**Trimble Business Center**

Trimble Dongle License Number :

**Important Note:**

Plug dongle into USB port on computer **BEFORE** starting TBC

If Trimble Business Center does not recognize your data collector under Device Pane, shut TBC down and restart it

For your information, this Cheat Sheet is based on the following organized file structure on my hard drive:

C:\

tmp

Jobs

2014

2015

TxxXRxxX

ArcMap

CMM

Drawings

Garmin

GCDB

MTPs and His

Notes and Plats

OPUS

TBC

TriStations

Weeklies

We also want to centralize our customized TBC export files for CMM and Garmin as well as the Arizona State Plane files, so let’s create a folder called:

**C:\tmp\Jobs\TBC Custom Files\**

**Customizing Ribbons**

Trimble Business Center is nice in that it utilizes “Ribbons” which we can customize to suit our specific Cadastral needs. When you open up TBC, you will notice that there are the following 12 tabs: File, Home, View, Data, Survey, CAD, Lines, Surface, Corridor, Photogrammetry, Point Cloud, & Support. You will also notice that under each tab, are various groups; let’s take for instance the Home tab, it has the following groups: Import/Export, Data, View, Images, Geodetic, Reports, & Print. Now under each group are various subroutines; let’s take for instance under the Home tab and in the Data group are the subroutines called Properties, Project Explorer, Selection Explore, and Select All.

Now this can get pretty confusing trying to locate the subroutine you want to execute under all of the various tabs and groups. TBC allows us to create and customize our own tabs and groups. The following process will show us how to make a tab called Cadastral with the following groups: Files, Layers, Points, Lines, Text, Survey, and Customize Appearance. This is the layout of how Cadastral Ribbon (tab) will appear; but of course you can create it however best suits your needs.

**Cadastral** tab

**Files** group

**Open**

**Project Settings**

**Devise Pane**

**Import**

**Export**

**Save Project As Template**

**Save Project**

**Close Project**

**Layers** group

**New Layer**

**Select by Layer**

**Layer Options**

**View Filter Manager**

**Points** group

**Select Points**

**Create Point**

**Selection Explorer**

**Rename Points**

**Lines** group

**Line**

**Line Style Manager**

**Line Type Editor**

**Text** group

**Create Text**

**Text Style Manager**

**Survey** group

**Inverse**

**Measure Angle**

**Measure Distance**

**Google Earth**

**Customize** **Appearance** group

New Points Spread Sheet “added in class”

Toggle Gridlines

**Options**

**Command Pane**

**Creating the Cadastral Tab**

**Right Click** in the ribbon

**Customize the Ribbon…**

**New Tab** button in the upper middle of the Options window

Towards the bottom of the Options window is **New Group (Custom)**

**Modify Item** icon to the right of **New Group (Custom)**

In the area of Main Tabs > New Tabs > type **Cadastral**

**OK** button

**OK** button

To the right side of the Options window are Up and Down Arrows. Click on the Cadastral tab and use the **Up Arrow** to move the Cadastral tab towards the top of the rest of the tabs.

Now we will add the Files, Layers, Points, Lines, Text, Survey, and Customize Appearance groups to our Cadastral Tab:

**Creating the Groups Under the Cadastral Tab**

This process will show us how to add a command to our ribbon bar. In this process, we will add the command “Rename Points” to the Home/Data tab.

**Right Click** anywhere in the Ribbon (which is under the tabs)

**Customize Ribbon** tab

Double Click **Home** located in the right half of Options window.

Expand **Data**

Drag and drop **Rename Points** from the left half of window into **Data.**

**Creating State Plane Project Templates**

This process will allow us to create the templates: Arizona Central, Arizona East, and Arizona West with an assortment of layers to help organize the data. We want to first create a project, establish the project settings, import Dashed 1-1 Line, create the layers, and then save it as a template.

**Start Page** tab located to the lower left of the Cadastral ribbon

**Start a new project**

Highlight **US Survey Foot**

**OK** button

“Highlighted text is the only changes that should need to be made”

**Establish the Project Settings**

**Cadastral** tab

**Files** group

**Project Settings**

**Coordinate System** folder in the upper left of the Project Settings window

Datum Transformation

**Change…** button left of center of Project Settings window

**Coordinate System and Zone**

Highlight **US State Plane 1983**

Highlight **Arizona Central 0202 NAD 83 (Conus)**

**Next** button

 **Predefined geoid model:**

 **GEOID12B (Conus)**

Geoid model quality  **Survey Quality**

**Finish** button “If you hit the finish button you will need to go back into this menu. Only hit the finish button if you are done making all of your changes.

**Coordinate System** folder

**Geoid Model & Vertical Datum**

**Change…** button

 **Predefined geoid model:**

 **GEOID12B (Conus)**

Geoid model quality  **Survey Quality**

**Finish** button

**Cadastral** tab

**Files** group

**Project Settings**

**Units** folder

Coordinate

Coordinate

Display order: **Northing, Easting, Elevation**

Formatting

Decimal Precision

Latitude / Longitude **0.12345**

Coordinate: **0.123**

Elevation: **0.123**

Show trailing zeros: **Yes**

Show trailing decimal: **Yes**

Suffix

Display: **Yes**

Add space: **Yes**

Latitude / longitude

Format: **Degrees, minutes, seconds**

Label latitude / longitude: **Yes**

Show zero minutes: **Yes**

Show zero seconds: **Yes**

**OK** button “If you hit the OK button you will need to go back into this menu. Only hit the OK button if you are done making all of your changes.”

