effect as the "Hide/Show Contours" icon on the Terrain Visualization dialog. (August 24, 2016)
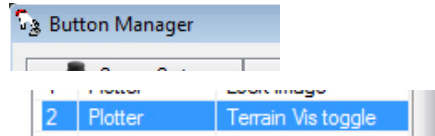

The New Terrain Visualization Toggle from the Button Manager…
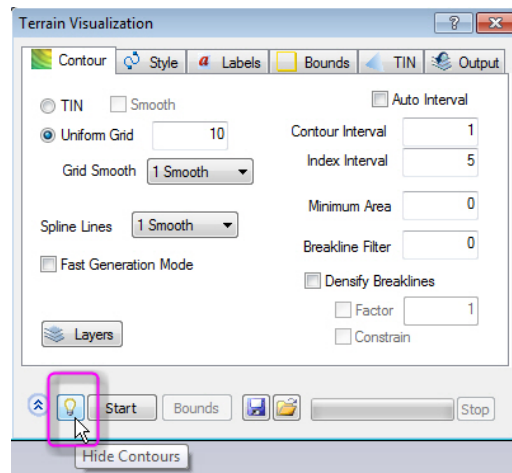
… has the same effect as the "Hide/Show Contours" button in Terrain Visualization

    b. The Type=Plotter, Action=**Min/Restore Keypad** button is now working to properly minimize and restore the Keypad Controller window. (November 8, 2016)

    c. A diagram for the Stealth S4-V mouse has been added. Set the diagram display using the menu to the upper right of the image area for the "Immersion or Stealth V/E" input device tab.
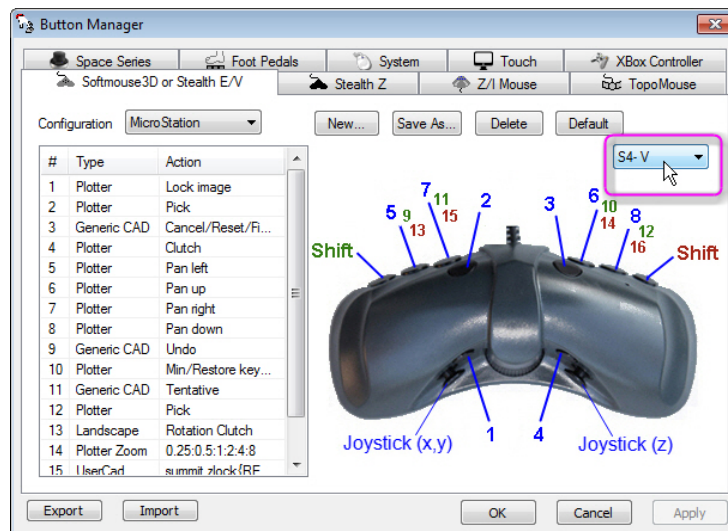
Stealth S4-V button diagram

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11. Generate LIDAR Image (GenLidarImageUI[_64].exe). No changes.

12. Stereo Mate Generator has the following change:

    a. The Stereo Mate Generator now offers to make a Summit project from the resulting stereo pairs. (Oct. 12, 2016)

13. Contour Creator. No changes.

14. Point Translator has the following change:

    a. This applies to all DAT/EM applications that read .img point files. A customer sent an .img file where the header listed an incorrect elevation range. DAT/EM's point reader library then misread points that had an elevation outside the header's stated range. This is fixed to no longer use the given ranges in the header. (March 10, 2017)

1. DAT/EM Image Viewer has the following change:

    a. Image Viewer with a vector file loaded will now move Summit to a ground coordinate picked by the "Move Summit by Pick" tool. Previously, it would move Summit to a pixel coordinate instead of a ground coordinate. Note that there is no change for orthophotos loaded in Image Viewer, since orthophotos always worked with Image Viewer's "Move Summit by Pick" tool. (Sept. 29, 2016)

2. Project Overview / Ortho+Mosaic has the following change:

    a. Tools > Options > Images tab > **Load Images** is a new setting. It toggles loading the preview images when a project is opened. The default setting is on. Turn the setting off for very large projects where the preview images takes too long to load and you don't want to see the preview images. (August 17, 2016)
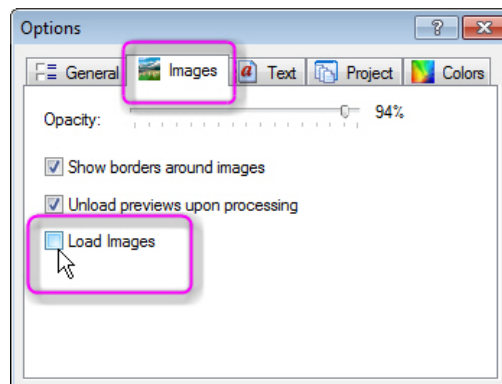

New Load Images toggle in Ortho+Mosaic/Project Overview Tools > Options > Images
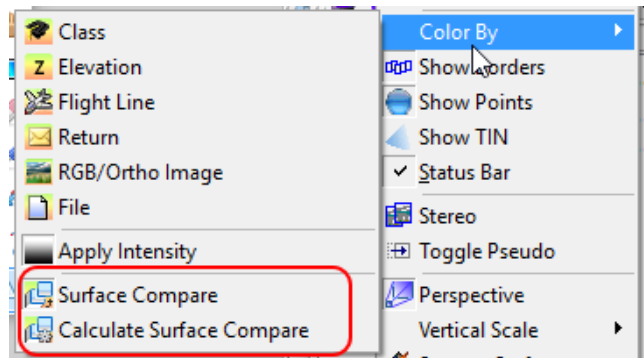
Landscape

The following changes were made to Landscape:

1. **Faceshift** in the Interactive Point Edit tools has a new option to shift a copy of the points, while leaving the original points in their original location. Both the original points and the copy can be optionally classified separately. For example, draw a polygon around a stand of trees, optionally classify the original points as trees, and optionally classify the copy at ground elevation as bare earth. This may be especially useful to classify objects such as cars, trucks, and vegetation in a point cloud made by image correlation. (January 13 and January 23, 2017)
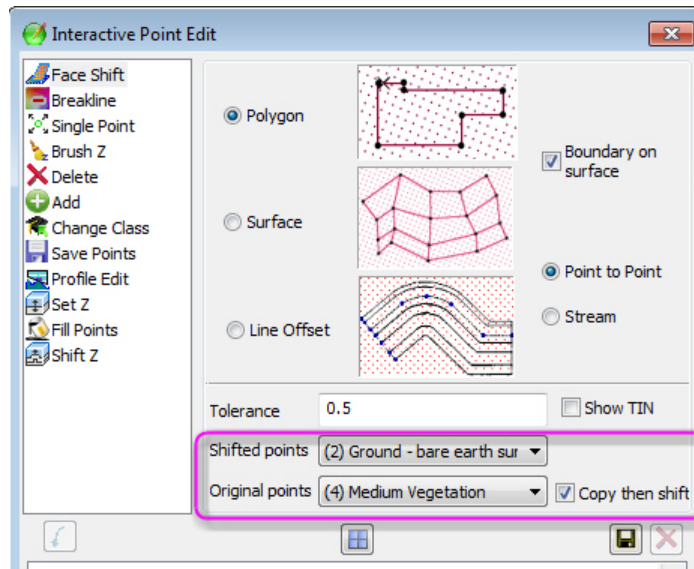

New copy and reclassify settings in Faceshift

2. Landscape **Surface Compare Color** is a new tool in Landscape. (Sept. 16, 2016)

Color by Surface Compare menu/buttons

Surface Compare Color adds two new buttons to Landscape's point color choices. The **Surface Compare** button colors points based on the current comparison surface. The **Calculate Surface Compare** button creates the compare surface. If a comparison surface has not yet been calculated then the points will all appear gray.
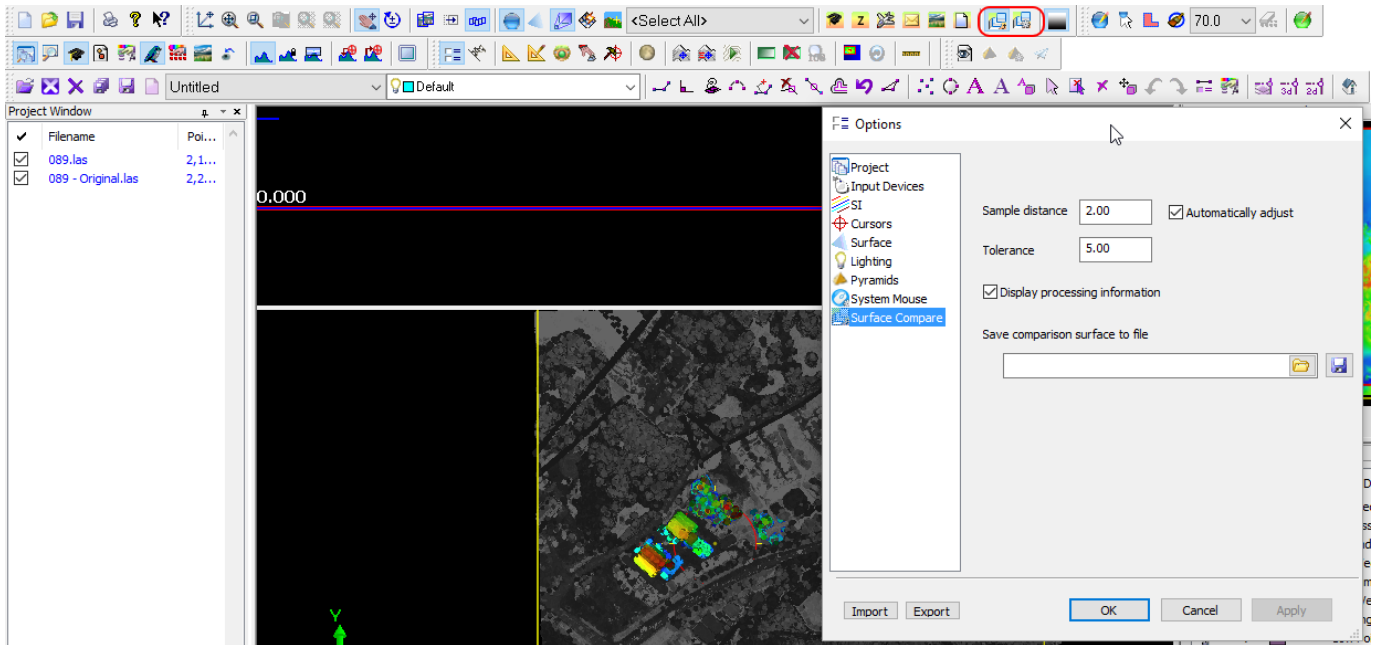
Color by Surface Compare Options and Main View

When viewing the comparison surface, gray indicates points that have not changed, blue indicates points that have the least amount of change, and red indicates points that have the most change.

Landscape > Tools > Options > Surface Compare offers options for creating the comparison surface:

- **Sample Distance** controls the distance between sample points. The smaller the sample distance, the more detailed the comparison surface and the longer the calculation will take. The sample distance cannot be smaller than the density of the point cloud.
- If **Automatically adjust** is selected, then the sample distance will be updated if it is too small prior to generating the comparison surface. If **Automatically adjust** is turned off and the sample distance is too small, then a dialog similar to the following will be displayed.
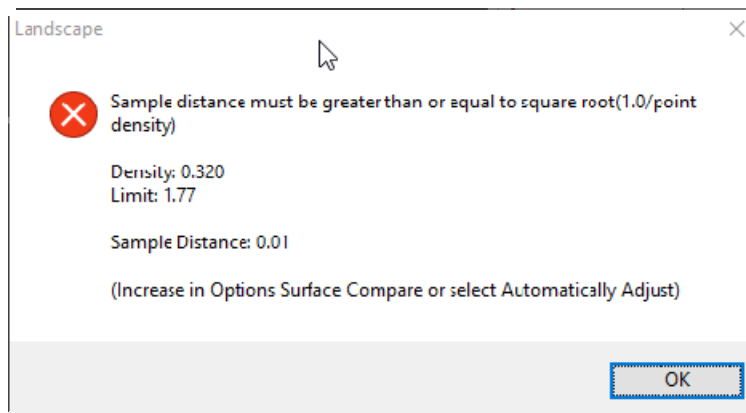

Sample distance too small error

- **Tolerance** controls what values are considered changed. If the z change at a given sample location is less than tolerance, then it is considered unchanged and the surrounding points will be colored gray.

