MOVE3 Field Notes

NOTE1: **Use the resection program if you wish!**

Feel freedom using the resection program on the Trimble or Leica total stations for your network adjustment jobs!

The only important thing to consider to make is that you use the same station names at every set up (with instrument height if you are set up over a known station) and to the stations in your network.

You have the freedom to use the resections program let MOVE3 do the rest for you!

NOTE2: **Which Constraint do you use Pseudo or Absolute?**

The difference between Pseudo Constraint and Absolute Constraint is the computed standard deviation (standard ellipse) for the adjusted points. The computed coordinates itself are identical, since both are based on the assumption that the Control Points coordinates do not change in the adjustment.

SP1.7 only classifies the relative ellipses, so there is no difference in the classes between Pseudo and Absolute.

The SP 1 version 2.1 uses the Survey Uncertainty, and that will differ since Pseudo takes into account the quality (standard deviations) set for the control points, whereas Absolute assumes standard deviation 0 for the control points. SU values will thus be smaller for the Absolute Constraint.
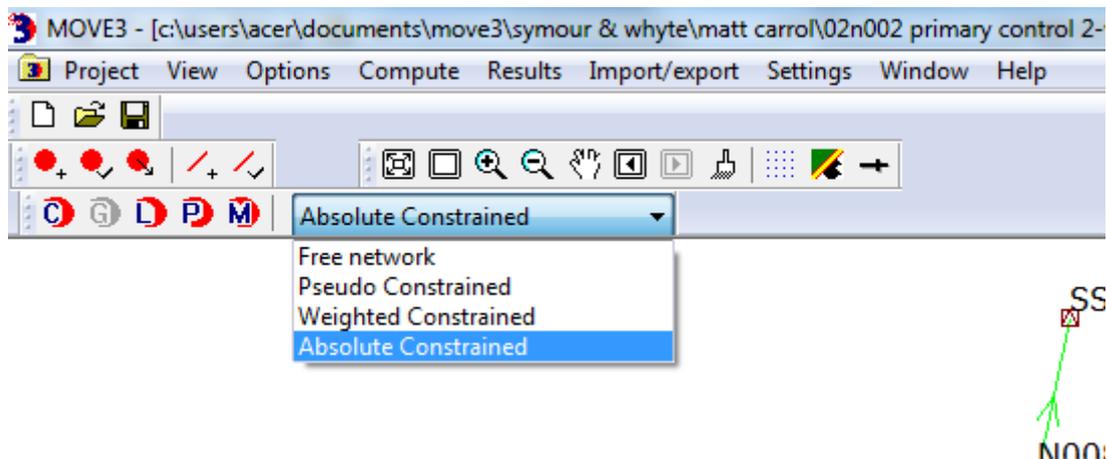
==After a constrained adjustment== the adjusted coordinates can also be exported to a Grid To Ground file. The adjusted coordinates can receive a correction for the Projection scale factor and Height scale factor. The scaling factors of either a single point or the average for the network can be used.

It is advised to apply a Translation to the exported coordinates to avoid confusion with the adjusted coordinates in the specified projection.

Fill-in the format parameters station name X, Y, Z and press export to create the file. You can use these coordinates for your set-out purposes just remove the header when importing the coordinates back into the controller. The Grid To Ground export file can also be used to export adjusted coordinates together with the stations Projection scale factor, Height scale factor and Convergence Here you will get the average scale factor from the project and you can use this scale for your TS.

SCALE FACTORS GRID to GROUND

- Distances measured need not be corrected before they are entered into MOVE3! When you come to do the adjustment (of your uncorrected distances and using the correct fixed stations) MOVE3 will automatically compensate for the scale distortion as you have selected the proper projection and zone so you can keep it to 1.00000 on the instrument The projection selected and zone will compensate for this!

  If you want to use the adjusted and fixed stations coordinates for setting out you must take into account that the distance computed from the coordinates is not exactly the one you should measure in the field. Then you must apply the (inverse) of the scale distortion at that point.

- With Grid to Ground you can produce a set of coordinates that have been scaled to remove the effect of projection distortion and/or height. But this should be used with care because you may confuse the one with the other. Therefore we always advise to apply a translation when exporting so that you can see the difference between the actual coordinates in the National Grid and the local Grid to Ground set. In the Grid to Ground set the distance computed from the coordinates is (almost) identical to the one you will measure in the field.