**Cadastral** tab

**Files** group

**Project Settings**

**Units** folder

Distance

Display: **US Survey foot**

Formatting

Decimal precision: **0.123**

Show trailing zeros: **Yes**

Show trailing decimal: **Yes**

Rounding mode: **Normal**

Automatic Rounding: **Yes**

Suffix

Display: **Yes**

Abbreviation: **ft**

Add space: **Yes**

**OK** button

**Cadastral** tab

**Files** group

**Project Settings**

**Units** folder

Angular

Unit

Display: **Degree, minute and second**

Formatting

Decimal precision: **0.12345**

Show trailing zeros: **Yes**

Show trailing decimal: **Yes**

Degrees, minute, second settings

Show zero seconds: **Yes**

Show zero minutes: **Yes**

DMS format **DDD MM SS.sss**

DMS rounding mode: **None**

**OK** button

**Cadastral** tab

**Files** group

**Project Settings**

**Units** folder

Azimuth

Units

Display: **Bearing**

Formatting

Add azimuth labels: **Yes**

Decimal precision : **0.12345**

Show trailing zeros: **Yes**

Show trailing decimals: **Yes**

Suffix

Display: **Yes**

Add space: **Yes**

Bearing settings

Always show North angles: **No**

Always show South angles: **No**

Bearing format: **N12°34'56"E**

Degrees, minute, second settings

Show zero seconds: **Yes**

Show zero minutes: **Yes**

DMS format **DDD MM SS.sss**

DMS rounding mode: **None**

**OK** button

**Cadastral** tab

**Files** group

**Project Settings**

**Units** folder

Area

Unit

Display: **Square foot**

Formatting

Decimal precision: **0.1**

Show trailing zeros: **Yes**

Show trailing decimal: **Yes**

Rounding mode: **Normal**

Automatic rounding: **Yes**

Suffix

Display: **Yes**

Abbreviation: **ft²**

Add space: **Yes**

Alternate

Display: **Acre**

Abbreviation: **AC**

Decimal precision: **0.12**

**OK** button

**Cadastral** tab

**Files** group

**Project Settings**

**Computations** folder

Point tolerances

Survey Quality

Horizontal tolerance (Survey): **0.066 ft**

Vertical tolerance (Survey): **0.164 ft**

Mapping Quality

Horizontal tolerance (Mapping): **16.404**

Vertical tolerance (Mapping): **32.808**

Unknown Quality

Horizontal tolerance (Unknown): **32.808**

Vertical tolerance (Unknown): **49.213**

Merge On Import

Merge options: **By Point Tolerance x 3**

**OK** button

**Cadastral** tab

**Files** group

**Project Settings**

**Computations** folder

GNSS Vector

Tolerance of Mean Vectors

Horizontal: **0.164 ft**

Vertical: **0.262 ft**

**OK** button

**Cadastral** tab

**Files** group

**Project Settings**

**Computations** folder

Mean Angles

Tolerances of Mean Angles

Horizontal angle: **0°00'15.00000"**

Vertical angle: **0°00'15.00000"**

Slope distance: **0.016 ft + 2.0 ppm**

**OK** button

**Cadastral** tab

**Files** group

**Project Settings**

**Computations** folder

As-Staked Points

Tolerance of As-Staked Points

Horizontal tolerance: **0.083 ft**

Vertical tolerance: **0.083 ft**

Flag vertical out of tolerance: **No**

**OK** button “Now you can hit the OK button”

**Importing Dashed 1-1 Lines Style**

Before we begin creating layers, we first want to import the Dashed 1-1 Line for both the Section Lines Unsurveyed and Subdivision layers.

**Cadastral** tab

**Lines** group

**Line Style** icon

Browse folder: C:\Program Files\Trimble\Trimble Business Center\FCEdit\Linetype.ltp

Highlight: **Dashed 1-1**

**<** button

**OK**

**NOTE: Do not change the Length unit to English or the Unit reference to Ground**

**otherwise the imported lines do not import correctly.**

Unlike TGO, TBC does not have an option to assign the dashed line to a specific ground or sheet distance. This is changed in the scale units under Properties\Line Style Scale which this process is described below under **Editing Lines \ Changing a Layer’s Default Line Scale.** We are unable to perform this task now until we actually have lines already drawn up in the Section Lines Unsurveyed and Subdivision layers.

**Creating Layers**

**Cadastral** tab

**Layer** group

**New Layer**

Layer name: **Accessories**

Color: **Cyan**

**Apply** button

Layer name: **Calculated**

Color: **Yellow**

**Apply** button

Layer name: **Check**

Color: **Orange**

**Apply** button

Layer name: **Control**

Color: **Magenta**

**Apply** button

Layer name: **Gas Lines**

Color: **Yellow**

Line Style: **Solid**

**Apply** button

Layer name: **GCDB**

Color: **Medium Green**

**Apply** button

Layer name: **Local**

Color: **Grey**

**Apply** button

Layer name: **Points**

Color: **Green**

**Apply** button

Layer name: **Power Lines**

Color: **Red**

Line Style: **Solid**

**Apply** button

Layer name: **Roads**

Color: **Brown**

Line Style: **Solid**

**Apply** button

Layer name: **Search Areas**

Color: **Pink**

**Apply** button

Layer name: **Section Lines**

Color: **Red**

Line Style: **Solid**

**Apply** button

Layer name: **Section Lines Unsurveyed**

Color: **Dark Grey**

Line Style: **Dashed 1-1**

**Apply** button

Layer name: **Subdivision**

Color: **Green**

Line Style: **Dashed 1-1**

**Apply** button

Layer name: **Section Numbers**

Color: **White**

**Apply** button

Layer name: **Topo**

Color: **Dark Grey**

**Apply** button

Layer name: **Township**

Color: **Blue**

Line Style: **Solid**

**Apply** button

Layer name: **Trash**

Color: **Dark Grey**

**Apply** button

Layer name: **True**

Color: **White**

**Apply** button

Layer name: **True Not Set**

Color: **Yellow**

**Apply** button

Layer name: **Water Lines**

Color: **Blue**

Line Style: **Solid**

**Apply** button

**Saving Project as Template Arizona Central 0202**

Now that we have established our project settings with a state plane zone of Arizona Central 0202, imported Dashed 1-1 Line, and created our various layers, all of the tedious work is done and we will now save this as a template entitled Arizona Central 0202

**Cadastral** tab

**Files** group

**Save Project as Template** icon

Name: **Arizona Central 0202**

**Save** button

**Creating Template Arizona East 0201**

All of the tedious work has been done! We will take the now saved Arizona Central 0202 template and change the state plane zone to Arizona East 0201 and save it as template Arizona East 0201

**Cadastral** tab

**File** group

**Project Settings** icons

US **Survey Foot** tab in the lower right of your screen

**Coordinate System** folder in the upper left of the Project Settings window

Datum Transformation

**Change…** button left of center of Project Settings window

( **Coordinate System and Zone**

Highlight **US State Plane 1983**

Highlight **Arizona East 0201 NAD 83 (Conus)**

**Next** button

( **Predefined geoid model:**

b **GEOID12B**

Geoid model quality b **Survey Quality**

**Finish** button

**OK** button

**Files** tab

**Save Project as Template** icon

Name: **Arizona East 0201**

**Save** button

**Creating Template Arizona West 0203**

**US Survey Foot** tab in the lower right of your screen

**Coordinate System** folder in the upper left of the Project Settings window

Datum Transformation

**Change…** button left of center of Project Settings window

( **Coordinate System and Zone**

Highlight **US State Plane 1983**

Highlight **Arizona West 0203 NAD 83 (Conus)**

**Next** button

( **Predefined geoid model:**

b **GEOID12**

Geoid model quality b **Survey Quality**

**Finish** button

**OK** button

**Files** tab

**Save Project as Template** icon

Name: **Arizona East 0201**

**Save** button

**Importing CMM into Trimble Business Center**

This process will take us from creating a custom export file in CMM to creating a custom import file in Trimble Business Center.