- If **Display processing information** is selected, then at the conclusion of surface calculation, a dialog similar to the one shown below displays processing information.
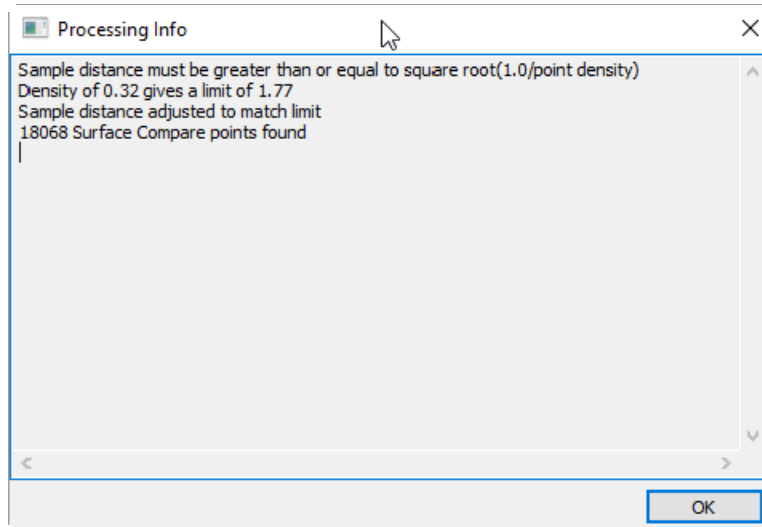
Processing information dialog

- **Save comparison surface to file** may be used to save the comparison surface out to a .las file. To use,
  either browse ⬜ or type in the full path to the new file and press the ⬜ button. The point file generated
  will contain points with z values going from just above the **tolerance** to the maximum z change detected.
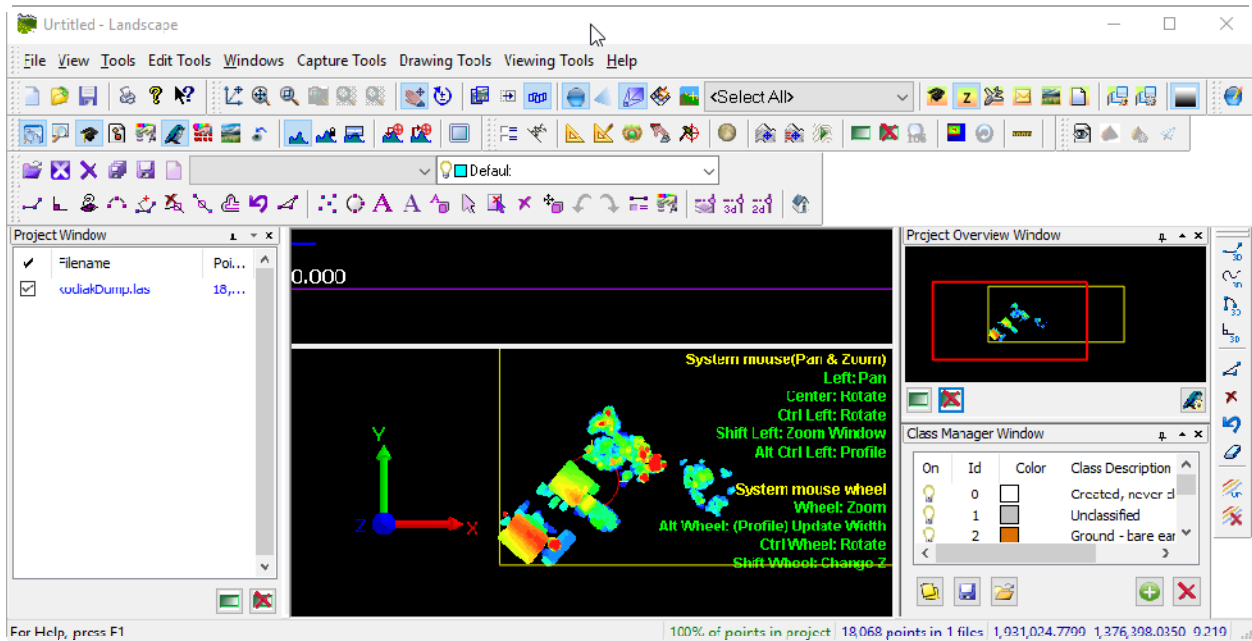

Sample of Comparison Surface File

**Future plans for Landscape's Surface Compare tool:**
In the future, there will be an option to display the elevation values that correspond to the colors. There will also
be another tool to calculate volumes based on the compared surfaces. Customers with an active support contract
may receive our betas; ask support@datem.com to be notified when this work is done and to request a beta.

3. There is a new **-noload** flag that may be used with Landscape shortcuts. It prevents Landscape's **Tools**>**Options**>**Project**>**Load last project on startup**" option from working, and instead opens a new "Untitled" Landscape project. The flag can be used alone or in combination with the existing **-nostereo** option, which starts Landscape in mono viewing mode. To use the flag, make a copy of the installed Landscape desktop shortcut, rename it to indicate its flag(s), right click, select Properties, and add **-noload** to the end of the **Target** field. The flag or flags must be after the double quote character; the double quote must be at the end of the Landscape_64.exe file name. If **-nostereo** is also used, there must be a space between the flags. (March 14, 2017)
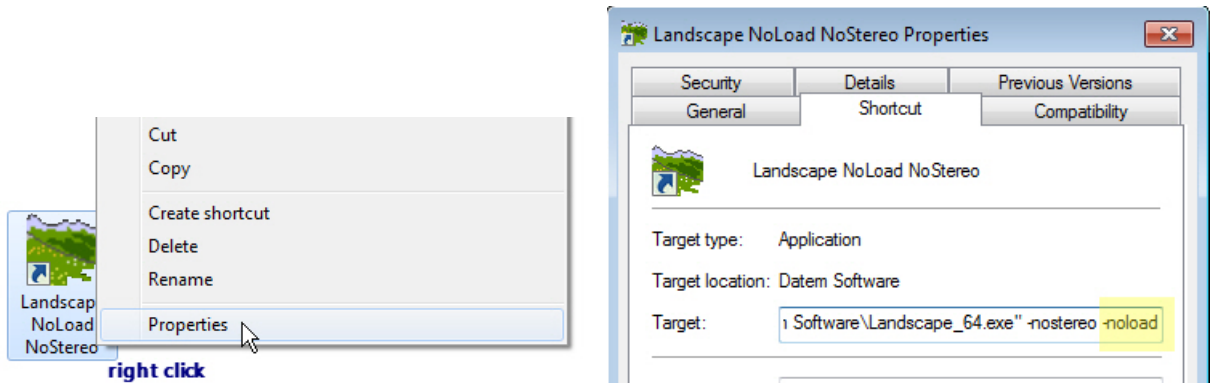
*Optional **-noload** flag for the Landscape shortcut **Target***

4. When points were turned off in the Class Manager, they were being drawn as black instead of disappearing completely. When the view rotated, this became a problem, because the black would draw over other points that were still on in the Class Manager. Now the points are not in the view at all when turned off. (Nov. 2, 2016)

5. The user commands between CAD (e.g. MicroStation) and Landscape are now functioning. (Nov. 7, 2016)

6. When using Landscape with Capture for MicroStation, Landscape will now zoom MicroStation correctly. (Nov. 2, 2016)

7. The tip/tilt/rotate behavior with the system mouse wheel has been re-enabled. (Nov. 2, 2016)

8. There is a new Capture page in the Options dialog. It sets how you would like DAT/EM Capture to rotate the AutoCAD, MicroStation, or ArcGIS view with Landscape. (Nov. 8, 2016)
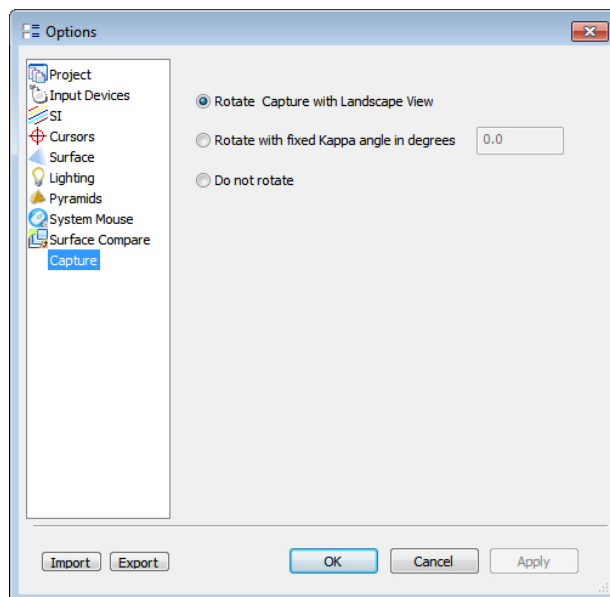
New DAT/EM Capture view rotation options

9. When Landscape was rotated to match Summit's kappa angle (cursor movement direction on screen), lines created since the last superimposition (SI) update would disappear. It now updates SI correctly. (Dec. 8, 2016)

DAT/EM Capture for ArcGIS - ArcMap

This version is compatible with ArcGIS 9.1, 9.2, 9.3 (service pack 1), 9.3.1(service pack 2), 10.0 (service pack 4), 10.1 (service pack 1), 10.2, 10.2.1, 10.2.2, 10.3, 10.3.1, 10.4, and 10.5 (plus any available service pack as they are released).

BE ADVISED: In response to user requests, DAT/EM has decided to support ArcGIS 9.x with DAT/EM version 7.4. During the next release cycle, DAT/EM will again review plans to drop support for ArcGIS 9.x. Please continue to make plans to upgrade any remaining ArcGIS 9.x version to 10.x. Contact DAT/EM if you have concerns about upgrading.

Note: **Blue Marble's Geographic Calculator** ArcGIS plugin directly conflicts with DAT/EM's **CaptureArcInfo.2010.dll**. When DAT/EM software is installed, "Registration Failed" is reported near the end of installation. Run "C:\Program Files (x86)\Blue Marble Geo\Geographic Calculator\UnRegisterEsriPlugin.bat" before installing DAT/EM software. Contact DAT/EM for more information if you have Geographic Calculator and would like to use it in ArcGIS.

The following changes were made to DAT/EM Capture for ArcGIS:

<u>Capture for ArcGIS subjects</u>

1. **Enable/Disable Capture for ArcMap**: There is a new, alternative method to enable and disable DAT/EM Capture for ArcGIS. It may be used by those who don't have Administrator privileges, which are required for the old DAT/EM CAD Enabler method. The new method does not unregister/register the DAT/EM extension as the CAD Enabler did; instead, it toggles the continuously registered extension's demand for a Capture license. (Sept. 16, 2016)

   - Note! You will still need Administrator privileges to perform the initial DAT/EM software installation and extension registration in ArcGIS. Once it is registered, you may use the new method without Administrator privileges.

   - Note! The CAD Enabler will still work if you have Administrator privileges. If you run the CAD Enabler for one of DAT/EM's other products, be careful to check its setting for ArcMap before you select **OK**.

   To use the new method, find the new **DAT/EM Enable**/**Disable** button on the DAT/EM Capture Coordinates dialog.
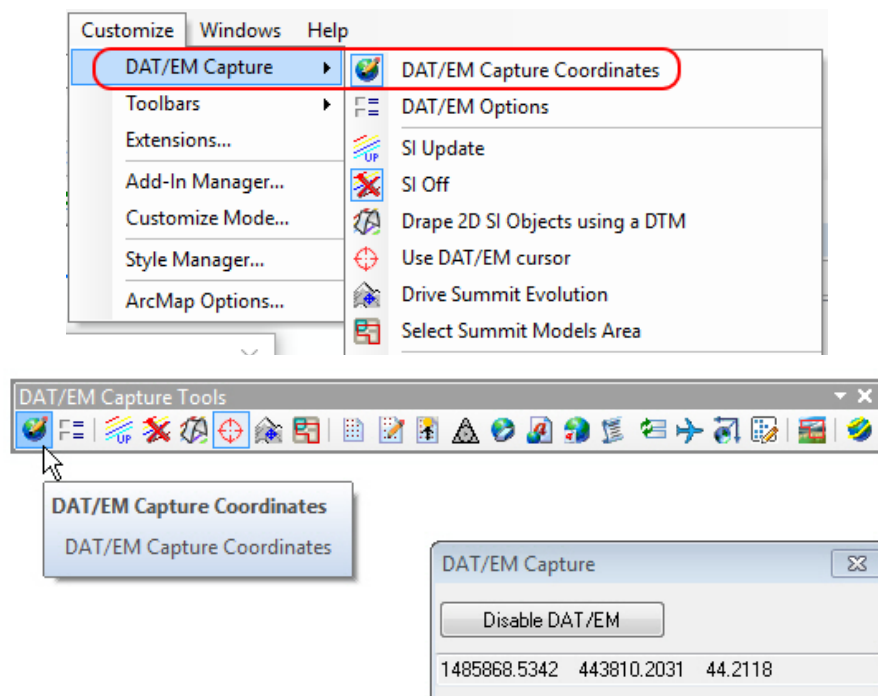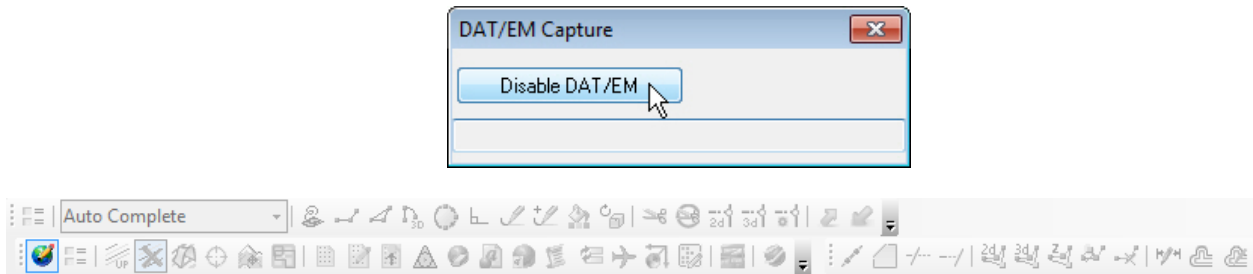

Figure 1 Accessing the Capture Coordinates Dialog

If Capture is currently active (taking a Capture license), the button will display **Disable DAT/EM**. Pressing the button releases the Capture license from the lock and disables all of the DAT/EM Toolbar buttons except for the **Capture Coordinates** button.

Disable DAT/EM releases the Capture license and

*disables all toolbar options except **DAT/EM Capture Coordinates***

When the lock has been released, the button label will switch to **Enable DAT/EM**. Pressing the button attempts to acquire a license and enable the buttons.
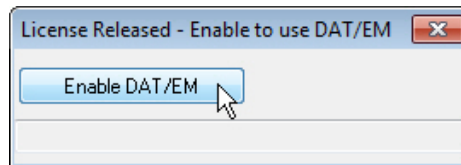
***Enable DAT/EM** enables or attempts to enable the full Capture for ArcGIS*

If a license is available, the DAT/EM buttons will all be enabled. If not, then the following dialogs will appear and the buttons will continue to be disabled. "DAT/EM Hardware lock required" may appear in the following cases:

- When there is no lock attached to the computer or lock server.

- When the three Sentinel services are not all running on the local computer and the lock server, in the case of a network lock.

- When a network lock was found, but all licenses on it are already in use.
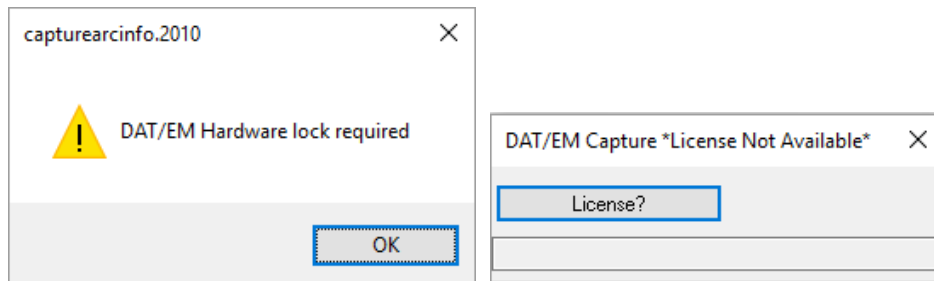
Messages appear if a license is not available.

