



# Version 8.0 Release Notes

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The following changes have been made to DAT/EM products between Release 7.7 and Release 8.0. 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](mailto:support@datem.com) or call us with your requests.

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## Operating Systems and Microsoft Updates

DAT/EM software no longer supports 32-bit operating systems. Any reference to an OS in the remainder of this document refers to the 64-bit version of that OS only.

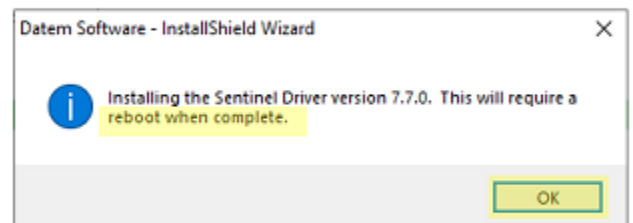
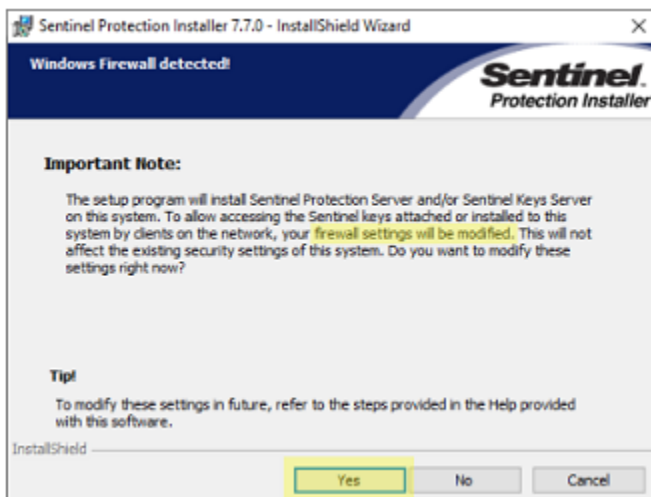
DAT/EM Release 8.0 is supported on the following operating systems:

- 64-bit Windows 8.1 Professional and Enterprise is supported, but discouraged. Notes:
  - **\*NEW\*** DAT/EM plans to stop supporting Windows 8.1 before Microsoft stops extended support for it. DAT/EM plans to drop Windows 8.1 OS support in the next DAT/EM release after this one.
  - Be aware that it will be very slow for DAT/EM to troubleshoot any Windows 8.1 OS-related issues you might encounter. Our Support Department uses Windows 10 exclusively.
  - We strongly encourage any Windows 8.1 OS to be updated to Windows 10 as soon as possible.
- 64-bit Windows 10 Professional and Enterprise. Notes:
  - 64-bit Windows 10 is DAT/EM's preferred OS.
  - DAT/EM generally recommends installing all Windows updates; however, if you are using nVidia 3D Vision and a Microsoft semi-annual channel update greater than 21H1, please check with DAT/EM to ask whether 3D Vision still works with the newer channel update. Let us test it before you do.
  - DAT/EM software does not work with Windows 10 LTSC (Long-Term Servicing Channel), also formerly known as LTSB (Long-Term Servicing Branch).

## Hardware Locks/Dongles

Install Microsoft Updates 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. Stacked Capture for Global Mapper is now a locked DAT/EM product. There is a new Stacked Capture and annual Support price for Capture for Global Mapper. With a Stacked Capture for Global Mapper order, DAT/EM will provide a WriteLock executable to apply to your hardware lock. Please contact your DAT/EM reseller if you would like to order Capture for Global Mapper (July 21, 2020)
2. The Thales Sentinel driver version 7.7.0 is provided with DAT/EM version 8.0. This is the first DAT/EM release to use Sentinel 7.7.0. The first run of DAT/EM v.8.0 Setup or DAT/EM Prerequisites installation built 4 February 2021 or later will install or update the Sentinel driver to 7.7.0. Answer **Upgrade** to the **Confirm Upgrade** dialog, accept the license agreement, and answer "Yes" to Sentinel's firewall question and "OK" to reboot when asked.



*It is very important to answer "Yes" to this question and reboot when done*

**Sentinel Driver on Network Lock Servers:** If you have a network lock on a network server, DAT/EM strongly advises you to install Sentinel 7.7.0 on the network lock server to match the version on the DAT/EM workstations. DAT/EM provides a convenient prerequisites setup file that installs the required Microsoft C++ redistribution files and the Sentinel 7.7.0 driver:

- [Datem PreReqs blt 02 03 2021.exe](#)
- This is [www.datem.com](http://www.datem.com) > Support > Downloads > Prerequisites > "DAT/EM Prerequisites ... Sentinel 7.7.0 ..."
- Answer "Yes" to Sentinel's firewall question (see images above).
- Reboot the server after installation.

**Please do not skip the update for the network lock server.** The newer Sentinel driver works better, and the best communication can be expected when the Sentinel versions match.

## DAT/EM Virtual Reality (VR)

DAT/EM Virtual Reality (VR) was re-released in DAT/EM version 7.7, but is still considered in development as of version 8.0. It is now developed with Amazon Lumberyard®, making it compatible with almost any brand of VR headset. Although we say "almost any", we recommend the highest-resolution options and not the least expensive options. It does not work well with the Oculus Quest 2, for example. There were no changes to DAT/EM VR between v.7.7 and 8.0.

Amazon Lumberyard is a trademark of Amazon.com, Inc. or its affiliates in the United States and/or other countries. Oculus Rift is a trademark of Facebook Technologies, LLC. HTC Vive is a trademark of HTC Corporation.

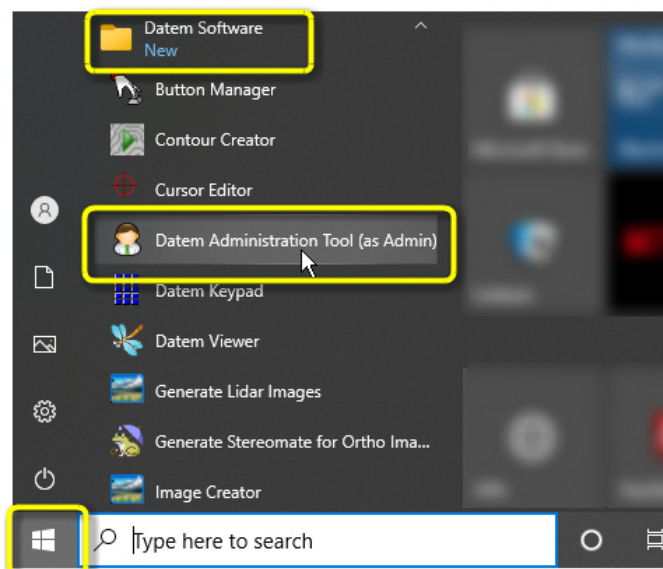
## Stereo Viewing Devices and Drivers

Please contact DAT/EM Support if you have any questions about setting up nVidia 3D Vision, buying 3D Vision-compatible monitors, or setting up any other brand of stereo monitor. There is too much information to include here.

## DAT/EM Administration Tool **\*New!\***

The new DAT/EM Administration Tool combines a few tools that DAT/EM has offered separately in the past, plus some new tools. All can be accessed from one convenient location now.

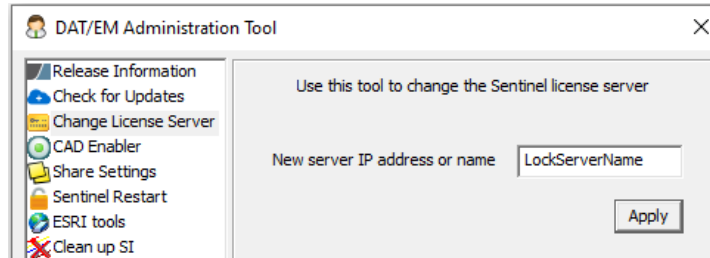
Start the tool with **Windows Start > Datem Software > Datem Administration Tool (as Admin)**. This launches the tool as Administrator; if you receive a message asking you to confirm running as Administrator, answer **Yes**.



*Launch the new DAT/EM Administration Tool*

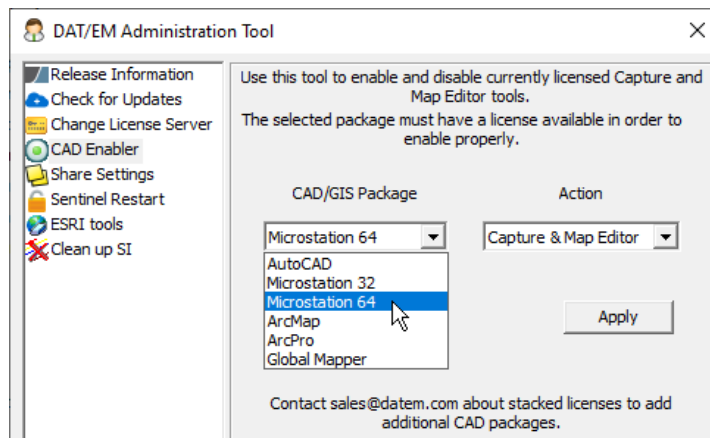
DAT/EM Administration Tool descriptions:

- **Release Information button:** Runs DAT/EM Release Information.
- **Check for Updates:** Checks your version against the latest DAT/EM release and latest beta. It requires an Internet connection.
- **Change License Server:** Allows you to key in a new machine name (preferred) or IP address of a DAT/EM network lock.



*New hardware lock server name entry in the new DAT/EM Administration Tool*

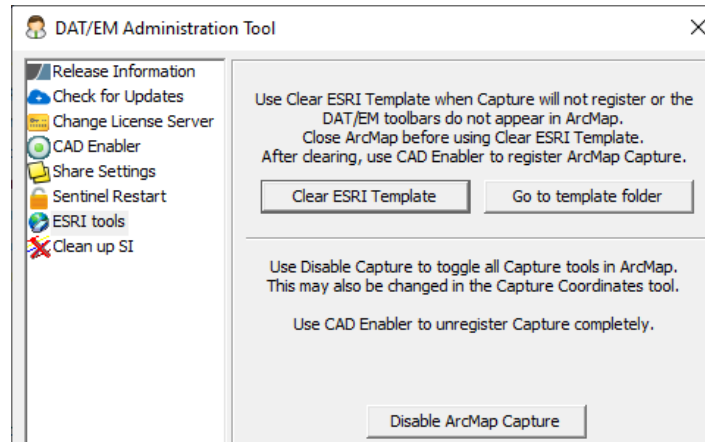
- **CAD Enabler:** This tool replaces the older stand-alone CAD Enabler, which is no longer installed. It allows you to choose a CAD or GIS package and enable or disable the licensed DAT/EM components or extension for that package. This performs one additional function over the previous stand-alone CAD Enabler: It can enable Capture alone without enabling MapEditor, so the choices are Capture, MapEditor, or both Capture and MapEditor for AutoCAD and MicroStation. Note: Like the older standalone CAD Enabler, the current activation or even installation status of any product is neither checked nor displayed.



*Example: Capture & MapEditor setting for "MicroStation 64" (CONNECT-based products) in the new DAT/EM Administration Tool's CAD Enabler*

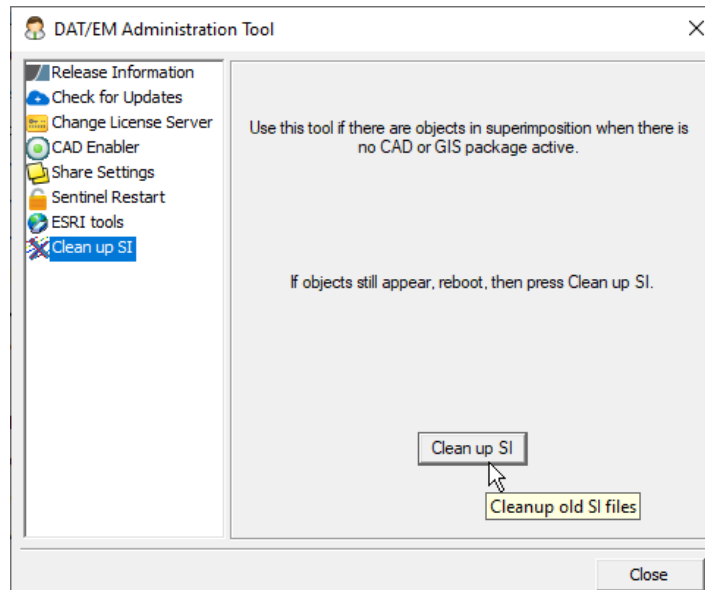
- **Share Settings:** This tool is just like the old Share Settings application, except now it's located here. Share Settings is still available from Windows Start as well, but it is the same no matter where it is started.
- **Sentinel Restart:** Stops and restarts the three Sentinel services: SentinelKeyServer, SentinelProtectionServer, and SentinelSecurityRuntime. Try this tool if you see a "hardware lock not found" error when trying to start a DAT/EM application and you know the hardware lock is plugged in.

- **Esri Tools:**



*New Esri-related Tools in DAT/EM Administration Tool*

- Use **Clear ESRI Template** when your ArcGIS template is corrupt, which is especially noticeable when it won't allow the DAT/EM Capture extension to register.
- Use **Go to template folder** when you want to view or rename the template instead of deleting it.
- Use **Disable/Enable ArcMap Capture** when you want to disable and enable Capture without actually unregistering/registering the extension. When disabled, it will not take a Capture for ArcGIS license from the DAT/EM hardware lock, but leaves the extension registered. This can be used without full Administrator privileges. **Disable ArcMap Capture** is the same as using the Enable and Disable buttons from the DAT/EM Capture Coordinates dialog inside ArcMap; it is not the same as using the **CAD Enabler** tool to disable or enable the extension.
- **Clean up SI:** Close all DAT/EM software and close the CAD/GIS software before running this tool. Run this tool if obsolete superimposition (SI) vectors appear in Summit/LandScape/Ortho+Mosaic/Point Cloud/Contour Creator, even when CAD/GIS is not running or when a different CAD file is loaded. **Clean up SI** removes SI remnant files that may have been left on the disk after an SI source application abruptly stopped due to a crash or power outage.



*New Esri-related Tools in DAT/EM Administration Tool*

## **Point and Image File Formats (Affecting Multiple DAT/EM Applications)**

DAT/EM applications read a variety of file formats that contain points and images. The code is shared among several DAT/EM applications, so when one can read a certain format, so can the others. The following changes have been made to the list of supported formats:

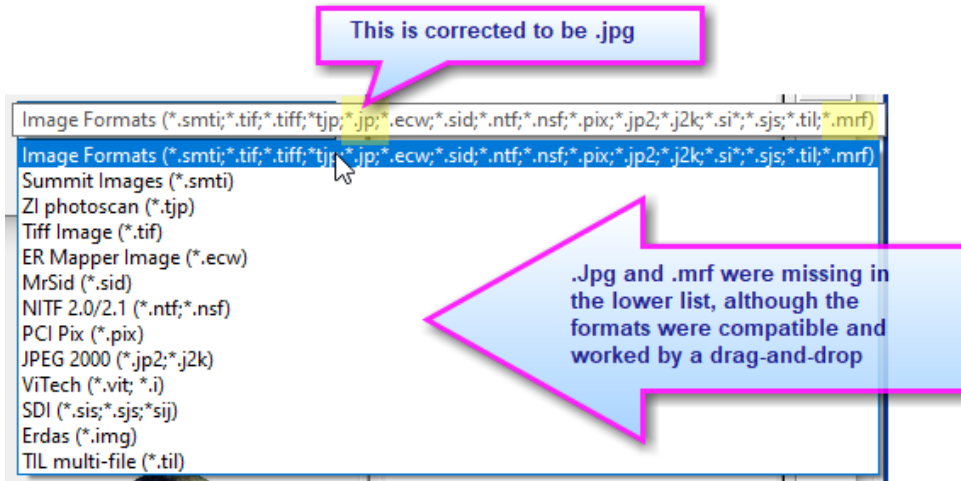
1. Large, tiled TIF DEM files could cause DAT/EM Point Translator to crash on processing. This is fixed. (June 2020)
2. The open-source LAZ library that DAT/EM and most developers use was changed by its author. Using the old method to read and write LAZ caused crashing in DAT/EM applications or the CAD/GIS programs running DAT/EM commands. DAT/EM v.8.0 updated to the new LAZ library. While this restored the ability to read and write LAZ in DAT/EM stand-alone applications and some Capture and MapEditor products, it was not possible to restore LAZ read/write in other products. The new LAZ library is not compatible with old compilers used for old CAD/GIS versions. Capture and MapEditor CADs/GISs that will no longer offer LAZ include: (August 31, 2020 with further fixes for true 16-bit color September 10, 2020)
  - Bentley MicroStation V8 2004 Edition, XM, V8i SelectSeries (up to and including SelectSeries 10)
  - Autodesk AutoCAD 2010 and earlier
  - Blue Marble Global Mapper
  - Esri ArcGIS versions 9.x

In these applications, if LAZ is presented in a list of formats by DAT/EM commands such as DAT/EM “Elevate”, which reads DEM files, it will not crash, but it will simply do nothing if you select a LAZ file. Where possible, the application or command will not show LAZ as a format choice.

Applications and tools that use newer compilers, for example DAT/EM Point Translator and the DAT/EM Capture for ArcGIS 10.x “Elevate” tool, will now read/write LAZ successfully.

If you need to read a LAZ file in one of the applications that no longer supports it, convert the LAZ to a LAS file using DAT/EM Point Translator, then use the LAS file instead.

3. DAT/EM applications will now read TFW files that do not have a blank line feed after the last text field in the file. TFW are “Tiff World” files that define coordinates for a TIF orthophoto image. Previously, if this final line feed was not in the file, it would misread the Y corner coordinate, resulting in the Y origin being 0 (zero) for DAT/EM image displays such as in Summit and DAT/EM Image Viewer. (October 2, 2020)
4. The Image Information tool offered in various DAT/EM applications will now show compression as “JPEG” for compressed JPG files. Previously, it showed compression as “Not known”. (October 2, 2020)
5. JPG files with JGW world files did not display at the correct coordinates in DAT/EM applications. This is fixed to properly position the upper left coordinate from the JGW at the upper left corner of the JPG. Note that world files give the (x,y) of the upper left pixel corner, not the center of the upper left pixel. This only affected JPG format, which is read by the new GDAL library that was first implemented in version 7.7. (October 2, 2020)
6. Image browsing dialogs had a misspelling so that \*.jp appeared instead of \*.jpg. In addition, .jpg and .mrf files were not properly showing as files in the folder for selection. The browse format lists and the files offered in the folder are now corrected and match the valid image file formats. (October 5, 2020)



7. DAT/EM received an untiled JP2 image at 21248x23574 pixels with 3 channels and 2 bytes per channel. This image was essentially one giant tile, and it crashed our previously existing image readers and several other common third-party image reading applications. DAT/EM updated the OpenJPEG library version and applied this reader successfully to the file. DAT/EM applications are now able to open this file type and display it without having to add tiles. The speed and memory use are generally acceptable, but if you'd like to speed it up and reduce memory use, use the DAT/EM Image Creator v.8.0 or higher to convert this file type to a tiled JP2 or tiled TIF/BigTiff (all Image Creator output is tiled automatically). (November 5, 2020)
8. DAT/EM applications will now correctly read an additional variation of TIF format that has LZW compression in the image levels. (March 16, 2021)



## DAT/EM Keypad

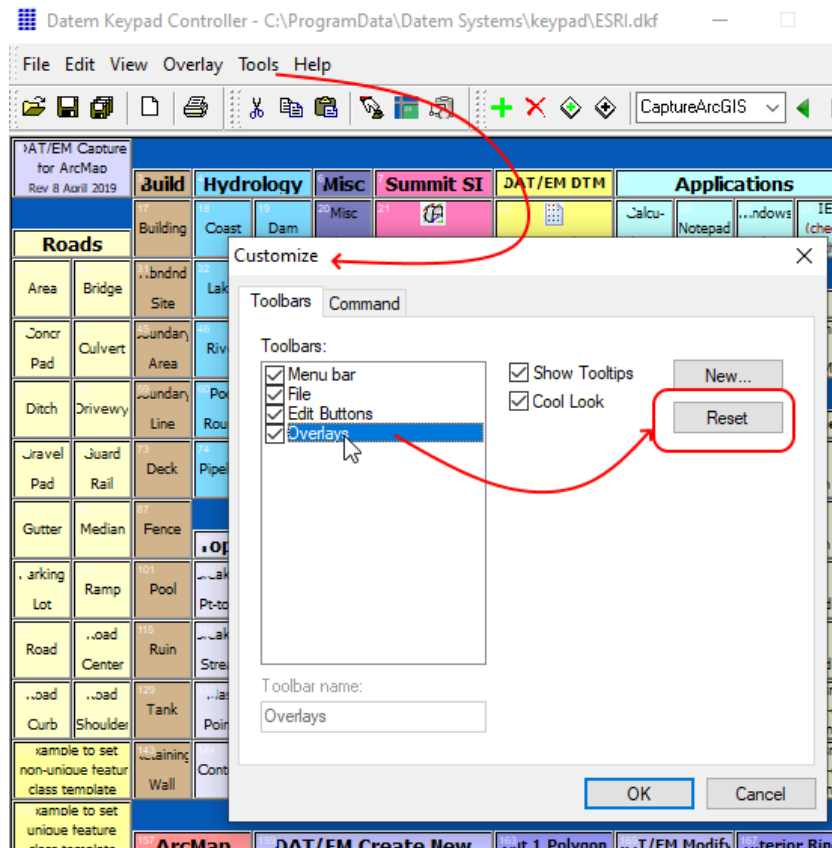
The following changes have been made to the DAT/EM Keypad products:

1. There are new buttons to quickly set the previous or next overlay. (May 29, 2020)



*New Keypad overlay previous and next buttons*

These new buttons should appear on the toolbar to the right of the overlay name. If you don't see them, select Keypad Controller > Tools > Customize > select "Overlays" > "Reset" button.



*If necessary, do this to make the new previous/next overlay buttons appear on the toolbar*

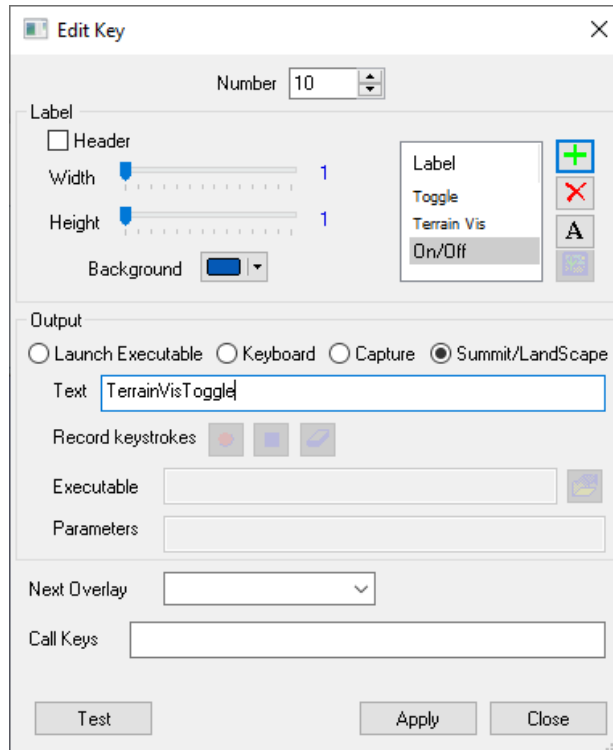
2. The example DAT/EM Keypad file called ESRI.dkf has been generally reorganized and updated to show the new DAT/EM Replace Geometry tool options. (August 14, 2020)
3. There is a new example DAT/EM Keypad file called MicroStation64.dkf for demonstrating with 64-bit MicroStation versions such as CONNECT and OpenRoads. Note that the key-in to set a level now needs quotes around the level name if the level name contains a space character. (June 23, 2021)
4. The Standalone Keypad for 32-bit MicroStation (such as V8i SelectSeries) might fail to load if the full version of DAT/EM Capture was previously installed on the same computer. This is fixed. (January 28, 2021)



5. The DAT/EM Keypad Controller's **Summit/LandScape** output type now has a set of keywords to activate Summit and LandScape application tasks from the Keypad. The lists of keywords are presented in two separate documents:

- For Summit keywords, see “SummitKeypadKeywords\_<date>.pdf” offered for download from [www.datem.com](http://www.datem.com)
- For LandScape keywords, see “LandScapeKeypadKeywords\_<date>.pdf” offered for download from [www.datem.com](http://www.datem.com).