**NOTE:** If your points in TBC are on various layers, it is **HIGHLY** advisable to ONLY import those points that you calculated in CMM and not to export points that are already in TBC, otherwise, all of your points in TBC will be automatically moved from your various layers to the Points layer. The points that you already have in TBC can be thinned out of the \*.cor and \*.lev files in CMM:

**Project\_Files**

**View Project Reports w/WordPad**

**In CMM, Creating Custom \*.csv Export File**

This process creates a \*.csv file which is a Microsoft Excel Comma Separated Values file. This process is not a onetime set up but will have to be performed **EVERYTIME** when exporting from CMM to Trimble Business Center

**File**

**Export**

**User Defined Export**

Input File: ***C:\tmp\Jobs\year\TxxNRxxE\CMM\TxxNRxxE.*def**

Output File: ***C:\tmp\Jobs\year\TxxNRxxE\CMM\TxxNRxxE.*csv**

1: b **Name**

2: b **Northing**

3: b **Easting**

4: b **Elevation**

5: b ***blank***

6: b ***blank***

7: b ***blank***

Geo Target Format: **dddmm’ss.s” N/W**

Output File Delimiter: b **Comma**

Precision

Grid: **4**

Geodetic: **5**

Elevation: **3**

**In TBC, Creating Custom \*.csv Import File**

This process will set up a custom import file format for the CMM.csv file and this process will only have to be done once.

**Cadastral** tab

**Files** group

**Import** icon

**Import Format Editor** icon near the top middle of window.

**New** button

Definition name: **CMM.csv**

**Next** button

Description: **Name, Northing, Easting, Elevation**

( **Delimited**

**… Browse** button ***C:\tmp\Jobs\year\TxxNRxxE\CMM\TxxNRxxE*.csv**

**Next**

Delimiter: **Comma**

Store Points as: **Points**

Default File Extension: **.csv**

**** Show editor on import

Coordinate Quality: **Survey**

**Next**

**Fields** button

**Point ID**

**Fields** button

**Northing**

**US Survey Foot**

** Apply to all**

**Fields** button

**Easting**

**US Survey Foot**

** Apply to all**

**Fields** button

**Elevation**

**US Survey Foot**

** Apply to all**

**Finish** button

**In TBC, Importing CMM.csv File**

This process will import our CMM.csv file (created in CMM) into TBC.

**Cadastral** tab

**Files** group

**Import** icon

**Import Format Editor** icon near the top middle of window.

**… Browse** button located in the middle and towards the right of the window.

***C:\tmp\Jobs\year\TxxNRxxE\CMM\TxxNRxxE*.csv**

**Import** button

Highlight **CMM.csv**

**Exporting Comma Delimited File from TBC to CMM**

The general overall process of exporting from TBC to CMM and from CMM back into TBC is as follows:

1. In TBC, export \*.nez file
2. In CMM, import \*.nez file and convert to \*.lsa file
3. Perform calculations in CMM
4. Thin out \*.cor and \*.lev files to ONLY contain newly calculated positions.
5. In CMM, export \*.csv file
6. In TGO, import \*.csv file

This process will allow us to create a comma delimited file in the format of:

*name, northing, easting, elevation*. CMM will then use this file to create a *township*.cor and a *township.*lev file.

**In TBC, Creating the Custom CMM.nez Export File Editor**

**Cadastral** tab

**Files** group

**Export** icon

**Custom** tab

**Export Format Editor** icon near the upper center of window.

**New** button

Type **CMM.nez** under the Definition Name header.

**Next** button

Format definition description: **name, northing, easting, elevation**

**Uncheck** box in front of Include header

 Delimited

Default file extension: .**nez**

Decimal separator:  **.**

Encoding:  **ASCII**

**Next** button

Available Fields: **expand** General

**Double Click Point ID**

**Double Click Northing**

**Double Click Easting**

**Double Click Elevation**

Click on **Northing** tab

Units **US Survey Foot**

Click on **Easting** tab

Units **US Survey Foot**

Click on **Elevation** tab

Units **US Survey Foot**

**Finish** button

**In TBC, Exporting the CMM.nez File into Your CMM Folder**

With this process, we will select our points from the True layer and export them into CMM folder.

**Cadastral** tab

**Points** group

**Select Points** icon

**General** tab

Layer b **True**

**OK** button

**Cadastral** tab

**Files** group

**Export** icon

**Custom** tab

Single Click **CMM.nez**

File Name: C:\tmp\Jobs\*year\TxxxNRxxE\*CMM\**TxxNRxxE.nez**

Click the **...** browse button and navigate to your CMM folder.

Start your CMM program and open up your job.

**File**

**Import**

**Convert NEZ to LSA**

**Open** button

Navigate to and highlight your C:\tmp\Jobs\*year\TxxxNRxxE\*CMM\**TxxNRxxE.nez**

**OK** button

**Save** button

Project Definition window opens up. Select your correct State Plane Zone, project elevation, ect.

**Exit** button

**Exit** button

**NOTE:** Don’t panic! It appears as if your points were not imported, but they did; we just need to refresh the your view in CMM

**File**

**Refresh F3**

**Zoom**

**Zoom Extents**

**GCDB – WinGMM**

Before we start a project, we will take a small detour from TBC and use WinGMM to convert our GCDB data from NAD27 to NAD83. For Arizona GCDB data, go to:

http://www.blm.gov/az/st/en/prog/cad/downloads.html

**GCDB** folder

**Survey-Data-Gila-and-Salt-River-Meridian** folder

***Quadrant*** folder

***TxxXRxxX.*zip**

Store zip file in **C:\tmp\Jobs\*year*\*TxxXRxxX*\GCDB**

In WinGMM, we will unzip the folder and then convert from NAD27 to NAD83.

Open up **WinGMM**

**File**

**Zip Maintenance**

**Extract files from a ZIP archive**

**C:\tmp\Jobs\*year*\*TxxXRxxX*\GCDB**

Highlight ***TxxXRxxX.*zip**

**** Set target folder as current WinGMM working folder

****Convert LF to CRLF

**OK** button

**OK** button

**File**

**Open**

***TxxXRxxX.*def**

**Open** button

**Command**

**Datum Transformation NAD27<>NAD83 (GCONW)**

**Enter**

**Enter**

**Enter**

**Enter**

After you have created a CMM project for this township in your CMM folder, navigate to **C:\tmp\Jobs\*year*\*TxxXRxxX*\GCDB** and copy and paste the ***TxxXRxxX*.cor** and ***TxxXRxxX*.lev** files into **C:\tmp\Jobs\*year*\*TxxXRxxX*\CMM.**

Now follow the steps under the heading **Importing CMM into Trimble Business Center**

**Starting a New Project**

This process will show us how to start a new project using one of our newly created Arizona State Plane templates and save it in our desired folder location. But first, make sure you have all of your folders created for your particular project as illustrated on page 1.