Pressing the **License?** button will bring up the **Enable DAT/EM** button again for another attempt. If for some reason you cannot acquire a license, DAT/EM recommends you save your changes, close, and re-open ArcMap.

The setting is saved so if you exit with the license released, it will not try to acquire a license when you re-open ArcMap. It will not attempt to acquire a license until you hit the **Enable DAT/EM** button.

2. Automatic object and vertex selection (without snapping) has a larger selection tolerance. This will improve tools such as Edit Vertex in XY, XZY, and Z when snapping is off. It will help the tools to find the nearest object or vertex more reliably. Previously, the non-snapping selection tolerance could be so small, the selection would be missed if the cursor was not right on top of the object or vertex to be edited. (Dec. 5, 2016)

3. **Circle Drawing tool**: The simulated circle drawing tool can now tip the circle in 3D based on the elevations of the input points. Previously, the entire circle would be placed on the elevation of the first digitized point. For two-point circle (digitize the center, digitize the edge, cancel to finish), the circle will be tipped onto a plane defined by the center point. For the three-point circle (digitize three points on the ring of the circle), the result may not be planar, but will conform to the input elevations. To make a circle that has one set Z for the entire object, lock Summit's Z coordinate during digitizing and us either digitizing method.

<div align="right">Airfield3D</div>

4. Airfield3D:

    a. Airfield3D reports have the following changes:

- The VGPCS report used different language than the VGRPS. Now it uses the VGRPS language, for example, "First 1/3 of runway left side" instead of "First left side." (Oct. 5, 2016)

- It now properly splits the VGAS and VGPS reports between the two ends of the runway. Note that an earlier v.7.4 beta listed the five most penetrating points incorrectly: It listed the five most penetrating points overall for the VGAS, and it is now fixed to list the five most penetrating points separately for the two ends of the runway. (Oct. 5, 2016 and Dec. 5, 2016)

- There is a change to the above to accommodate the following information from the FAA Help Desk: "Obstacles should only be reported in the runway +200' surface (primary). Do not report those obstacles in the VGPS or VGAS." (Dec. 9, 2016)

- The VGPS report was only a report of all the points on the surface. Now it is now broken into high- and low-numbered ends. (Dec. 8, 2016 and Dec. 9, 2016)

- The VGAS was reading the VGPS points for inclusion in the reported obstacle assignment. The VGPS points are now excluded from the VGAS in the report. (Oct. 5, 2016)

- Reports will now write text fields enclosed in quotation marks. This will prevent commas within the text from being read as delimiters when Excel opens the .csv comma separated file format. (Dec. 5, 2016)

- It was not reporting and showing the VGATS sections correctly or consistently for to how they really should be numbered, the Summit superimposition label, and the report section. Now it will process these according to the FAA 18B - 2.7.1.2.5: Quadrants based upon NE most Section and looking from High numbered end of runway. (Oct. 31, 2016)

- The VGCS and VGHS were not reporting data in their Quadrants 1 and 3. This is fixed. (Nov. 1, 2016)

- There were report fixes for removing VGAS points from the VGPS and another surface they overlap. (Dec. 19, 2016)

b. There is now a superimposed indicator near the cursor that shows different colors for Primary (which affects only one runway glide slope) and Supplementary (which affects more than one runway glide slope). (Oct. 17, 2016)
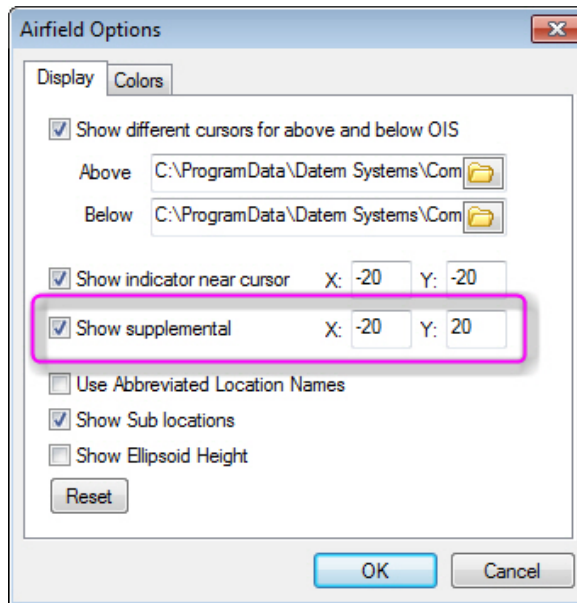

New Summit-side Airfield3D Options **Show supplemental** *setting*

c. Airfield3D has a new **<Automatic>** field that does two things:

- For an obstruction area polygon, **Apply** places the polygon's own ObjectID into its Group Code field. Since the ObjectID (assigned by ArcMap) is always unique within the layer, it will ensure that each obstruction area polygon's number is different from that of any other obstruction area polygon.

- For an obstacle point placed inside an obstruction area polygon, **Apply** places the ObjectID of the obstruction area polygon into the obstacle's Group Code field.

- Nothing happens to the Group Code for an obstacle that is not located inside an obstruction area polygon.
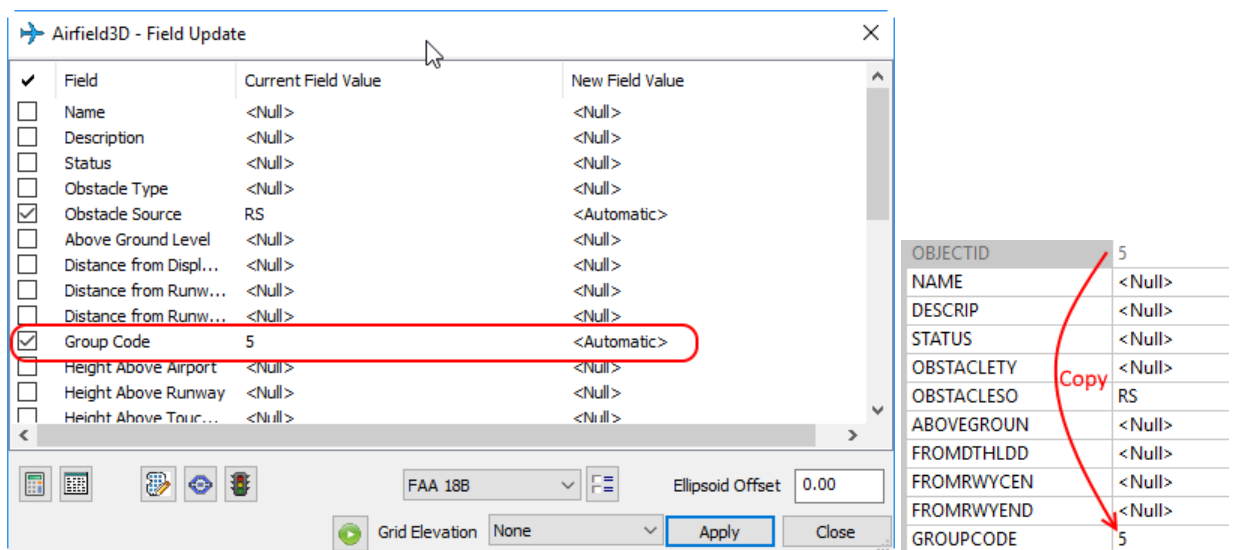
The "Recalculate" button, (in the lower left of the dialog), refreshes the Group Code fields along with other automatic fields on the ObstructionArea and Obstacle layers. For Group Code fields that are

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already set to the ObjectID, there will be no change. If the field is null or is set to another value, Recalculate will change the field to the ObjectID of the obstruction area polygon. Again with Recalculate, nothing happens to obstacles that are not located inside an obstruction area polylgon.
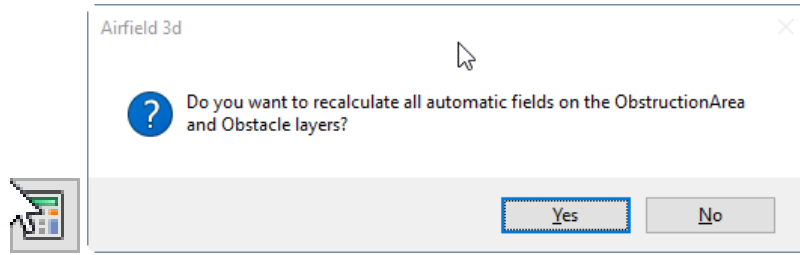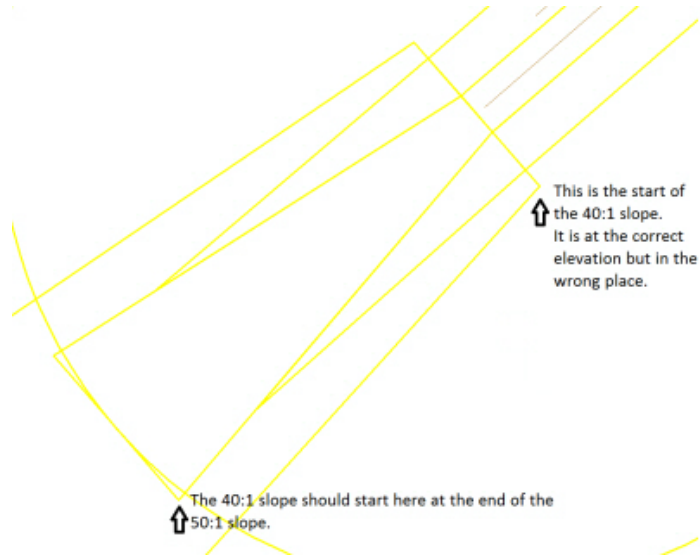

d. For a Part 77 project, the outer edge of the transitional surface was lacking individual vertices to "match" the ones on the edge closer to the runway. Instead, it was one long segment. (November 15, 2016)

e. The Recalculate button previously would not run the first time it was selected, although it would run the second time. This is fixed. (Nov. 17, 2016)

f. If an obstruction area polygon crossed into the area where the grid spacing changes for more than one runway area, it would only generate the different grid spacing correctly.
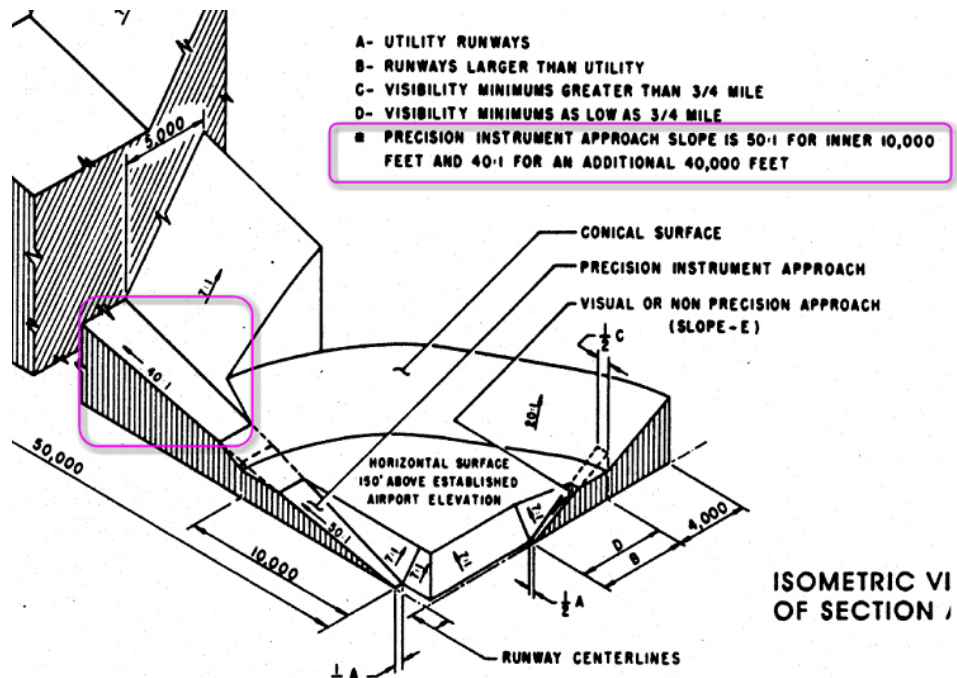

Grid spacing calculation before and after the fix for multiple runways

g. The Part 77 Precision Instrument Approach slope has two parts: 50:1 for the inner 10,000 feet and 40:1 for an additional 40,000 feet. These slopes were both starting at the end of the runway. This has been fixed to place the 40:1 in the proper place: (January 7, 2017)

This is the start of the 40:1 slope. It is at the correct elevation but in the wrong place.

The 40:1 slope should start here at the end of the 50:1 slope.

