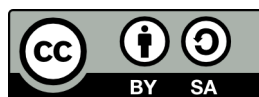




Download of the Leica 700 and 800 series Total Station

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Manuals and documentation produced by Oxford Archaeology North:

Hodgkinson, Anna (2010) *Open Source Survey & GIS Manual*. Documentation. Oxford Archaeology North. (Unpublished): <http://library.thehumanjourney.net/367/>

Robinson, Christina and Campbell, Dana and Hodgkinson, Anna (2010) *Archaeological maps from qGIS and Inkscape: A brief guide*. Documentation. Oxford Archaeology North. (Unpublished): <http://library.thehumanjourney.net/366/>

Hodgkinson, Anna (2011) *Using the Helmert (two-point) transformation in Quantum GIS*. Documentation. Oxford Archaeological Unit Ltd.. (Unpublished): <http://library.thehumanjourney.net/462/>

Software sources and downloads:

Qgis: <http://qgis.org/>

INTRODUCTION

The aim of this document is to prove that these instruments can be downloaded without the use of programs such as LisCAD or AutoCAD

The use of LisCAD requires a large amount of training time and the software is complicated and not user-friendly. Furthermore, LisCAD is proprietary software, i.e., an expensive license is required – the software used in this manual is free to use, and some of it is open source.

Please note that this with this methodology string data (i.e. polygons and lines) cannot be downloaded. Features must be surveyed as points and can be connected later.

During Survey

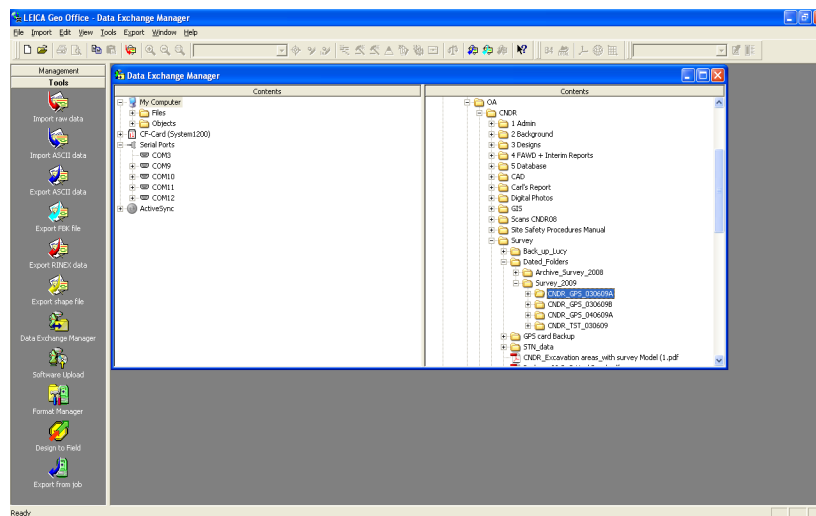
All survey must be done as points, lines and polygons will have to be connected at a later stage. Hence, it is important that the Point ID used during survey is chosen wisely / point codes are used.

If no point codes are used during survey, the Point ID used, if no code is used, **MUST** be chosen sensibly for later recognition:

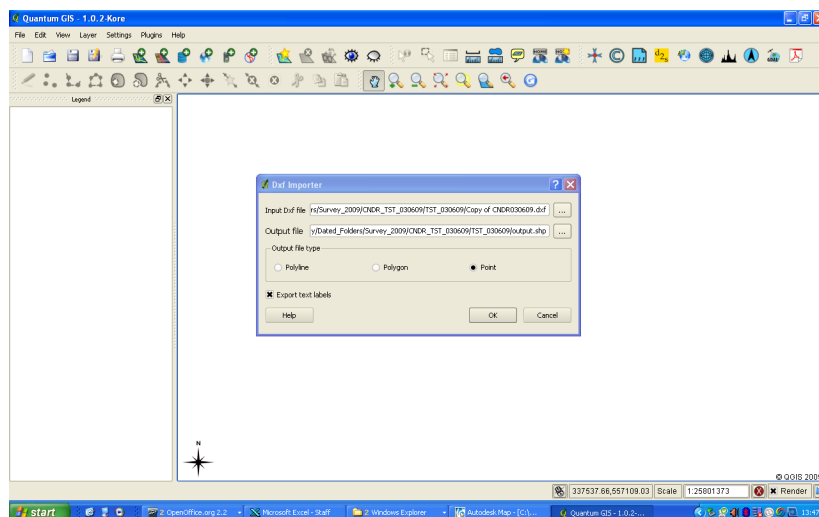
- for example: DP1000.1 or SF1254 or LVL43
- or Fea1.1, Fea1.2 etc.
- this aids later recognition of the points during download and their grouping into layers