To set a Keypad key for Summit or LandScape, set the output type to **Summit/LandScape** in the DAT/EM Keypad Controller's Edit Key dialog. Then set the **Text** field to the keyword string from the above documents. (July 9 and 10 and November 6-12, 2020)



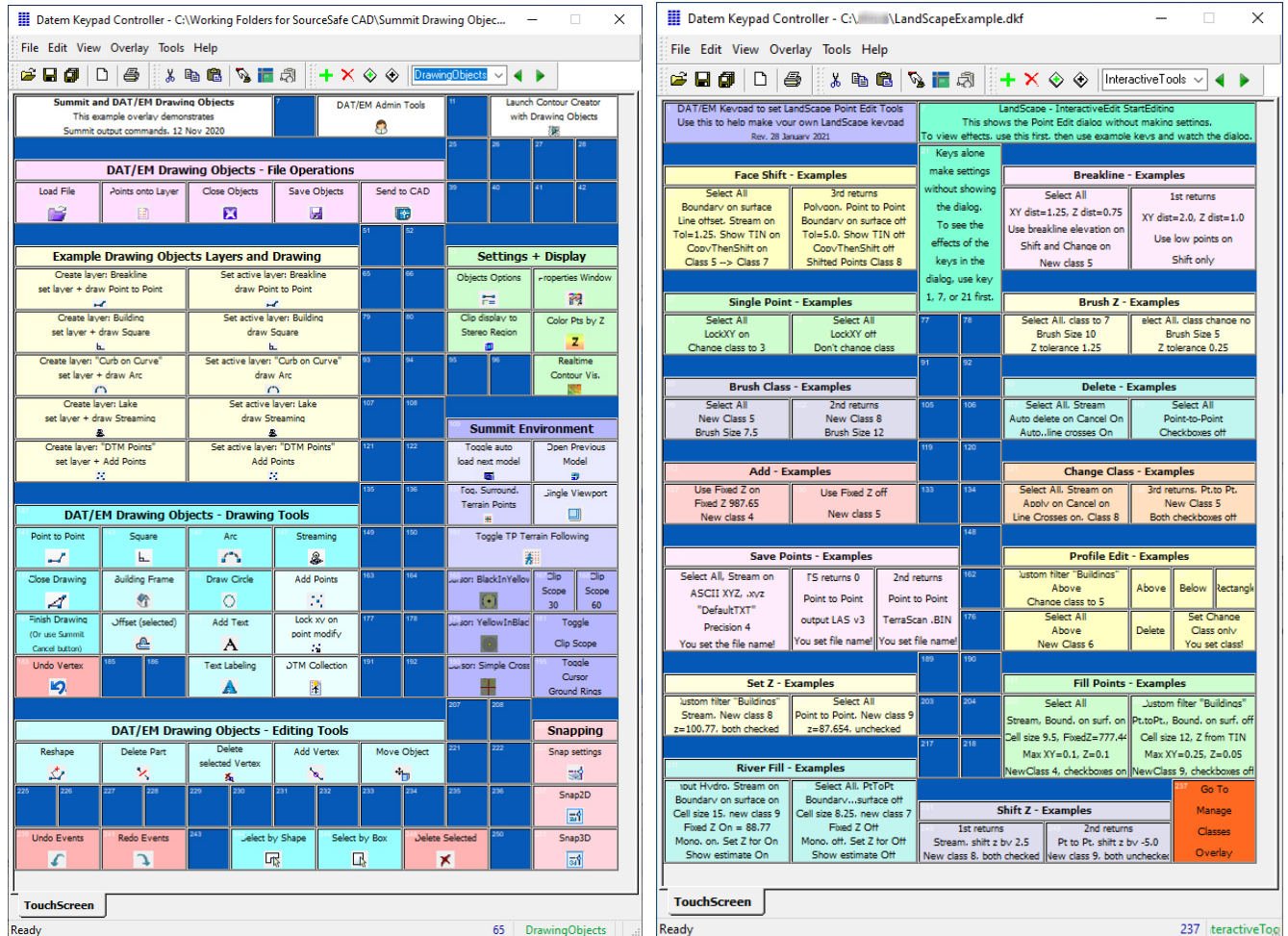
*New Summit and LandScape output type keywords are available*

6. To demonstrate the new Summit and LandScape output type keys described in the item above, there are new example DAT/EM Keypad .dkf files called:

"C:\ProgramData\Datem Systems\keypad\SummitOutput+DrawingObjects.dkf"

"C:\ProgramData\Datem Systems\keypad\LandScapeExample.dkf".

The Summit example contains most of the Summit output keys, with the exception of the Airfield3D-specific keys. It can be used to view examples of how to use the Summit output keys or as a keypad for DAT/EM Drawing Objects (these are the Summit environment drawing tools found on Summit's three "Drawing..." toolbars; they are not for Capture into an external CAD/GIS). The LandScape file contains many examples, which you can use as templates to set up your own configuration. (November 16, 2020)



New example keypad .dkf files for Summit- and LandScape-type output keys

## Coordinate Transformations and Elevation Database

There have been no changes to the elevation database installation file built in 2015 found here: <http://datemsystems.com/download/SetupElevationModels%20blt%2003%2015%202015.exe>. If you already installed that file with previous DAT/EM versions, you do not need to reinstall it. Any changes have been added to the DAT/EM setup installation, so that you do not need a new, separate Elevation Database file.

- The CHGeo2004 geoid for Switzerland is now available on request. It consists of two files to manually place in folder as "custom" geoid files. Contact DAT/EM Support at [support@datem.com](mailto:support@datem.com) to ask for the files. The files may be used with DAT/EM v.8.0, v.7.7, and some earlier versions. (August 25, 2020)

## DAT/EM Stereo Viewer

The DAT/EM Stereo Viewer was added in DAT/EM version 7.6. For instructions on how to use the Stereo Viewer, please see the new *Stereo Viewer Operation Manual* available from [www.datem.com](http://www.datem.com) > Support > Downloads > Manuals > Stereo Viewer. There have been no specific changes to the DAT/EM Stereo Viewer for v.8.0; however, some of the general image file format changes listed above apply to it.

## Summit Evolution

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

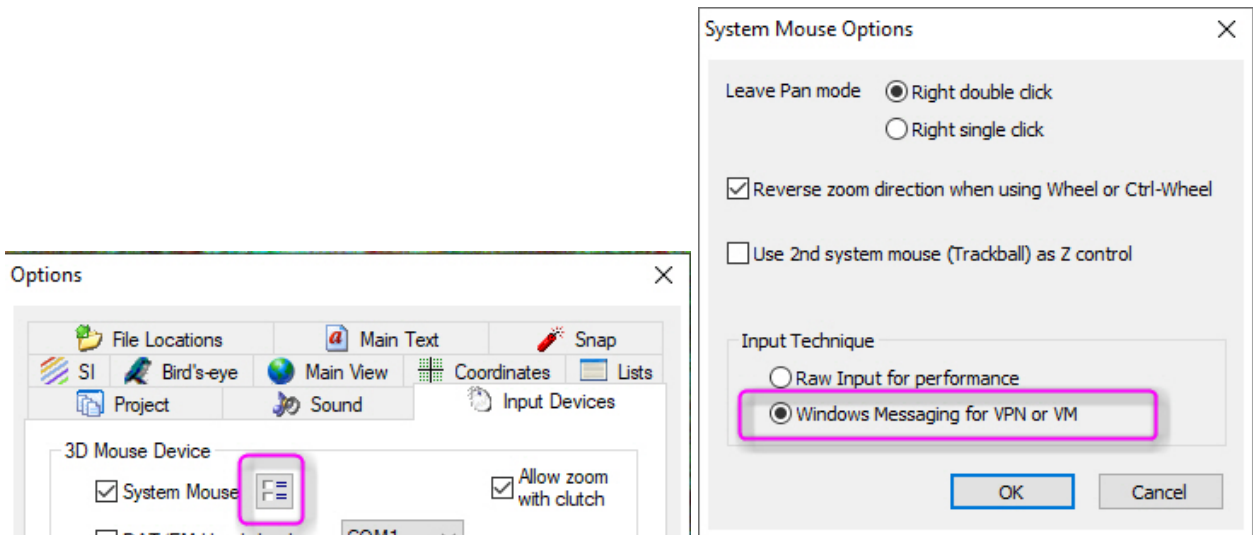
### General Summit Evolution Subjects

1. Summit now has two choices for how it can process system mouse digitizer input. The previously existing method was called **Raw Input**, and the new method is called **Windows Messaging**. Windows Messaging may be most useful for remote students who log in to an account at the University to run Summit for an assignment of limited digitizing with anaglyph stereo. Windows Messaging is not recommended for commercial use due to the slow response and anaglyph stereo limitations. (June 10, 2020)

The Raw Input method should be used by Summit users who use the system mouse as the Summit digitizer on a local Summit workstation. Raw Input is faster and more reliable for local users; however, raw mouse input does not work over the Internet. The new Windows Messaging method is intended for users who log in using VPN and Remote desktop to a remote computer or Virtual Machine (VM) to run Summit remotely. Windows Messaging is slow, but it is the only way for the mouse button hits to be logged correctly in Summit over the Internet.

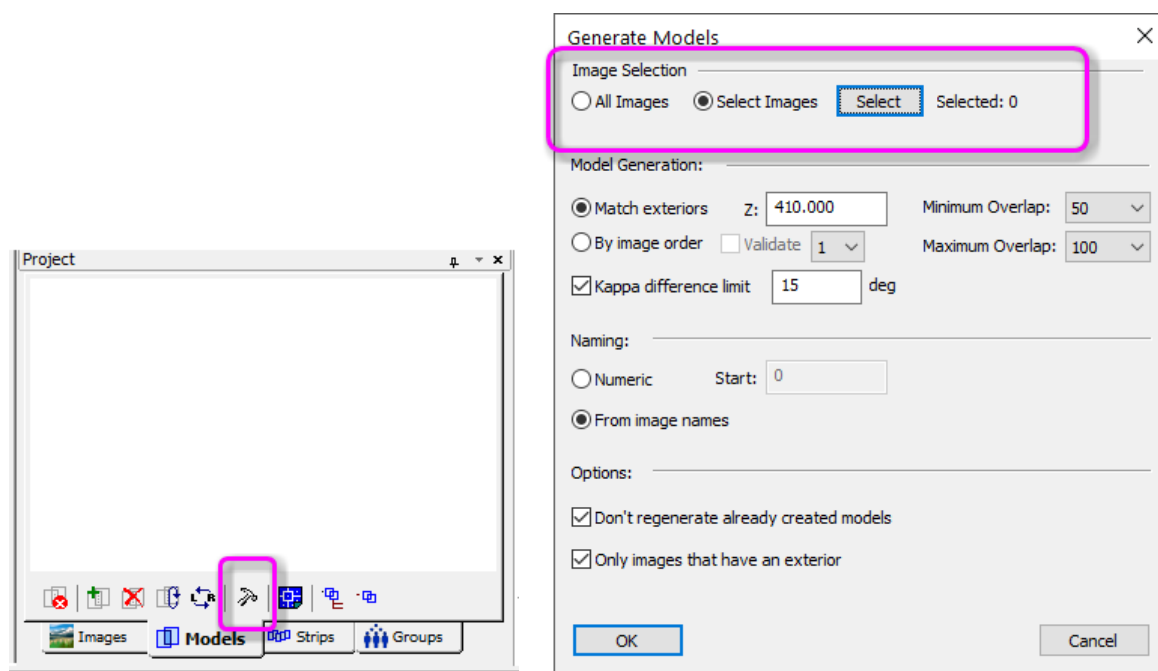
To select the mouse technique, select Summit > Tools > Options > Input Devices > System Mouse (check on)

and then the system mouse options button . Select either **Raw Input for performance** or **Windows Messaging for VPN or VM**.



Settings for the system mouse Raw Input or Windows Messaging methods

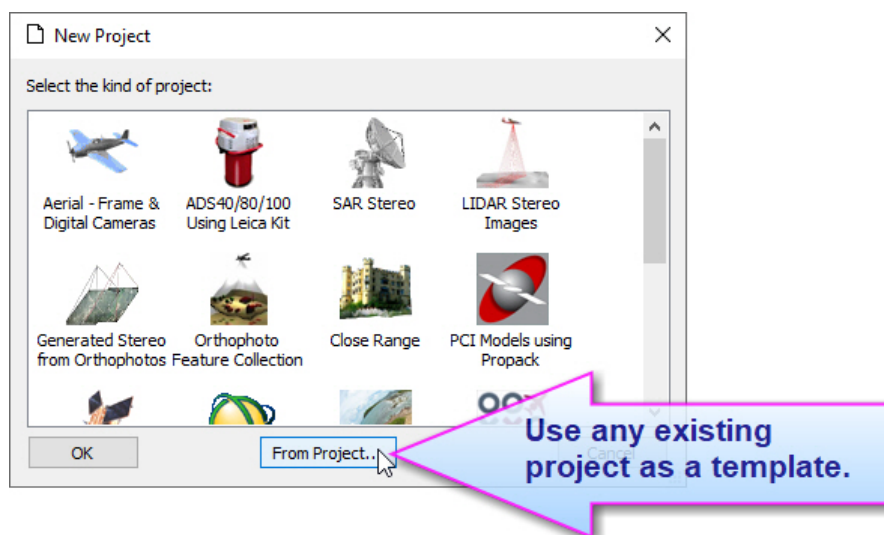
- The Automatic Model Generator found on the Project Window's **Models** tab has a new option to make models from only selected images. Regular Expressions with partial matching functionality are used. So, to name a few examples, you could search for images that have a recognizable string such as "Right", "Left", "Nadir", "RGB", or "2019" and use only those images for model generation. If Regular Expressions are a new concept for you, DAT/EM offers a quick tutorial document for downloaded at [www.datem.com](http://www.datem.com). (February 19, 2021)



*New selected images filter in the Generate Models dialogs*

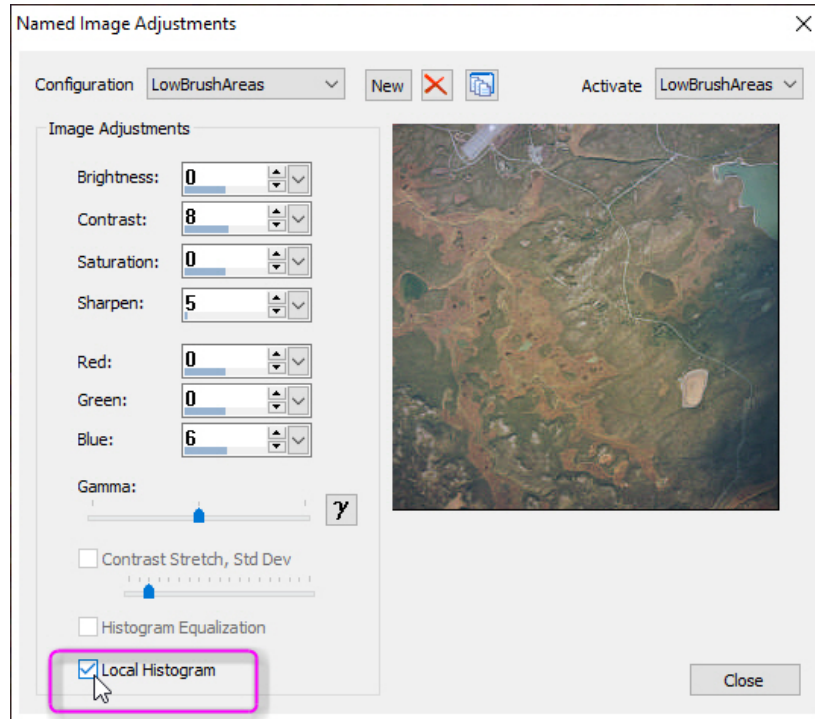
- Any existing Summit SMTXML project may now be used as a template for starting a new project. **Summit > File > New Project** has a new **From Project** button that allows you to browse for projects. All the project settings will be "imported" into the new project. The camera will be retained as well as project settings such as coordinate system settings and aerial project interior corrections options (Earth Curvature Correction, Dynamic Terrain, units, etc.). Images and control files will not be retained; you should add them to the new project manually. (May 29, 2020)

This template capability will be especially useful to users who often work with the same camera, same project type, or same coordinate system settings.



4. Named Image Adjustments has a new **Local Histogram** option. (June 10, 2020)

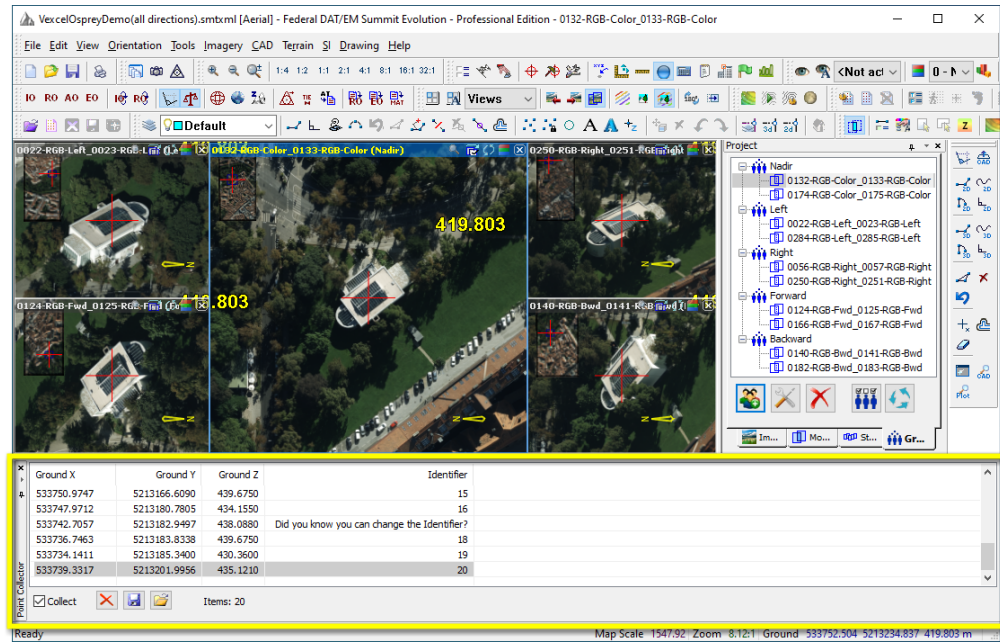
To use, start **Summit > Imagery > Named Image Adjustments**. Select an existing adjustment or create a new one. Check on the **Local Histogram** option. Note that **Histogram Equalization** and **Local Histogram** are mutually exclusive, so you may not have both on at the same time.



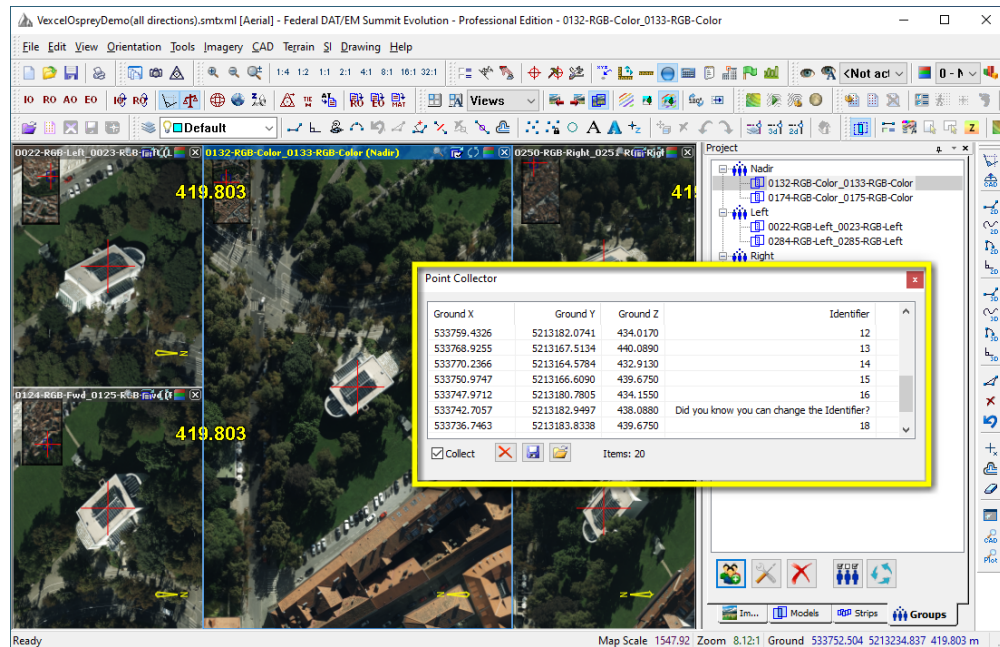
5. The **Models at Cursor** tool on the **Model Switch** toolbar (and **View > Model Switch > Show All Models at Cursor**) could return an incomplete list of models for the location. This is fixed. (May 11, 2021)
6. **Summit > Tools > Point Collector** has the following changes:
- Point Collector now prompts the user if there are unsaved changes upon closing the window. (July 24, 2020)
  - The Point Collector has a new **Collect** checkbox to toggle recording. When checked, points picked in Summit are recorded. When unchecked, nothing is recorded in Point Collector. Note: If there is an active Capture, points are always sent to it as usual no matter whether Point Collector is currently recording or not. (January 29, 2021)



- c. The Point Collector window can now be optionally docked in your choice of positions around the Summit window edges. (January 29, 2021)

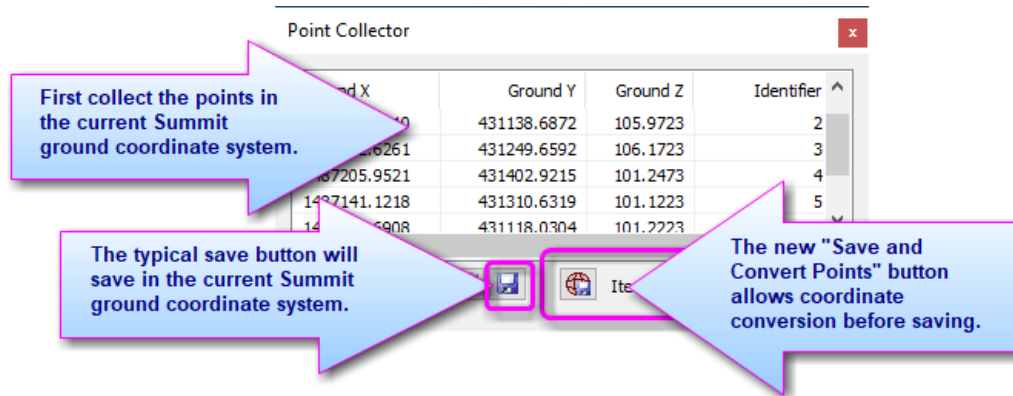


*Point Collector docked at the lower edge of the Summit window*

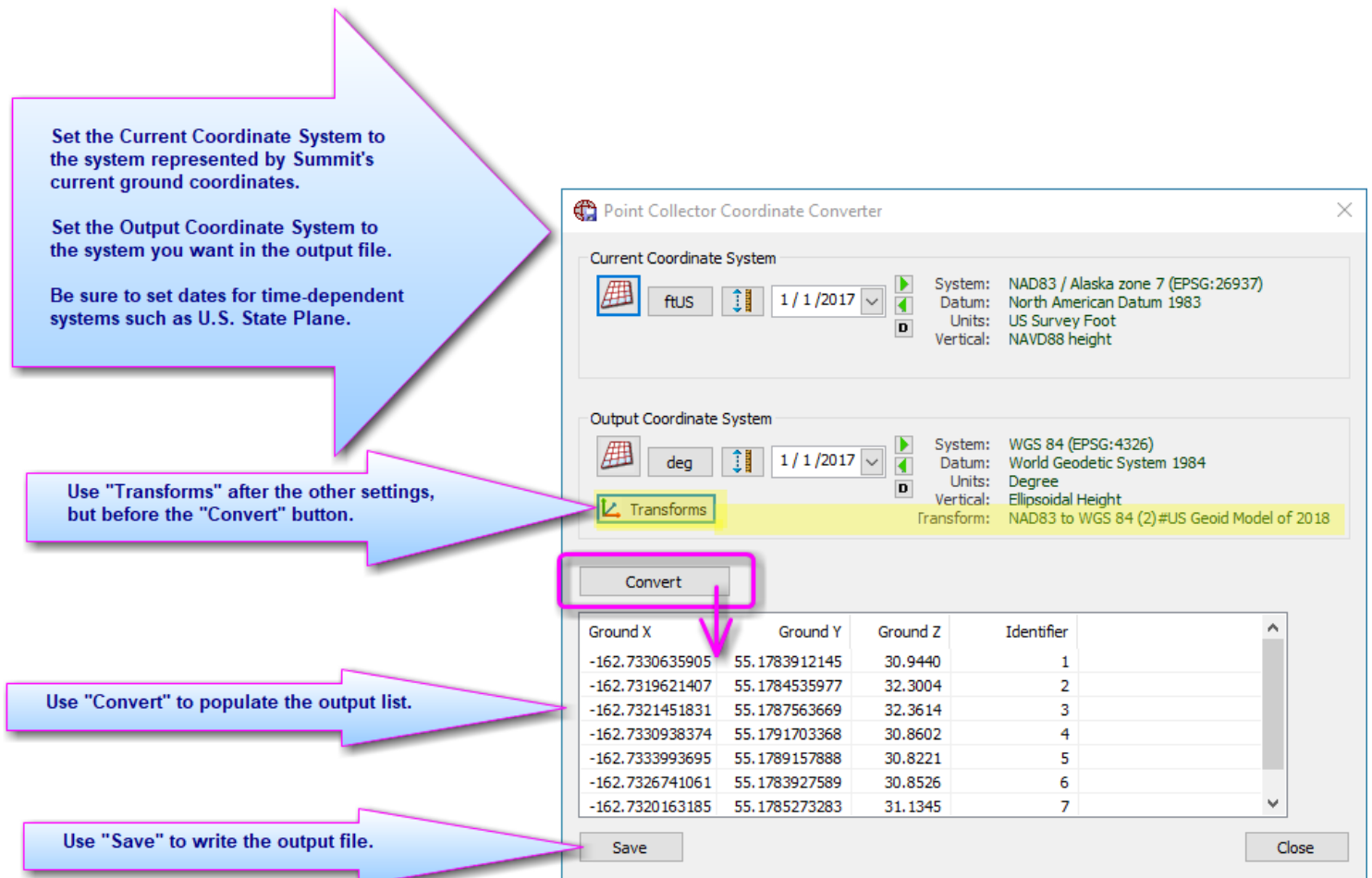


*Point Collector undocked*

- d. The Point Collector now offers coordinate translation when saving to an external file.