The 40:1 slope was drawing in the wrong location

A- UTILITY RUNWAYS
B- RUNWAYS LARGER THAN UTILITY
C- VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D- VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
■ PRECISION INSTRUMENT APPROACH SLOPE IS 50·1 FOR INNER 10,000 FEET AND 40·1 FOR AN ADDITIONAL 40,000 FEET

CONICAL SURFACE
PRECISION INSTRUMENT APPROACH
VISUAL OR NON PRECISION APPROACH (SLOPE-E)

HORIZONTAL SURFACE 150' ABOVE ESTABLISHED AIRPORT ELEVATION

ISOMETRIC VI
OF SECTION

RUNWAY CENTERLINES

The 40:1 slope is now located according to the FAA's description

h. The Part 77 hard surfaces had a missing point at the end of the runway. This caused other problems, such as the Precision Instrument Approach to start at the wrong width and an unexpected elevation jump between surfaces. These issues have been fixed in two stages. (January 12, 2017 and January 26, 2017)


These Part77 problems are fixed

i. A problem was fixed where the Part 77 surface being displayed in superimposition was different from the surface written to the ObstructionIDSurface layer in ArcGIS.

j. In the custom part 77 setup dialog, there was an extra blank line at the end that made the list appear to be complete in the initial display. The scrollbar to the right could be overlooked. The graphical user interface has been fixed to make it clear that some settings require scrolling down in the list. (January 27, 2017)

k. If the Conical Surface was below the Approach Surface in an area, the fields for obstruction points would not be set or recalculated, because the Conical Surface was taking precedence and those fields are not set for the Conical Surface. Now the fields will be set or recalculated if they are on any Approach Surface. (January 27, 2017)

l. The Calculate tool was not setting values for some of the points that fall within one of multiple approach surfaces. Instead, they were left with a Null value (their previous setting in this case). Here is an example of an area where this happened (indicated with the red outline and red arrow):
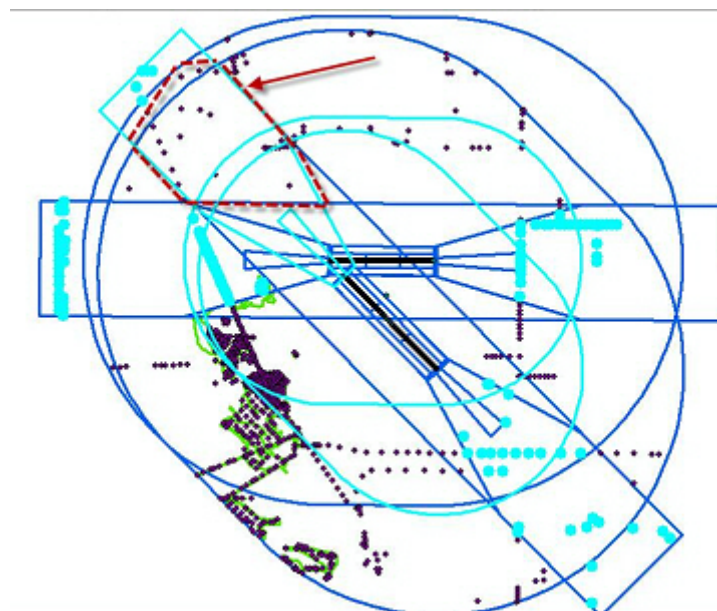
The attributes that had problems were Distance from Runway Centerline, Distance from Runway End, Height Above Runway, and Height Above Touchdown Zone. This is fixed. (Jan. 27, 2017)

Note that you will need to set one or more touch down zone elevation points on the control point layer (POINTTYPE field = TDZE) if you want the Height above Touchdown Zone filled in automatically.

m. There are new individual field settings for the Airfield3D Recalculate option. In the past, the Recalculate

button ![calculator icon] always recalculated all of the fields that it could. Occasionally a user may want to keep values in the fields and other times they may want to set an automatic field back to its default values. These new individual field settings add this functionality. The Recalculate button now launches the Airfield Recalculate dialog shown below. All of the fields that can be automatically calculated are listed.

- Each field has its own operation value setting. Valid settings are **Recalculate**, **Set to default**, **Do not change**, and **Set to default if not calculated**.

- Not all automatic fields can be calculated all the time. Sometimes a field's calculation value depends on the surface with which it interacts. That is the rationale behind **Set to default if not calculated**. If a field wouldn't have been calculated, then it provides the ability to clear the previous data.

- Multiple values can be changed simultaneously by highlighting them in the **Field** column and then right clicking on one of them in the **Operation** column.
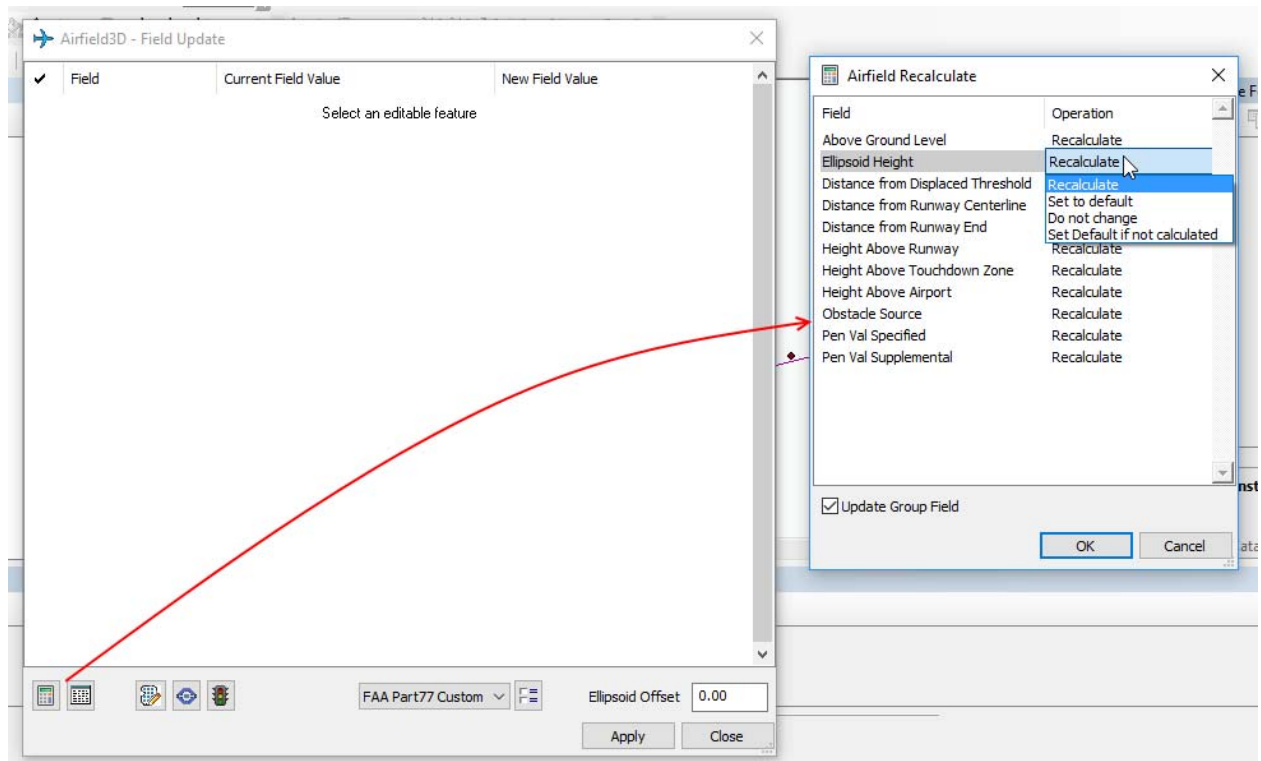
New individual field settings for Airfield3D Recalculate

DAT/EM Capture for ArcGIS – ArcGIS Pro (Beta)

This beta version is compatible with ArcGIS Pro versions:

- *1.1 and the 1.1.1 patch*

- *1.2. It is compatible with Version 1.2 only if the project coordinates are meters. This is an ArcGIS Pro v.1.2 limitation.*

- *1.3*

- *1.4*

The following changes were made to DAT/EM Capture for ArcGIS Pro:

1. Capture is now compatible with ArcGIS Pro v.1.4. It is expected that this fixed the issues with crashing seen in v.1.3 as well. (March 23, 2017)

DAT/EM Capture and MapEditor for AutoCAD

Changes apply to:

32-bit AutoCAD 2004-2016 versions with the latest service packs. Testing no longer occurs for 32-bit AutoCAD versions.

64-bit AutoCAD 2009-2017 versions with the latest service packs. Exception: 64-bit AutoCAD 2008 is not supported.

BE ADVISED:

Autodesk no longer supports their business partners in downloading and activating old versions of AutoCAD. At this time, DAT/EM still supports Capture and MapEditor for older AutoCAD versions, but Autodesk does not support these products in turn for DAT/EM. DAT/EM will continue to support as many versions as possible for as long as possible. Be advised that there may be a release in the future in which DAT/EM will be forced to drop the older versions.

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 install for AutoCAD 2011 and AutoCAD Map3D 2014 together, but it will not install for both AutoCAD 2016 and AutoCAD Map3D 2016. Please note that files may be copied manually to activate more same-year versions (contact DAT/EM Support for instructions).

Autodesk Infrastructure Design Suite installs three same-year AutoCAD versions (AutoCAD, Map3D, and Civil3D). You must run each version and register/"accept" each one before installing DAT/EM software *whether or not you intend to run every version with DAT/EM Capture active*. DAT/EM software will install completely for only one of them. After that, the user can manually copy the AutoCAD \datem folder and the wintab driver file into the other two versions of AutoCAD. Contact DAT/EM Support for instructions.

Reminder: Install all available AutoCAD service packs and updates before installing DAT/EM software.

Reminder: After every new AutoCAD installation, you must run AutoCAD at least one time to activate its license *before* installing DAT/EM software. This applies to every version of AutoCAD on the computer *whether or not you intend to use every version with DAT/EM Capture*.

The following changes were made to DAT/EM Capture and MapEditor for AutoCAD:

DAT/EM Capture and MapEditor for AutoCAD

1. Version 7.4 is the first version to support AutoCAD 2017. There are new "2017" .arx files and menu files. The menu files are different only in the tools that load DAT/EM applications, since the names of the applications have changed to have "2017" in them.

DAT/EM Capture and MapEditor for MicroStation

Changes apply to Capture for MicroStation. DAT/EM software installs for the following MicroStation versions on 64-bit operating systems:

- *MicroStation V8 and V8 2004 Edition: Version should be 08.05.00.34 or higher.*

- *MicroStation XM: Version should be 08.09.04.88 or higher.*

- *MicroStation V8i, V8i-based Bentley Map and Map Enterprise SelectSeries 1 (1 not recommended), 2, 3, and 4; MicroStation PowerView SelectSeries 3 and 4; Power GeoPak* SelectSeries 3 and 4*

- *PowerCivil SelectSeries 3 or 4*

  If you upgrade from Select Series 1 to 2, 3, or 4, you must reinstall DAT/EM software after installing the Series upgrade.

  DAT/EM will install for all versions of MicroStation that are present on the computer at the time of the DAT/EM installation.

  *Note about Power GeoPak Select Series 3: DAT/EM Software *installs* for Power GeoPak SS3, but has initial loading conflicts that affect the GeoPak and DAT/EM menus. Bentley has offered a workaround for this issue. If you have the Bentley Power GeoPak SS3 product, please contact DAT/EM for further installation instructions.
  *Note about Power GeoPak Select Series 4 (which runs with MicroStation Select Series 3): This product seems to be more successful running together with DAT/EM applications. There still could be issues. Please contact DAT/EM Support if having problems installing for or using this version.

  Note for MicroStation CONNECT Edition (64-bit MicroStation): DAT/EM version 7.4 does not contain an interface to MicroStation CONNECT Edition. DAT/EM plans a limited beta interface available during the v.7.5 development cycle. Please contact DAT/EM Support if you are interested in beta testing.

The following changes were made to DAT/EM Capture and MapEditor for MicroStation:

<div align="right">General Subjects in Capture for MicroStation</div>

1. Support has been added for MicroStation SelectSeries 4. Please see item 4. on page 5 for more information on related installation changes to DAT/EM Capture for MicroStation SelectSeries 3.

2. The DATEM menu was missing the "2D" for "Stairs2D". It would launch the "STAIRS" command, which allowed you to pick Stairs2D, but it was an extra step to do so. This is fixed. (Sept. 6, 2016)

3. Toggle Comment in the Parameter File Editor was being saved in the parameter file, but being ignored on executing a parameter file from the Parameter File Editor and also when being opened in the Parameter File Editor. Commented lines will be handled properly now. (Sept 9, 2016)

4. Superimposition rubber banding has the following changes:

   a. Some code to handle the superimposition rubber bands had been changed in v.7.3 and adversely affected performance. Timing problems were corrected for cases where DAT/EM and MicroStation's primitive rubber band handlers interfering with each other. The new code is more efficient. Commands especially affected were legacy (but still used) MicroStation commands PLACE SMARTLINE and PLACE LSTRING SPACE, especially if used after PSQR or other DAT/EM commands. These commands also had SI refresh issues after Undo, tied in with rubber band issues after Undo; those problems have been corrected as much as possible. (Oct. 21, Nov. 2, Nov. 7, 2016)

   b. There is a new simple superimposition interface for the MicroStation PLACE CURVE command. It displays a linear element with vertices at the pick points and has a rubber band. The curve is updated to match the final element in MicroStation when digitizing is finished. (Oct. 10, 2016)

5. The "Run Multiple Files" code in MapEditor was saving settings to HKEY_LOCAL_MACHINE, which caused registry errors on Windows 7 test computers. All references were changed to HKEY_CURRENT_USER to prevent permission problems. (Oct. 24, 2016)

6. There were several MapEditor dialogs that did not save previous settings after using the "Sets" button to launch the Selection Set Editor and then returning to the settings dialog. They will now retain settings. (Nov. 11, 2016)