Start Trimble Business Center and click on the **Start Page** tab to the lower left of the ribbon.

**Start a new project**

**Arizona *zone* 020*x***

**OK** button

**Cadastral** tab

**Files** group

**Save**

**HIGHLY IMPORTANT – Project File Locations**

When starting a new job, we want to all of our import files and export files to be in specific locations.

**Cadastral** tab

**Custom Appearance** group

**Options** icon

**General** folder

**File Locations also Project Management**

Project management folder: **C:\tmp\*year*\*TxxXRxxX*\TBC\*TxxXRxxX***

Export folder: **C:\tmp\*year*\*TxxXRxxX*\CMM**

Download & import folder: **C:\tmp\*year*\*TxxXRxxX*\TBC\*TxxXRxxX*\Import**

**** Copy imported files to import folder

Folder for intermediate report: **C:\tmp\*year*\*TxxXRxxX*\TBC\*TxxXRxxX*\Report**

Block definition file folder: **C:\ProgramData\Trimble\Block Definitions\**

Template folder: **C:\tmp\Jobs\TBC Custom Files\**

Format definition folder: **C:\tmp\Jobs\TBC Custom Files\**

**OK** button

**NOTE:** When we made our Arizona State Plane templates, they may have been created and stored in C:\tmp so we will want to cut and paste them into C:\tmp\Jobs.

**Renaming Points**

This process will add the prefix “G” to our GCDB points.

**Cadastral** tab

**Points** group

**Rename Points** icon

(Add prefix

**G**

**OK** button

**Project Location and Height**

The data collector will not function properly out in the field unless we first have the project in TBC set up with a project location and height.

**Cadastral** tab

**File** group

**Project Settings**

**Coordinate System** folder

**Local Site**

**Local Site Settings** button

Coordinate type: **Grid**

Northing: Click in the Northing field and then click on G400400,

this will put both the northing in the Northing field and

the easting in the Easting field.

Elevation: ***Enter average project elevation***

Un Check Use ground coordinates

Ground scale factor: **1.0000000000**

False northing offset: **0.000 ft**

False easting offset: **0.000 ft**

**OK** button

**Turning Layers ON & OFF**

**Home**

**View**

**View Filter Manager** icon

**Layers**

**Point Labels**

To toggle Point Labels ON & OFF:

**Home**

**View**

**View Filter Manager** icon

**Point** tab

**Show Point Labels**

**Vector Lines**

To toggle RTK Vector Lines ON & OFF:

**Home**

**View**

**View Filter Manager** icon

**Raw Data**

**RTK Vector**

**Importing From TSC2**

Connect TSC2 data collector to the computer.

**Cadastral** tab

**Files** group

**Device Pane** button

Device Pane window opens. Expand the Survey Controller by clicking on the +

**Double Click** your job (or you can drag and drop your job from the Device Pane and into the Plan View of your job.

**NOTE:** If your controller does not show up in the Device Pane window, shut down and restart Trimble Business Center.

**Alternate Method of Importing From TSC2**

For some strange reason I was having problems with TBC connecting to the TSC2. Here is an alternate method of dragging and dropping from Windows Explorer to TBC

1. Open up your job in TBC.
2. Connect TSC2 to computer.
3. Open Windows Explorer and reduce the Windows Explorer window to a small window.
4. + Computer
5. + TSC2
6. Click on Trimble Data
7. Drag and Drop field file from Windows Explorer into our opened job in TBC.

Every time you download, all of your data will be been imported into the **Points** layer. This next process will transfer our points from the Points layer to our other various layers such as the True and Topo layers.

**Cadastral** tab

**Points** group

**Select Points** button

**General** tab

Layer: **Points**

**OK** button

Now that our points have been selected, we will move these points to their appropriate layers; in this example we will move certain points to the true layer.

**Cadastral** tab

**Points** group

**Selection Explorer** button

Hold down the **Ctrl** button and **Left Click** on all of the points you want moved to the True layer

**Right Click** somewhere in the Plan View of TBC

**Properties**

Layer: **True**

Close button

**Exporting to TSC2**

Connect TSC2 data collector to the computer.

Turn on all layers you want exported and turn off all layers you do not want exported.

Select all points of the “active” layers using **Ctrl A**

**Cadastral** tab

**Files** group

**Device Pane** button

**Export** icon

Highlight **Survey Controller job file exporter**

Under File Name (Survey Controller) type: ***filename.*job**

**Export** button

**Creating Lines**

This process will allow us to put in various lines such as Township, Section, Subdivisional, mineral survey, wilderness boundaries, and various other lines into TBC thus make viewing points much easier. In the following examples, we will be making Dashed 1-1 lines in the Subdivision layer so that you can see how to change the size (scale) of the dashed lines.

These lines are also necessary when making maps in ArcMap.

**Importing Line Style**

The solid line is already a default line in TBC, however, we need to import a Dashed 1-1 line to be used in both the Section Lines Unsurveyed and Subdivision layers.

**Line** tab

**Style** group

**Line Style** icon

Length unit: # **English**

Unit reference: # **Ground**

Browse folder: C:\Program Files\Trimble\Trimble Business Center\FCEdit\Linetype.ltp

Highlight: **Dashed 1-1**

**<** button

**OK**

Unlike TGO, TBC does not have an option to assign the dashed line to a specific ground distance or sheet distance. This is changed in the scale units under Properties\Line Style Scale which this process is described below under **Changing a Layer’s Default Line Scale.**

**Creating Layer with Line Style**

**CAD** tab

**Drafting** Group

**New Layer**

Layer Name: **Subdivision**

Color: **Green**

Line Style: **Dashed 1-1**

**OK**

**Creating Polyline in Subdivision Layer**

**Lines** tab

**Create** group

Name: **Subdivision**

Layer: **Subdivision**

Elevation: *(I leave blank)*

Automatically close by connection ends: **Never**

# **Specify Individual Points**

**Click** in Next point: field

Next, I would start drawing the lines in between the desired points. While the line is green, the line is not dashed. If I

**Creating Lines in a Specific Layer**

We want to create lines between points only, so we want the end points of the lines to “snap” to ONLY points. At the bottom (and just right of center) of the TBC window is a small icon called **SNAP.** Left-Click on **SNAP** and make sure that ONLY **Points** is checked.