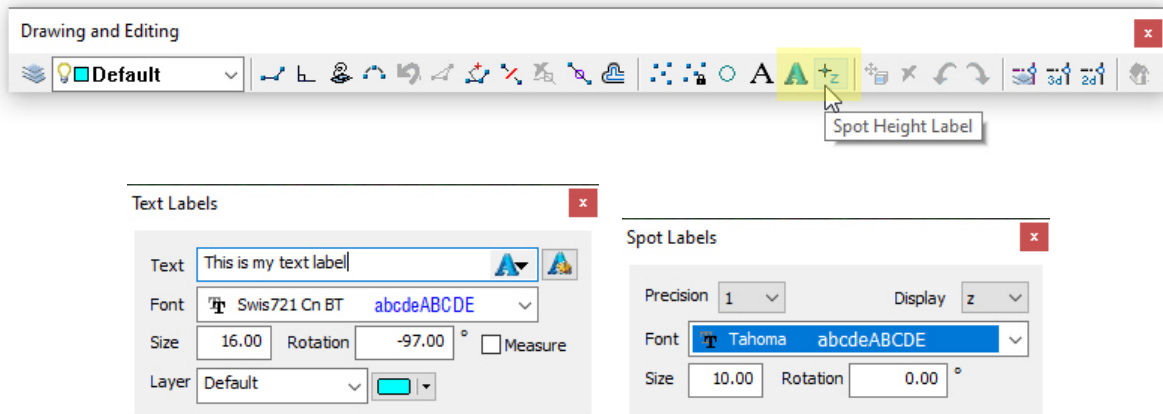
*Point Collector's new "Save and Convert Points" button*



*Point Collector's new method to convert coordinates before saving*



7. Realtime Contour Visualization has the following changes:
  - a. The **Realtime Contour Visualization > Bounds tab > Static Area > Current View** button will now fetch the correct view area for UAS imagery models. Previously, the view area was calculated as offset from the cursor location, so it was possible that the contours would be generated in an area outside the view. (September 9, 2020)
  - b. The Start/Stop button and the positioning of some other dialog components was fixed. (September 9, 2020)
8. DAT/EM Drawing Objects' Text Labeling toolbar icon was bringing up the Spot Labels tool, and the Spot Labels toolbar icon was missing. They now have separate toolbar icons that launch the matching tool. (December 1, 2020)

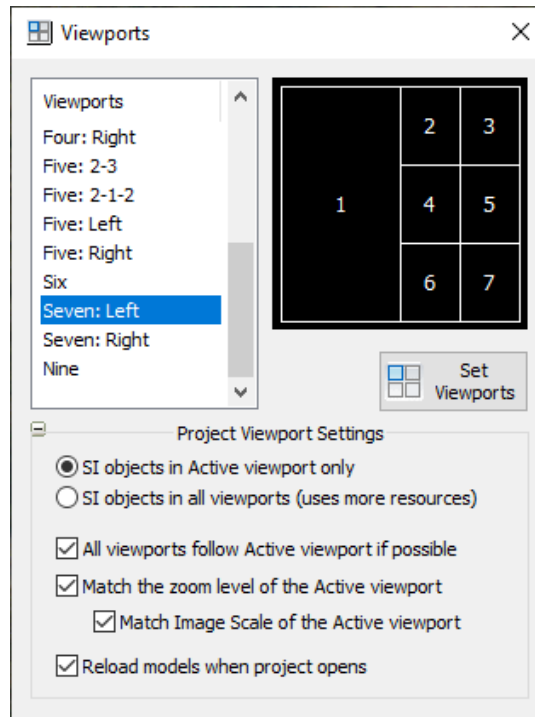


*The DAT/EM Drawing Objects' Text Labels and Spot Labels tools now have the proper toolbar icons*

9. **Summit > Orientation > Parallax Shift** is modified to be able to set different parallax shifts in multiple viewports. As long as the Parallax dialog stays displayed, it will keep track of the parallax shift setting for each viewport. Its display will show the setting for the focus viewport (the one that has the blue title bar). If you click on another viewport to give it focus, the Parallax dialog will change to that viewport's existing shift value. When you close the Parallax dialog, all settings will revert to zero/off in all viewports. (February 25, 2021)
10. A problem was fixed in **Summit > Project window > Images tab > Sort** option. Summit could crash if sorted by column or by selected images, then the OK button was selected. Note that sorting by drag and drop method would not crash. (August 12, 2020)
11. **Summit > Tools > Corner Detection** could crash on starting the tool. This is fixed. (August 12, 2020)
12. **Summit > Tools > Status Tracker** was not working in the previous version, mostly due to using a no-longer-supported Jet database. To fix it, the following changes were made: (August 11, 2020)
  - The database type is now SQLite3, for which the source is available, so is not expected to go obsolete.
  - It now works with newer compilers.
  - Status Tracker is now a 64-bit application.
  - It can use the most recent Blue Marble versions.

This new version of Status Tracker is not compatible with any older version. The databases are different. There are no plans to convert the old MDB Access database to SQLite3.

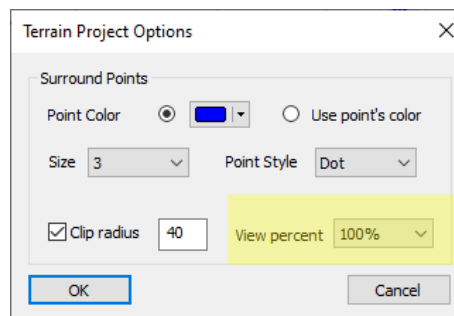
13. The following additional preset multiple viewport layout choices have been added: **Four Right**, **Five Left**, **Five Right**, **Seven Left**, and **Seven Right**. Hint: These layouts allow you to widen the Summit window to span two monitors, put a stereo model in the “main” right or left viewport and position it on the stereo monitor, then open orthophoto (mono) projects in the column of multiple viewports on the other side. Use **Summit > File > Create Multiple Project Solution** to combine different types of projects. (March 23, 2021)



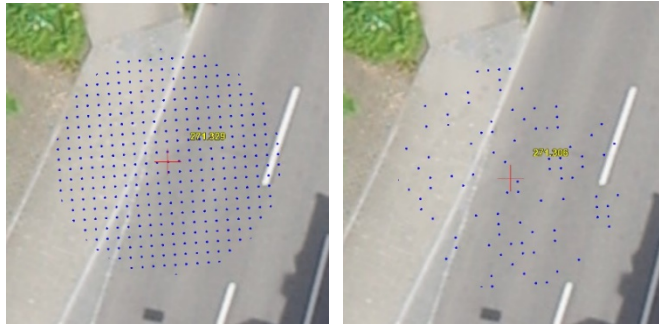
*More multiple viewport presets are now offered*

#### Terrain Project Tools (except Point Cloud)

14. Terrain Projects and Terrain Project-related subjects (except Point Cloud) have the following changes. Note: Point Cloud application items are in the next section of this document.
- Show surrounding terrain points** is now working properly in multiple viewports. Previously, it would only work in the first viewport, even when that viewport no longer had focus. (June 26,,2020)
  - Summit > Terrain > Terrain Project Options > View percent** is a new option for reducing the number of terrain points in the display while Show Surrounding Points is on. Use this option when there are so many points that it becomes difficult to see the imagery under the points. The setting is in for display only and does not affect the surface generation for Terrain Following, which always uses 100% of the points in the area. Processing priority is given to surface generation; no attempt is made to filter to an even distribution, because it would be too “expensive” as additional processing: (March 21, 2021)



*New **View percent** filter for showing surrounding terrain points*



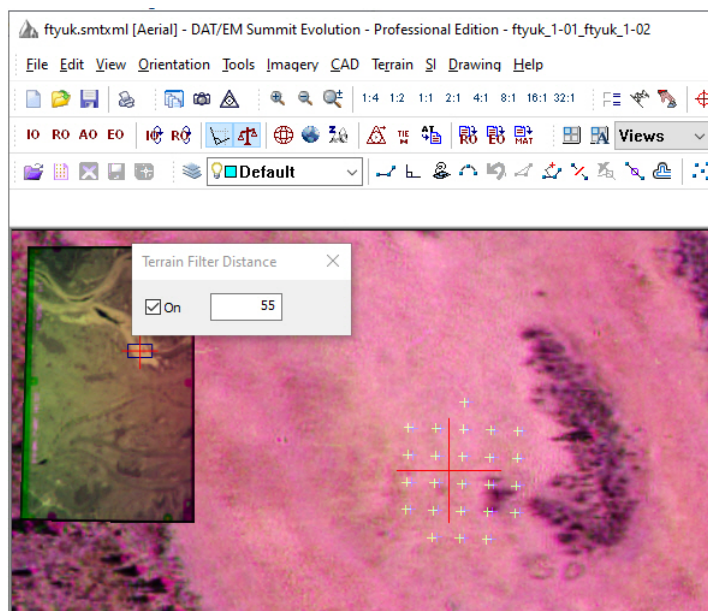
*100% is set to view on the left; 25% is set on the right.  
An uneven distribution is expected.*

- c. There is a new **3D distance filter** for Terrain Project Terrain Following. During Terrain Project Following, points used to generate the surface are filtered by XY and Z in a spherical shape with the cursor at the center and at a user-defined radius. This is different from the existing Z filter, which could prevent large elevation jumps, for example from a road to the top of a tree or overhead bridge. This new spherical distance filter was designed to help with areas where there is a small elevation jump nearby, which you don't want to affect the surface generation. (August 4, 2020)

For example, it could be used to keep the cursor on the road surface where there is a curb nearby. You would still need to keep the cursor beyond the radius distance away from the curb in XY, so you couldn't use this to digitize the bottom or top of the curb line at the vertical elevation drop of the curb. You could use it to digitize the outside/sidewalk side of the curb line or the outside/road edge of the gutter line, then use a set of automatic 3D offsets to draw the rest of the curb lines.

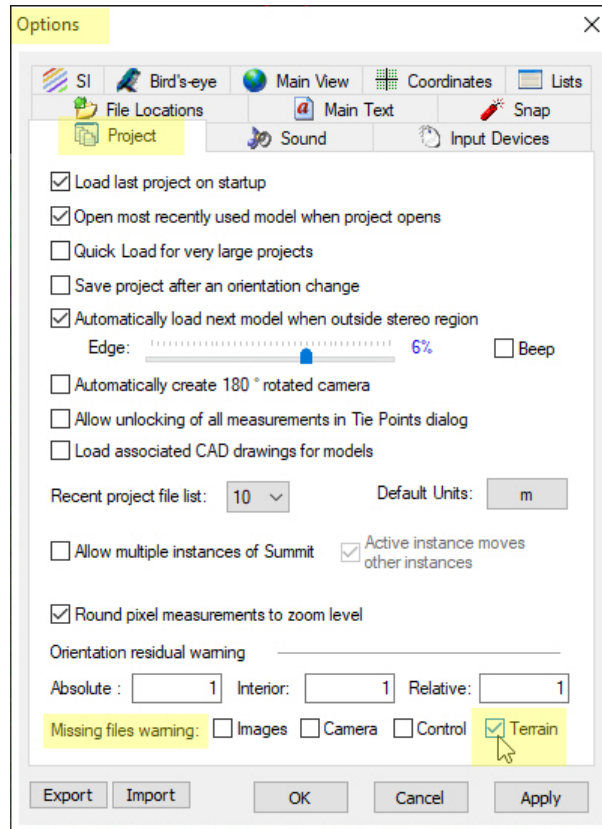
This tool works best with dense terrain points. If you plan to filter curb and gutter points, then these features must be well defined by points both on top of and below the curb. It will not be productive if the radius is smaller than the distance between points, which often might leave no input points inside the surface generation sphere.

To use, first use **Summit > Terrain > Create Terrain Project, Load Terrain Project, and Follow Terrain Project** (on). Then select **Terrain > TP Filter Distance**. Check the "On" box and enter the radius. Even if you have a larger radius set to show points, it will reduce the points display within the spherical shape at the given radius. This way, you can see which points will affect the surface generation:



*New Terrain Filter Distance tool*

- d. TP Filter Distance, TP Filter Z, and TP Options have been added to the Terrain Project toolbar. (August 27, 2020)
- e. The Terrain Project toolbar will now be installed as “on” by default in new installations. (August 27, 2020)
- f. **Summit > Tools > Options > Project > Terrain** is a new setting to show a warning if a linked Terrain Project file is not found. (December 9, 2020)

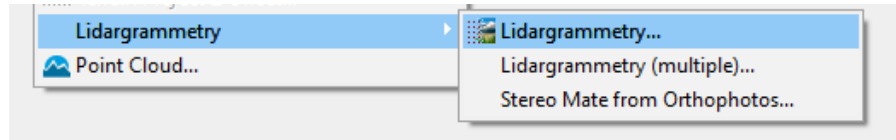


*Tools > Options > Project > Terrain gives a warning when the linked .vldr file is not found*

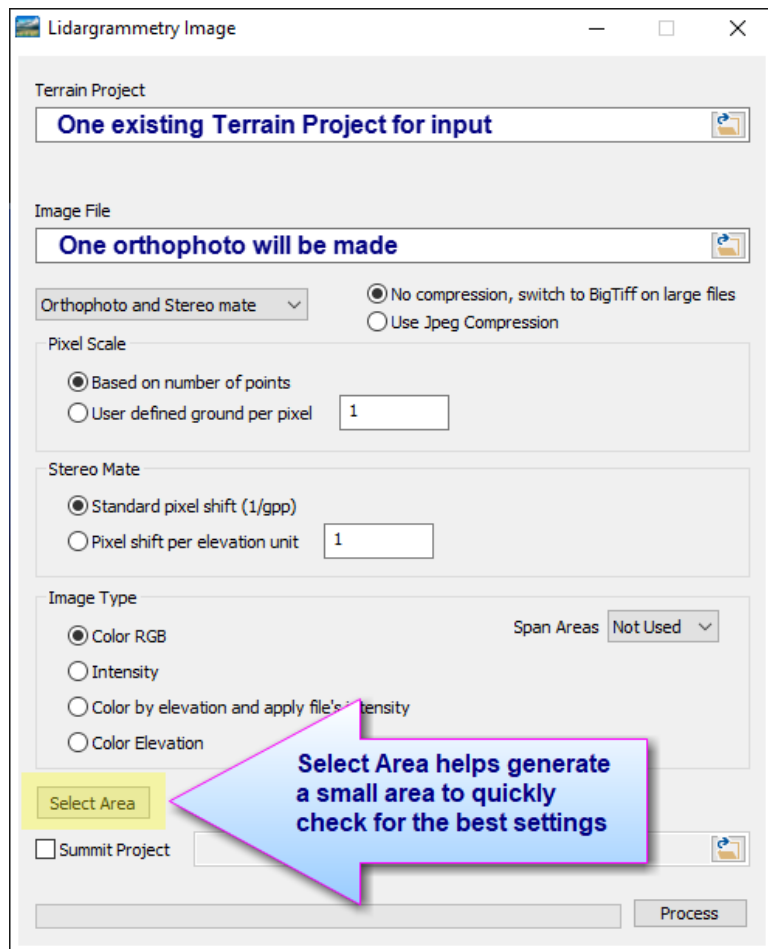
- g. The Terrain Project Lidargrammetry and Stereo Mate from Orthophotos tools have the following changes:
  - There are speed improvements for generating a stereo mate image from a Terrain Project. In one test, a very large BigTiff image that previously took 11 hours to generate was reduced to 3 hours. (January 7, 2021)
  - Lidargrammetry had an overflow error while creating images larger than 32768 pixels in width and height. This is fixed so that large image generation is now successful. (December 28, 2020)
  - Lidargrammetry will now make images where the origin pixel starts at the nearest whole ground unit. This applies to both the generated image and its stereo mate. (February 16, 2021)
  - Lidargrammetry will now create an intensity image where the tiles are color blended or normalized to the next tiles. Previously, the tile edges were very distinct, so although there was nothing wrong with the image, it wasn't pleasing to view as a whole. (February 16, 2021 and further tiling corrections March 2, 2021)
  - Lidargrammetry could give an ambiguous “invalid operation” error message, which was traced to an OpenGL error. This is fixed. (March 1, 2021)
  - There is a new Lidargrammetry application called **LidargramUI.2017.exe** that offers three user interfaces (UIs) and runs from a command line. Command line runs may either be silent or start a dialog. This represents significant additions to the Lidargrammetry functionality. The

new application can produce output approximately 10 times faster than the old applications. It never filters points (the old ones filtered to around 10 million input points). (June 14-15, 2021)

One method to start the three different UIs is from **Summit > Terrain > Lidargrammetry**:

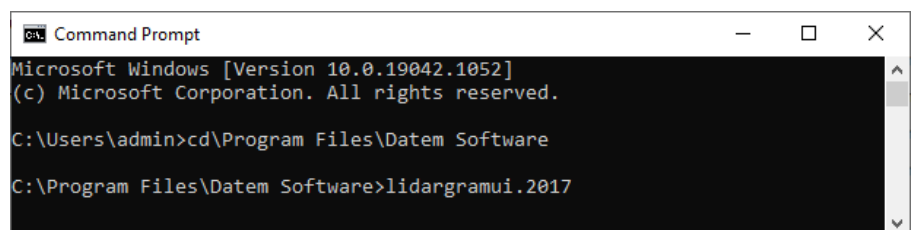


- A) **Summit > Terrain > Lidargrammetry > Lidargrammetry** starts a dialog that asks for one existing Terrain Project (TP) as input and outputs one orthophoto. Most of this dialog may be familiar from previous versions, but it also has a new option to **Select Area**, which can to quickly generate a small area to check for the ideal pixel shift value and other settings. Once you know the best settings, you can generate the whole image using those values.

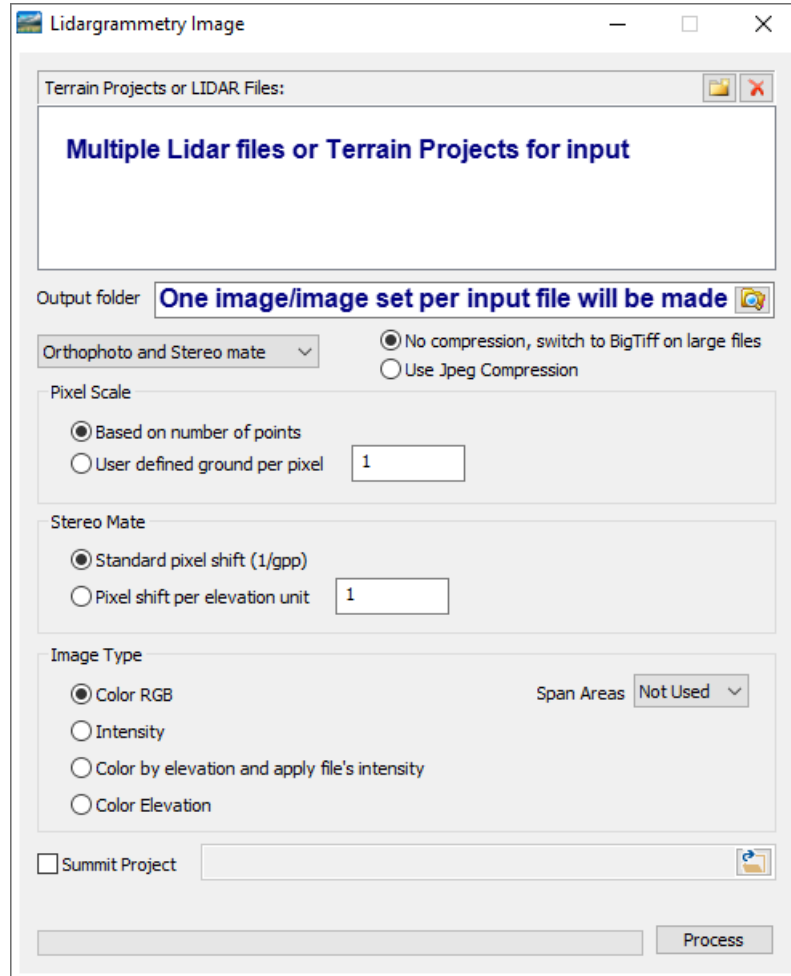


**Summit > Terrain > Lidargrammetry > Lidargrammetry**

This dialog can also be started from a command line or shortcut without any flag:

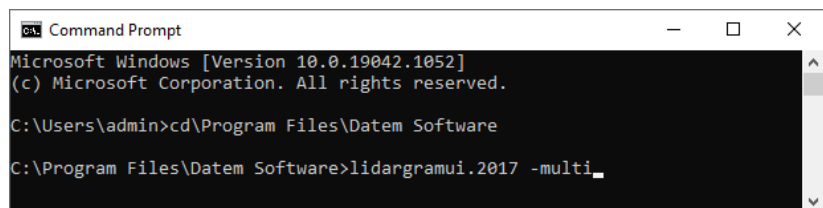


- B) **Summit > Terrain > Lidargrammetry > Lidargrammetry (multiple)** starts a dialog that asks for multiple input Lidar files or multiple existing Terrain Projects. It outputs one orthophoto image per input file. This is most useful if you have already tiled Lidar files in the exact areas you want for in each output file. For any input Lidar files, a temporary Terrain Project will be generated automatically in the output folder and will be removed when finished.



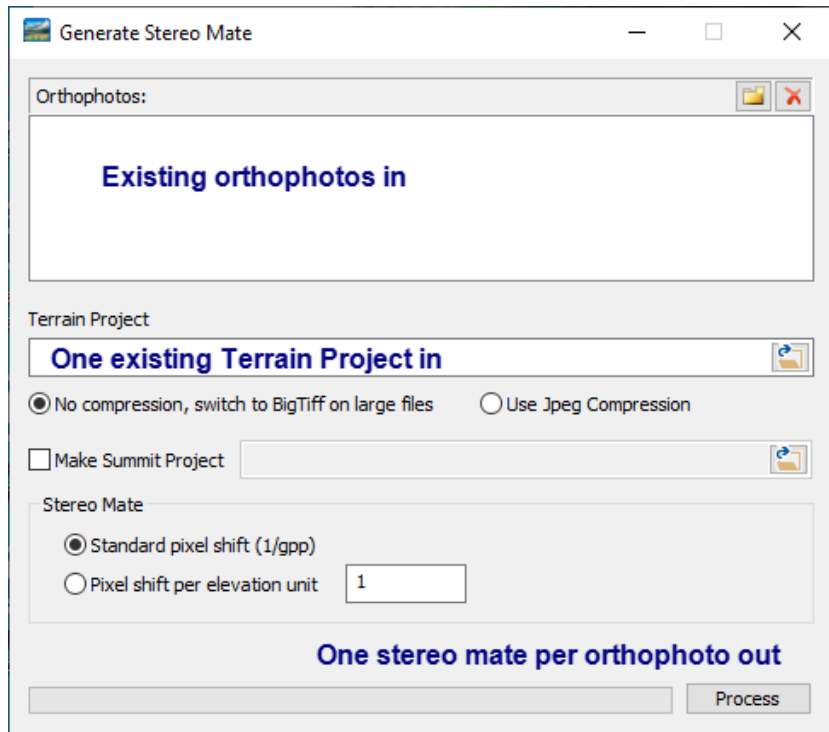
**Summit > Terrain > Lidargrammetry > Lidargrammetry (multiple)**

This dialog can be started from a command line or shortcut using the **-multi** flag:



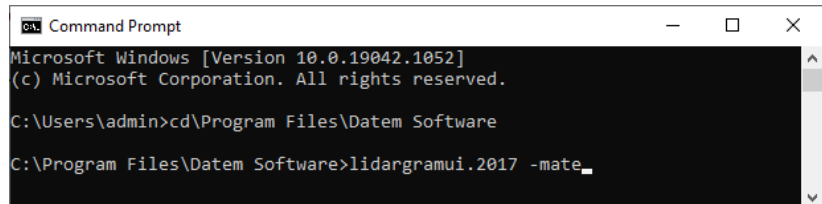
**Note:** Since this “multiple” dialog does everything better and faster than the old **Summit > Images > Generate LIDAR Image** option, that menu item will also launch this new dialog. That older menu item may be removed in the future.