7. There are new diagnostics and progress reports for the DAT/EM application loading processes. View these in the MicroStation Message Center after MicroStation starts. The example shows successful loading messages; error messages will appear here if errors are encountered. (Dec. 2, 2016)
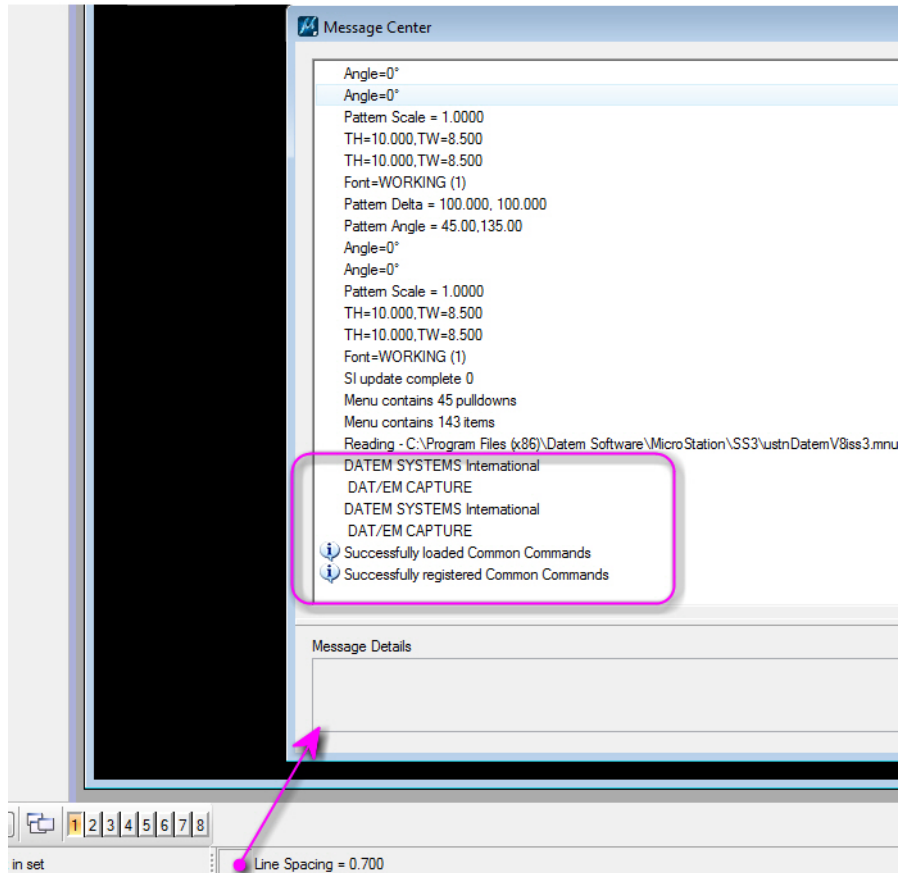
New diagnostics and progress reports can be viewed in the Message Center

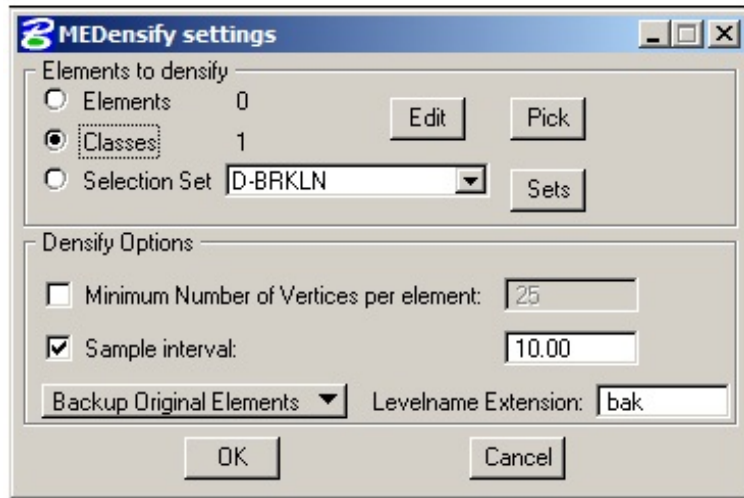<u>New Commands in MapEditor for MicroStation</u>

8. NEARESTZ is a new command to edit the elevations on a first-selected element so that they match the elevations on a second-selected element as well as possible. The algorithm approximates the elevation for each vertex on the first-selected element based on the elevation of the nearest (x,y) location of the second-selected element. (Note: This doesn't work very well for extrapolating Z values from parallel elements.) (Sept. 5, 2016)

For example, this command could be used to match the elevations on one bank (side) of a river to the other bank.

To run, perform the following steps:

1) Start the NEARESTZ command.

2) Pick the Element to be edited. (If you want to cancel at this time, enter two back-to-back resets to completely exit the command.)

3) Select the element used to determine Z values. (If you change your mind about the element to be edited at this time, enter two back-to-back resets. After the resets, you can select a different element to edit.)

4) After editing, it prompts to pick another element to edit. Continue editing objects as desired. Enter to back-to-back resets to exit the command.

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9. MEDENSIFY (vertex densification) is a new command in version 7.4. It adds vertices along existing segments of a string element. It is intended to reduce the distance between vertices without changing the footprint of the element. It can be helpful to densify prior to creating a TIN based on element vertices, for example.


MEDENSIFY is a new command

Changes to existing commands in Capture for MicroStation

10. 3DOFFSET now supports multiple offsets through a road configuration .rcfg file that is made earlier by ROAD SETTINGS. To use:

   a. Use ROAD SETTINGS to configure multiple offsets. Use the ROAD SETTINGS "Save" button to create an .rcfg file.
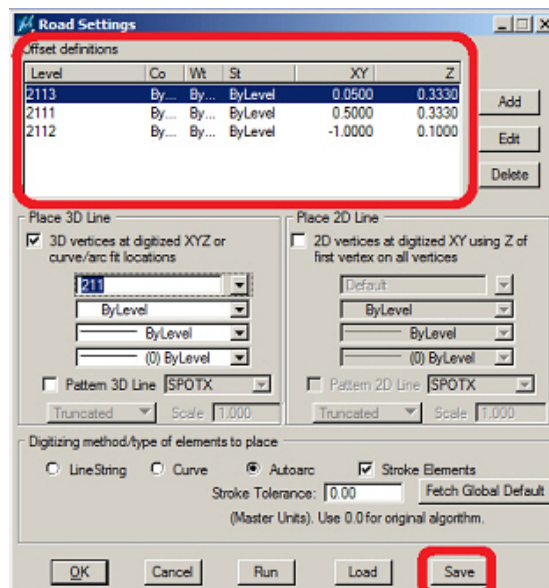
First use ROAD SETTINGS to save a .rcfg file

b. The new 3DOFFSET dialog supports current options plus a new option to **Define offset** > **Import symbology and (multiple) offset(s) from .rcfg (ROAD Config file)**.
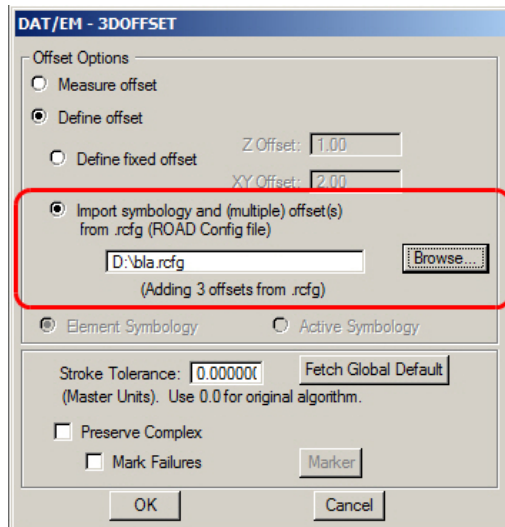
3DOFFSET's new ability to load a .rcfg file to create multiple offsets

c. The .rcfg file name in 3DOFFSET will default to the file most recently saved in ROAD SETTINGS. Browse for a different file if desired.

d. There are three new keyins to control the dialog settings. These may be used from the DAT/EM Keypad, for example.

> **3DOFFSET ROADFILE <full .rcfg path and filename>** - sets 3DOFFSET to use offsets and symbology defined in <full .rcfg path and filename>. The dialog will be updated to show the number of offset definitions read from the file.

> **3DOFFSET USEFIXED** – switches back to using a single XY and Z offset

> **3DOFFSET USEROADCFG** - switches 3DOFFSET to use offsets and symbology defined in the most recently used .rcfg file.

11. AUTOARC and AUTOARC2D have a new setting to break the element that AUTOARC is currently drawing where it snaps to another element. This adds to the existing, independent option to break the element being snapped to while drawing. Together, the two options allow you to break the element being drawn, the element being snapped to, or both elements at their intersection. (August 18, 2016)

In order to maintain the ability to undo, the break for the new option takes place after digitizing is complete.
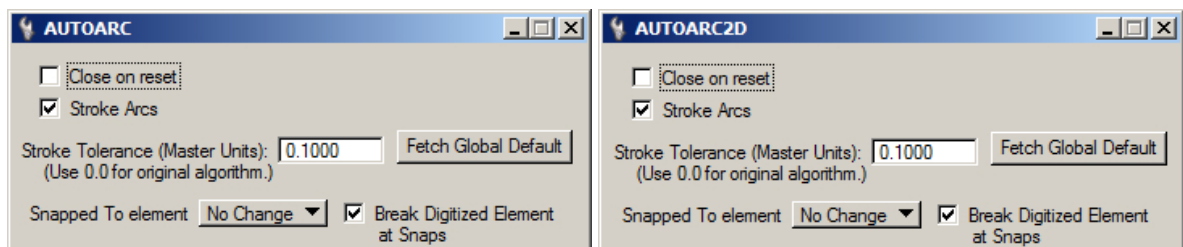
New "Break Digitized Element at Snaps" setting in Autoarc (left) and Autoarc2D (right)

New key-ins are provided with this command. They may be used on buttons or the DAT/EM Keypad:

For AUTOARC:

- AUTOARC DRAWBREAK ON – Enables the AUTOARC functionality to break digitized elements at snap locations.

- AUTOARC DRAWBREAK – Same as AUTOARC DRAWBREAK ON.

- AUTOARC DRAWBREAK OFF – Disables the AUTOARC break functionality (will no longer break digitized elements at snap locations).

- AUTOARC DRAWBREAK TOGGLE – Toggles the AUTOARC functionality to break digitized elements at snap locations from on to off or from off to on.

For AUTOARC2D:

- AUTOARC2D DRAWBREAK ON – Enables the AUTOARC2D functionality to break digitized 2D elements at snap locations.

- AUTOARC2D DRAWBREAK – Same as AUTOARC2D DRAWBREAK ON.

- AUTOARC2D DRAWBREAK OFF – Disables the AUTOARC2D break functionality (will no longer break digitized 2D elements at snap locations).

- AUTOARC2D DRAWBREAK TOGGLE – Toggles the AUTOARC2D functionality to break digitized elements at snap locations from on to off or from off to on.

12. BREAKLINEFILTER has three new keyins for enhanced breakline selection options (Sept. 28, 2016):

   a. **BREAKLINEFILTER LAST** – runs BREAKLINEFILTER on the master design using the most recent dialog settings. This requires that a selection set (defining break lines) was previously specified. If other modes were set (breaklines defined by classes or element picks), the BREAKLINEFILTER dialog will be raised.

   b. **BREAKLINEFILTER CHOOSELAST** – runs BREAKLINEFILTER using the most recent dialog settings on the most recently placed (last) element. The last element must be dimensioned line work suitable as a breakline.

   c. **BREAKLINEFILTER PICK** – runs BreaklineFilter, using the most recent dialog settings, as the user picks (one by one) each break line element. Two back-to-back resets ends this command.

13. BUILDINGFRAME's **Process Elements using Fence** setting is now able to be activated. It was previously visible on the dialog, but always inactive. To use it, first set the desired fence mode and place a fence that defines the objects to process. The current fence mode is enforced: **Inside** will process elements within the fence, **Void** will process elements outside the fence, etc. When the fence is ready, start BUILDINGFRAME and check on the setting. (March 17, 2017)

14. CHANGE ATTRIBUTES INTERIOR's dialog is fixed so that any new checkbox settings are retained properly after launching and returning from the Selection Sets Editor and between MicroStation sessions. (August 15 and September 6, 2016)

15. CHECKATTRIBUTES now has a **VISIT** button that writes the results to a Visit file. Use the file later in the VISIT command to move to the locations. (March 14, 2017)

16. CHANGE TEXT has improved error handling. (Feb. 7, 2017)

17. CHANGE to 2D (MECHANGETO2D) is fixed to properly set the "Fixed Z" > "New Z" elevation to the objects when the design file's Global Origin is a large negative number. (Dec. 7, 2016)