Example Grid to Ground

- When Using Grid to Ground coordinates for setting out the scale factor in the TS should be set To 1.

- When Using the adjusted coordinates from an adjusted MOVE3 project the scale factor for setting out should be set to the scale factor from the Grid to Ground results example: 0.99998 (unless the TS is projection aware and can apply the correction itself).

NOTE4: **Merging MOVE3 Projects (e.g. in a underground mine situation) Import – MOVE3**

If you have a Master Network and you would like to combine it with a new MOVE3 job You can adopt those already adjusted points in the master network and use them as fixed stations.

But if you want that new partial network to be added to the master network and then re adjust the Master network as a whole you would naturally remove any fixed control points which you fixed with a * symbol in a partial network as this would over strain the network again.

If you extend a network and would like to do a total readjustment you can combine the network in one project using the import MOVE3 option.

If you want to keep fixed what you already adjusted you should enter the Adjusted points from the
previous adjustment as control points (Known points) in the next adjustment and then do an Absolute Constrained adjustment so that the Control points won't change.

It would also be possible to combine the networks and keep all previously adjusted points fixed to their original adjusted value, but that does not make a difference with the previous.

If you have observations and keep all points fixed to their previously adjusted values the only way to distribute the miss-closure is to shift the corrections into the observations, since the points are not allowed to move.

I would not call this over constraining. It does not add anything to the new adjustment, you might as well just take your new measurement and connect it to the previously adjusted points and do an absolute constraint, so the older points won't change.

A practical way to do so is make a csv file of the adjusted coordinates (and maybe also export the standard deviations). And then import it in the new project via **Import Coordinate file** and select Update existing only to avoid that all points will enter into the project, also the ones that were not used.

The decision you have to make is do you want to change already established coordinates if you add new measurements to your network if you extend it.

It should also be noted that if you re-measure a network that you always will get slightly different adjusted coordinates. Each measurement set is an approximation of the realty, and the standard deviations and ellipses give an idea how good this approximation is. In 68% of the cases you will get a result that is within plus or minus the standard deviation.

Note5 Adding a Gyro Azimuth

View – Observation – Edit –Insert Azimuth
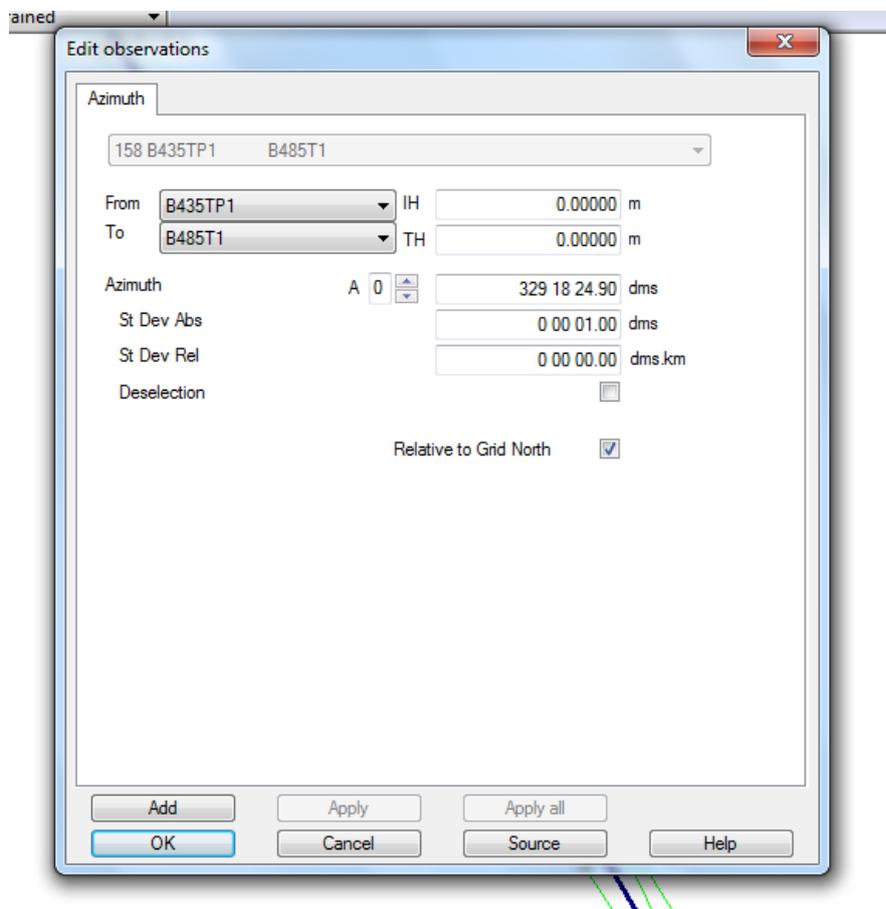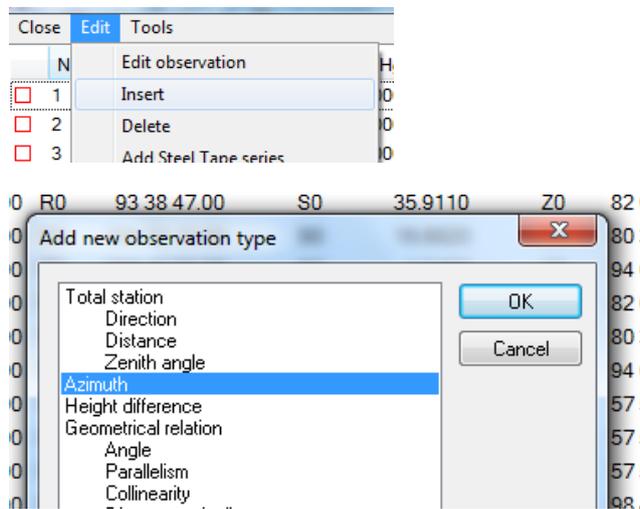
In excel some columns give only 3 decimal places and not 4 It could be that if Excel tries to be smart and display the number of digits of the first row. If the first row has a 0 in the 4th decimal place it may show just 3 decimals for the whole column.