- C) **Summit > Terrain > Lidargrammetry > Stereo Mate from Orthophotos** was a previously existing option and looks the same as the **Terrain > Stereo Mate from Orthophotos** option in version 7.7. It asks for existing orthophotos and one existing Terrain project as input. It outputs one stereo mate per orthophoto.



**Summit > Terrain > Lidargrammetry > Stereo mate from orthophotos**

This dialog can be started from a command line or shortcut with the **-mate** flag:



To perform silent Lidargrammetry launches with a command line, there is a new “sister” application called **LidarGramCmd.exe**. It has the following syntax and flags, which can be displayed at any time using the Lidargrammetry Help command line:

#### **LidarGramCmd -Help**

This option displays help information about all the other command line flags.

#### **Syntax (this is a wrapped line; do not use line feeds):**

```
LidarGramCmd -out <folder> [-f <filename>]... [-indir <folder>] [-type:
<colorType>] [-gpp <value>] [-pixelShift <value>] [-nomate] [-noortho]
```

#### **Flags:**

**-out <folder>** : An output folder for the resulting image(s).

**-f <filename>** : Input point file. <Filename> should be a complete path and filename with extension. Multiple can be added, each starting with flag -f.



**-indir <folder>** : An input directory. The folder is searched for LAS files to process. Can use with or without -f

**-type: <colorType>** : Image Type. Where **colorType** is one of: '**rgb**', '**intensity**', '**cbe**' (cbe is color by elevation plus intensity), or '**elev**' (color by elevation only). Default **cbe**.

**-gpp <value>** : User-defined ground per pixel.

**-pixelShift <value>** : User-defined pixel shift per elevation unit.

**-span <span type> or <value>** : Span areas, where **spanType** is one of: '**Most**' (equivalent to 100 times gpp), '**Some**' (equivalent of 25 times gpp), '**a Little**' (equivalent of 12 times gpp), or '**Hardly**' (equivalent of 5 times gpp), or a positive value multiplier times the original ground per pixel. The default is **Not Used** (no span filtering).

Examples: '**-span Hardly**' is the same as entering '**-span 5**'. '**-Span 3**' will use a value of 3 times the **gpp** value to remove triangles. If **Hardly** is removing too many triangles, you could try a value of **8**, which is between **Hardly** (5 x gpp) and **a Little** (12 x gpp).

*Important! If you make the span value very small, there will be areas of black pixels or even a mostly or completely black image. This will happen when the span filter length is greater than the distances between points in the input, so too many triangles are removed. If you are not sure which settings to use, generate one image set first and inspect water areas (for enough span removal) and vegetation or building areas (for too much span removal). Find the best span setting to match the input and other processing settings.*

**-nomate** : Do not generate mate. Orthophoto only.

**-noortho** : Do not generate orthophoto. Mate only.

**-project <filename>**: Generate a Summit project. <Filename> should be the complete path and filename.smtxml. If not listed, no .smtxml will be created.

**Example (this is a wrapped line; do not use line feeds):**

```
C:\Program Files\Datem Software\LidarGramCmd -out "F:\MyFolder\cmdOut" -f
"F:\MyFolder\test.las" -f "F:\MyFolder\test2.vrldr" -type cbe -span 9
-project C:\MyFolder\Summit\SummitProject.smtxml
```

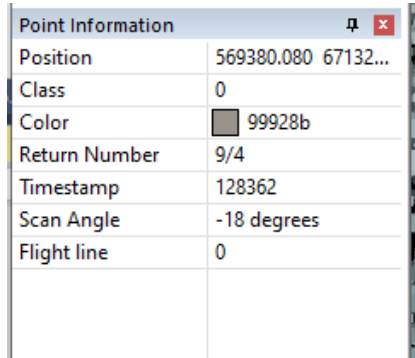
In this example, an output folder of "**F:\MyFolder\cmdOut**" is used. Two input files are used: **test.las** and **test2.vrldr**. The **-type cbe** (color by elevation plus intensity). This would result in four images being generated:

"F:\MyFolder\cmdOut\test.tif", "F:\ MyFolder \cmdOut\ test\_mate.tif",  
 "F:\ MyFolder \cmdOut\test2.tif", and "F:\ MyFolder \cmdOut\test2\_mate.tif".

An output folder is always required **-out**. You specify one or more input files using **-f** and/or use a folder via **-indir** (only for LAS file input). Therefore, an output folder and some input files are required, and all other arguments are optional. The default color type is **cbe** (color by elevation plus intensity). By default, it generates both mate and ortho. By default, **gpp** (ground per pixel) and **pixelShift** are calculated. A custom span filter of 9 (9 x gpp) is specified. The resulting images and stereo mates would be added to the listed "Generated Stereo" type Summit project.

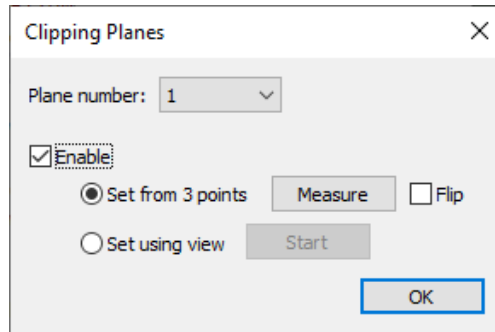
15. Point Cloud has the following changes:

- a. Point Cloud will now give a warning if the data files associated with the .vrlr are not found. The data files should be in a subfolder with the .vrlr file. (December 9, 2020)
- b. .Vrlr loading speed is now faster. On a specific testing platform, a project with 1.3 billion points that previously took 82 seconds now takes 20 seconds. (January 13, 2021)
- c. There is a new Point Information docking window. Example: (January 13, 2021)

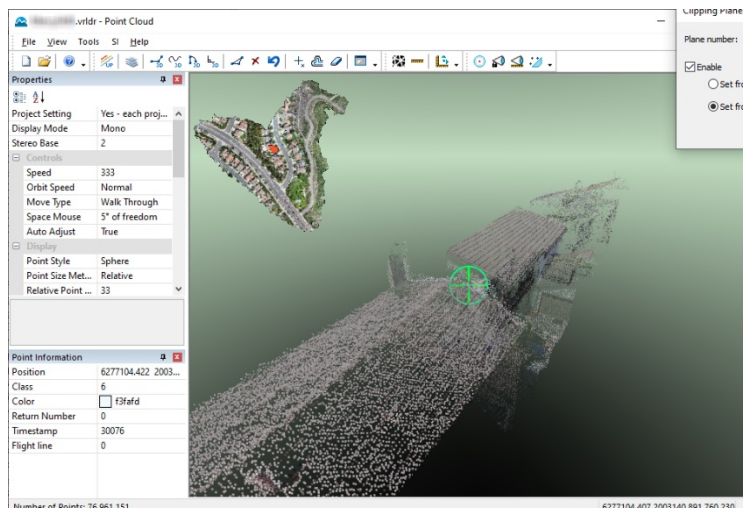


*Point Cloud's new Point Information docking window*

- d. Point Cloud now offers clipping planes on the View menu. There is currently a limitation of 2 clip planes. Set a plane by setting the **Plane number** to 1 or 2 and then measuring 3 points or by positioning the view interactively and selecting 'done': (January 13, 2021)



*Point Cloud's new Clipping Planes dialog*



*Example of two clip planes set to clip to the front and back of some houses*

Aerial Projects (traditional and UAS)

16. Aerial projects (traditional and UAS) have the following changes:

- a. Absolute Orientation (AO) was using default standard deviation sigmas of 0.1, 0.1, 0.1, even if different values existed in the control file. Symptoms of this problem were that changing the sigmas in the control file had no effect on the AO residuals. This is fixed to properly use the values in the AO calculations. (January 20, 2021)

Superimposition

17. Superimposition (SI) has the following changes:

- a. Superimposition (SI) of dashed line styles originating in the CAD/GIS environment could look as if it changed elevation along the vector it represented, so the pattern in SI didn't match up well in the viewer's eyes and didn't seem to keep to the elevation of the original vector object. The OpenGL shader making up this dash in superimposition has been changed to reduce this effect. (June 8, 2020)
- b. Superimposition could become very slow when certain Capture commands were in progress, such as MicroStation DATDRAW. Too many vectors would be added to the SI database until the object was finished drawing. This is fixed. (June 11, 2020)
- c. Superimposition was optimized to better handle MicroStation's "unselect all" calls. If selected object highlighting was on, it could be very slow on tentative point snaps, etc. (April 29, 2021)
- d. Superimposition (SI) did not show any vector object that extended outside the Summit model's valid ground coordinate area, even if part of the object crossed the current model's stereo display area. This was particularly noticeable in projects that used a coordinate conversion, because the total valid ground coordinate area is smaller for such projects. For example, an aerial project with an active coordinate conversion has a ground coordinate area of about 15 times the size of the model, whereas it is almost unlimited when there is no coordinate conversion. Since ADS sensor and satellite RPC projects always have a coordinate conversion, they were especially susceptible to missing SI objects. Now when any object returns an invalid ground-to-pixel coordinate conversion for SI, the part of the object inside the model will be displayed in SI as follows: (September 24, 2020)
  - On an SI UPDATE or model change, it detects and flags when an object (or part of it) is unable to be converted from ground to pixel coordinates for SI display.
  - A flagged object is clipped in ground coordinates on the model extents boundary.
  - After clipping, the remaining part of the object is successfully converted from ground to pixel coordinates and displayed in SI.
  - There will be very little to no slowdown in SI processing, since clipping is only done when necessary. It is possible that many of the most distant objects that do not cross the current stereo area will be completely clipped.
  - **Important!** Clipped objects will only appear after an SI UPDATE or model change. This means if you are actively drawing a new out-of-bounds object (usually an object started in a far-away model and having model changes during drawing), it will not show up until an SI UPDATE or model change. This does not affect the drawing tool, so keep drawing. When the object is finished, it will most likely do its own SI UPDATE, and it will then be clipped and appear in SI. If it does not, manually submit SI UPDATE from Summit or from a Capture command. This limitation is intentional and is not likely to be changed in the future.
- e. Superimposition has increased the maximum allowed number of layers/levels to 200 000 layers/levels total in combined main files and reference files. (May 27, 2020)
- f. Superimposition (SI) could leave obsolete folders and files on the hard drive, which could in turn display vectors in SI that no longer exist in the SI source. This is fixed so they will not be left in normal operating circumstances. The new DAT/EM Administration Tool (see page 3) offers to delete such files that are from older versions of DAT/EM software or that might be left after a power outage or crash leaves the files on the drive. (July 21, 2020)

- g. Superimposition in v.7.7 could leave folder trees on the hard drive that were variations of the folder that is actually used: "C:\ProgramData\Datem Systems\Common\SIUpdate". For example, these folder names might exist:
- C:\SIUpdate
  - C:\Common\SIUpdate
  - C:\Datem Systems\Common\SIUpdate
  - C:\Datem Systems\SIUpdate
  - C:\ProgramData\SIUpdate
  - Etc.

The reason for these folders being made is that a Microsoft compiler function that we used successfully for many years suddenly stopped working the same way.

The new DAT/EM Administration tool (shown on page 3) will not delete these folders, because DAT/EM does not want to be responsible for deleting folders on the user's hard drive. You may investigate whether you have such folders. If you do, close Summit and delete the folders manually. The only folder that should be retained is the fully named "C:\ProgramData\Datem Systems\Common\SIUpdate". Even if you accidentally delete this folder, it will be made again next time superimposition starts, so you will not lose anything by doing so. (July 2020)

- h. Superimposition with Capture for ArcGIS has some improvements for highlighting the selected object using the settings in **Summit > Tools > Options > SI tab > Selected Objects** area > **Object** and **Line**. It will now highlight an object selected before any edit session is active, keep highlighting the line after an SI Update, and correctly highlight selected lines along shared edges. (July 21, 2021)
- i. Superimposition in multiple viewports could draw the rubber band and Capture for ArcGIS snap line in the wrong color. This is fixed. (August 13, 2021)

#### ADS40/80/100 Kit Projects

#### 18. ADS40/80/100 (ADS) Kit projects:

- a. There were some ADS image configurations where it was difficult or impossible to properly position the embedded bird's-eye overview. The same project might have trouble with determining stereo vs. pseudo stereo and stereo rotation on screen (for left-right rather than top-bottom viewing). It could also have trouble building stereo models. These issues were all related and they are all fixed. (June 16, 2020)
- b. A new ADS40 Kit project will now have **Automatically rotate view up or right** and **Combine split imagery blocks** on by default. Note: If you set up a lot of ADS project where you want these off by default, you may save a project with them off and then use the new **Summit > File > New Project > From Project** button instead of picking the ADS project icon. (May 29, 2020)
- c. ADS40 Kit and Orthophoto Feature Collection projects with a large number of images could be extremely slow to load in the **Summit > Edit > Project** dialog. It would appear to be 'locked up', but was actually working extremely slowly while setting the path field in the project tree control. The slow function is in a third-party software, so DAT/EM can't optimize or fix it. Instead, we now avoid showing the path in the file list in this dialog when there are more than 300 images. (March 10, 2021)

#### Orthophoto Feature Collection (Summit) Projects

#### 19. Orthophoto Feature Collection projects (in all Summit editions):

- a. Orthophoto Feature Collection and ADS40 Kit projects with a large number of images could be extremely slow to load in the **Summit > Edit > Project** dialog. It would appear to be 'locked up', but was actually working extremely slowly while setting the path field in the project tree control. The slow function is in a third-party software, so DAT/EM can't optimize or fix it. Instead, we now avoid showing the path in the file list in this dialog when there are more than 300 images. (March 10, 2021)

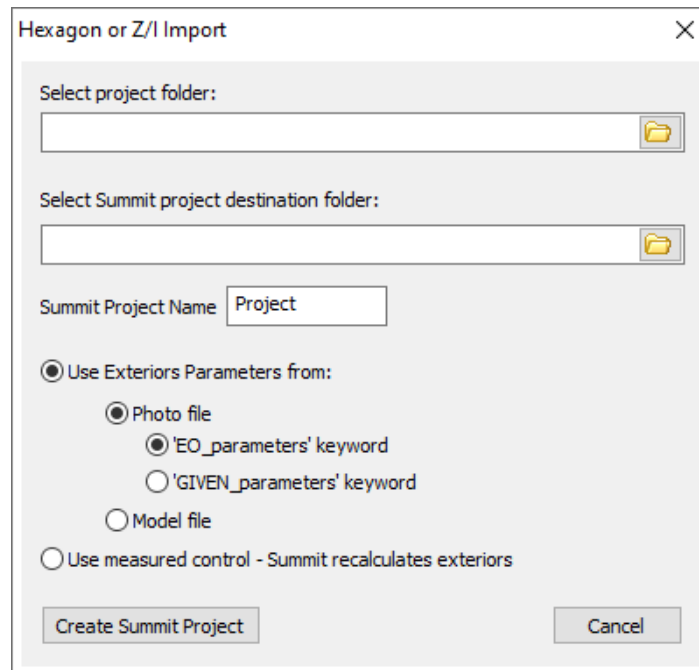
Imported Projects

20. Imported Projects have the following changes:

- a. The **Summit > File > Import > Hexagon Z/I** (ISAT) import process now offers a new option called **'Given\_parameters' keyword**. This is just one more list of exterior values found in the ISAT file set (there are at least four sets of exterior values in the ISAT files).

Important! DAT/EM is not responsible for the contents of the Hexagon ISAT files. DAT/EM believes that in most ISAT projects, the "Given" parameters are the initial GPS/IMU values, and therefore would not be desired in a Summit project. If you have the GPS/IMU list, you could verify whether the values match it once you import using "Given" and look at the EO values in Summit's EO dialog. However, it is possible that any EO values from any source could have been given to ISAT in place of typical GPS/IMU values. It is up to you whether to use "Given parameters" or not.

It remains the user's responsibility to select the option that contains the best exterior values. Prove the results using **Summit > Tools > Move to Ground** and check control points carefully. Note that usually the goal is to import **Use Exteriors Parameters from > Photo File > 'EO\_parameters' keyword**, because DAT/EM believes that option contains the results of the ISAT aerotriangulation. The options now look like this: (March 8, 2021 and July 26, 2021)



***New 'Given\_parameters' option for Hexagon Z/I (ISAT) imports***


- b. The **Summit > File > Import > BLK** file import process has been improved. It can now handle special characters encountered in the camera file information and it can detect when a camera is a digital camera and set the digital camera flag in the resulting Summit camera file. (March 18, 2021)

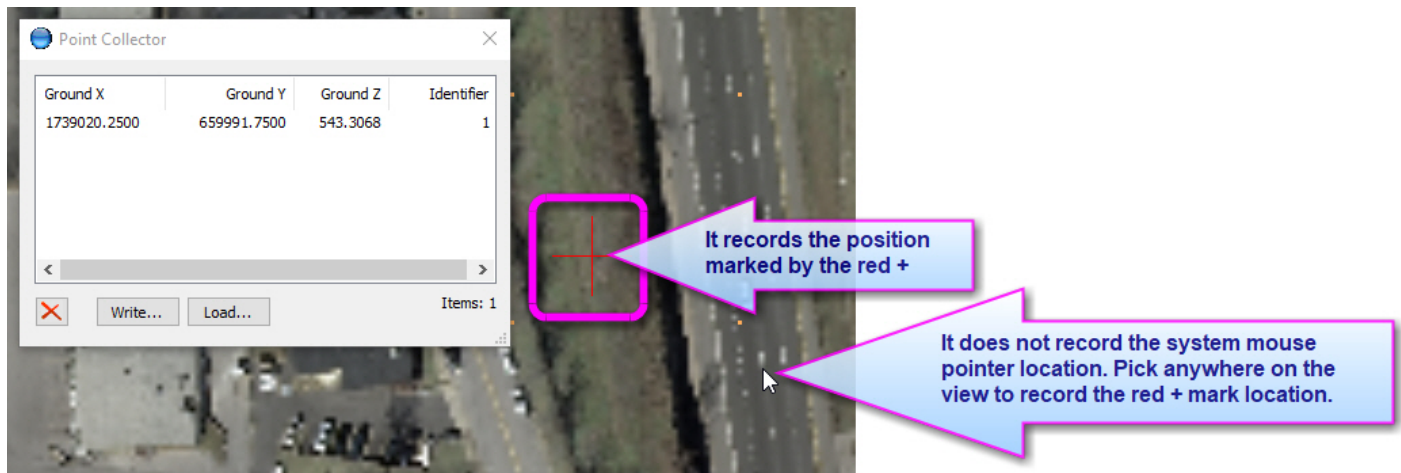
Point Translator (and point manager code)

21. Point Translator and the point manager code used by several DAT/EM applications to read terrain point files have the following changes:
- Large, tiled TIF DEM files could cause DAT/EM Point Translator to crash on processing. This is fixed. (June 2020)
  - Image Creator could crash while copying a rarely used TIFF tag when converting a TIF to the SMTI or TIF output type. This is fixed. (November 17, 2020)

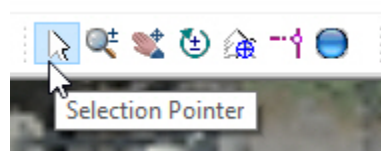
DAT/EM Image Viewer

22. DAT/EM Image Viewer has the following changes:

- DAT/EM Image Viewer has a new Point Collector tool. It is very similar to Summit Evolution's Point Collector tool. One of many purposes for this tool may be to create a control file to use in Summit's Relative Tie Points orientation as an alternative to using Summit's Control Transfer tool. To use: (July 15, 2020)
  - Open an orthophoto image in Image Viewer (an orthophoto is necessary to provide xy ground coordinates).
  - Collected points will be (x,y) only unless a terrain file is loaded. If (x,y,z) points are desired, use **Image Viewer > Terrain > Load DTM File** and load a terrain file for the area of interest.
  - Select **Image Viewer > Tools > Point Collector** or the toolbar icon, .
  - Position the red "+" cross mark in the center of the Image Viewer display on a feature of interest. Note that it is the red cursor cross that must be on the object, not the system mouse cursor. Positioning may be done using any of the following methods: Use the system mouse and Image Viewer's **Tools > Pan** tool, or press and hold down the system mouse wheel button and move the mouse to pan, or use Summit to position the cursor when **Image Viewer > Tools > Move with Summit** is on.



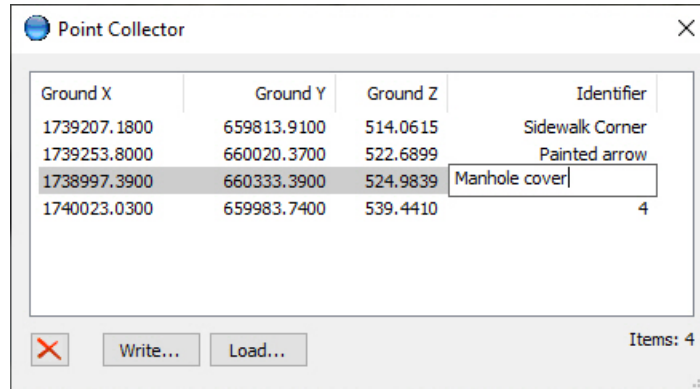
- If it is not already on, select the Image Viewer's Selection Pointer tool:



- Pick with the left mouse button anywhere in the Image View area to digitize. Digitizing must be done with the Selection Pointer tool on. The 2D or 3D point will be recorded in the Point Collector list at the location of the red cursor cross, not at the mouse pointer position.

**Note:** If a terrain file is loaded in Image Viewer when a 3D point is picked, it will use the Z (elevation) of the terrain file, even if “Move with Summit/Landscape” is currently on. (changed September 25, 2020)

- If desired, edit the assigned Identifier. Point Collector will assign an integer. Click directly on the number in the Identifier column and key in any alphanumeric string.