Downloading the Survey Instrument

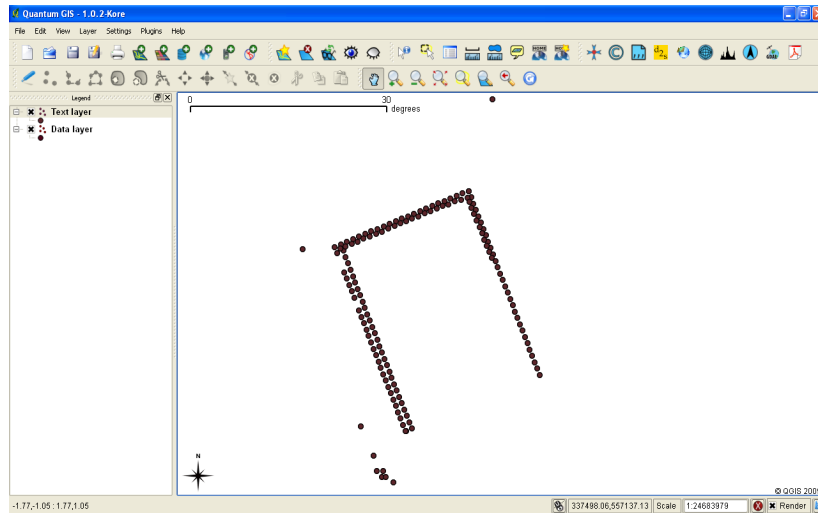
- 1) Connect the Total Station to the computer's USB port using the serial cable and open Leica GeoOffice or Leica GeoOfficeTools (the latter is available for free download from the Leica website)
- 2) Open the 'Data Exchange Manager' and click on the serial ports made available – one of them will display a list of jobs: select the one you wish to download.



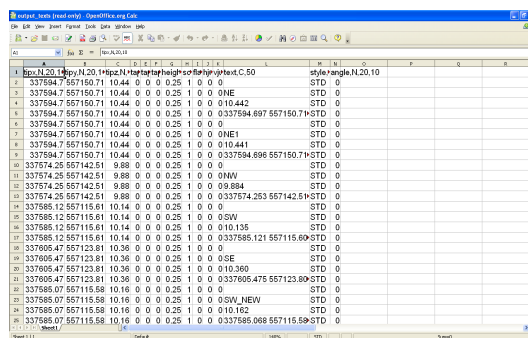
- 3) The folder will display fixpoints and measurements, which for continuity's sake should both be downloaded. This is done by dragging and dropping the files into the appropriate folder (dated folder in the correct directory; one created for each job!).
- 4) After dragging the files to the appropriate folders, a window will pop up, asking you for the output-format. Your format of choice is "AutoCAD (.dxf)". Make sure to rename the files to **_fixpoints and **_measurements.
- 5) The files produced will have the extension .ASC – Copy these (but leave the originals in the folders for archiving) and rename the copies **.dxf
- 6) Now load QuantumGIS (QGIS) and start an empty project. Load the Dxf to Shapefile-conversion tool : yellow box with d2s written in diagonal letters, to be found either in the toolbar or in plugins under "dxf2shp".
- 7) Select the first set of data you wish to convert. Usually this should only be the measurements, as the fixpoints should already be in your project. Select "points" as your output file type, as the Total Stations used here do not export string data. Also tick the box "Export text labels", the latter being very important. Choose your output location and name: this is the dated folder you created for the job.