I use the decimal places setting in Excel sometimes if I want to round to 3 decimal placed. The 4th decimal place is then removed after saving the csv

I would preference in opening in NotePad. NotePad shows the original file with no rounding off.

So you got to be very careful saving it from Excel. If you are using excel it is best to set in Excel the number of decimal places for the coordinate columns.

In the Ribbon you see Number. If you click that then you can format the cells or selected columns as a number with 4 decimal places

Station grid bearing summary If you to see the grid bearings between stations due to the open-ended nature of the traverses being advanced forward.
The STATION file can be found with the MOVE3 files
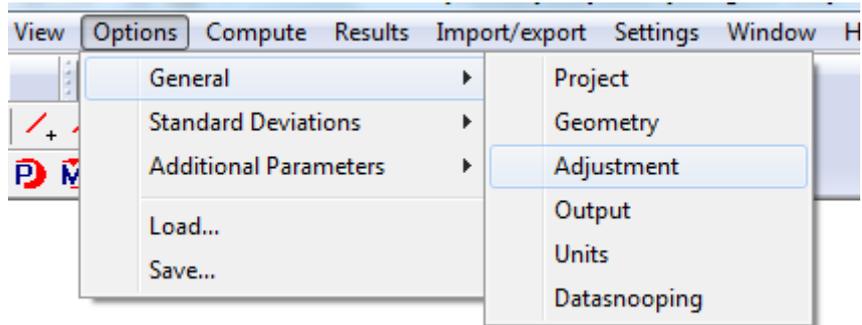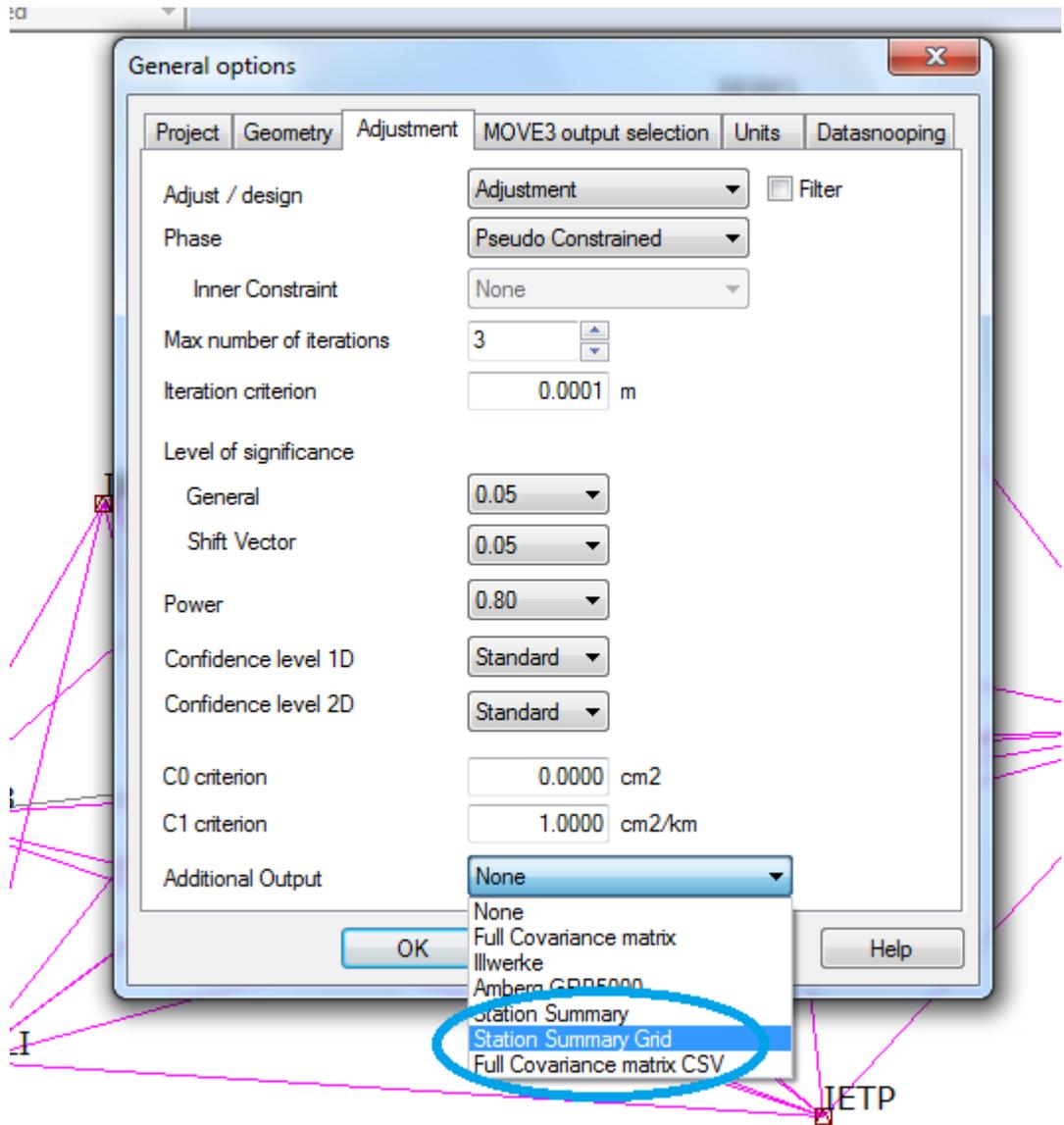
Station Summary Grid

Linear Unit: m Angular Unit: dms

Station

IEEN   E: 538354.3395 N: 675674.7886 h: 87.1283

IELI   E: 528063.8121 N: 633197.6052 h: 123.3082 GridBearing: 193 37 05.21
GridDistance: 43705.9042 dh: 36.1799

IETP   E: 592652.0415 N: 629088.5182 h: 153.1192 GridBearing: 130 37 44.00
GridDistance: 71543.8399 dh: 65.9909

IEPO   E: 584595.7814 N: 705599.7714 h: 116.2638 GridBearing: 57 05 28.39
GridDistance: 55079.7199 dh: 29.1355

IETH   E: 619562.3284 N: 658635.4660 h: 180.0898 GridBearing: 101 51 00.28
GridDistance: 82976.3579 dh: 92.9615

CWL2   E: 545871.2101 N: 646723.8369 h: 60.2491 GridBearing: 165 26 42.08
GridDistance: 29910.8834 dh: -26.8792

CWL3   E: 524742.4368 N: 651930.9163 h: 59.8970 GridBearing: 209 49 29.33
GridDistance: 27368.8759 dh: -27.2313

CWL1   E: 558402.2277 N: 655894.8602 h: 74.6614 GridBearing: 134 36 52.28
GridDistance: 28163.1566 dh: -12.4669