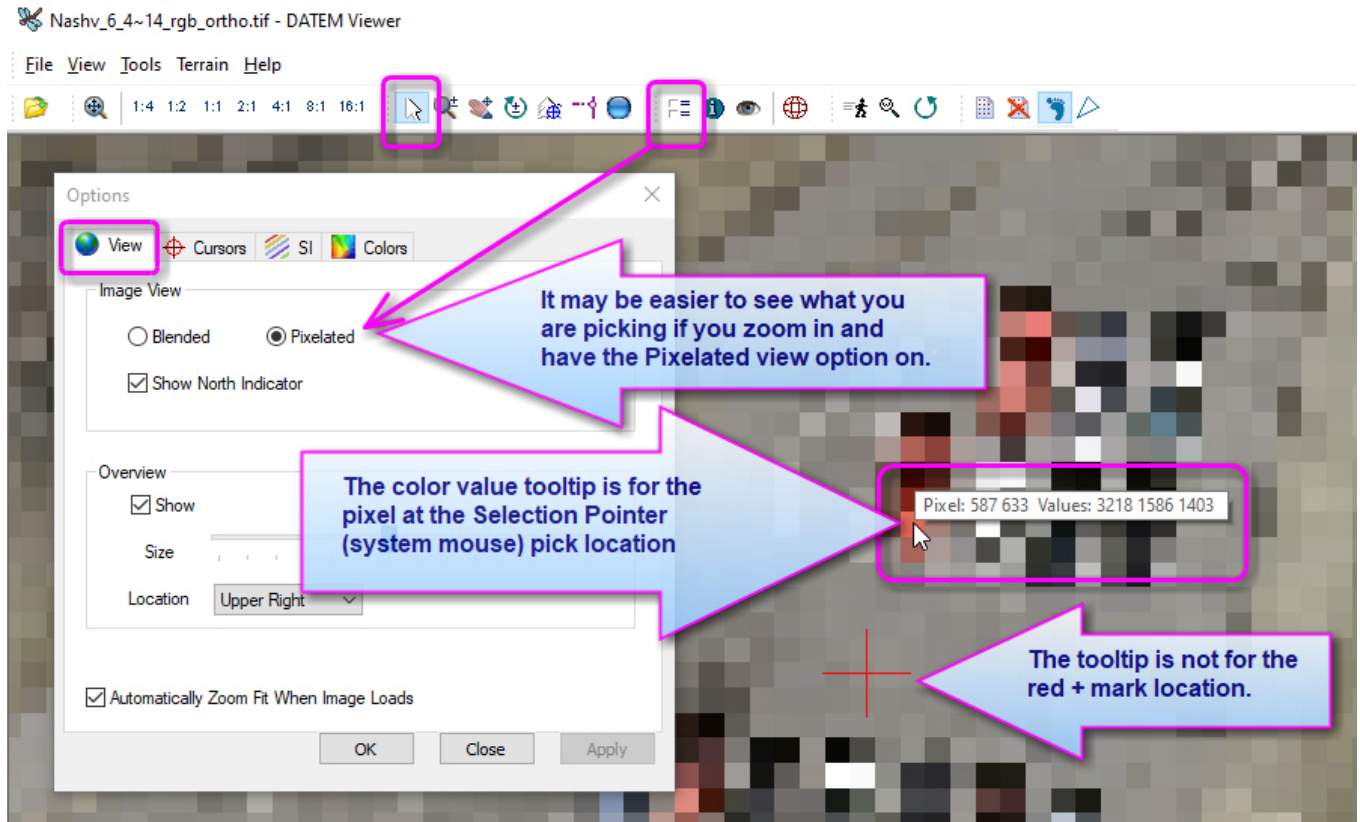
*Edit the point identifiers if desired*

**Note about Identifier:** There are no checks to make sure the user does not assign the same Identifier to multiple points. This is allowed in case you want to use it as a common description rather than a unique ID. During the same Point Collector session, it will automatically assign the next integer to any new points, even if you have deleted previous points. The numbering will reset for new files/run sessions.

- When finished, optionally use the **Write** button to save to a choice of formats, including (but not limited to) .txt and DAT/EM .con control file format.
- If there are unsaved changes upon closing the dialog, it will prompt the user and give a choice of returning to use the **Write** function.
- To revisit the points from any file of a compatible format or to append to an existing file, open any orthophoto of the same coordinate system and geographic area of the points in the file. If you want to add 3D points to the file, load a terrain file. Select **Tools > Point Collector > Load** button and browse for the existing file. Click on points in the list to move to the locations. Digitize more points to append to the file, if desired. Save again, if desired.
- The file made by Image Viewer's Point Collector is compatible with Summit's Point Collector.



- b. Image Viewer can now show information about a selected pixel location. With the cursor in “arrow” mode (arrow highlighted on the toolbar), left click on a pixel. It will give a tooltip for the pixel located at the mouse arrow. It will not give a tip if another tool is in use. For example, if **Point Collector**, **Move by Pick**, or **Rotates the View** are active, then no pixel tip is shown. The tip will always give the true pixel values found in the image. All image adjustments of any kind are ignored. The number of values correspond to the number of channels in the images. Note: The range of color values varies depending on the number of bits in the image, for example 0-255 for 8-bit images and 0-65535 for 16-bit images. (July 20, 2020)



*Image Viewer showing a pixel coordinate and color value tooltip for the picked location*

- c. Image Viewer's zoom level, pixel coordinates, and ground coordinates that appear in the window's lower right corner are now all editable. Click on a value and enter a new value. If you key in a new value, it will zoom or move to the value, if possible. You can also right click on a value to receive a variety of “Copy” options, such as “Copy as space delimited” or “Copy as comma delimited”, then paste the coordinate in the selected format into another application. (July 15, 2020)

#### Project Viewer / Ortho+Mosaic

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

- a. Ortho+Mosaic previously read a Terrain Project (.vrldr) in v.7.6 to provide the surface points, but after reading, it would treat it just like any of the other formats, so processing would not be faster than other formats. Now it takes full advantage of the Terrain Project format to offer faster surface processing. If you have many input points, it may be fastest to use Summit > Terrain > Create Terrain Project to generate the .vrldr, then use as input in Ortho+Mosaic for the fastest surface processing. (June 2020)
- b. There is a new method to delete a single vertex from a seam line. First click on the seam line to edit, which adds vertex markers. Then click one time on the vertex to delete and press **<Delete>**, **X**, or **x** on the keyboard. Previously, Ortho+Mosaic could crash if the **<Delete>** key was used in this manner and it would ignore the **X** key, but these issues are fixed as well as activating the keys for valid edits. (July 27, 2020)

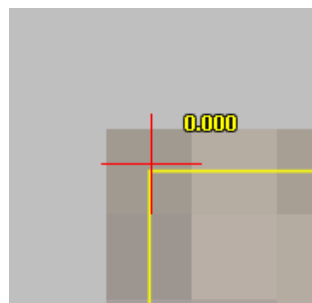
- c. Ortho+Mosaic has a new, smoother edge panning method that takes effect while drawing and editing boundaries and seamlines. It pans slightly near the edge when the cursor reaches the edge of the current view. Previously, it would perform a center pan, which could seem rather visually distracting. (April 2, 2021)
- d. Ortho+Mosaic's drawing and editing tools will now allow a transparent mouse wheel-button pan while in an active draw/edit task. Hold down the mouse wheel button to perform the pan without breaking out of the drawing/editing command. This allows you to pan to an area of your choice if the edge pan did not show you the whole area you wanted to see. (April 2, 2021)
- e. Ortho+Mosaic's Edit Seamline tool will now leave the edited seamline selected after the edit is finished. This will allow another edit on the same seamline without having to reselect it first. Hint: Key in <Control>E to activate the seamline edit tool again and make another edit on the previously edited, still-selected seamline. (April 2, 2021)
- f. The following problem is fixed: **Ortho+Mosaic > Mosaic > Generate Mosaic > Image tab > Use scale of orthophotos** would display the correct pixel size of the input orthophotos, but would process the mosaic at a slightly different size. The mosaic would be correct at that different pixel size, but it would not match up to a well-planned mosaic boundary that was made for the displayed pixel size. Note that it would work well if **User defined pixel scale** was used instead with the pixel size keyed in. (May 13, 2021)
- g. The **Ortho+Mosaic > Orthophotos > Orthophoto Generation** has a slight change to how it chooses the edges of the orthophotos with respect to the position of the boundaries. Now the pixel center coordinates are always contained inside or on the boundary. (May 17, 2021)

If the boundary is arbitrary and you check on **Ortho+Mosaic > Orthophotos > Orthophoto Generation > Main tab > Closest Whole Number** on, this can happen:



Notice the yellow boundary might not touch the pixels. This is because the pixels are discrete and are forced to a whole number. Setting to a whole number forces a shift, but it will remain contained.

If **Ortho+Mosaic > Orthophotos > Orthophoto Generation > Main tab > Closest Whole Number** is off, then the upper left corner will always be like this:



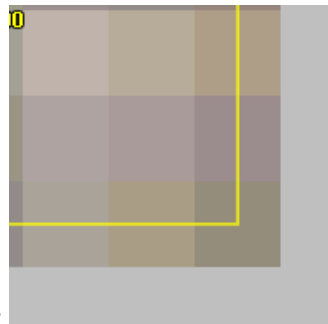
The lower right may or may not land on the center of the pixel depending on the width of the boundary area and the size of the pixel (ground per pixel). So, you might get something like this:



The lower right pixel's center coordinate should always be contained within or on the boundary.

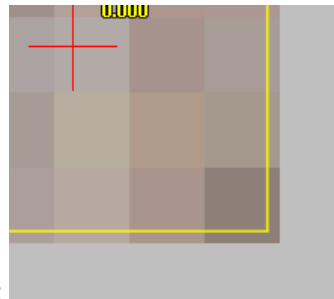
DAT/EM recommends to check on the **Closest Whole Number** setting and make exact boundaries when you are going to use the orthophotos as deliverable products. Often, they are only an intermediate stage before making a mosaic, in which case you can use the automatically generated boundaries without too much worry, as long as they allow enough rows and pixels of overlap to generate a nicely feathered/blended final mosaic. If the mosaic is the main deliverable, then spend the time making the mosaic boundary exactly as you want it. See the next item below for more information on changes to mosaic boundaries.

- h. The **Ortho+Mosaic > Mosaic > Generate Mosaic > Main** tab > **Inclusive** and **Overlapped** settings have been removed. Pixels will always be processed at the boundary according to a new fitting method, which is most like the old **Inclusive** setting: (May 13, 2021)



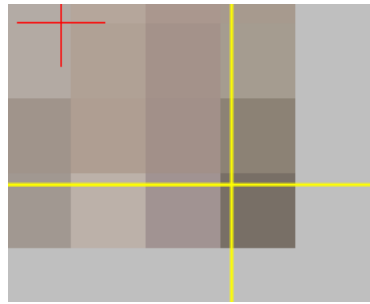
Exact fit (1.0):

The yellow lines are a boundary. Notice it hits dead center of the pixel. (A pixel is really a point, but we represent it as a color-filled square centered at the pixel coordinate.) Pixels must be discrete, but a boundary can be continuous. Rounding is used to decide whether to add a pixel row/column or not.



Fit (0.75):

Here a boundary is past the center of the lower right pixel (yellow boundary not in the center of the pixel). It is off, but not enough to add another pixel in the row/column. In this case, the actual corner pixel is center coordinate is slightly inside the boundary. If the boundary is  $> 0.5$  pixel width units past the center of the pixel, then another row/column of pixels is added like this:



pixel row and column added:

A row may be added without adding another column, or a column without another row, but this depends on the (x,y) location of the pixel center compared to the boundary. Above, we showed rows and columns to be equally offset from the pixel center for simplicity.

## LandScape

LandScape has the following changes:

1. LandScape is fixed so it can load a LandScape .Indscp project by double clicking on the file in File Explorer, while LandScape has the “Load last project on start” option on. Previously it could crash due to a conflict while trying to load the double-clicked project and also the last project. (August 19, 2020)
2. Some LandScape tools and settings can now be launched by the DAT/EM Keypad Controller using “**Summit/LandScape**” output keys.
  - There is an example LandScape keypad .dkf file installed in “C:\ProgramData\Datem Systems\keypad\LandScapeExample.dkf”.
  - For a list of the new keywords to use in the Keypad Controller’s text strings for LandScape, see the separate document called “LandScapeKeypadCommands<date>.pdf” available for download from [www.datem.com](http://www.datem.com). (December 7, 2020 -- February 2021)
3. The Interactive Point Edit FaceShift tool is fixed so that it will properly show the TIN lines when the Show TIN option is on. (January 2021)
4. The method of processing input from all types of 3D mouse devices was changed to better suit operation in newer versions of Windows 10. Previous symptoms could include the mouse becoming unresponsive in LandScape and “Give up” and “Get 3D device” would not help get the mouse going again. (March 24, 2021)
5. There is improved inter-process data access that may prevent some application freeze errors. (April 29, 2021)


## DAT/EM Capture for ArcGIS - ArcMap

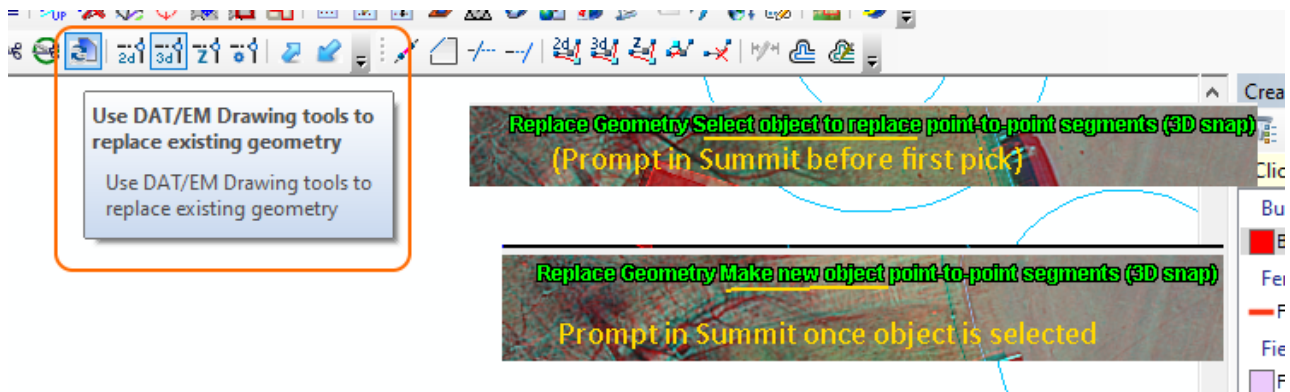
**This version is compatible with ArcGIS** 10.0 (service pack 4), 10.1 (service pack 1), 10.2, 10.2.1, 10.2.2, 10.3, 10.3.1, 10.4.x, 10.5.x, 10.6.x, 10.7.x, and 10.8 (plus any available service pack as they are released).

**This version may be compatible with ArcGIS** 9.1, 9.2, 9.3 (service pack 1), 9.3.1(service pack 2). BE ADVISED: Testing no longer occurs for DAT/EM Capture with ArcGIS 9.x. It still installs for it and no code has been removed, so you may use 9.x as long as it continues to work for you. Any issues will not be corrected. ArcGIS 9.x support may be dropped completely in a future release. Please continue to make plans to upgrade any remaining ArcGIS 9.x version to 10.x.

DAT/EM Capture for ArcGIS has the following changes:

### Capture for ArcGIS (ArcMap) Items

1. **DAT/EM Replace Geometry** is a new DAT/EM Capture for ArcGIS tool. It may be used to replace the geometry of an ArcMap object without affecting its tabular data. It works with the Capture Drawing tools. The steps for its use are: (July 16, 2020)
  - ✓ Begin an ArcMap editing session.
  - ✓ Select the **Replace Geometry** button . Note: the same button may be used to turn off **Replace Geometry**.
  - ✓ Select the object to be replaced using the 3D cursor.
  - ✓ Draw the new object using the Datem Drawing tools Point-to-Point, Stream, or Square. Point-to-Point is chosen by default. The drawing mode may be changed during drawing, but only to another one of these three drawing tools.
  - ✓ When finished, use the **Cancel/Reset/Finish Sketch** button on the 3D cursor as usual to find Polygon or Polyline drawing. *Exception:* Point-geometry objects will automatically update as soon as the new point is picked, so **Finish Sketch** is not required for points. **Replace Geometry** will stay active until either the button is selected again or an un-supported drawing tool is chosen.



The keywords to use on the DAT/EM Keypad and Summit's Custom CAD buttons are:

**ReplaceGeometry On**


**ReplaceGeometry Off**

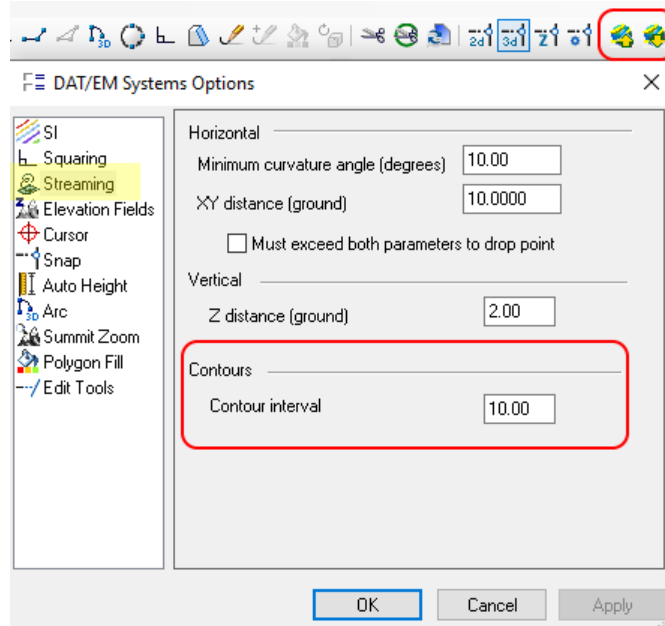
These are not case sensitive, and they may be combined with the drawing tool, such as:

**replacegeometry ON draw square**

You may want to add **ReplaceGeometry Off** to the beginning of existing Keypad keys or buttons that start Point-to-Point, Square, and Stream mode in regular, new-object drawing mode. This would ensure that **DAT/EM Replace Geometry** is not still active when drawing a completely new object. Example:

**ReplaceGeometry off CreateNewFeatureTask draw point-to-point**



2. **Contour Up** and **Contour Down**  are new tools to move the Summit Evolution stereoplottter up or down in elevation to the nearest even contour interval. For example, with a contour interval of 5.00, move Summit from its current elevation of 102.79 to 105.00 and then from 105.00 to 110.00. The contour interval may be set by a keyword or from **DAT/EM Systems Options > Streaming tab > Contour interval**:

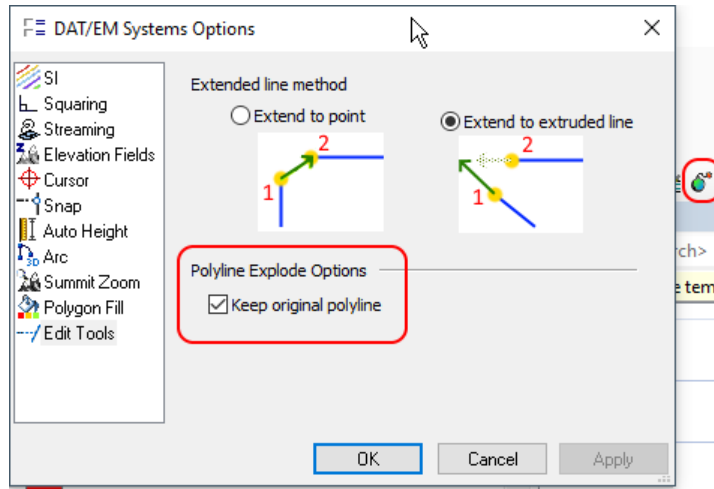


*New Contour interval setting to use with Contour Up and Contour Down*

The keywords to set and use these commands from the DAT/EM Keypad Controller or Button Manager are:

<b>ContourUp</b>	Moves Summit up to the nearest even contour interval.
<b>ContourDown</b>	Moves Summit down to the nearest even contour interval.
<b>ContourInterval &lt;value&gt;</b>	Sets the contour interval. Example: <b>ContourInterval 2.0</b>

3. **Explode Polyline**  is a new tool to break a polyline into its component line segments and copy the original polyline's database attributes, including field values, into each line segment. The new lines are placed on the original polyline's line-geometry layer. Use **DAT/EM Systems Options**  > **Edit Tools > Keep original polyline** to choose whether or not to retain the original polyline in addition to the new line segments. (April 12, 2021)

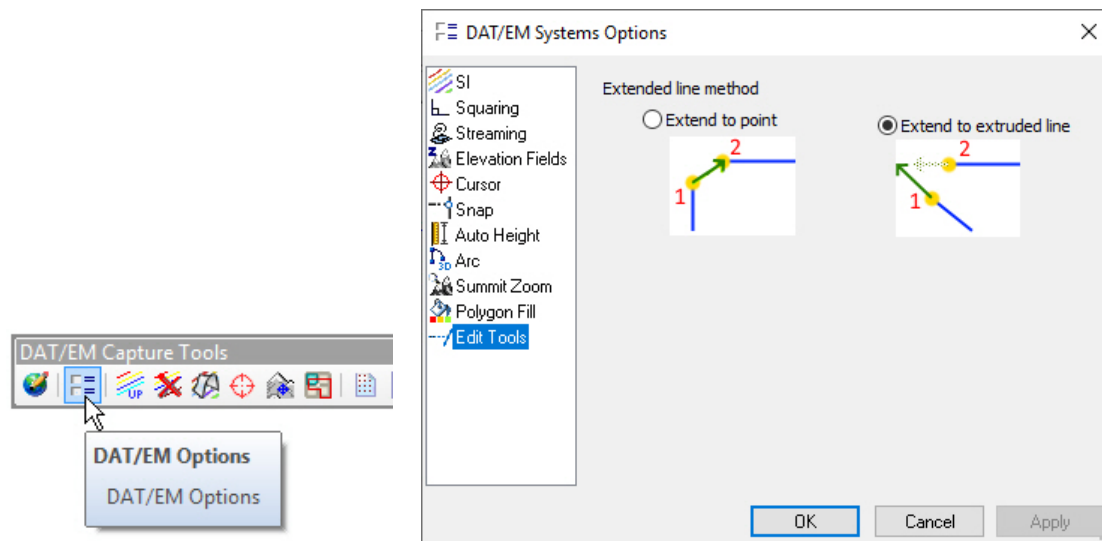


*Explode Polyline setting in the Edit Tools options*

The keyword to activate **Explode Polyline** from the DAT/EM Keypad Controller or Button Manager is:

**ExplodePoly**

4. The example DAT/EM Keypad file called ESRI.dkf has been generally reorganized and updated to show the new DAT/EM Replace Geometry options. (August 14, 2020)
5. The **Extend one line to another object** tool now has two options for the type of extension it will use. Set the type in the ArcMap-side DAT/EM Systems Options **Edit Tools** settings: (October 14, 2020 and modifications in April 2021)



The settings are:

- **Extend to point** – This is the preexisting method. It adds a segment to the extending object (Object 1) so that it meets the point you picked on the extend-to object (Object 2). It preserves the picked point, therefore does not enforce the original end segment angle on Object 1.
- **Extend to extruded line** – This is the new setting. It extends the end segment of Object 1 at its original angle until it meets Object 2. If there is no natural intersection with the Object 2, it virtually extrudes the closest end segment of Object 2 to create a virtual intersection with the extension of Object 1. If an end segment extrusion is done, the new endpoint of Object 1 will not have a real intersection with Object 2; there will be a gap. Hint: If you run it again and swap the order of picking Object 1 and 2, it will perfectly fill the gap without changing the end segment angle of either object.