18. CHECKATTRIBUTES has a new Visit option.

- With the interactive version, the option is available as a **VISIT** button after results have been calculated. After you press the button, it will prompt you to provide a name for a visit file to save results. After it writes file, it will prompt you to optionally run Visit right away (on the new file).
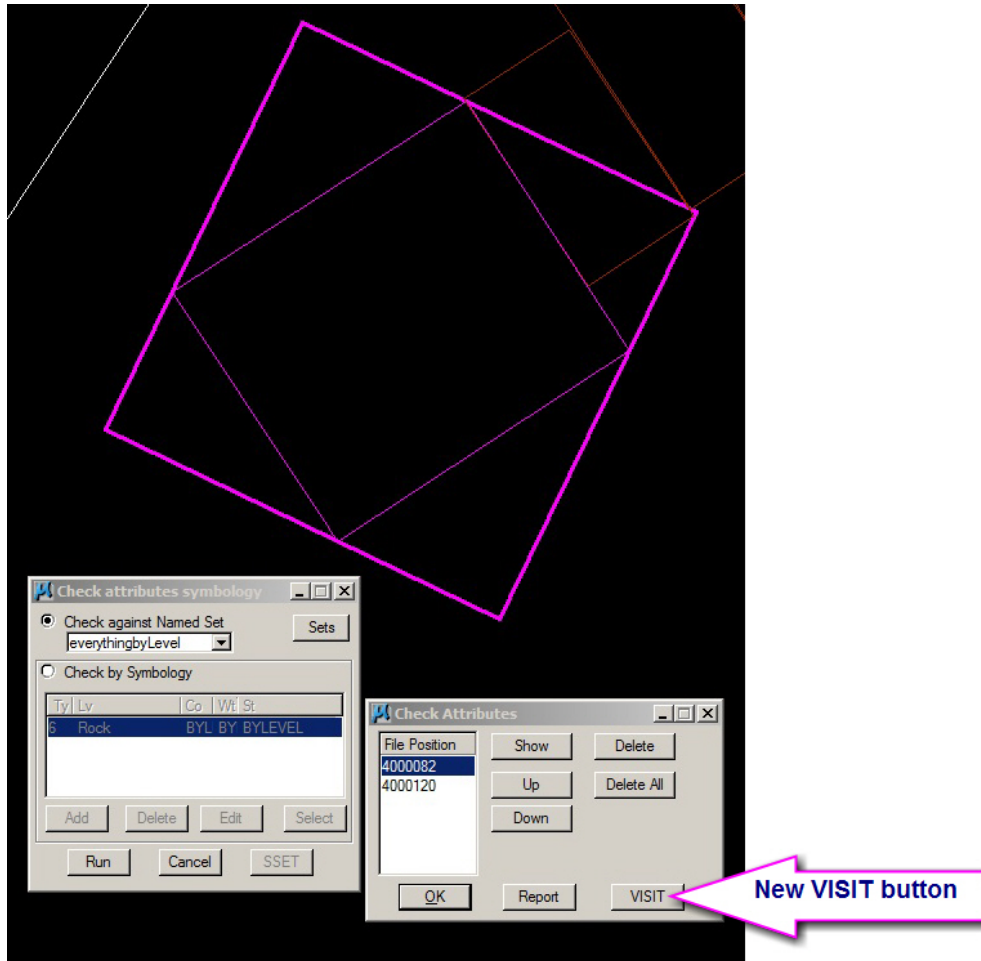
- The parameter file/batch version of Check Attributes gives you the option to make a report or a Visit file. If you choose the Visit file option, you may run "VISIT FILE <visit file name>" to review the Attribute errors.
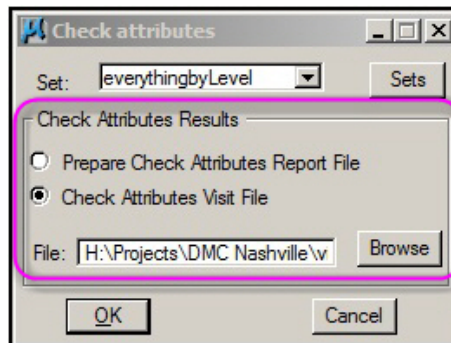
- The following is an example of a selection set used by Check Attributes to verify line work having ByLevel symbology. Note: Comprehensive entries are added to skip checks on Text and Cells. The Check Attributes logic on selection sets flags elements that are not in the specified selection set.
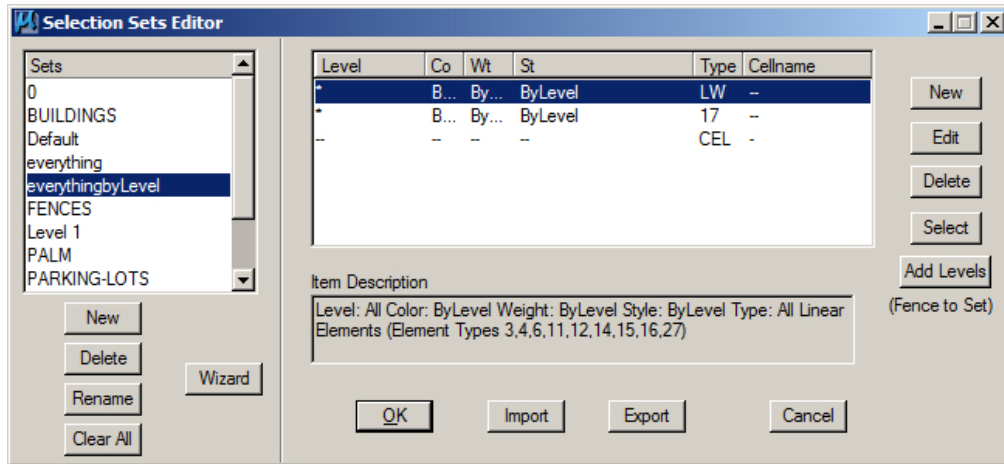
Example of a selection set to have Check Attributes find non-ByLevel symbology on linework

19. CLOSE (MECLOSE) has the following changes:

   a. CLOSE (semi-interactive version) has a new internal algorithm. Previously, the algorithm only handled strings and complex strings. In the case of complex strings, any internal structure (e.g. interleaved arcs) would be lost when the element was stroked. Any other elements, such as b-splines, were not supported. Now relevant (open line work) element types are supported and the element type is preserved (often within complex strings or shapes). (Sept. 8, 2016)

   b. CLOSE (semi-interactive and parameter file) has a new option menu with **Close as Shape** and **Snap ends Only**. These settings allow you to choose what type of element to make. The default setting is **Close as Shape**. **Close as Shape** will result in shapes and complex shapes. The new **Snap ends Only** option must be explicitly selected and will close as end-to-end-snapped strings instead of converting to shapes. (Sept. 8, 2016)
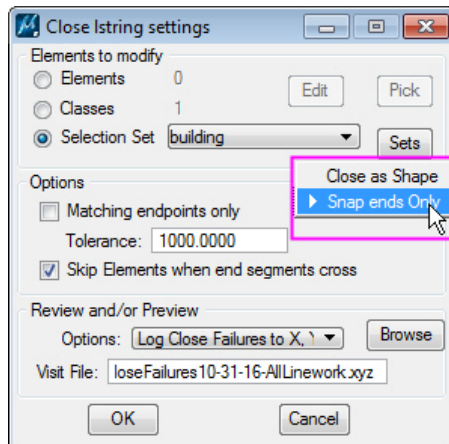
New option to close as a shape or snap ends to retain the original object type

c. CLOSE (all versions) has a new toggle to **Skip elements when end segments cross**. This prevents closing elements that have a 2D intersection of their first and last segments, which would cause a "figure 8" if closed. Instead of closing, these are reported in the log as close failures. (Oct. 27, 2016)
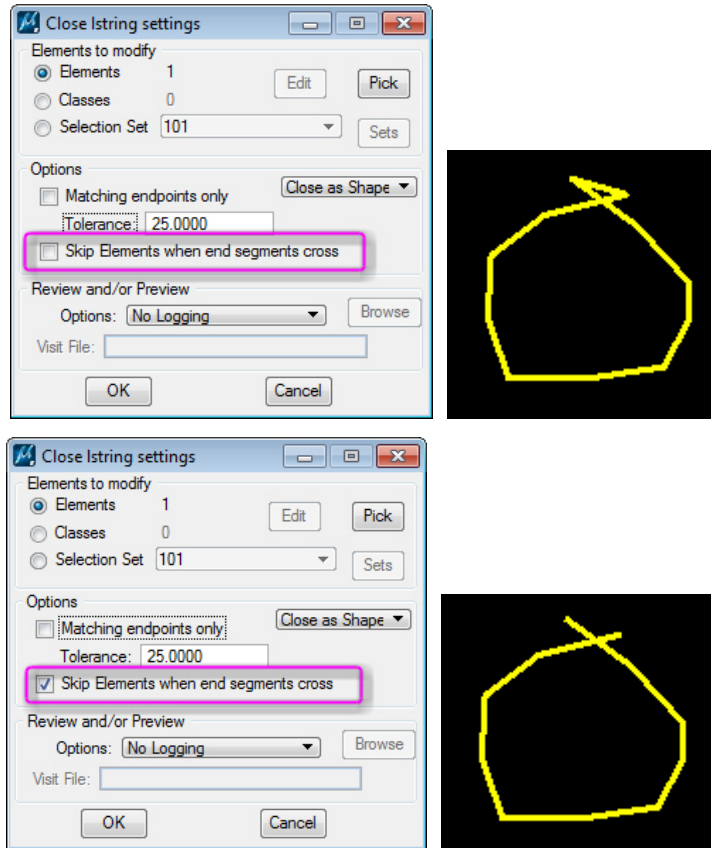
*New option to skip elements that have crossing end segments (prevent a "figure 8")*

d. CLOSE (all versions) has a new check (when the close option is set to **Matching endpoints only**) to ignore elements whose ends were already snapped. This prevents already closed elements from being reported as successful snaps in the log. (Oct. 27, 2016)

e. If endpoints do not match within the **Tolerance** setting, but they are between 1 and 2 times the **Tolerance** setting, they will be reported in the log. Endpoints more than 2 times the tolerance setting from each other will not appear in the log. (Oct. 27, 2016)
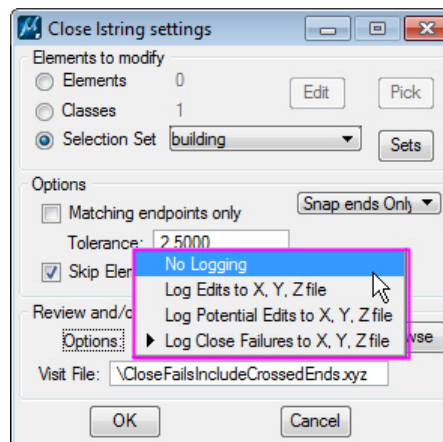
CLOSE has additional logging options and functionality

20. DATDRAW AUTOARC has new checks to make sure the element uses the active level and attributes in its complex header and simplifies elements to non-complex when possible. (January 19, 2017)

21. FILTER (MEFILTER) could give a message, "MDL detects a bad pointer passed to "free" when running FILTER with the "Define Filter Criteria" option set. This problem is fixed. (Dec. 14, 2016)

22. JOINIT has the following changes:

   a. JOINIT (interactive version) has a new **Inhibit shapes** checkbox. If it is checked on, objects that need to close will be closed as their original element type, for example, end-snapped line strings or complex chains. If it is off, they will close as shapes or complex shapes.

   JOINIT's new **Inhibit Shapes** is off by default. JOINIT does not turn joined elements into shapes unless "Join into a single element" is selected and all the end points of combined elements are joined.
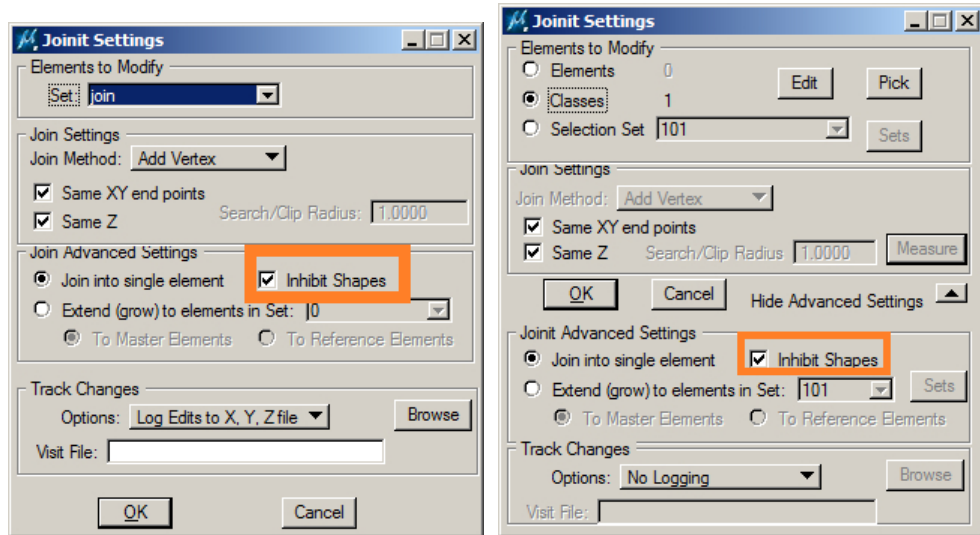
JOINIT (parameter file and interactive versions) "Inhibit Shapes" setting

   b. JOINIT has a new **Log potential edits to Visit file** option. This setting creates a Visit file of potential edit locations, but does not perform any edits. Note that this is different from the "Log Edits to X, Y, Z file" setting, which both edits and creates a Visit file.
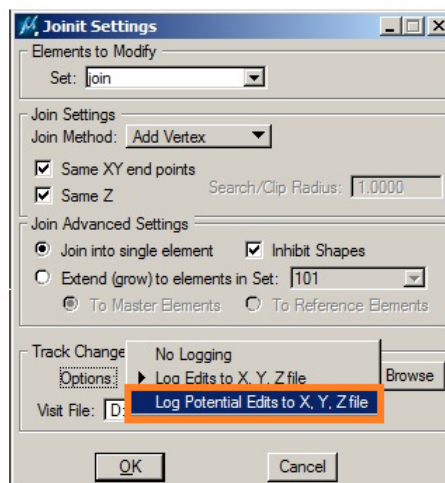
*JOINIT's new **Log Potential Edits to X, Y, Z file** setting*

c. JOINIT (parameter file version) logs more details to the .log file. There is a new count for the number of successfully completed join operations. (Sept. 2, 2016)

d. JOINIT's **Join into single element** setting has a fix for a problem that could happen when touching elements in a main file to elements in a reference file. The problem happened when the same element was cut multiple times at the border between the main file and the reference file. It would have multiple crossings between the main file and the reference file. In this case, the "join into single element" setting could properly touch the objects in the reference file, but then improperly connect the parts that were in the main file together, even if that meant adding a very long segment between the main file parts. (Nov. 28, 2016)
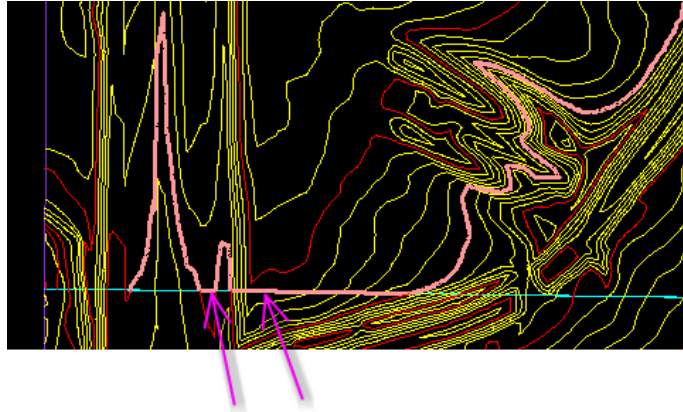
Reference file below, main file above the cyan line.