For this illustration, we will create lines in the Section Line layer.

**Lines** tab

**Create** group

**Create Polyline**

Name: **Section Lines**

Layer: **Section Lines**

Elevation: *(I leave blank)*

Automatically close by connection ends: **Never**

**Specify Individual Points**

**Click** in Next point: field

Begin clicking on each of the points you want to draw lines in between.

To begin a new polyline, click **New** button at the bottom of the Create Polyline window.

**Creating Section Numbers**

**Cadastral** tab

**Text** group

**Text Style**

Choose **New**

Style Name **Section Numbers**

Font: **Times New Roman “you may have to check or uncheck Stroke fonts”**

Justification: **Center Middle**

Font Style: **Bold**

Height: **600**

( Ground Units

**OK** button

**Cadastral** tab

**Text** group

**Text**

Layer: **Section Numbers**

Style: **Section Numbers**

Justification: **Middle Center**

Height: **600**

Rotation: **90°00'00.00000"**

Leader type: **No leader**

Text: ***type in Section #***

Text insertion point: ***left click in the township where you want the Section #***

**Apply** button

**Helpful Hint:** What I like to do is type in a capital **X** in the Text field, right click in the Text insertion point field and left click on **Free Snap.** This will give you a big cross hair so that you can align the section numbers in the center of the section. Once you have entered an X in all of the sections, then you can right click on each X, click **Properties**, and change the X to its appropriate section number.

**Editing Lines**

**Changing Polyline into Individual Line Segments**

This process will break the “Section Lines Unsurveyed” polyline (which is a grey Dashed 1:1 polyline) into individual ½ mile line segments so that we can later convert them to Township, Section, or Subdivision lines. We want to break the polyline at the section and quarter corner points.

**Left Click** and then **Right Click** on a polyline.

**Break Line**

Distance Alone: **Right Click**

**Station at Point**

**Left Click** on a True point

**Break** button

Keep repeating this process until the polyline is broken into line segments.

Now we will change the line segment from Section Lines Unsurveyed to Section Lines.

**Left Click** the line you want to change from Section Lines Unsurveyed to Section Lines.

**Properties**

Layer: **Section Lines**

**Close** button

**Changing a Layer’s Default Line Scale**

This process will change the “Section Lines Unsurveyed” Dashed 1:1 default line scale of 1 to 150. Once all of the polylines have been created from point to point in the “Section Lines Unsureyed” Layer, we will select all of the lines in the layer.

**Select by Layers** icon

** Section Lines Unsurveyed**

**Close** button

Now that all of the polylines are selected:

**Right Click**

**Properties**

Line style scale: **150**

**Moving Points C\* Points to Calculated Layer**

We want to open up the list of all points:

**Home** tab

**Data**

**Project Explorer**

A list of ALL of the project points are in the list.

**Left Click** the top C\* point.

Hold down the **Shift** button and **Left Click** bottom C\* point.

Now that the C\* points are highlighted in yellow, we will put them into the Calculated Layer.

**Home** tab

**Data**

**Properties**

The Properties window opens up.

**Point Information**

**Layer**

**Calculated**

**Viewing Points in a Certain Layer**

If we want to view the points in the Calculated Layer:

**Data** tab

**Select**

**Select by Layer**

Select by Layer window opens

**Calculated**

Now all of the points in the Calculated layer are selected.

**Data**

**Select**

**Selection Explorer**

**Creating User Defined Shortcuts**

This process will show you how to create user defined shortcuts with the Function, SHIFT, CTRL, and or ALT keys. In this example we will assign the F3 key to select points and the F7 key to compute inverses.

**Support**

**Customize**

**Define Command Shortcuts**

Command:  **Select Points**

Shortcut: **F3**

**Support**

**Customize**

**Define Command Shortcuts**

Command:  **Inverse**

Shortcut: **F7**

**OPUS**

**Note:** -Static data only; the antenna must remain unmoved throughout the observing session.

-15-minutes of data or more, up to 48-hours, but not crossing UTC midnight more than once.

-Files under 2 hours, processed as rapid-static, must include the P2 and either P1 or C1 observables.

-GLONASS or Galileo observables may be included; though only the GPS are used.

-Any elevation cut-off or mask angle; though only satellites more than 10° above the horizon are used.

-Recording (epoch) rates of 1, 2, 3, 5, 10, 15, or 30 seconds; though all are decimated to 30 seconds. Trimble RTX uses 10 second data.

**TSC2** data collector

**Configuration**

**Survey Styles**

**R8-4 INFILL** (or whatever you named your R8 style)

**Base options**

Survey Type: **RTK & infill**

Broadcast format: **CMRx** (or CMR+ if not an R8 Generation 4)

Station index: ***your choice***

Logging device: **Receiver**

Logging interval: **10s**

Elevation mask: **10s**

Type: **R8-4 Internal** (or whatever your antenna type is)

Measured to: **Bottom of antenna mount**

Antenna height: **?**

Serial number: **?**

Use L2e **Yes**

GPS L2C ****

GLONASS ****

GPL L5 

Galileo 

**Accept (or Enter)**

**Store** button in lower left of screen

**Esc** button

**Trimble RTX**

Trimble RTX can be accessed by importing a Trimble Static file into a TBC project. You can also access the service by going to [www.TrimbleRTX.com](http://www.TrimbleRTX.com).

Trimble RTX Supports GPS, GLONASS, QZSS and BeiDou.

Observation files must meet the following requirements:

* Data formats accepted include Trimble proprietary data formats (e.g. DAT, T01, T02, Quark) and the standard RINEX 2 and RINEX 3 data formats
* For optimal processing results, it is recommended to provide at least 60 minutes of observations.
* Data files cannot exceed 24 hours in length
* Data files must be static only
* Data files must contain dual frequency pseudorange and carrier phase observations (L1 and L2)
* Data must have been collected after 14 May 2011
* BeiDou data is included since 04 June 2014
* If your observation data consists of several files, please compress them to a ZIP archive and upload the zipped file. All files in the ZIP archive must belong to the same station.

**Creating an R8 Device Connection in TBC**

**Cadastral** tab

**Files** group

**Device Pane**

**Computer** b icon in the upper left of window

**Survey Devices**

b to the right of Task near the upper right of window

**Options**

**Edit Devices**

**New** button

**GPS Receiver (R/SPS/5000/Series)**

**OK** button

Port: **COM1**

**Next** button

Enter name for new device: **R8** (or whatever you wish)

**Next** button

Maximum baud rate: **38400**

Parity: **None**

Max retries: **5**

Timeout (secs): **10**

**Next** button

****Display summary upon completion

**Finish** button

**Downloading Static Data from R8 to TSC3 to TBC**

**TSC3 Data Collector**

This process will allow us to transfer the Static file (which is located in the BASE Receiver) and transfer it to the TSC3 Data Collector. So we first need to turn on the BASE Receiver and the TSC3 data collector. Then we need to connect the data collector to the receiver using Bluetooth.