The keywords to toggle this setting from the DAT/EM Keypad or a Button Manager button are:

**ExtendToExtrudedLine on**

**ExtendToExtrudedLine off**

6. The **Faceshift** tool has a new keyword, **Faceshift**, to use on the DAT/EM Keypad or on a Button Manager User CAD button. Previously, you could only use its command ID with CallCommand. Either one of these command strings will now work: (May 29, 2020)

**Faceshift**

Or,:

**CallCommand Capture.ArcInfo.Faceshift**

7. **Feature Shift** has the following changes:

- a. Negative numbers keyed in to the distance fields will now have the negative signs preserved and implemented. Previously, they would be treated as positive numbers. (October 26, 2020)
- b. The **Feature Shift** dialog will now stay visible until another command is started. To close it, pick another command such as the point-to-point drawing tool. This solves a problem where the user would attempt to close the dialog, and it would disappear, but it would not easily reappear again. (October 26, 2020)
- c. **FeatureShift** is a new keyword. When used alone, it launches the Feature Shift dialog.
- d. **FeatureShift dialog settings keywords** are a new way to set the Feature Shift tool dialog settings automatically from the DAT/EM Keypad or a Button Manager button without launching the Feature Shift dialog. **FeatureShift** is the keyword to begin; it only needs to appear one time. It is followed by the specific settings keywords as follows:

#Keyword to begin and to start the Feature Shift tool. Use any of the following settings after it:  
**FeatureShift**

**MakeCopy On | Off**

#Using Summit (These automatically turn on "Use Summit to shift"):

**SummitHor | SummitVert | SummitBoth**

**SummitRotate On | Off**

**SummitScale On | Off**

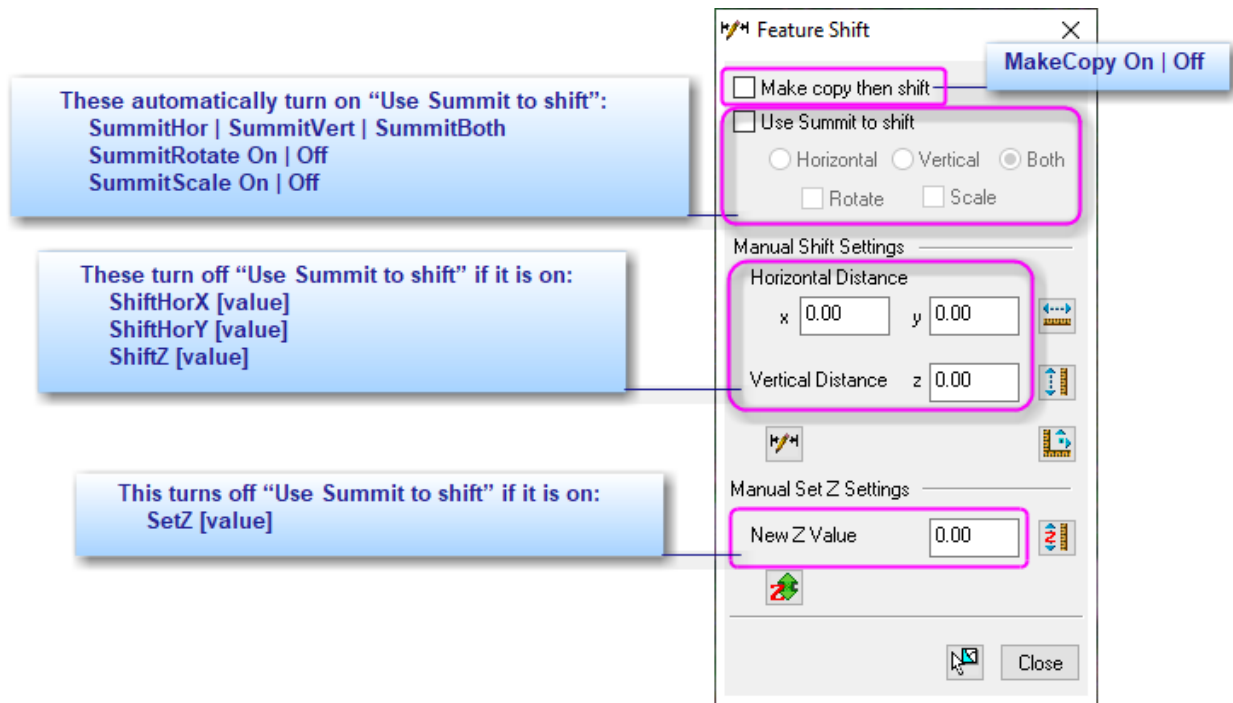
#These turn off "Use Summit to shift" if it is on:

**ShiftHorX [value]**

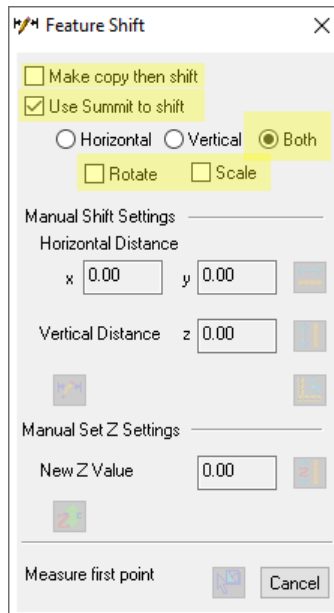
**ShiftHorY [value]**

**ShiftZ [value]**

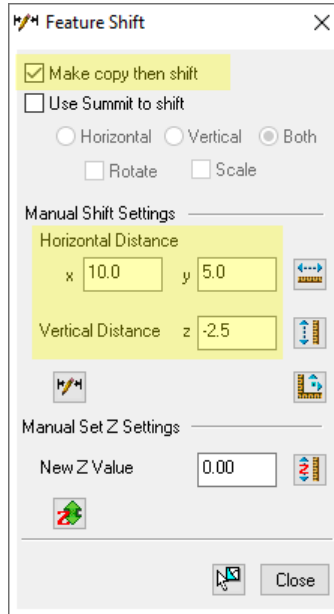
**SetZ [value]**



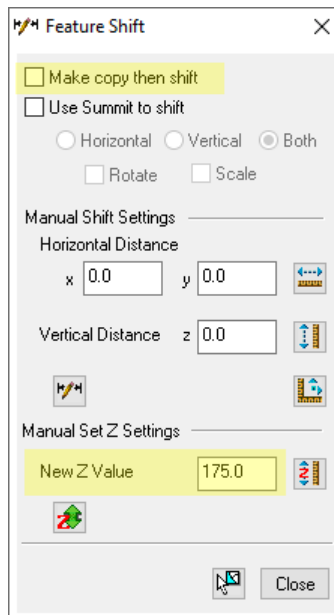
Examples:



**FeatureShift MakeCopy off Summitboth Summitrotate off Summitscale off**



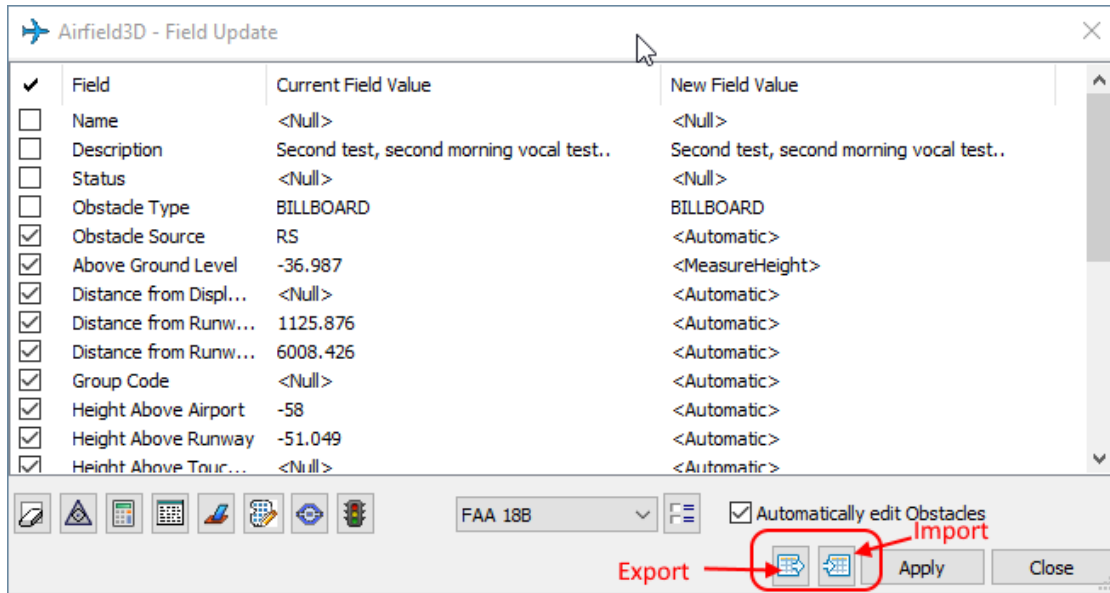
**FeatureShift MakeCopy on ShiftHorX 10.0 ShiftHorY 5.0 ShiftZ -2.5**



**FeatureShift MakeCopy off SetZ 175.0**

8. Both **Field Update** and **Airfield3D** have new export and import buttons to save and reload previously used field values. The purpose is to save you from having to re-key complicated field values, particularly long text strings.  
(October 6, 2020)
  - The files saved by Field Update and Airfield3D are the same format and may be imported later by either of these dialogs.
  - All user-entered field values will be exported for the layer of the currently selected object. Automatic field values will not be exported.
  - There is a limit is 20 saved field values per field.

- During import, field values will be matched, regardless of the layer of the selected object; current and imported field values will appear in the pull-down menu for the field in the “New Field Value” column. For example, if a selected object on Layer1 exports a field called “Description”, it may be imported later for a selected object on Layer2 that also has a field called “Description”.
- A field does not need to be checked on in order to be exported.
- Field names that don’t match at the time of import will be ignored.
- The saved files are text files, and may be *carefully* edited with a text editor. That is, you may edit the field values listed there, but do not change the overall file format. Do not exceed 20 field values per field.



*New field value export and import tools for Field Update and Airfield3D*

9. **Field Update** has a new automatic field, “Measure Vertical Field Delta” **<MeasureVFieldDelta>**. **<MeasureVFieldDelta>** is useful when measuring an object that has an elevation that changes over time and already contains a Height above Ground field and an older Z vertex elevation. Such a field requires two measurement points to fill initially, but can be updated by a single measurement. This option may be useful in airport obstruction projects to update existing tree obstacles after the trees have grown; in this case, switch to using the Field Update tool instead of Airfield3D. (February 10, 2021)

**<MeasureVFieldDelta>** performs two operations based on one measurement:

- 1) It sets the new field value to the current field value + the difference between the new measured location Z and the current object elevation in the drawing.
- 2) It also sets the elevation of the object to the measurement’s Z value.

The calculation for the field value looks like this:

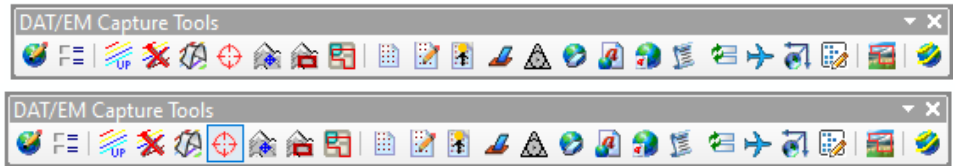
$$\text{NewValue} = \text{CurrentFieldValue} + \text{measuredPoint.Z} - \text{selectedObject.Z}$$

An example would be a tree with a top at 110 meters and a measured Height Above Ground of 10 meters, and which has grown 3 meters since the previous measurement that was made in older imagery. The tree needs to be updated to reflect its new 113-meter height and the Height Above Ground field needs to be updated to 13 meters. The calculation would be:

$$\text{NewValue} = 10 \text{ (current field value)} + 113 \text{ (new measured location)} - 110 \text{ (original location)}$$

To use this tool:

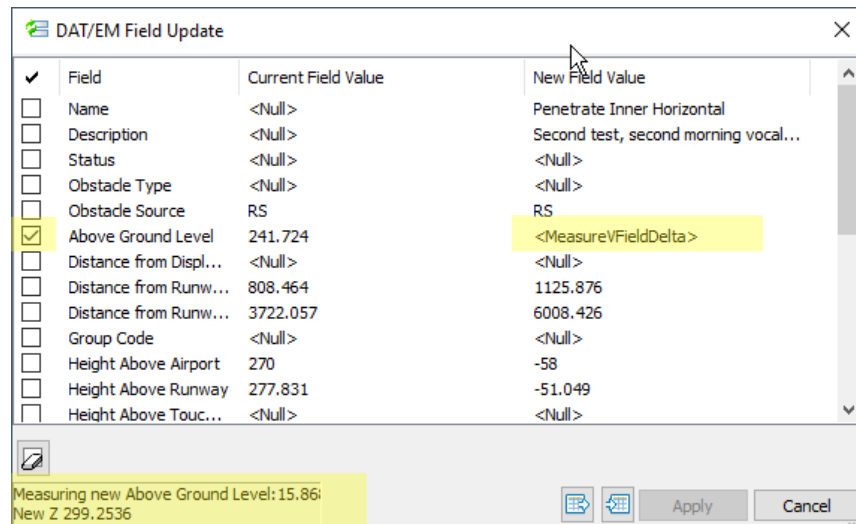
- ✓ Begin an edit session.
- ✓ If desired, select the object to edit now. Selecting it later is described below.
- ✓ Launch the Field Update Tool and select **<MeasureVFieldDelta>** in the **New Field Value** column for the field to be updated.
- ✓ If not already selected, select the object to be edited now. Use either the ArcMap Edit Tool or Selection Tool with either the system mouse in the ArcMap view or the Summit pick button.
  - Note: If you want to pick the object using Summit while the Field Update dialog is active, turn off the DAT/EM Cursor from the ArcMap-side DAT/EM Capture Tools toolbar, pick the object using Summit, then toggle the DAT/EM Cursor back on. Leave Field update running while you do this.



*The DAT/EM Cursor is off if it is plain on the toolbar; it is on if it has a box around it*

Normally, the DAT/EM Cursor toggles off automatically when a native ArcMap tool is selected and on when a DAT/EM tool is selected (as long as the ArcMap-side **DAT/EM Systems Options > Cursor > Automatically toggle DAT/EM cursor** is checked on). However, since Field Update turned the cursor on, and Field Update is still running, it will not turn off automatically when you start the edit or selection tool. This is why the manual toggle must be done if you want to select with Summit instead of the system mouse.

- ✓ Press the **Apply** button on the dialog or from an **Apply** button set on a Button Manager cursor button.
- ✓ When prompted, measure the new elevation for the object using Summit's cursor. This may either be higher or lower than it was before. For example, a tree that has grown will be higher, but a tree that has broken off in a windstorm will be lower.



*MeasureVFieldDelta prompts to measure the new height, then edits the field and the object's Z*

10. The **SetFieldValue:<layer>:<field name>:<field value>** keyword for the DAT/EM Keypad has a special, new **<field value>** option called **PromptForValue** (also **AskUser** works the same way). These are not case sensitive, so PromptForValue works the same as promptforvalue. If the Keypad submits a string such as:

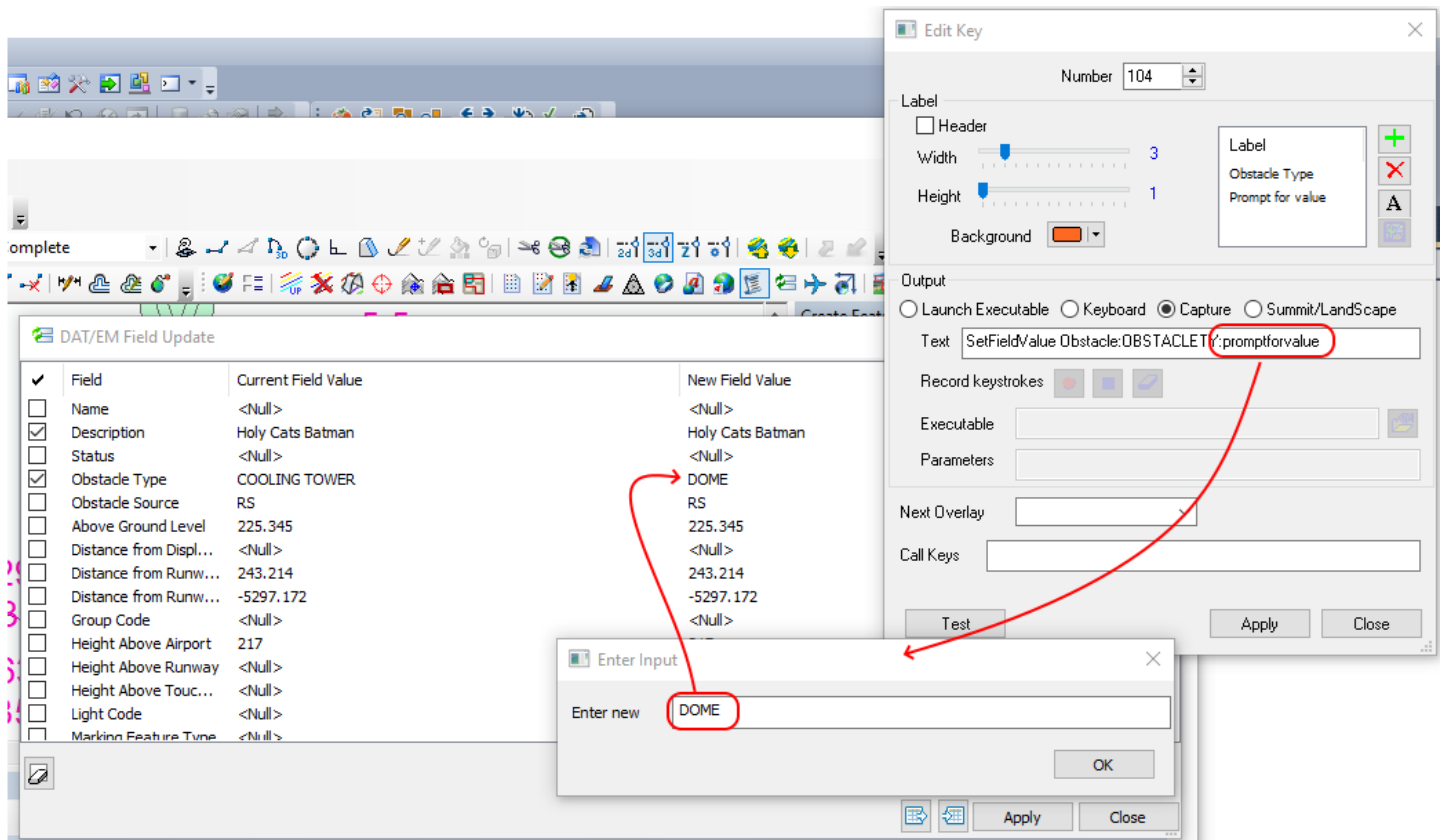
SetFieldValue:LayerName:FieldName:PromptForValue

Or,

setfieldvalue:LayerName:FieldName:askuser

Then when this Keypad key is pressed, a dialog appears asking for the user to key in the field value.

It is the user's responsibility to enter a value that conforms to the particular field type definition and/or preset field values. Preset text field values are case sensitive in ArcMap. For example, enter a text string up to 55 characters for a 55-character text field, enter a short integer for a short integer field, or enter TREE (not Tree) for a preset allowed text field value of TREE. The **Enter Input** dialog can't verify the entry, but Field Update will reject it upon **Apply** if it does not conform to the field type definition and/or preset value.



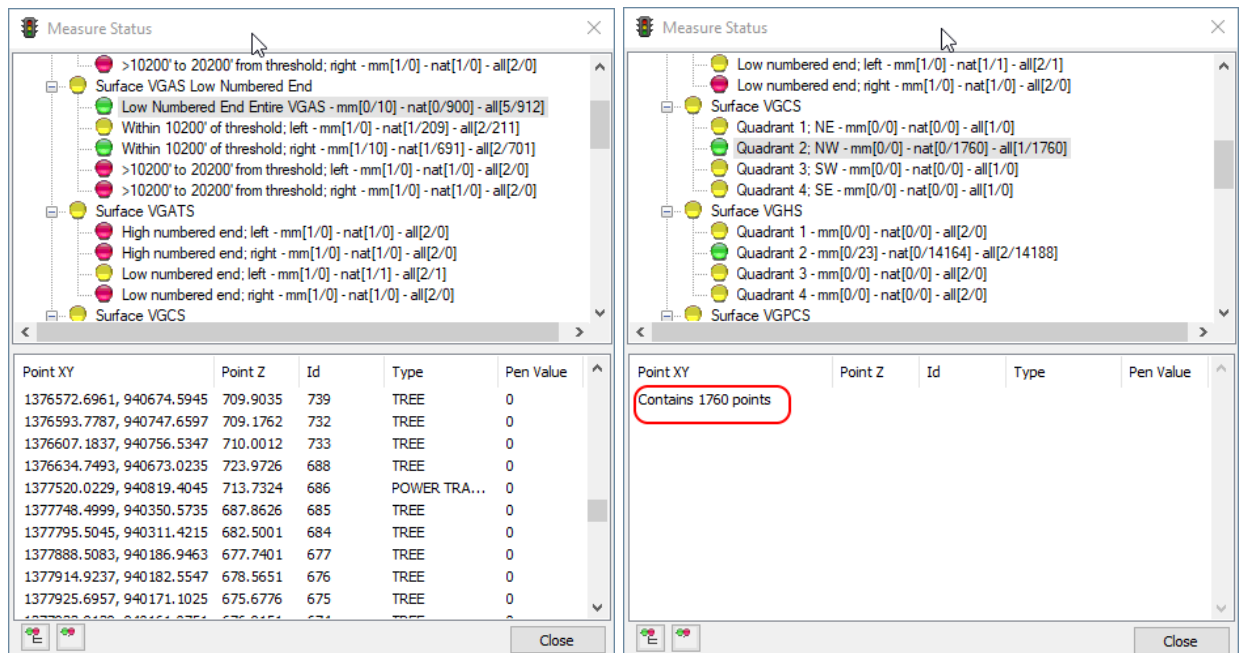
*Example of the DAT/EM Keypad's Edit Key dialog with **SetFieldValue...PromptForValue** set, the resulting **Enter Input** dialog with user entry, and the New Field Value showing in the Field Update dialog in ArcMap. After **Apply** to Field Update, the value will be set in the selected object's Current Field Value list.*

11. The Shift Features tool wasn't snapping correctly if the **DAT/EM Systems Options > SI > Quick Snap** setting was on. This is fixed. (December 2, 2020)
12. The **Square** drawing tool now offers a first-point perpendicular snap. If the Square tool starts drawing with a snap to a segment on another object, it will take its first squaring angle from that snapped-to segment. As long as you don't exceed the squaring angle set in **DAT/EM Systems Options > Squaring**, the first segment of the new square mode object will be perpendicular to the snapped-to segment. (If you do not want a perpendicular snap, use the point-to-point tool instead for the first segment, then resume the square mode tool when needed.) (April 1, 2021)

13. The **ZoomPlotter** keyword submitted from the DAT/EM Keypad or Button Manager buttons wasn't activating in Capture for ArcGIS. This is fixed. (March 17, 2021)
14. Superimposition with Capture for ArcGIS has some improvements for highlighting the selected object using the settings in **Summit > Tools > Options > SI tab > Selected Objects area > Object and Line**. It will now highlight an object selected before any edit session is active, keep highlighting the line after an SI Update, correctly highlight selected lines along shared edges, and correctly highlight during DAT/EM multisnap operations. (July 21, 2021)

### Airfield3D

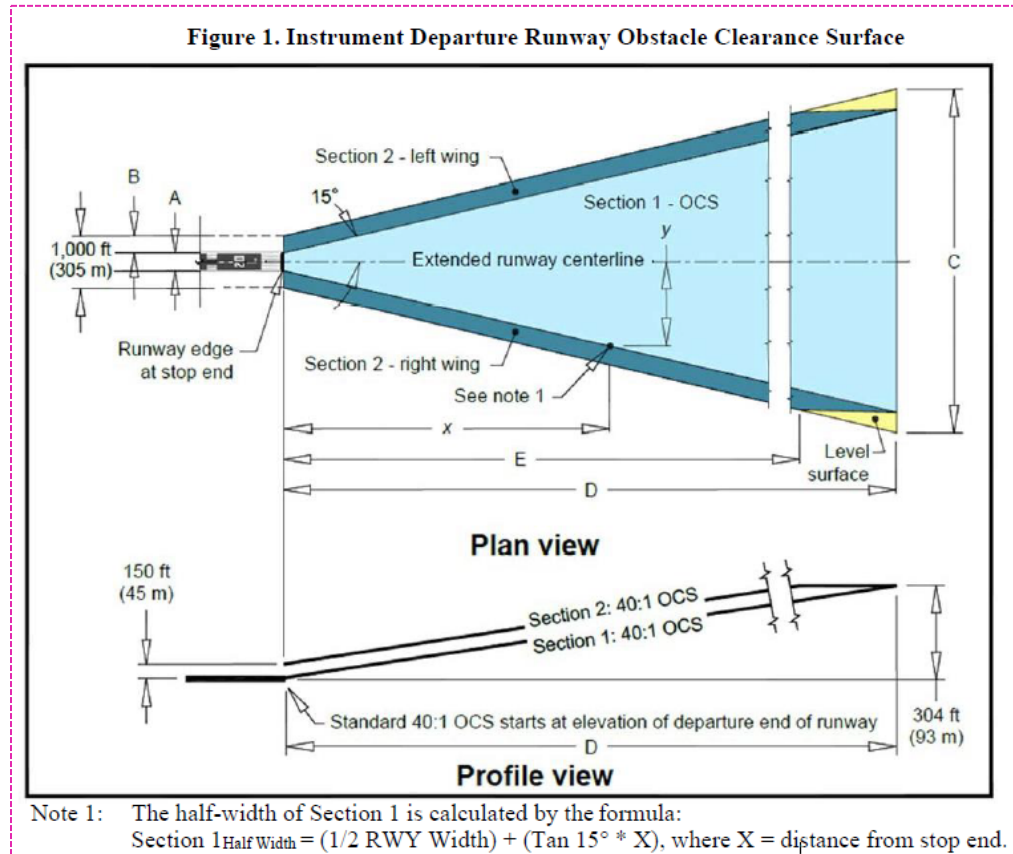
15. Airfield3D has the following changes:
  - a. Airfield3D's Measure Status tool listing speed is improved. Previously, it could be very slow if there were tens of thousands of entries (obstacles) to count and list. Now if there are more than 1000 points in the selected surface's area, the list will be truncated to show a total only. (May 29, 2020)



Measure Status showing fewer than 1000 points (left) and a count only for more than 1000 points (right)

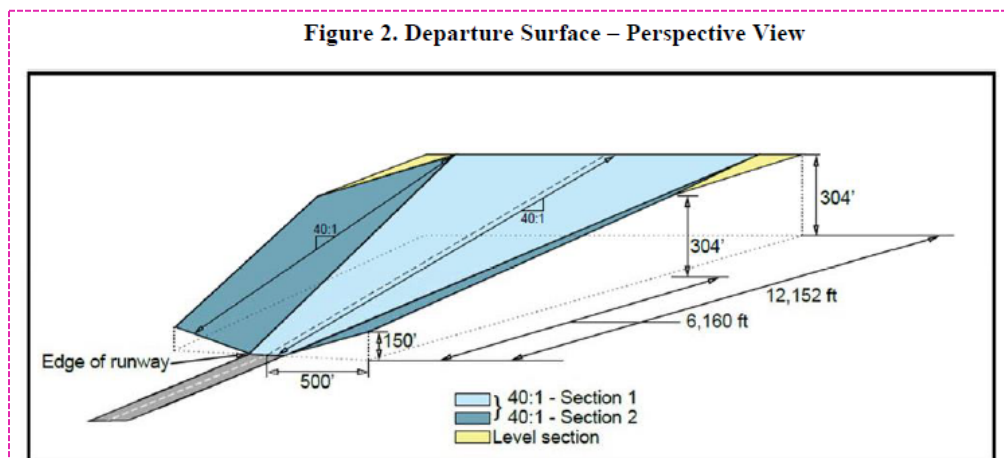


- b. The Part 77 Custom end setup has a new **Approach dog ear distance** field and surfaces. This allows you to add the “level surface” sections as shown in the FAA’s “Engineering Brief No. 99A, Changes to Tables 3-2 and 3-4 of Advisory Circular 150/5300-13A, Airport Design” document. Below is Figure 1 from that document, which shows the new sections in yellow, which DAT/EM nicknames “dog ears” in these instructions and in the Airfield3D Custom Part 77 custom end dialog settings: (July 15, 2021)



The yellow sections in this FAA graphic can now be added in the Custom Part 77 end definition


**Important note!** There's often ambiguity in FAA obstruction surface publications, and this one is no exception. Figure 1 in the document labels the yellow sections as “level surface” and Figure 2 shows the surface starting and ending at 304', but also connected to the outermost corner of the light blue Section 1 and 2 surfaces:



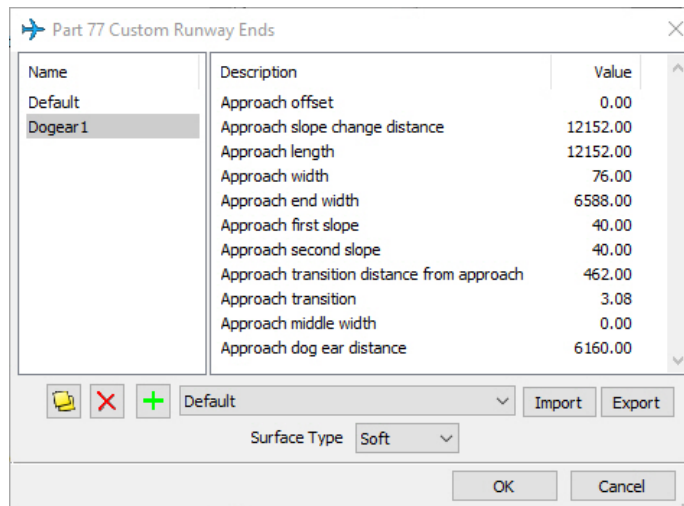
The FAA document's Figure 2 show the yellow surfaces starting and ending at 304'. This is impossible.

