miniCAD7 QuickStart Tutorial

Stage: 2

Load Field Survey Data

Aim: Load survey field data into an existing job.

Start miniCAD by selecting the miniCAD7 icon on your desktop. Ignore this step if it is already open.

Processing the field data

Open the job file.

- Select Tools>>Utility New Software. Note: This closes miniCAD7 and opens the Utility program.

- Select File>>Merge and select *Tutorial-1a.mcd* from the list. Press the OPEN button. Notice that the screen turns green to indicate that field data will be merged with an existing job file.

    About Merged Files – Merging files has the following benefits:

    1. Multiple field data files can be loaded into the one miniCAD job and field point numbering is preserved (usually 1000 is added to each field point number)

    2. Station points (usually numbered from 1 to 100) in the selected project are matched with the same station points in the field data. The coordinate from the miniCAD project takes precedence over the coordinate in the field data.

    3. Auto coordination is possible if coding of stations conforms to the miniCAD standards. This means that miniCAD will automatically calculate station coordinates from the field file observations. There is no need to pre-calculate station coordinates.

    4. If Azimuth swing is set to YES in the Utility parameters, it is possible for a field survey to be performed by setting a zero backsight at every station setup. miniCAD automatically swings the field data onto the correct azimuth. Azimuth swing will also fix problems where an incorrect backsight bearing has been set.

    Benefits 3 & 4 are also available when Project Files are not selected. More information on project files, auto coordination and azimuth swing can be found in the help files for the Utility Software.

- Select Parameters from the menu bar. Check your settings match those in the figure below, especially the String Prefix / Suffix, String Length, Observed Number offset and Azimuth Swing settings.
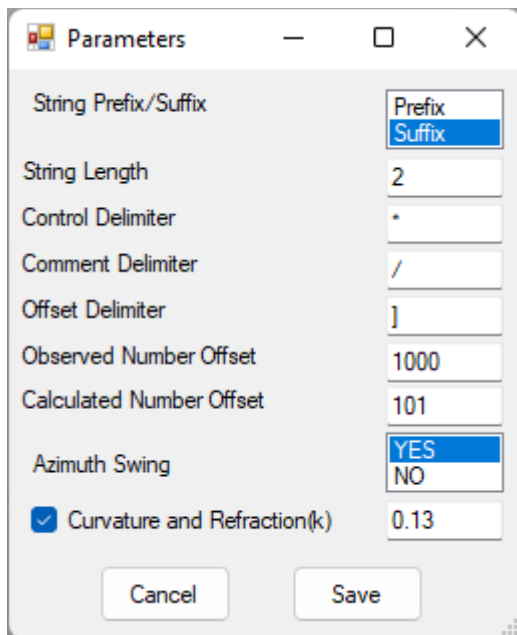

Figure 1 - Parameters

Select Data Recorder>>Read>>Leica 16GSI
- Select the file Tutorial-1b.gsi and press the OPEN button.
- The processing will occur. If the NFF, FLD and MCD files exist you will be prompted to overwrite them. Answer YES to all prompts. Refer below to learn more about these file formats.
- You can scroll back up through the processed data, first through the NFF file and then onto the GSI file.

miniCAD processes this file as follows:
1. It converts it into a Neutral File Format (NFF) which is much easier to read than the Leica file.
2. It processes the NFF and produces both a miniCAD file (MCD) and a field file (FLD)

NOTE: Pages 3 & 4 provide a detailed description of the method used to convert the Leica file into a miniCAD file and Field file. You may wish to skip to Page 5 and revisit this section later, if you find it too technical.

```
*110001+0000000000000001 84..10+0000000000000000 85..10+0000000000000000 86..10+0000000000000000 87..10+0000000000001300 88..10+0000000000001660
*110002+0000000000000001 21.324+0000000000000080 22.324+0000000008931240 31..00+0000000000042014 51..1.+000000000006+023 87..10+0000000000001300 81..00+0000000000000002 82..00+0000000000042013 83..00+0000000000000710
*410003+0000000000000005STN 42....+0000000000000002
*110004+0000000000000002 21.324+0000000000000020 22.324+0000000008931240 31..00+0000000000042014 51..1.+000000000006+023 87..10+0000000000001300 81..00+0000000000000001 82..00+0000000000042013 83..00+0000000000000710
*410005+0000000000000SSM 42....+0000000000/52301
*110006+0000000000000003 21.324+0000000026711070 22.324+0000000009336380 31..00+0000000000005853 51..1.+000000000006+034 87..10+0000000000000000 81..00-0000000000005834 82..00-0000000000000287 83..00+0000000000001291
*410007+00000000000000DH
*110008+0000000000000004 21.324+0000000026711050 22.324+0000000009328550 31..00+0000000000005864 51..1.+000000000006+034 87..10+0000000000000000 81..00-0000000000005846 82..00-0000000000000287 83..00+0000000000001304
*110009+0000000000000005 21.324+0000000010335020 22.324+0000000011510360 31..00+0000000000039864 51..1.+000000000006+023 87..10+0000000000001500 81..00+0000000000035068 82..00-0000000000008473 83..00-0000000000016799
*410010+0000000000000STN 42....+0000000000000003
*110011+0000000000000006 21.324+0000000010335050 22.324+0000000011510360 31..00+0000000000039864 51..1.+000000000006+023 87..10+0000000000001500 81..00+0000000000035068 82..00-0000000000008474 83..00-0000000000016799
*110012+0000000000000007 21.324+0000000011147340 22.324+0000000011604050 31..00+0000000000037895 51..1.+000000000006+023 87..10+0000000000001750 81..00+0000000000031607 82..00-0000000000012637 83..00-0000000000016742
*410013+00000000000000NS
```