The fixed version will no longer add the connecting segments indicated by the arrows.

e. Some checks were added around the single undoable delete in JOINIT to skip past any element references (cache entries) that are no longer valid. (Dec. 7, 2016)

23. LD CP DLG (Load Control Dialog) and other commands use a picker library that is fixed so that it will not initialize to the wildcard, *, where such wildcards are invalid. (Feb. 22, 2017)

24. LINESLOPE has two new settings to allow the text objects to be placed on separate levels and attributes. (April 7, 2017)
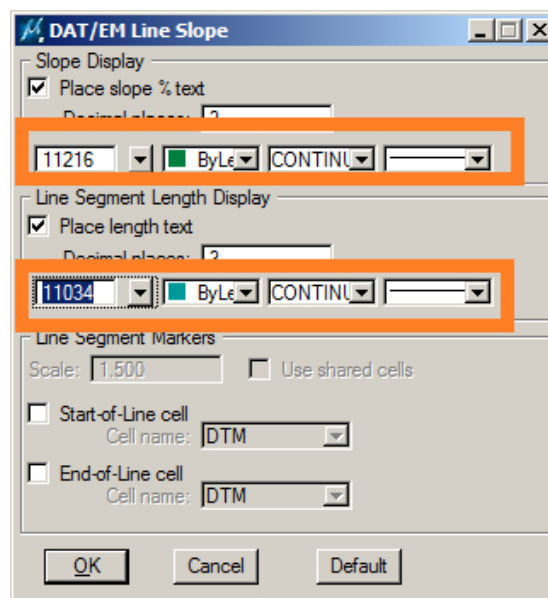
LINESLOPE's new text level settings

33

25. MEXPORT has the following changes:

    a. MEXPORT (SRV, ADF, CEAL) registry settings were being saved to HKEY_LOCAL_MACHINE, which caused registry errors on a Windows 7 test machine. All references were changed to HKEY_CURRENT_USER to prevent permission problems.

    b. MEXPORT had EXP file editing problems. Column sorting when editing EXP file contents might desynchronize internal and external records. This could cause EXP file contents to be damaged if desynchronized edits were saved. Column sorting has been disabled.

    c. The MEXPORT EXP file content display now saves the user's display changes (e.g. column resizing) between MicroStation sessions.

    d. In MEXPORT's logging, the minimum/maximum coordinates are now being initialized correctly, so invalid results are avoided in the report.

    Note that MEXPORT is primarily used by a Department of Transportation client in the U.S., and may not be useful to all clients. (Oct. 24, 2016)

26. PLOTTERZOOM is fixed to force Summit to change models if necessary. (August 22, 2016)

27. SI SETTINGS has the following changes:

    a. SI SETTINGS' dialog prompts have changed and have been rearranged. This should make it easier to understand what the settings do. The internal operation of the settings is exactly the same as for the old dialog; this is a dialog appearance change only. (March 7, 2017)
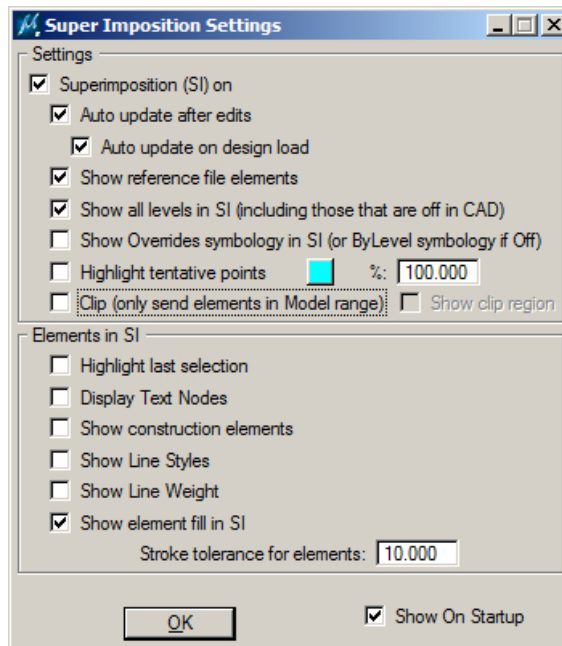
New arrangement for SI SETTINGS

b. SI SETTINGS has a new **Show element fill in SI** option to fill polygons in superimposition (SI). This option works for most elements that are fillable in MicroStation (for example, shapes, ellipses, circles, and closed bsplines) that display in Summit's SI. The exception is complex shapes, which will continue to display as unfilled in SI. (March 2, 2017)
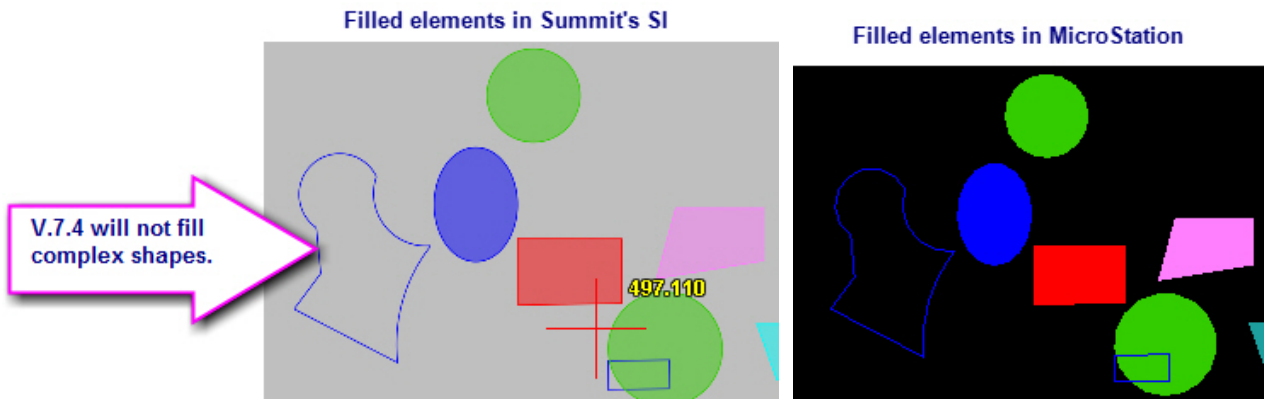
SI fill fills non-complex elements that can be filled in MicroStation

28. SPOTX has the following changes:

a. SPOTX SETTINGS is fixed to better handle the case where **Specify Text Level** is on, but the most recently used (saved in the registry) level doesn't exist. (Sept. 12, 2016)

b. SPOTX has improved memory and error handling that affects the **Use Active Text Settings** checkbox. If it is checked, some memory inside SPOTX could be overwritten. The effect would be an unexpected style setting in the placed text and SPOTX would stop running and would need to be restarted. (March 10, 2017)

29. TWOSHOT <ANGLE/SCALE> has some changes: (Jan. 6, 2017)

a. A rubber band was added between the first and second points for a cell placement.

b. TWOSHOT could fail by exiting too soon. This is fixed.

c. Some versions of MicroStation, including V8i SelectSeries 3, had a mismatch in rotation between point cell display during TWOSHOT and the final placement rotation in superimposition. This is fixed.

Note about TWOSHOT SIBOX_ON: The rubber band will display with or without the SI box (superimposition bounding box). If the cell is a graphic cell, the SI box will display at Summit's cursor elevation; however, if it is a point cell, the bounding box will display at Z=0. Due to the way point cells operate in MicroStation, the bounding box can't be displayed at the right elevation for point cells.

30. VOLUME (MEVOLUME) accuracy has been significantly improved.

31. VISIT ELEMENT has new element size filters. This may be used to find objects that are too small or too big in length or area. The **Include Reference Elements** option allows the filter to either search or ignore reference file elements. (Oct. 28, 2016)
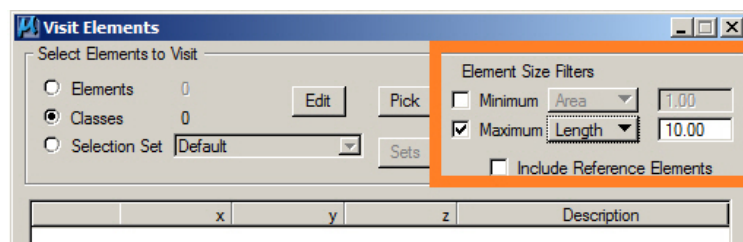

VISIT ELEMENT's new Element Size Filters

Notes:

- Element size parameters are 2D, that is, checked against the object's projection in the (x,y) plane.

- Element size estimates are initialized from the element's bounding box, then refined if the element is linear. This allows size checking on all supported element types.

For example, to find tiny line fragments, check on **Minimum**, set **Length**, and set the smallest allowable length. It will find objects from within the **Select Elements to Visit** criteria that are shorter than the allowable length.

As another example, to find contour exclusions (closed contours that have a very small area) and to check very large closed contours at the same time, set the selection to find the contour shapes, then check on **Minimum**, set **Area**, and set the smallest allowable area. Then check on **Maximum**, set **Area**, and set the largest allowable area. Visit each shape it finds and decide whether it is valid.

32. ZLABEL dialogs have a new option, **Only Mark Elevations evenly divisible by <filter val>**. It filters elevation labels when they are evenly divisible by a set filter value. For example, it can label so that all labels are evenly divisible by 5, resulting in labels of 1050, 1055, 1060, 1065, etc., while elevation contours in between do not receive labels. For example, with ZLABEL GUIDERS, it will only label objects that meet the elevation divisibility rule, even if the guider crosses more objects that do not. (Feb. 24, 2017)
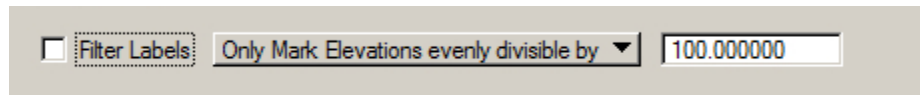
New setting in ZLABEL dialogs

When **Only Mark Elevations evenly divisible by…** is set:
- ZLABEL INTERVAL – Checks evenly spaced locations along linear elements, but will only add labels when the filter divisibility rule is met.

- ZLABEL GUIDERS – Element intersections with Guiders will only be labeled if the filter divisibility rule is met. Other guilder intersections will be ignored.

- ZLABEL GUIDERDRAW – Intersections will be checked while drawing temporary guiders, but elements will only be labeled if the filter divisibility rule is met.

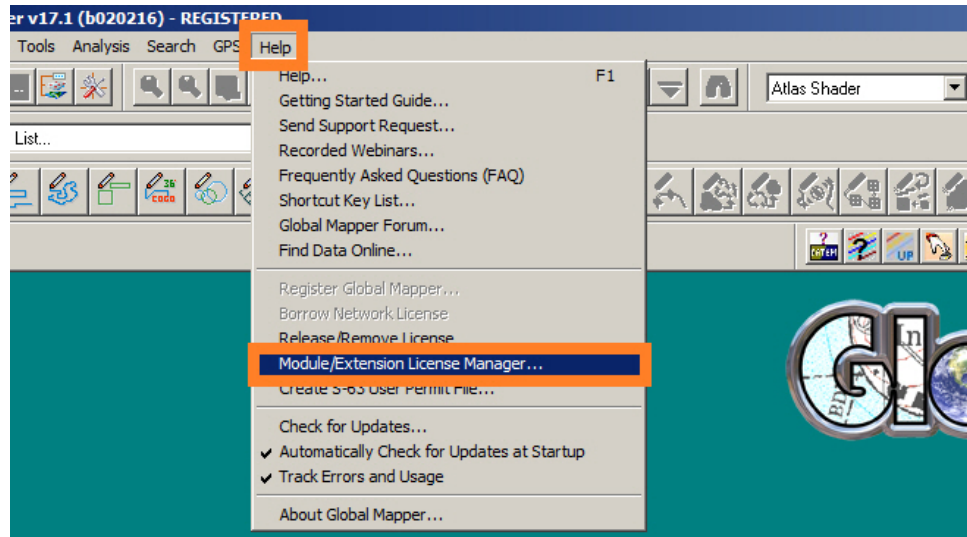# DAT/EM Capture for Blue Marble Global Mapper

Changes apply to Capture for Global Mapper. DAT/EM Capture for Global Mapper is supported for the following Global Mapper versions:

- *16.x dated after March 2, 2015*

- *17.1.2 or higher*

- *18.x (up to the date of this DAT/EM release)*. For Global Mapper 18 versions after the date of this document, please ask DAT/EM Support whether the version is expected to work well.

Version notes:

- If Global Mapper 17 or 18 is the only version of Global Mapper on the computer, DAT/EM will install a new extension that uses Global Mapper's v.17 API. If v.16 and/or v.15 are also on the computer, the older extension using the older API will be installed for all versions.

- To see which extension version is running, select Global Mapper > Help > Module/Extension License Manager:
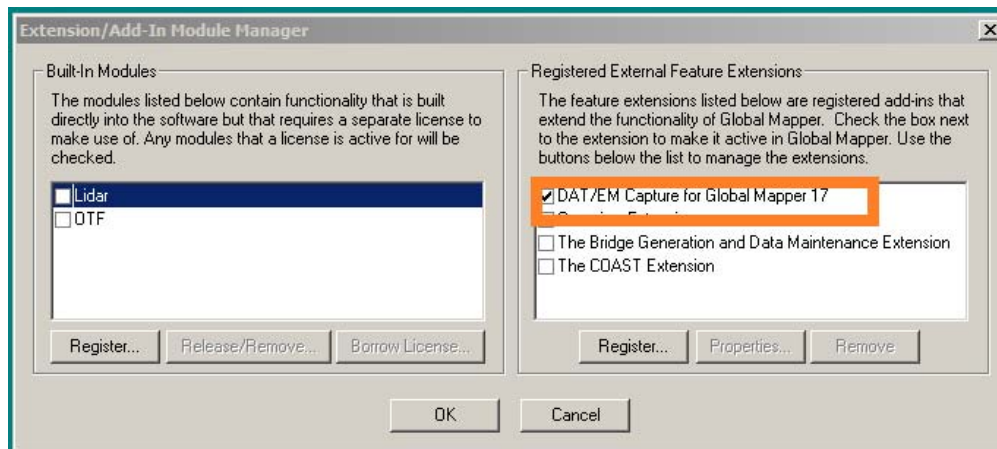

The DAT/EM multiplatform DLL appears as "DAT/EM Capture for Global Mapper":
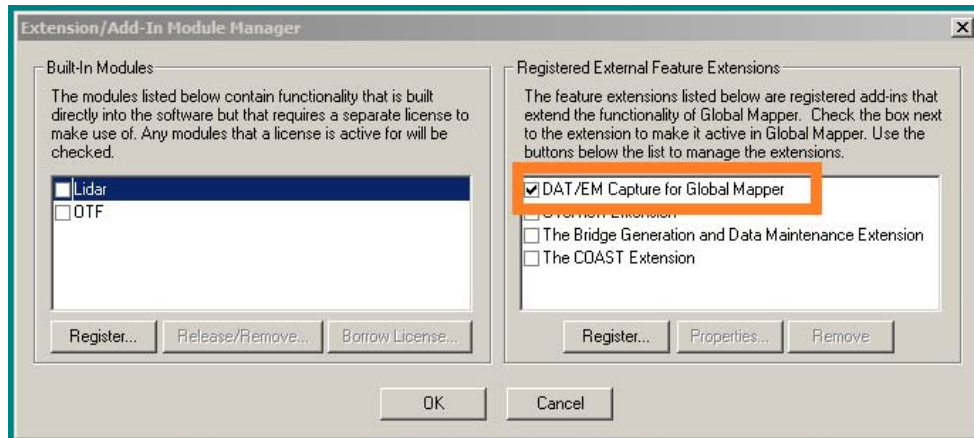
Old DLL that uses the pre-v.17 SDK

The new DLL that uses the v.17 SDK appears as "DAT/EM Capture for Global Mapper 17":

New DLL that uses the Global Mapper v.17 SDK

Advice for disabling and re-enabling the DAT/EM Capture extension:

- If you would like to disable the Capture extension, please close Global Mapper and use the DAT/EM CAD Enabler instead of unchecking it in Global Mapper's Help > Module/Extension License Manager. To start the CAD Enabler, select Windows Start > All Programs > Datem Software > Utilities > CAD Enabler. Set Global Mapper to "Disable" and OK.