However, if we enter these distances into the various formulas, and find the following:

- **Starting elevation:**  $6160' / 40 + 150' = 154' + 150' = 304'$ . This agrees with Figure 2.
- **Elevation at the end of the Section 2:**  $12152' / 40 = 303.8'$ . This does not agree with Figure 2. Thus, the end elevation is not 304' as indicated on the diagram; rather, it is 303.8', indicating an elevation change occurs along the so-called "level" dog ear surface.
- There is also a problem with the "500'" distance label in Figure 2. In the diagram, 500' is marked from the *center* of the runway to the outer corner (closest to the runway end) of the Section 2 area. This is not the distance you need to use for the Airfield3D Custom Part 77 custom end "Approach transition distance from approach" or in the "Approach transition" calculation. What the FAA has marked as 500' is not actually a straight line on the plane of Section 2; instead, it is the length of two non-colinear segments added together: From the center of the end of the runway to the outer corner of the runway plus the outer corner of the runway to the outer corner of Section 2. To calculate the "Approach transition distance from approach", you must subtract  $\frac{1}{2}$  of the width of the runway from 500'. So, for example, let's say a runway is 76' wide; in this case, calculate "Approach transition distance from approach" as  $[500' - 0.5(76')] = 462'$ . Then calculate "Approach transition" as  $462' / 150' = 3.08$ . These values will be different depending on the width of the runway in your particular project. (See example entries in graphic below.)

The new setting is found in the ArcMap-side **Airfield3D** dialog > **Part 77 Custom** > **Options**  button > **Define Runways** button > **Part 77 Custom** dialog > **Approach dog ear distance**. The dog ear is the distance of the start of the dog ear (starting closer to the runway). It can be disabled by setting to **0** (zero), which is the default value for a new custom runway end.

The **Approach transition distance from approach** and **Approach transition** fields are also important and take some manual calculation to get them right; calculate them as described above.



Name	Description	Value
Default	Approach offset	0.00
Dogear1	Approach slope change distance	12152.00
	Approach length	12152.00
	Approach width	76.00
	Approach end width	6588.00
	Approach first slope	40.00
	Approach second slope	40.00
	Approach transition distance from approach	462.00
	Approach transition	3.08
	Approach middle width	0.00
	Approach dog ear distance	6160.00

*Part 77 Custom runway end with the new "Approach dog ear distance" set to 6160'.*

*Your project may use a different value than 6160'.*

*If "Approach dog ear distance" is set to 0 (zero), it will not be drawn.*

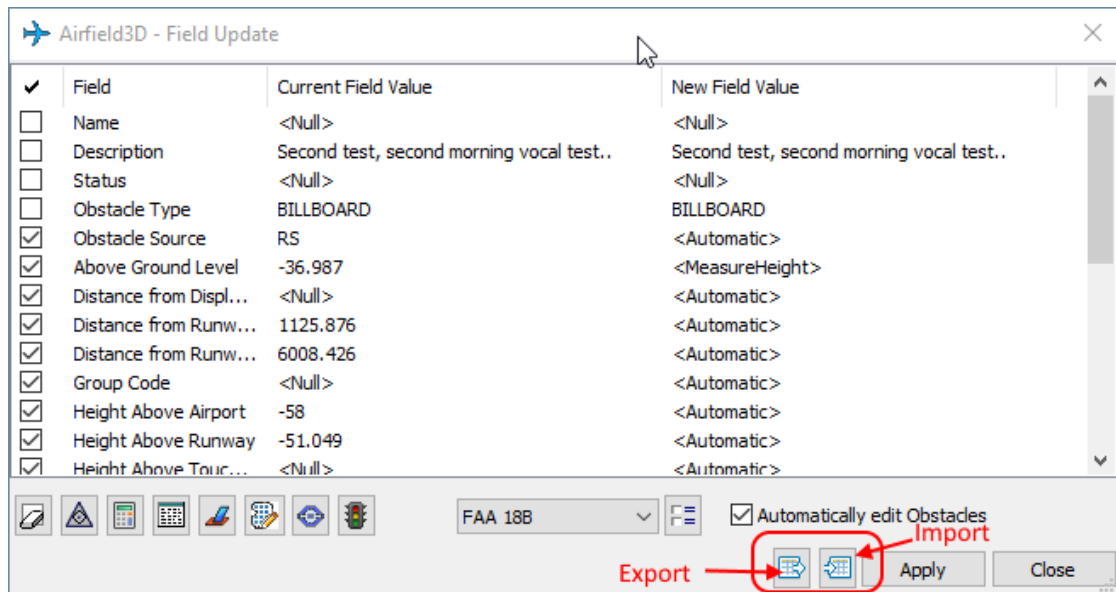
*This example is for a runway width of 76' to match the example calculations above.*



*Example of the new dog ear surfaces being generated to the left and right sides.  
The green Summit cursor with yellow elevation text is located in one of the dog ears.  
This example is simplified by removing the conical and horizontal surfaces.  
The actual size of the dog ears in your project may not be similar to this example.*

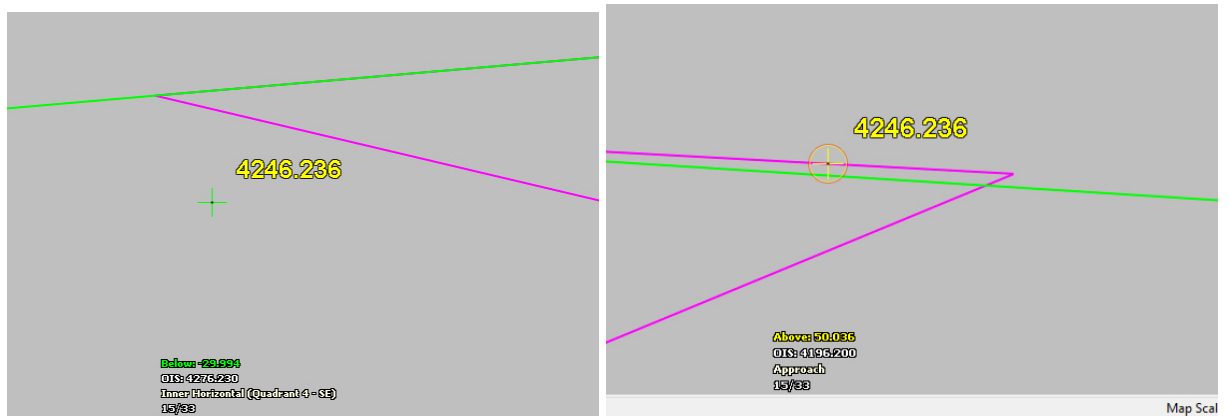
- c. Related to the new “dog ear” surface addition shown above, superimposition surface clipping by the conical surface was deactivated. This was done, because clipping could prevent the “dog ear” surfaces from displaying at all, depending on the distance definition of the conical surface. (July 19, 2021)
- d. There is a new report called the “VGPS High End Only”. (July 29, 2020)
- e. The NVGPS was reporting points on the opposite sides (left instead of right and vice versa). This is fixed. This affects the superimposed head’s-up text, the Measure Status dialog lists, and reports. (September 3, 2020)
- f. The NVGAS has added high/low numbered end definitions. Previously, the two ends were grouped together. This affects the superimposed head’s-up text, the Measure Status dialog lists, and reports. (September 3, 2020 and additional reports clarification July 12, 2021)
- g. If the **Follow Lowest Surface** flag is turned on, points in the VGPCS will now also be checked against the VGAS, and the point will be assigned to the lowest of these two surfaces. If the **Follow Lowest Surface** flag is turned off, it keeps working as it did previously, that is, if a point is in the VGPCS, it is not included in the VGAS check, and it is left in the VGPCS. (July 12, 2021)
- h. Both Airfield3D and Field Update have new export and import buttons to save and reload previously used field values. The purpose is to save you from having to re-key complicated field values, particularly long text strings. (October 6, 2020)
  - The files saved by Field Update and Airfield3D are the same format and may be imported later by either of these dialogs.
  - All user-entered field values will be exported for the layer of the currently selected object. Automatic field values will not be exported.
  - During import, field values will be matched, regardless of the layer of the selected object; current and imported field values will appear in the pull-down menu for the field in the “New Field Value” column. For example, if a selected object on Layer1 exports a field called “Description”, it may be imported later for a selected object on Layer2 that also has a field called “Description”.
  - A field does not need to be checked on in order to be exported.
  - Field names that don’t match at the time of import will be ignored.

- The saved files are text files, and may be *carefully* edited with a text editor. That is, you may edit the field values listed there, but do not change the overall file format.



*New field value export and import tools for Field Update and Airfield3D*

- Part 77 Transitional surface generation was incorrect on one end in some runway configurations. On one end, the Approach and Transitional surfaces would correctly share an edge; on the other end, they could diverge from each other, so you might see a mismatch similar to this example: (December 17, 2020)



*Correct edge sharing shown on the left; this situation in Part 77 is now fixed so the Transitional and Approach correctly share an edge on both ends of the runway*

- Please note the new DAT/EM Keypad Summit-controlling keywords listed above in the DAT/EM Keypad section, item 4., starting on page 9. The table of keywords shows some Airfield3D keywords to toggle following the surface. (July 10, 2020)
- If a point on the **RunwayEnd** layer has a blank or <Null> **Runway End Designator** field, a message will appear and the runway will be skipped. (May 17, 2021)

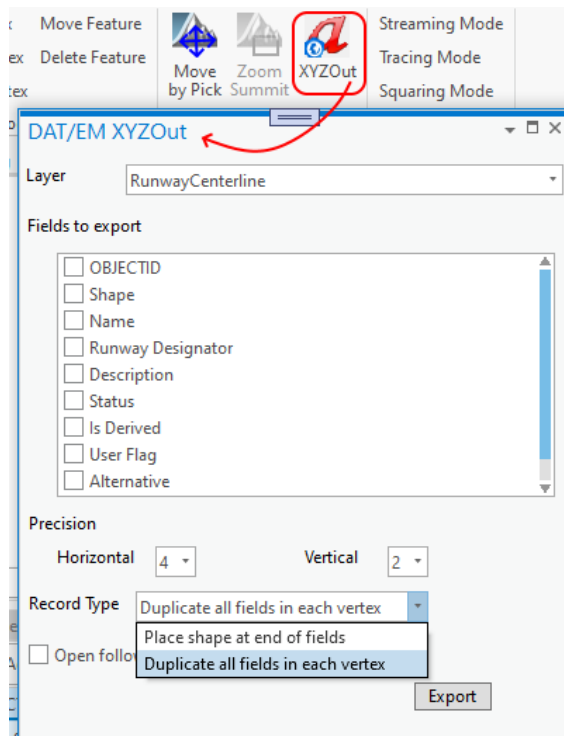
## DAT/EM Capture for ArcGIS – ArcGIS Pro (Beta)

DAT/EM Capture for ArcGIS Pro is compatible with versions:

- **ArcGIS Pro versions 2.3 through 2.8.1. Please ask DAT/EM about any higher version numbers as they are released.**
- **The API no longer needs to be present on the hardware lock. If you have Capture for ArcGIS and want to try Capture for ArcGIS Pro, use the DAT/EM CAD Enabler (standalone or located in the DAT/EM Administration Tool) to activate the extension for ArcGIS Pro.**

DAT/EM Capture for ArcGIS Pro has the following changes:

1. Compatibility with ArcGIS Pro versions 2.5.1 through 2.8.1 has been added. (up to July 26, 2021)
2. **XYZOut** is a new tool in Capture for ArcGIS Pro. It exports selected information from an ArcGIS Pro feature layer to a text file.



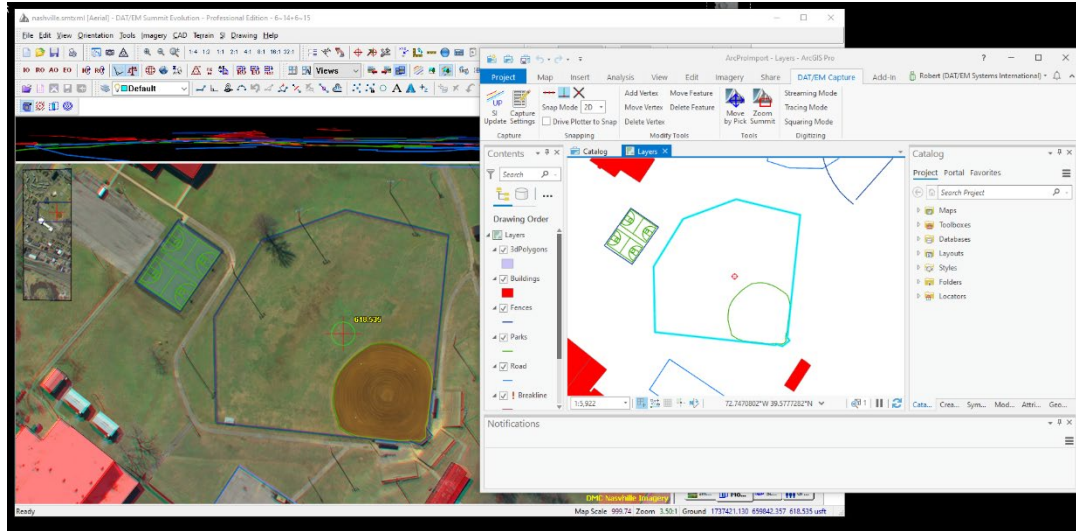
*New XYZOut toolbar button and dialog in Capture for ArcGIS Pro*

To use **XYZOut**:

- Start the command using the toolbar icon shown in the graphic above or from the DAT/EM Keypad or a digitizer User CAD button using the following keyword:  
**xyzout**
- Select the layer to be exported using the **Layer** drop-down menu.
- Select the fields to export using the **Fields to export** list. Fields will be exported in the order of the list. The order of the list cannot be modified at this time.
- Adjust the decimal precision using the **Precision** controls (**Horizontal** for x,y and **Vertical** for z).
- The **Record Type** control identifies the method that will be used to export each object on the layer. Select the type most appropriate for your use: **Place shape at end of fields** will create 2 lines per object. The first line will contain the field contents, and the second field will contain the vertices that make up the shape of the object. **Duplicate all fields on each vertex** writes a new line that includes all fields for every vertex in the object.



- **Open following export** will call the system to open the output file following export. This may cause a CSV file to be opened by a spreadsheet tool, for example, or Windows may ask you which application should open the file type, depending on your system settings.
  - The **Export** button performs the export.
3. **Zoom to Selected** is a new tool in Capture for ArcGIS Pro. It zooms Summit or LandScape to the features currently selected in ArcGIS Pro. (March 15, 2021)

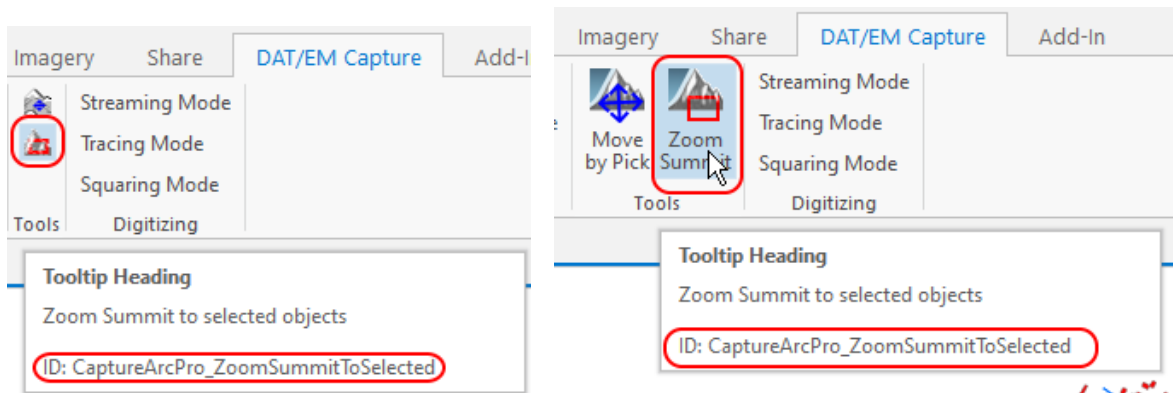


*Summit and ArcGIS Pro zoomed to the same area using **Zoom to Selected***

**Zoom to Selected** may be launched using the DAT/EM Capture ribbon button shown below. It may also be launched from the DAT/EM Keypad or a Button Manager User CAD button using the following keyword or CallCommand plus the Command ID:

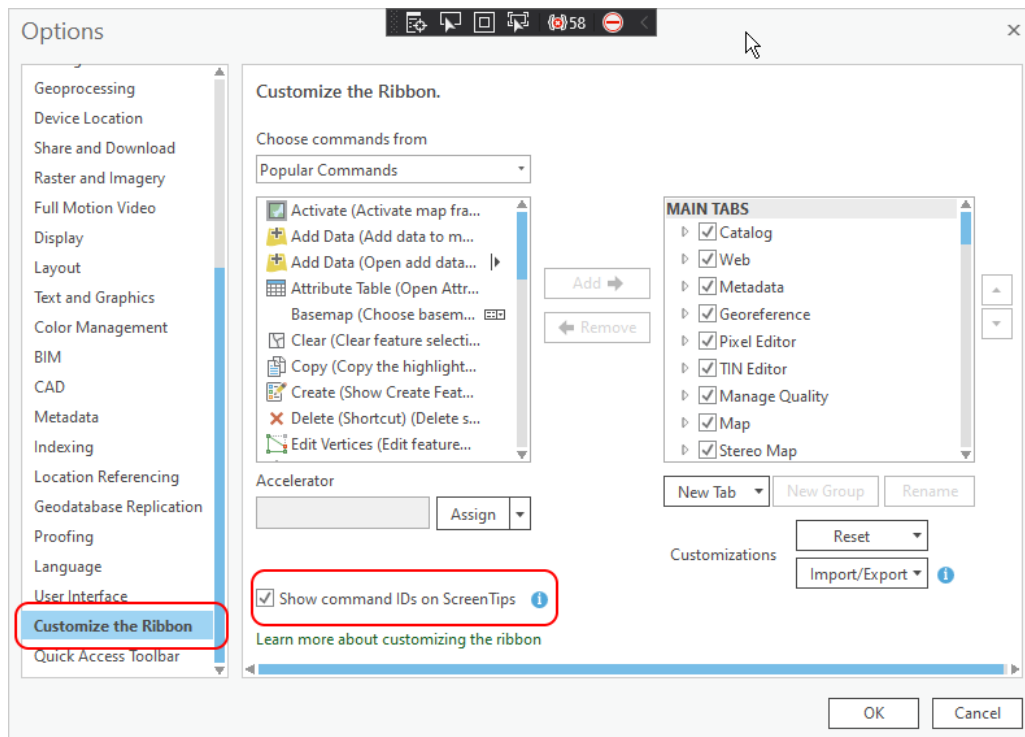
**ZoomSummitToSelected**

**CallCommand CaptureArcPro\_ZoomSummitToSelected**



**Zoom to Selected** shown on the DAT/EM Capture ribbon as small icons (left) and large icons (right)

Note: Both icon sizes are available in ArcGIS Pro's **Project > Options > Customize the Ribbon**. The default is currently Large Icons. To display the Command IDs in the Ribbon screen tips, check on **Show command IDs on ScreenTips**.



*Hint to be able to see the DAT/EM command IDs in the ribbon menu icon's tooltip*

## DAT/EM Capture and MapEditor for AutoCAD

**DAT/EM Capture and MapEditor for AutoCAD are compatible with the following AutoCAD versions:**

- **32-bit AutoCAD 2004-2008 versions with the latest service packs, as long as you can get them to install on your 64-bit operating system (OS).** DAT/EM no longer tests on 32-bit OS, so these must be running on 64-bit OS. DAT/EM is not responsible for helping to install a 32-bit version of AutoCAD on a 64-bit OS and cannot guarantee that this will succeed.
- **64-bit AutoCAD 2009-2022 versions with the latest service packs. Exception: 64-bit AutoCAD 2008 is not supported.**

**When referring to a year/version number in the lists above, it includes "plain" AutoCAD, Civil3D, and Map3D. It does not include AutoCAD LT, which is a 2D product, and therefore will never work with a 3D cursor.**

Reminders: Install all available AutoCAD service packs and updates before installing DAT/EM software. Before installing DAT/EM software, run each version of AutoCAD and make sure its license is active. Do this for each version *whether or not you intend to use every version with DAT/EM Capture*.

DAT/EM software will install for multiple AutoCAD products of different year numbers on the same computer; however, it will only install for one of any multiple same-year versions. For example, it will install for AutoCAD 2015, 2016, 2017 Civil3D, and Map3D 2018, because they are all different year versions; however, it will not install for both AutoCAD 2017 and AutoCAD Civil3D 2017 at the same time, because they are both the same year. In the case of multiple same-year versions, only one of them will receive the DAT/EM files at installation. To activate DAT/EM Capture in all of them, the AutoCAD \datem folder and the DAT/EM wintab driver file may be copied from the one that received the files to the other same-year versions. Contact DAT/EM Support for instructions.

Autodesk Infrastructure Design Suite installs three same-year AutoCAD versions (AutoCAD, Map3D, and Civil3D). Using the rules outlined above, 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*. DAT/EM software will install completely for only one of them, and we don't know which one until after installation. The files may be copied manually to the others. Contact DAT/EM Support for instructions.