**Turn on R8 Receiver**

**Turn on TSC3 Data Collector**

In the TSC3 Data Collector

**General Survey**

**Instrument**

**GNSS Functions**

**Base Mode**

“Connecting to GNSS Base via Bluetooth:

Trimble R8 123456789

**Import files**

**New Screen opens**

**Import from receiver**

Highlight *filename “Make sure a check mark is next to the file name you want to import” Multiple files can be imported*

**Import**

**Start**

**IMPORTANT NOTE:** A folder (named with your job currently opened) with a subfolder, named Other Files, was automatically created in your currently opened job in the TSC3 data collector. If no job is open file will be downloaded into your main folder.

**Downloading Static file from TSC3 Data Collector to TBC**

Open up your job in **Trimble Business Center**.

We first need to make sure that your file will be automatically transferred to the location of your desired folder.

**Cadastral** tab

**Customize** group

**Options**

**Project Management**

Download and Import Folder:

**C:\tmp\Jobs\*year\TxxXRxxX\TBC\TxxXRxxX\*Data Files\Trimble Files\**

**OK** button

**Cadastral** tab

**Files** group

**Device Pane**

Expand **Trimble Access**

Expand **BLM – Projects**

Expand ***Current Job***folder

Expand **Other Files**

Double Click ***job file.***

Open up **Windows Explorer** and **Cut & Paste** from:

**C:\tmp\Jobs\*year\TxxXRxxX\TBC\TxxXRxxX\*Data Files\Trimble Files\**

to:

**C:\tmp\Jobs\*year\TxxXRxxX\*OPUS**

Rename the job file that you just transferred to the OPUS folder to the name of the point you collected the static information on, i.e. **BASE1**

**Inserting OPUS Point into TBC**

Once we get our OPUS solution, we can insert the point by copying and pasting from the OPUS solution report to TBC.

**Cadastral** tab

**Points** group

**Create Point**

Point ID: ***base name***

Layer: **Control**

Coordinate type: **Global**

Latitude: ***latitude from OPUS report* N** (put “N” immediately after latitude)

Longitude: ***longitude from OPUS report* W** (put “W” immediately after longitude)

Height: ***EL height* M** (put “M” immediately after height for meters)

Elevation: ***ortho height* M** (put “M” immediately after elevation for meters)

Status: **Enabled**

On the right side of the “Create Point” pane, change each of the three “?” to **Control Quality Add** button

**Send Static Data to Trimble for Post-Processing**

Unlike TGO where we would download the static session with a file format of \*.t02, convert it to a \*.DAT, convert it to a RINEX file, and then finally submit it to NGS; with Trimble RTX Post Processing website, all we have to do is upload the \*.t02 directly to Trimble RTX website. Trimble will e-mail you the result in 2 different file formats: \*.xml and \*.pdf. Take the \*.xml file and drag and drop it into your TBC job… pretty sweet!

**Registering on Trimble Website**

The first thing we need to do is register on Trimble’s website: <http://www.trimblertx.com/Register.aspx>

I am under the impression that we can process our data free for 1 year. I’m not sure if we will have to start paying or just reregister free for another year.

**Submitting Static Session to Trimble TRX**

Go to the website <http://www.trimblertx.com/UploadForm.aspx> to submit your static session.

We will be uploading the \*.t02 file which

Coordinate System: NAD83-2011

Tectonic Plate: North America

Select a file to upload: **C:\tmp\Jobs\*year*\*township*\*OPUS*\**

Provide your email address: [***yourname@*blm.gov**](mailto:yourname@blm.gov)

**Process** button

**Uploading Trimble Solution into TBC**

Open up your e-mail, and download both the \*.xml and \*.pdf Trimble solutions to your hard drive:

**C:\tmp\Jobs\*year*\*township*\OPUS**

At this point, I would highly suggest opening up Windows Explorer and renaming the Trimble generated file to an easy to remember file name such as **BASE1**.

Open up Windows Explorer, navigate to your \*.xml file in **C:\tmp\Jobs\*year*\*township*\OPUS**

and reduce the window of Windows Explorer to a smaller window, say 3” x 3” for example.

Open up your job in Trimble Business Center. Now click on Windows Explorer so that the small window of Windows Explorer is “on top of” your TBC job. Drag and drop your \*.xml file into your TBC job. Your Trimble RTX Post Processed static session is now in your job data base.

**Exporting to Garmin**

This process will allow us to create an export file format to go from TBC to TrackMaker and then to our Garmin. However, we will have to do a quick edit of the *garmin.*txt file by adding “WP,D,” to the beginning of each line in Microsoft Word.

**Creating Export Garmin Format File**

**Cadastral** tab

**File** group

**Export** b

**Export Format Editor**

**New** button

Definition Name: **Garmin**

Format definition description:

**** Include header

Record type:  Delimited

Delimiter  **Comma**

Text Qualifier **None**

Default file extension: **.txt**

Decimal separator: **.**

Encoding: **UNICODE**

**Next** button

Data type:  **Point**

**+ General**

Double Click **Point ID**

Double Click **Description 1**

Double Click **Description 2**

Double Click **Latitude**

Units: **Decimal degrees** 

**** Apply to all

Double Click **Longitude**

Units: **Decimal degrees** 

**** Apply to all

**Finish** button

**Exporting Selected TBC Points into TrackMaker Format File**

In TBC, select the points you want to export.

Right mouse click one of the points and choose **properties**

In the **Description 1** field type **WP**

In the **Description 2** field type **D**

**Then close the command**

**Cadastral** tab

**File** group

**Export**

**Custom** tab

**Garmin**

File Name: ***TxxXRxxX*.txt**

**Browse** button C:\tmp\Jobs\*year*\*TxxXRxxX*\Garmin

**** Close command after export

**Export** button

**Editing *Garmin.*txt File in Microsoft Word**

In this process, we need to add “Datum,WGS84,WGS84,0,0,0,0,0” to the top of the file

Open up your file in C:\tmp\Jobs\*year*\*TxxXRxxX*\Garmin\*garmin.*txt in Microsoft Word.