  To enable again at any time, run the CAD Enabler again and set Global Mapper to "Capture". Note that "Capture" will be the default in the dialog every time it appears, because it doesn't check the currently enabled status of any of the products.
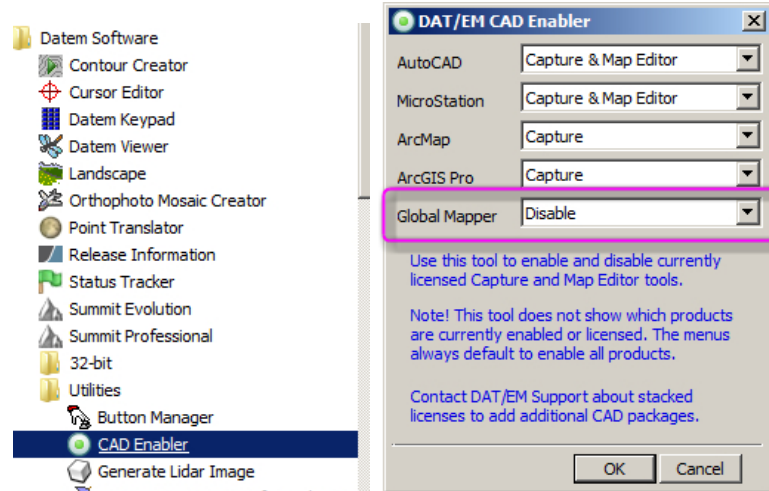
To disable, use the CAD Enabler instead of unchecking the extension inside Global Mapper.

Close Global Mapper before running the CAD Enabler.

The following changes were made to DAT/EM Capture for Blue Marble Global Mapper:

1. Feature picks can now be made from either Summit's cursor or the system mouse in Global Mapper. (July 1, 2016)

2. There were a few cases where the Summit stereoplotter drive was skipped. These are fixed. (July 1, 2016)

3. The DAT/EM Editing Tools are new. These tools allow you to modify existing lines and areas.

   The editing tools are accessible from your choice of the following:

   - The DAT/EM Keypad set to the command keyword

   - A digitizer button set to the command keyword

   - The Edit Tools button on the DAT/EM toolbar:
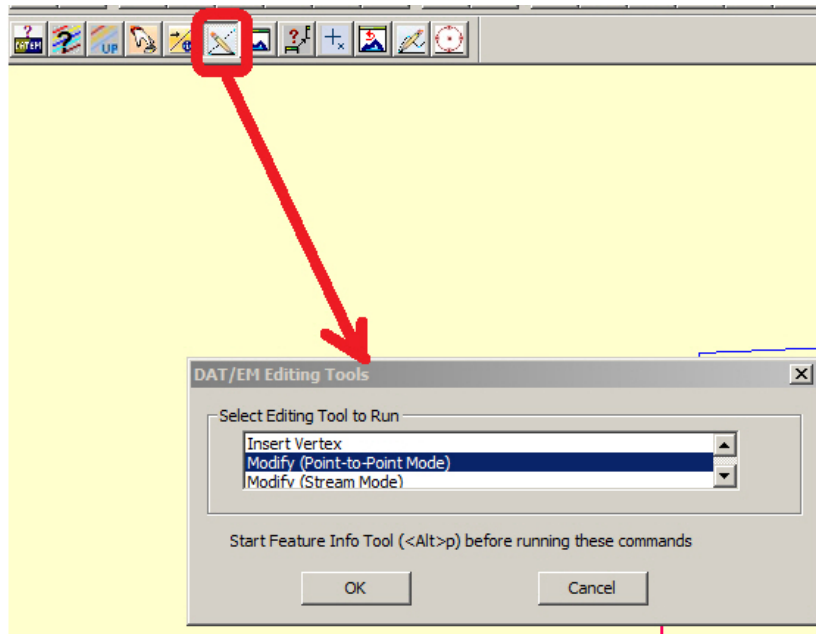
Use the Edit Tools button to start the editing tools

The editing tools are as follows:

a. **Insert (Add) Vertex** is a two-step command: Pick a location on an existing segment where the new vertex will be added and pick the location where the new vertex will be located. Like all the new commands, Insert Vertex works from both Summit and Global Mapper (previously, feature picks had to be made in the Global Mapper, while digitizing had to be done in Summit). The keyword to use on the DAT/EM Keypad and digitizer buttons is: **AddVertex**.
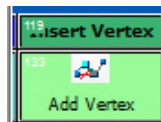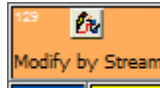

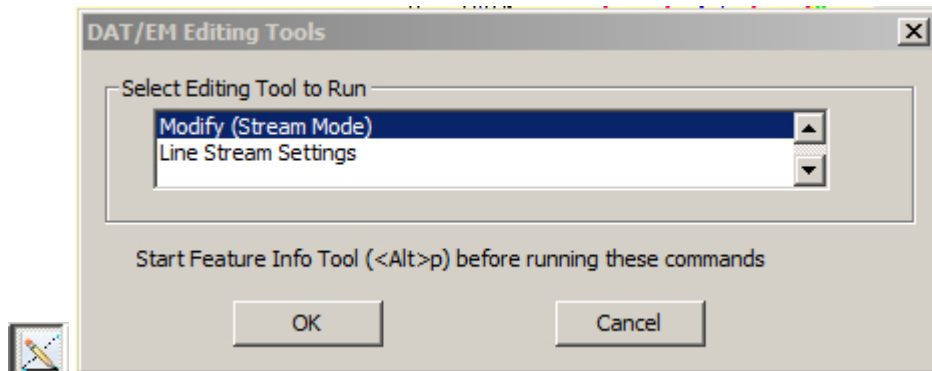*Insert (Add) Vertex as seen on the DAT/EM Keypad*
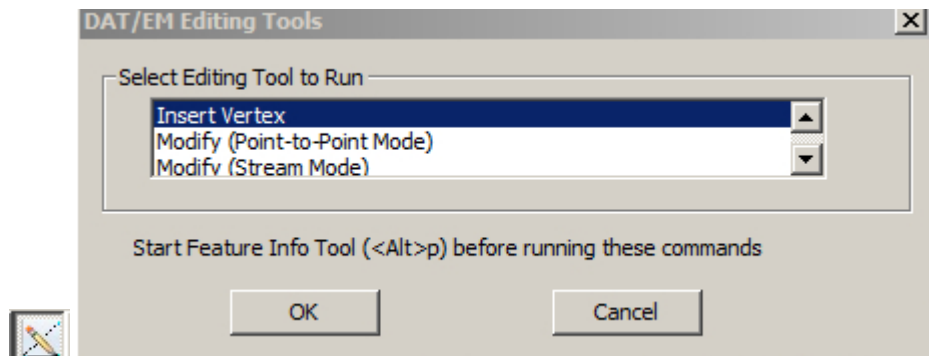
Insert Vertex as seen in the DAT/EM Editing Tools dialog

b. **Modify (Stream Mode)** is a new editing tool that edits an existing line or area using the new DAT/EM stream drawing mode to add a new section of vertices. The keyword to use on the DAT/EM Keypad and digitizer buttons is: **ModifyFeatureStream**. See instructions below "Modify by Vertex".
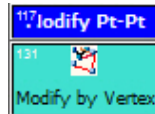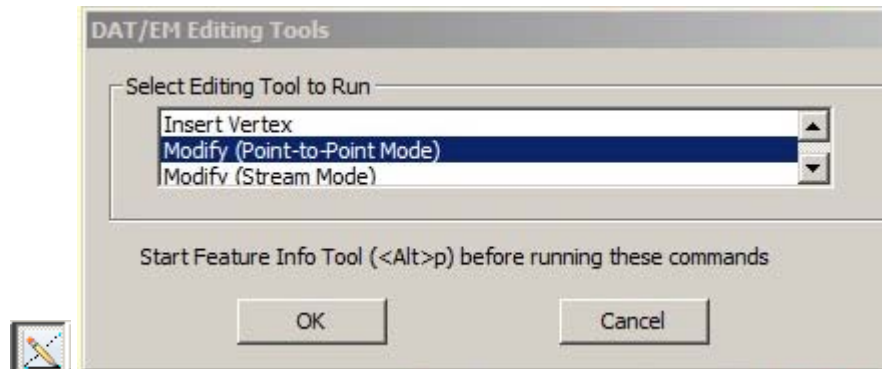

Modify by Stream as seen on the DAT/EM Keypad

Modify by Stream as seen in the DAT/EM Editing Tools dialog

c. **Modify (Point-to-Point Mode)** is a new editing tool that edits an existing line or area using the DAT/EM point-to-point drawing mode to add a series of new vertices to an existing object. The keyword to use on the DAT/EM Keypad and digitizer buttons is: **ModifyFeaturePt**.

Modify (Point-to-Point Mode), also known as Modify by Vertex, as seen on the DAT/EM Keypad

Modify (Point-to-Point Mode) as seen in the DAT/EM Editing Tools dialog

Instructions to use **Modify (Stream Mode)** and **Modify (Point-to-Point Mode)**:

   i. Select **Modify (Point-to-Point)** or **Modify (Stream Mode)** from the DAT/EM Editing tools or select **Modify by Vertex** or **Modify by Stream** from the DAT/EM Keypad or digitizer button.

  ii. Select a location on an existing line or area that requires editing. To append new vertices, select the end of a line. To edit an interior section or replace some vertices on the end section, select on the vertex or segment where the new vertices should start.

 iii. Digitize the new vertices by moving the cursor along the new vertex path for streaming mode or by picking each vertex for point-to-point vertex mode. In stream mode, vertices will be added automatically according to the current Line Stream Settings shown above in the 2D and 3D Line stream tool.

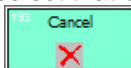 iv. To end digitizing, select Modify Review on the keypad or digitizer button or press the Reset/Cancel button.

      Note: When editing an area feature, the ending vertex must be snapped to a location on the feature being edited.

  v. Now decide how the new vertices tie into the existing object: To append the new vertices to the end of the selected line, select Modify/Apply (ModifyFeatureApply) or left click to accept. To cancel or rollback the edit, use (Cancel) or right click. In the case where the initial pick point on the feature is not at the start or end of the line, but is instead on an interior vertex or segment of a line or area, allows you to view up to four different clip options for the edit part of the modify. Keep pressing the Modify/Review key until the option you like is displayed, then use (ModifyFeatureApply) to save that edit choice.

 vi. To modify another object, select that object and repeat the editing process. Or, to terminate the Modify tool, select another or right click.

4. The DAT/EM Keypad tools have been improved for use with Capture for Global Mapper. DAT/EM encourages you to select "DAT/EM Keypad" during software installation, even if you don't have the DAT/EM Keypad hardware. If "DAT/EM Keypad" was not selected during installation, you can start it manually from "C:\Program Files (x86)\Datem Software\KeypadController.exe". Anyone may use the Keypad Controller on screen, even without the Keypad hardware. The Keypad for Global Mapper has the following changes:

  a. The new point streaming and editing commands mentioned above have been added to the example keypad configuration that is installed, "C:\ProgramData\Datem Systems\keypad\GlobalMapper.dkf".
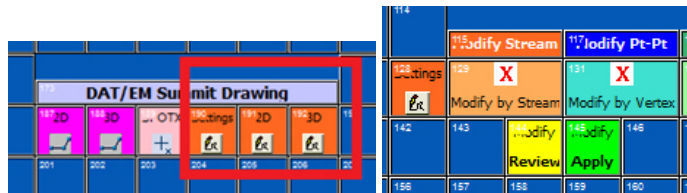

Streaming and Modify tools on the example DAT/EM Keypad overlay

b. The following is the keyword list to be used for the DAT/EM Keypad and Button Manager buttons, including new and existing keywords:

AddVertex	FitView
DeleteObject	ModifyFeatureApply
Draw Line2D	ModifyFeaturePt
Draw Line3D	ModifyFeatureReview
Draw Stream2D	ModifyFeatureStream
Draw Stream3D	RefreshView
Draw StreamSettings	SI On
Draw Spotx	SI Off
CallCommand MoveToCmd	SI Update
CallCommand StopMoveToCmd	ToggleDatemCursor
CallCommand Close	Undo – Limited to ongoing digitizing
CallCommand Open	ZoomPlotter
Cancel	

In addition, you may use the DAT/EM Keypad to call your own Global Mapper Scripts (refer to http://www.bluemarblegeo.com/knowledgebase/global-mapper/ScriptReference.html). In the DAT/EM demonstration DAT/EM Keypad .dkf file for Global Mapper, keys 225 (Script Demo) and 226 (Macro Demo) illustrate this.
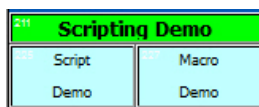
`c:\classBuildings.gms` (script demo key on left) and `EDIT_VECTOR FILENAME=*`
`AREA_TYPE="Building - Ground" COMPARE_STR="DGN_LEVEL=33"` (macro demo key on right)

-End-