Figure 2 – Leica GSI Field Data – difficult to read

The following lines are the translation of the 13 lines above into a miniCAD Neutral File Format:

J Leica Field File converted into miniCAD NFF format
S 1 0 0 0 1.66 STN 2 0.0008
P 1.3
V 1 0.0008 89.3124 42.014 2
V 2 0.0002 89.3124 42.014 SSM/52301
P 0
V 3 267.1107 93.3638 5.853 DH
V 4 267.1105 93.2855 5.864 DH
P 1.5
V 5 103.3502 115.1036 39.864 3
V 6 103.3505 115.1036 39.864 3
P 1.75
V 7 111.4734 116.0405 37.895 NS

A few of the rules for the Neutral File Format are as follows:
1. The first line must start with a *J* and is the job description line.
2. A line beginning with an *S* provides station information about the instrument setup – Station Number, East, North, Height, Code, Instrument Height, Backsight Number, Backsight bearing.
3. A line beginning with a *P* is a Prism height applied to all following observations.
4. A line beginning with a *V* is a slope observation – Observed Point Number, Horizontal direction, Zenith angle, Slope distance, Observed Point Code. If the code is a number only, this means that it is an observation to a station.
5. There are a few other options not displayed above
   a. *H* – horizontal observation
   b. *C* – point number and coordinates\
   c. *N* – a note or comment about the job or observation

From the Neutral File Format, the processed field file (FLD) and the graphical miniCAD file (MCD) is produced. We will see the miniCAD file shortly. Below is an example of the same 13 lines from the reduced Leica file

JOB - Leica Field File converted into miniCAD NFF format

```
 MCD#       East        North      Height     HI    CODE BS Stn Dir'n
  1        0.000        0.000       0.000 1.660 STN     2   0.0008
Fld# MCD#   HA        VA        SD        HD        VD     HT      CODE
  1 2       0.0008  89.3124   42.014    42.013     0.350 1.300 2
  2 1002    0.0002  89.3124   42.014    42.013     0.350 1.300 SSM
  3 1003  267.1107  93.3638    5.853     5.841    -0.369 0.000 DH
  4 1004  267.1105  93.2855    5.864     5.853    -0.356 0.000 DH
  5 3      103.3502 115.1036   39.864    36.077   -16.959 1.500 3
  6 3      103.3505 115.1036   39.864    36.077   -16.959 1.500 3
    dE:0.000 dN:0.001 dH:0.000 Coordinate check for Pt 3
  7 1007  111.4734 116.0405   37.895    34.040   -16.653 1.750 NS
```

This file is self-explanatory. It is a good idea to view or print this file to check that there are no observation or coding errors that need to be corrected. A few items are worth noting:

1. The horizontal (HD) and vertical (VD) components of each slope observation have been calculated.
2. The Horizontal angle (HA) may be different to the Horizontal direction. The Azimuth Swing setting in the Parameters Dialogue shown on page 3 of this tutorial and whether a File Merge has occurred, will affect this.
3. If a station has been observed more than once, an error check is provided. In the case above, Station 3 has been observed a second time and the errors in East (dE), North (dN) and Height (dH) are shown**. Every coordinate check in this file should be verified to be correct before proceeding with the graphical minCAD file.** If you would like to view or print the field (FLD) file, right click on it in Windows File Explorer, select Open With and then select Notepad.
4. Because the Parameters dialogue is set to add 1000 to all observations, the field file lists the Field number and the resulting miniCAD number. Observation 1 is to Station 2, so it remains as point 2 in miniCAD. Similarly, Observations 5 and 6 are to Station 3. Observations 2, 3, 4 and 7 are not to stations and have 1000 added to them, respectively.

Select File>>Exit. (to exit the Utility Software)

Back in miniCAD select File>>Open and open the file Tutorial-1b.mcd

You should now notice that you have 2 distinct areas of work in your job – your plan and your field information. In the next tutorial stage, we will transform the field data onto the plan data and prepare the job for printing.

Congratulations on reaching the end of this tutorial. Please explore the extensive help files associated with the program and found online.   Should you have further queries, don't hesitate to contact us directly.

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