You will notice that below is an example of what your file looks like:

100200,36.40409,-110.77589

100240,36.41133,-110.77589

100300,36.41858,-110.77589

100340,36.42583,-110.77589

100400,36.43308,-110.77589

100440,36.44033,-110.77589

100500,36.44758,-110.77589

100540,36.45483,-110.77589

100600,36.46208,-110.77589

100640,36.46933,-110.77589

At the top of the file, add:

**Datum,WGS84,WGS84,0,0,0,0,0**

Your file should now look similar to this:

Datum,WGS84,WGS84,0,0,0,0,0

100200,36.40409,-110.77589

100240,36.41133,-110.77589

100300,36.41858,-110.77589

100340,36.42583,-110.77589

100400,36.43308,-110.77589

100440,36.44033,-110.77589

100500,36.44758,-110.77589

100540,36.45483,-110.77589

100600,36.46208,-110.77589

100640,36.46933,-110.77589

I recommend saving this to a text file that you can copy and past from.

**Exporting a Shape File for ArcMap**

This process will allow us to export our township lines, section lines, subdivision lines, & mineral survey lines as well as point names into a geo-referenced shape file that will be used in ArcMap.

**NOTE:** Unfortunately, when creating a shape file, TBC combines all of the lines from the Township Lines, Section Lines, Subdivision Lines layers into only one line shape file and NOT individual lines for each layer. So we will have to export one line layer at a time, and change the name of Line.dbf, Line.prj, Line.shp, & Line.shx to Township.dbf, Township.prj, Township.shp, & Township.shx in Windows Explorer. While this, at first may seem like a tedious process, the resulting outcome is well worth it.

So turn on only the line layer (such as Township Lines) you want to be visible in ArcMap and hit CTRL-A to select all of the lines that are visible in that particular layer.

**Cadastral** tab

**Files** group

**Export** icon

**GIS** tab

**Shapefile exporter**

File Name: **C:\tmp\*year*\*TxxXRxxX*\TBC\ArcMap\*TxxXRxxX*.shp**

**** Close command after export

Settings

Distance Units: **Meters**

Output Horizontal: **Grid: North, East**

Output Vertical: **Elevation**

Name: **Yes**

Layer: **Yes**

Feature Codes: **No**

Global Coordinates: **No**

Local Coordinates: **No**

Grid Coordinates: **Yes**

Horizontal precision: **No**

Vertical precision: **No**

Date recorded: **No**

Time recorded: **No**

**Export** button

In Window Explore, navigate to **C:\tmp\*year*\*TxxXRxxX*\TBC\ArcMap\** and change Line.dbf, Line.prj, Line.shp, & Line.shx to that corresponding layer such as Township.dbf, Township.prj, Township.shp, & Township.shx. Repeat this process for each layer that has lines in it that you want to be visible in ArcMap.

**Exporting Road Intersections from ArcMap to TBC**

This process utilizes the point and click Identify button in ArcMap to calculate the latitude and longitude of road intersections on the topographical map and then copy and paste the latitude and longitude into a Word document. Once all of the road intersections have been calculated and put into a Word document, we will remove all of the minute and second symbols and replace the degree symbol with a decimal point and then add a generic elevation to each point. After the Word document has been changed into a \*.txt format file, we will then import it into TBC.

**Copy** **and Paste from ArcMap to MicroSoft Word**

I will not go into much detail about ArcMap because that is an entirely different beast to address. **ArcMap**

Zoom in close to the road intersection.

Click on the blue **Identify** button.

In the middle of the new window which just opened up, the point is identified with a meters value. To the right of the meters, click on a very small pull down arrow and choose Latitude and Longitude Degrees, Minutes and Seconds. Highlight the Latitude and Longitude by dragging your cursor and hit CTRL C.

**MicroSoft Word**

Open a new document in Word and on the very first line type **01** and hit the **Tab** button. This will now start to automatically start number our road interesections.

**CTRL V** pastes

**Coordinate Transformation**

This process will shift our coordinates from one location (at a known Northing and Easting) to a different location (at a new Northing and Easting). Let’s say that we are looking for 500600 that was originally surveyed in 1883 and we were unable to locate that monument. In the 1883 notes, the original surveyor called top of ridge North 13.20 chains from 500600. So we perform Continuous Topo along the top of the ridge calling the first point RDG1 and we end the Continuous Topo survey with RDG89 . We then transfer those points from TBC to CMM and calculate only one point from RDG1 due South 13.20 chains and call it XRDG1. Next, export XRDG1 into your TBC job and perform the following task in TBC:

Select all of the points you want to move by dragging a box around them.

**Edit** tab

**Transform** group

**Transform Survey Points** icon

Calculation Method  **Helmet**

**** Delta Northing

**** Delta Easting

**** Delta Elevation

**** Fix Scale 1.00

Place cursor in **From point / to point** field

Click on RDG1 and then click on XRDG1

Uncheck box  **H. Residual V. Residual**

**Apply** button.

**Caution:** This is not a perfect coordinate transformation. In CMM I calculated XRDG1 South 13.20 chains from RDG1 and XRDG89 South 13.20 chains from RDG89, then **Transform Survey Points** from RDG1 to XRDG1, and then inversed in between RDG1 to XRDG1 and the distance was 0.00 ft. However, when I inversed in between RDG89 to XRDG89, the distance was 0.06 ft. So this is not a perfect transformation possibly due to XRDG1 and XRDG89 were calculated on a geodetic bearing and the transformation was done on a plane.

**Trouble Shooting**

If Trimble Business Center does not recognize your data collector under Device Pane

- unplug your data collector and plug it back in

- shut down and restart TBC.

- restart your PC

**Vector Lines –** To turn on or off the RTK vector lines,

**Manager** in the Layer group

b **My Filter**

**+ Raw Data**

**Uncheck RTK Vector**

**Miscellaneous**

Original Trimble Business Center line file in located in:

C:\Program Files\Trimble\Trimble Business Center\FCEdit\Linetype.ltp

Customized line file is located in:

C:\Program Files (x86)\Trimble\Feature Definition Manager\PEditor\Linetype

**Turning Grid Lines Off**

This process toggles on and off the grid lines in TBC.

**Home** tab also under your custom tab.

**View**

**Toggle Gridlines** icon

Opus Supplemental.

If the ***RTK&Infill Survey Style*** was used in the field, the raw GPS file at the ***Base*** can be sent to ***OPUS*** to bring accuracy to the survey (required for State Plane, UTM, etc). The ***Infill*** option also allows ***Rover*** points to be observed outside the connection from the ***Base*** station (or ***VRS*** cell connection).

***TBC*** has now simplified the entire OPUS submittal process. Once the raw data file (\*.***dat***, \*.***T01***, \*.***T02***) has been downloaded, go to the ***File/TCC*** pull down menu in ***TBC***, select ***Trimble ***

You may also go to this link directly.