DAT/EM Capture and MapEditor for AutoCAD have the following changes:

1. DAT/EM version 8.0 is the first version to install for AutoCAD 2022 versions.
2. MapEditor's Touch and Square dialog displays had some settings that displayed over other settings. This was visual, and did not affect processing. This is fixed. (July 20, 2020)



## DAT/EM Capture for 64-bit MicroStation CONNECT Editions

*This section applies to Capture for 64-bit MicroStation CONNECT Editions (CONNECT). DAT/EM software installs for the following CONNECT versions:*

- **MicroStation CONNECT Edition Version 1.x Updates 10-15.** Note: Update 14 contains a fix for the CONNECT 3D Offset function, which improves the results of DAT/EM commands that call it, such as 3DOFFSET and RCENTERLINE. "Update" numbers vary for the other products listed below. It is best if they are from a version concurrent with the DAT/EM release date.
- **OpenRoads Designer CONNECT Edition**
- **OpenCities Map CONNECT Edition**
- **OpenCities Map Enterprise CONNECT Edition**

*Certain earlier CONNECT versions may work with DAT/EM software, but are no longer supported. For higher versions and update numbers released after the DAT/EM release or software build date, contact DAT/EM Support for information.*

Starting March 24, 2020, DAT/EM software will install for CONNECT version values greater than 100000000 and less than 109900000 with a **ProgramPath** anywhere under the **Software\Bentley\Installed\_Products** key in the registry. If your CONNECT version has a number older than this, we suggest updating it. Despite installing for some rather old versions, we do not guarantee Capture will work with them if CONNECT itself has bugs in functions that the DAT/EM applications access. In that case, please update the CONNECT version and then reinstall DAT/EM software.

General information about Capture for MicroStation CONNECT:

- DAT/EM v.8.0 is the first release version of Capture and MapEditor for MicroStation CONNECT.
- There are a few commands that were in previous DAT/EM versions for 32-bit MicroStation that have not been activated for CONNECT as of the release of v.8.0. Some of them may be activated during the next development cycle. Any Capture or MapEditor that has active support is eligible for the next version betas. Contact DAT/EM Support if you would like a beta to try any newer command additions.
- The DAT/EM Keypad Controller communicates with MicroStation CONNECT and uses the same keypad overlay as the 32-bit versions of MicroStation, with the exception of needing quotation marks around layer names that contain spaces (see table below).

The following table shows some similarities and differences between Capture/MapEditor for 32- and 64-bit MicroStation:

Is this true?	32-bit MicroStation	64-bit MicroStation
<b>MS_DGNAPPS</b> is used to load <b>.cfg</b> files automatically from "C:\Program Files <(x86)>\Bentley\<MicroStation version name>\MicroStation\config\appl".	Yes	Yes
<b>MS_DGNAPPS</b> must not be modified to become a "User" variable, because that prevents properly loading the <b>.cfg</b> files.	Yes	Yes
The CAD Enabler tool sets <b>.cfg</b> files to hidden (read only) or not hidden status.	Yes	No. Unlike 32-bit MicroStation versions, 64-bit MicroStation versions load all <b>.cfg</b> files, whether they are hidden (read only) or not. For 64-bit MicroStation versions, <b>DAT/EM Administration Tool &gt; CAD Enabler</b> toggles the extension between <b>.cfg</b> and <b>.HIDEcfghIDE</b> to toggle loading. (See "DAT/EM Administration Tool <b>*New!*</b> " on page 3.)
Menus are provided as toolbars and pull-	Yes	No

down menus in a file called: C:\ProgramData\Bentley\<MicroStation version name>\WorkSpace\Interfaces\ MicroStation\default\ustn.m33"		
Menus are provided as ribbon workflows located in .dgnlib files. The DAT/EM .cfg files set <b>MS_GUIDGNLIBLIST</b> to point to the folder that contains the DAT/EM .dgnlib files, so that they will load automatically.	No	Yes. The ribbon menu files are in "C:\Program Files\Datem Software\MicroStation\Connect" and are called: <ul style="list-style-type: none"> <li>• <b>DAT/EM_MapEditor.dgnlib</b></li> <li>• <b>DAT/EM_Capture.dgnlib</b></li> <li>• <b>DAT/EM_Common.dgnlib</b></li> <li>• <b>DAT/EM_DTM.dgnlib</b></li> </ul> Each file contains a ribbon workflow for a single DAT/EM .ma application. All four are provided with Summit Professional; fewer for other products or Lite products.
DAT/EM Keypad Controller .dkf file commands that set a level require quotes around level names that contain spaces.	No	Yes. You will need to edit your Keypad .dkf file for any level name that contains spaces. Example: LV="Level With Spaces">{RET}
Tentative point event notifications allow DAT/EM superimposition to show tentative point text and markers.	Yes	No. An early 8.1 beta may include this functionality.

## DAT/EM Capture and MapEditor for MicroStation (32-bit versions)

**Changes apply to Capture for MicroStation for 32-bit MicroStation versions. DAT/EM software installs for the following 32-bit MicroStation versions:**

- **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 and V8i-based products in SelectSeries numbers 3\*, 4\*, and 10 (SS10 recommended).** DAT/EM software may install for SelectSeries 1 and 2 in some of the products, but those SelectSeries versions are not recommended. The V8i and V8i-based products are V8i, Bentley Map, Map Enterprise, PowerView, Map PowerView, Power GeoPak\*\*, and PowerCivil.

If you upgrade to a higher Select Series number, you must reinstall DAT/EM software after installing the Series upgrade.

DAT/EM will install for all supported versions of MicroStation (also including 64-bit CONNECT products) that are present on the computer at the time of the DAT/EM installation.

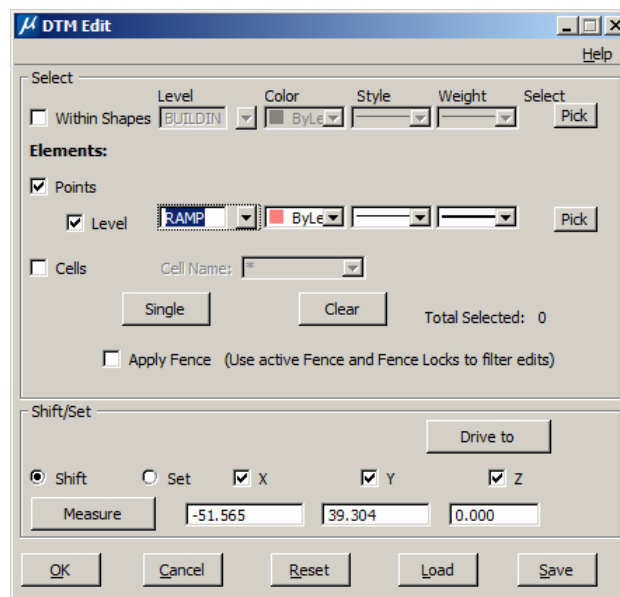
**\*Note about all 32-bit MicroStation versions up to SelectSeries 4:** Be aware of the situation! DAT/EM v.8.0 is only supported on Windows 8.1 and Windows 10 (Windows 10 recommended). The only 32-bit MicroStation version that Bentley officially supports on Windows 10 at this time is SelectSeries 10. Therefore, DAT/EM is in the difficult position of supporting more 32-bit MicroStation versions than Bentley itself supports. DAT/EM will continue to support V8, V8 2004 Edition, XM, and the older SelectSeries versions as long as possible; however, if Bentley stops allowing DAT/EM to license them for our development environments, then we will not be able to compile for them any longer. If that happens, we will be forced to drop installation and support for all 32-bit MicroStation versions except SelectSeries 10. This could happen at any time during our next version development cycle.

**\*\*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, but DAT/EM doesn't think it's worth the time. Please upgrade to Power GeoPak SelectSeries 10.

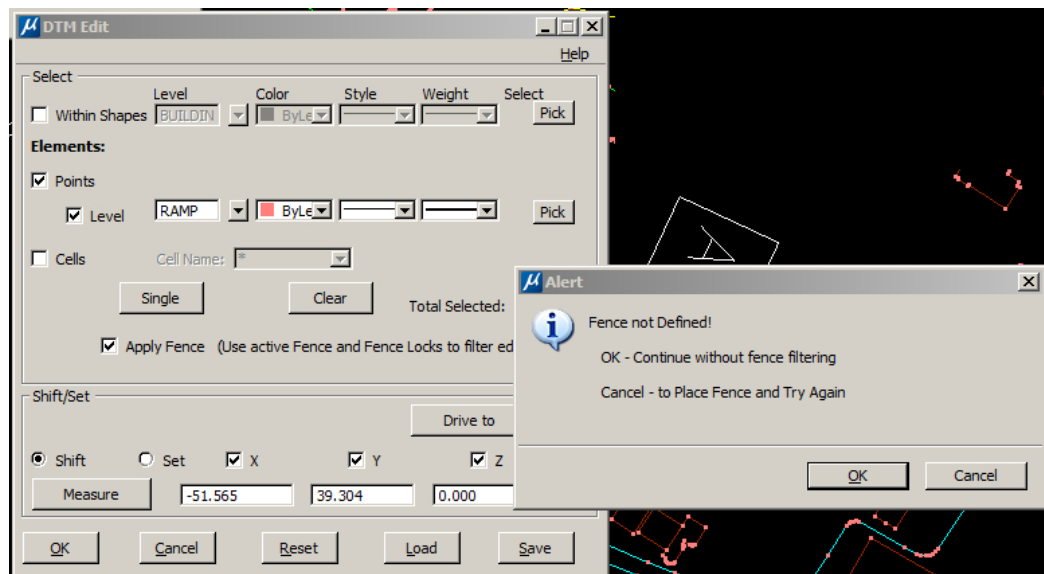
**Note about Power GeoPak Select Series 4 (which actually contains SelectSeries 3 in conflict with its name):** This product seems to be more successful running together with DAT/EM applications. There still could be issues. Please upgrade to Power GeoPak SelectSeries 10.

DAT/EM Capture and MapEditor for 32-bit MicroStation versions have the following changes:

1. Undo following MicroStation's PLACE SMARTLINE command could sometimes leave a "ghost" line in Summit's superimposition. This is fixed. (January 25, 2021)
2. CHECKATTRIBUTES has enhanced error checking so that it will not crash when configured for symbology-based verification. (February 23, 2021)
3. CLEARLEVELS had a display issue, which is now fixed. (May 28, 2021)
4. The DATEM COORDS (coordinate and SNAPZ display) dialog was so small, the "snapz" display could be cut off and there was no area in the title bar that would work to grab it and drag it to a different screen position. It is now wider, displays "snapz" and the elevation in full, and can be moved. (April 15, 2021)
5. DTMEDIT enhancements include the following: 1) the Fence button has been replaced with an **Apply Fence** checkbox. The previous version's **Fence** pushbutton used to add elements inside a fence to the processing list. The new **Apply Fence** checkbox is aligned with other commands: If set, it will limit processing based on the range and settings for an active fence. 2) Dialog settings are better synchronized to prevent configuration loss. (July 28, 2020)

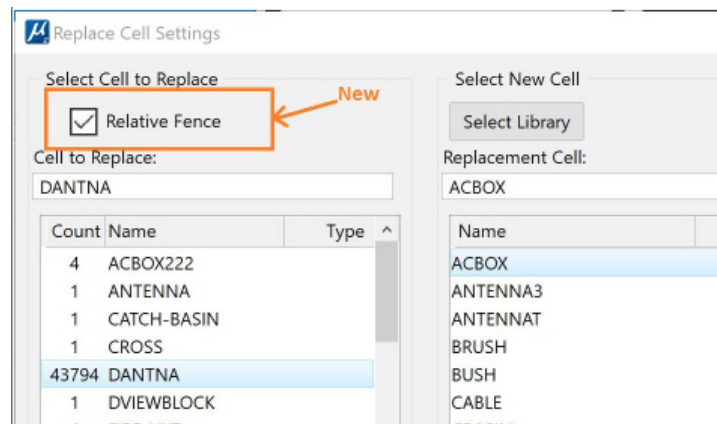


*DTMEDIT's fence option has changed to **Apply Fence***



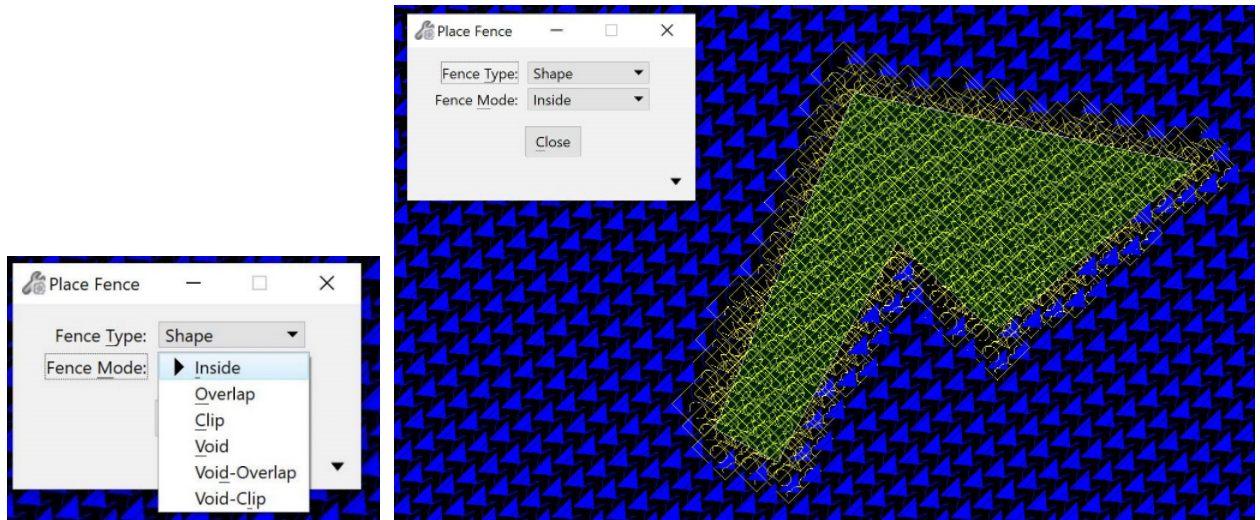
*If a fence does not exist when the option is on, a message appears*

6. ELINE now simplifies its result to be non-complex when possible, or to have the least possible number of component strings when a complex result is required. (April 19, 2021)
7. PATTERN and PATTERN INTERIOR (MEPATTERN, MEPATTERNINTERIOR) and ROAD (see also ROAD section below) have several changes. DAT/EM's commands that patterned elements were not following Bentley conventions for marking patterns and associated elements. This caused both DAT/EM's unpatterning commands and Bentley's delete pattern commands to fail or reject elements patterned by DAT/EM tools. DAT/EM's patterning tools now follow Bentley patterning conventions, as well as the additional changes: (December 17, 2020 and January 14, 2021)
  - a. The pattern and unpattern scanners were not checking for deleted elements or handling other common errors, which could cause a crash.
  - b. The unpattern element scan was rejecting all elements that were not in the linear pattern class. This check is appropriate for the pattern (an appropriate check takes place later on), but not the element (selection set member) that is patterned.
  - c. Unpattern was rejecting all elements that were not part of a graphic group. This is no longer a requirement and the software will now work whether or not the elements are part of a graphic group.
  - d. MEPATTERNINTERIOR code was updated to handle clipping/patterning shape elements.
8. Replace Cell (MEREPLACECELL) has the following changes: (April 23, 2021)
  - a. Replace Cell (MEREPLACECELL) has new **Relative Fence** option.



*Replace Cell has a new option to process by fence*

If you want to check on **Relative Fence**, set the active MicroStation fence mode before running Replace Cell. It will only apply to cells relative to the active MicroStation fence settings:



*The active MicroStation fence mode applies to the **Relative Fence** setting in Replace Cell*

- b. Replace Cell (MEREREPLACECELL) has increased error handling for cases such as having no cells in the file, no cell library attached, or an empty list box.
9. ROAD and ROAD SETTINGS have the following changes: (October 2, 2020)
  - a. RCFG (road configuration) files made in earlier versions of DAT/EM software were not loaded correctly and errors could occur. Error handling and reporting for old RCFG files was improved. The “Snap Ends within” checkbox and “Tol[tolerance]” values were not in the old format files. These parameters have been added and a “Version 2” appears in the RCFG comments section. If an old file is read, a message will appear unless the user has previously chosen to suppress it.  
  
**Note:** It is easy to replace the old RCFG with the new format: First load the old RCFG, then make the new “Snap Ends within” and “Tol” settings, then use “Save” to save the settings to the new file format.
  - b. A “ghost element” (invisible fragment of an element) on the Default level could be left after running ROAD for the first time in the MicroStation session with an old-format RCFG file loaded. This partial element could be invisible, but would respond to deletion with the MEDELETE command. There are new checks to make sure such a ghost element will not be made. (October 2, 2020)
  - c. A bad column sort result was detected when clicking the offset column title in ROAD SETTINGS. Either nothing would happen or MicroStation V8i SelectSeries 10 would crash. The column sort was removed to avoid the problem, since it could not be fixed by DAT/EM. (October 5, 2020)
  - d. The patterning options in ROAD were updated to follow Bentley patterning conventions. See also the PATTERN section above. (January 14, 2021)
10. MELSCALE, which runs MESCALE “last” using the most recent settings, but without showing the dialog, was missing from the command dispatch. The command is now available. (February 23, 2021)
11. The DAT/EM superimposition (SI) application would crash when attempting to send an SI UPDATE on type 11 curve fragments that had only two or three vertices. SI Updates now successfully transfer these curve fragments. (August 5, 2021)
12. XYINSERT can now add a vertex after the end point of a linear element. Previously, it would add a vertex before the first vertex and in between any two vertices, but not after the end vertex. (August 18, 2020)
13. XYZIN could place a graphic cell with cell header information that was set to the **Point cell attributes** settings. This is fixed so that graphic cells will properly keep their own level and attributes definitions, and the **Point cell attributes** settings will only apply to point cells. (July 7, 2021)



## DAT/EM Capture for Blue Marble Global Mapper

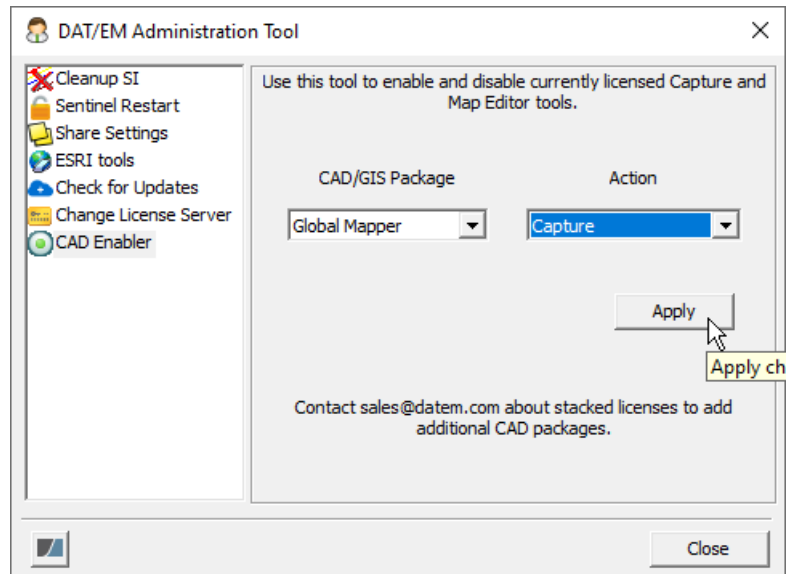
*Changes apply to Capture for Global Mapper. DAT/EM Capture for Global Mapper is supported for the following Global Mapper versions:*

- **17.1.2 or higher**
- **18.x – 22.x** up to the time of the DAT/EM v.8.0 build date. Please ask DAT/EM Support whether later versions are compatible.

**Notice:** If you use DAT/EM Capture for Global Mapper, please contact [support@datem.com](mailto:support@datem.com) or your reseller immediately for a quote for a Stacked Capture for Global Mapper. Starting in July 2020, v.8.0 beta versions will need a licensed Stacked Capture for Global Mapper and this will need a WriteLock to add it to the hardware lock. This is to help offset the extra cost that Blue Marble charges DAT/EM to include their license to use their Global Mapper SDK in DAT/EM software.

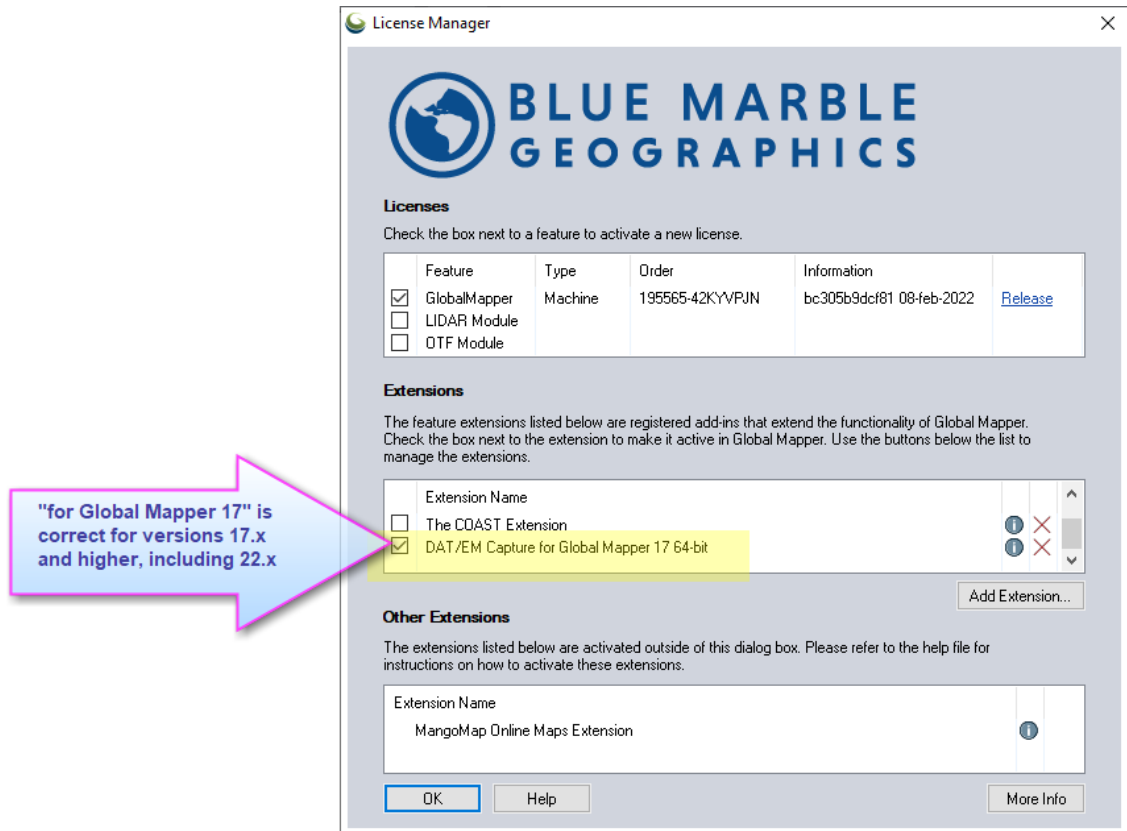
Advice for enabling and disabling the DAT/EM Capture extension for Blue Marble Global Mapper:

DAT/EM Software installs the Global Mapper Extension, but leaves it unregistered in Global Mapper by default. To use the extension, close Global Mapper, select **Windows Start > Datem Software** group > right click on **DAT/EM Administration Tool > More > Run as Administrator**. Set **CAD/GIS Package=Global Mapper**, **Action=Capture, Apply**. Or, to disable at any time, set it to **Action=Disable, Apply**.



*To register/enable or unregister/disable, use the DAT/EM Administration Tool's CAD Enabler*

Alternatively, you may toggle the extension from the **Global Mapper > Help menu > License Manager**. Note that it is correct to be called "DAT/EM Capture for Global Mapper 17 n-bit". This file is the same for 17.x to 22.x versions matching the supported versions listed above.



*The DAT/EM Capture extension may be toggled from the Global Mapper License Manager dialog*

1. DAT/EM Capture for Global Mapper will now install for Global Mapper v.22.x up to the date of the DAT/EM v.8.0 release.
2. Stacked Capture for Global Mapper is now a locked DAT/EM product. Previously, if Blue Marble Global Mapper was found on the computer, the DAT/EM Capture extension would be installed for it. There will be a small Stacked Capture for Global Mapper and annual Support and Maintenance cost for it. With a Stacked Capture for Global Mapper order, DAT/EM will provide a WriteLock executable and a new installation keycode to enable Capture for Global Mapper. Please contact your DAT/EM sales representative or reseller to discuss Capture for Global Mapper activation.

-End-