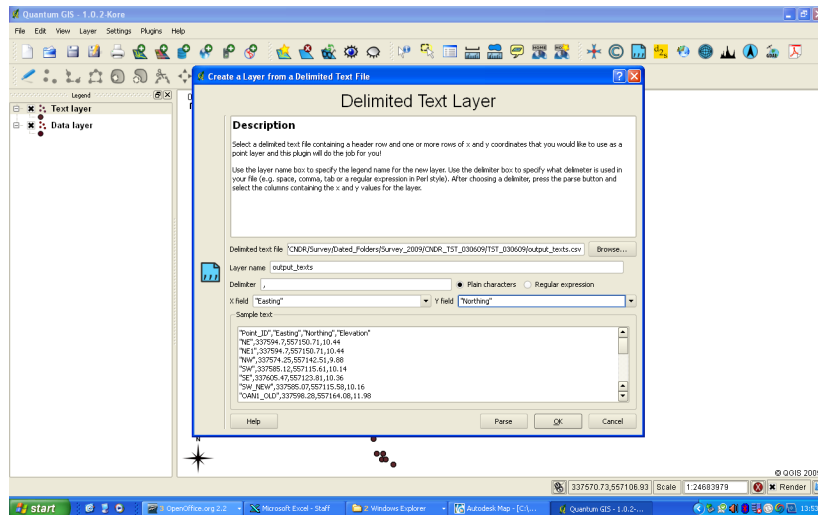
- 8) QGIS will display two new layers: one "Data layer" and one "Text layer". Although this might seem confusing, you can delete the "Data layer" straight away, as this is empty. Take a look at your dated folder: there are two new shapefiles: "output" and "output texts". Delete the "output" shapefile, as this corresponds to the "Data layer".



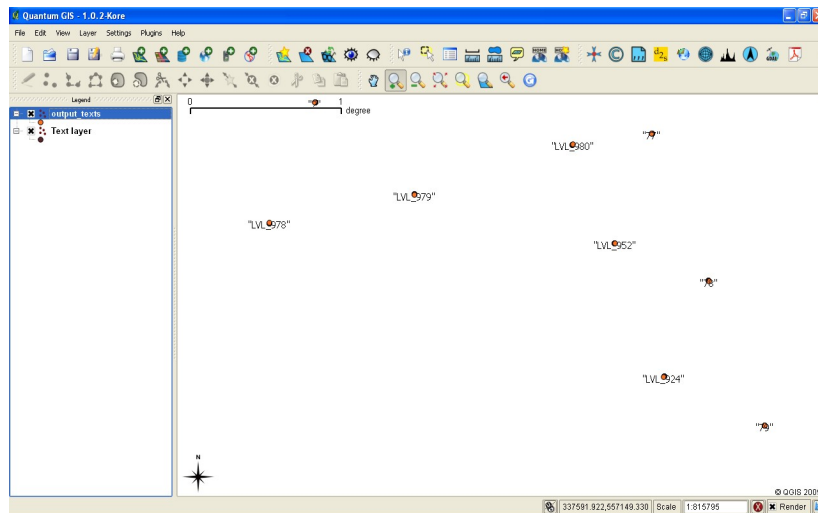
- 9) Now open the .dbf file of the “output texts” shapefile using the *OpenOffice calc* program and save it as a .csv (comma delimited) file. You will see that this contains columns for the easting, the northing and elevation, then some the content of which is 0, 0.25 or 1, then the point ID and then another two unnecessary columns.



- 10) Delete the superfluous columns and rename the header of the X column to “Easting”, the Y column to “Northing” and the Z column to “Elevation”. You will also see that each point, i.e. each set of x,y,z data has three triplets: one above the line with the point ID in the point ID column and two below. UNFORTUNATELY these must be deleted manually to avoid duplicates.
- 11) You can cut and paste points you wish to keep on a separate layer, with different, logical point IDs (see above, point 1 in this document), into new .csv files and save them separately but in the same dated folder.
- 12) Save the .csv file. Now go back to QGIS and open the plugin “Add delimited text layer”. A window will pop up, and the first task will be to hit “Browse” and to navigate to the .csv file you just created. Now choose “,” (comma) as your delimiter. Define the header of the column with the easting information as your X field and do the same for the Y field.



13) Hit "Okay" - the layer will be created and added to your view. You can now check the attribute table, highlight individual features and zoom to them etc. Highlight the layer in the list and select "Layer – Save as Shapefile".



Connecting Points to create polygons and lines

The "Points to One" plugin in QGIS (add 3rd party repositories and search for "points2one") will allow you to select a number of points with matching Point Ids and will create lines between them.