<https://www.myconnectedsite.com/site/surveyadministration/TrimbleAccessTools/Data%20Processing>

***Access Services/Survey Tools*** and then the ***Data Processing*** option. Then complete the prompts: browse for the file; select the appropriate service (OPUS Static); confirm the point ID, antenna type, antenna measurement type and antenna height; then provide the appropriate email address for the return and press ***Send***.

The results will be emailed to the address provided, usually within 30 minutes. Open the email and review the results. Be sure the % of data used and the RMS values are within the project tolerance, then save the XML attachment to the ***TBC Project*** directory.

Open the ***Project***, select ***Import***. Select the ***Project*** directory and the XML file. Using the OPUS/XML import in ***TBC 2.30+*** will only allow the ***Local*** (most often in the US, NAD83) position. If ITRF is required, it must be keyed in. Click ***Import*** and the following screen will appear:



After the OPUS return has been imported, the ***Base*** point is now accurate, HOWEVER IT WILL BE NECESSARY TO USE THE ***PROJECT EXPLORER*** TO RENAME THE OPUS POSITION THE SAME AS THE ***BASE*** POINT ID USED IN THE FIELD AND TO CREATE A WGS84 POSITION AT THAT POINT WITH THE STATUS OF ***CONTROL***.

Open ***Project Explorer*** and browse the OPUS point to show ***Properties*** and rename the point to match the ***Base*** point ID in the field. Right click on the point in ***Project Explorer*** and use the ***Add Coordinate*** command, choose ***Global*** for the ***Coordinate Type*** and set the status to ***Control***. The ***Global*** classification is required if the points is to be used in any sort of ***Site Calibration***.

Once this is completed, import the ***Job/DC*** file and if necessary merge the multiple ***Base*** points.

**NOTE**: with some ***Trimble*** receivers the raw data file (***DAT***, ***T01***, & ***T02***) for the ***Base*** which contains the AUTONOMOUS point position will come into ***TBC*** as a ***CONTROL*** point. When ***TBC*** sees the position conflict between the existing OPUS position and the autonomous position it will open the ***Merge on Import*** screen and if checked it will import the data file **BUT SINCE IT IS CONTROL AND IT IS THE LATEST IMPORT, THE AUTONOMOUS POSITION WILL BE HELD – THAT IS TO SAY, THE SURVEY IS NOW BASED ON THE AUTONOMOUS RATHER THAN THE OPUS POSITION. TO FIX THIS PROBLEM, GO TO THE POINT MANAGER AND RECLASSIFY THE DATA SOURCE (DAT, T01 OR T02) QUALITY TO “UNKNOWN” AND THEN RECOMPUTE THE PROJECT, OR IMPORT THE RAW DATA FILE BEFORE THE OPUS VALUES.**

**TBC Points and Classifications**

***SYSTEM DIVIDENDS***, ***THE MOST EXPERIENCED GPS TRAINERS IN AMERICA*** *45*

**POINT MANAGEMENT:**

**DUPLICATE POINTS, MULTIPLE OBSERVATIONS TO A POINT, MUTILPLE DOWNLOADS OF SAME DATA COLLECTOR FILES:**

WHILE CONSIDERING THE FOLLOWING ISSUES, BE SURE TO DISTINGUISH BETWEEN OBSERVATIONS AND POSITIONS DERIVED FROM THOSE OBSERVATIONS – ALSO BE SURE TO CONSULT THE LATEST TRIMBLE MANUALS AND README FILES.

Accidental and deliberate occurrences of station point names have long been an issue with field files and office database files. The ***Access Controller*** internally handles the problem using data types (post processed data or RTK), classifications (the highest in class determines the point used).

***TBC*** has several other issues however, not the least of which is downloading an ongoing RTK file multiple times, potentially creating many copies of the same point/position.

**Basically** the highest classification of a particular point is the default ***TBC*** display (***Control, Survey, Mapping***, and ***Unknown)*** which have different icons in the ***point properties*** box. This behavior is essentially the same as in the ***Access Controller*** and fine as far as it goes and accounts for ***observations*** from the field deferring (at least initially) to ***Control*** positions imported from an ASCII file or NGS data sheet for example. However as the points may come from a variety of sources, undergo several different levels of processing, adjustment, etc., ***TBC*** must have additional rules governing the current position for any given point.

1. If a station has a point quality of ***Control***, that position trumps any other position, that is to say both positions are in the database but only the control value will be listed in the reports and exported. If duplicate points are found in the database and one is ***Control*** and the other of a lower classification and the ***Merge Duplicate*** points option is executed, the lower class will move to the ***Control*** position. If duplicate points are imported with the same classification (***Control*** for example), the points will merge and **the latest position will be used**. If the tolerances under ***Project Settings/ Computational Settings/Point Tolerances*** are violated, the point will be red under the ***Project Explorer*** and it will be ***Flagged*** on the screen and listed under the ***Flags Pane***. Both positions are in the database however and either one can be deleted.

2. There is another level to the point positions well, in the ***Trimble*** geodetic world there are ***Grid, Local*** (NAD83 for example) and ***Global*** (WGS84). Unless told otherwise ***TBC*** treats ***Local*** and ***Global*** as being the same (they are NOT). All types can be keyed in, but only once. However, multiple versions of the same type can be imported (but not in the case of ***DAT/T01*** files, see below – RTK/DC files can however be imported multiple times).

3. ***DAT/T01*** files have a particular status since they contain raw positions that have not yet been processed. In the case of a Static survey, points will be imported numerous times and MUST be named the same even though the files have somewhat different positions. In this case the latest (although temporary) position is used if the point does not have another position of a higher quality. However, this is ultimately moot since after processing and

adjustment a single position will be created with an ***Adjustment*** quality level.

Obviously, this data flow can get very complicated!

**BOTTOM LINE** – **WHEN DEALING WITH MULTIPLE POSITION SOURCES (IMPORTED, KEYED IN, ADJUSTED, OR MERGED) BE SURE TO REVIEW THE POINT “HISTORY” UNDER THE *PROJECT EXPLORER*.**

**POINT SELECTION(s)**

***SELECT***/***Select Points*** and ***Advanced Select*** – basically the ***Select Points*** option is more rigid in that other than the software provided selections the user can only introduce limited filters (wildcards, partial strings, etc). ***Advanced Select*** allows for the user to specify a ***Data Type (Multiple Data Types, Points, Coordinates***, etc) and then allows specific interrogation of details using criteria like ***Not Equal To Regular Expression***, ***Not Equal***, ***Equal*** and ***Equal to Regular Expression***, with user input values. Note that the expressions used in ***TBC*** are international rather than Microsoft - see ***Select Using Advanced Criteria*** under ***Help*** for complete options.

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