MATIENZO CAVES PROJECT

Inkscape – Matienzo Caves Project surveys

Assumptions:

1) *Inkscape* is installed.
2) The latest version is 0.91. (The *Inkscape* 0.91-1.exe version including Speleo extensions should be installed, although this is not vital). See *Appendix 1*.
3) The *Matienzo Caves Project Inkscape* template.svg is available and has been copied into the working folder and renamed to nnnn.svg where nnnn is the site number.
4) Other resources have been copied into the working folder, eg scan of the hand drawn survey (at 150dpi) or dxf file sketch or Therion export from PocketTopo. See *Appendix 2* for obtaining the correct .dxf format and Therion file change.
5) Keep saving the work every few minutes.
6) Don't assume that this is the "best" or quickest way to use *Inkscape*, eg use the short-cut keys, eg F1 to choose the select icon. Experiment, but save beforehand.

Getting started

1) Right click on the nnnn.svg icon and select *Inkscape*
2) Resize the window to the whole screen, if necessary.
3) Press Shift + Ctrl + L to show the layers management window on the right. Find the almost invisible white line below the Opacity section and drag it down to reveal the complete layer manager.
4) **LAYERS** A layer selected to work on is blue. The eye icon toggles visibility. The padlock icon toggles layer locking. Layers further up this management window are also higher in the drawing. The layers and names are personal choice and not sacrosanct. Use or discard them as you wish. They can be renamed by clicking twice on the word(s). Only visible layers will be printed as hard copy or to a pdf file.
   Delete anything in this template file that is not required, eg the NOTES in the *NOTES* layer
5) **ZOOM** Press Ctrl and use the middle mouse button or use the - and + keys.
6) The first item to bring into the drawing is the scaled centre line although this is optional if a scan with the correct declination is being imported.
   a) In the new Inkscape with Speleo extensions, the centreline 3d file can be imported directly into the *centreline* layer. Make the *centreline* layer visible, unlocked and selected (blue). Ensure the other layers are locked. Use *File/Import* or Ctrl I. Choose the correct scale on import - usually 1:500.
   b) A pdf file of the centre line can also be imported but this will need scaling. The scale line on the pdf should be brought up against the top ruler (which should be in millimetres or centimetres – see File / Document Properties : Default units).
      i) Scales:
         (a) 1:1000 1cm on ruler is 10m on pdf scale
         (b) 1: 500 1cm on ruler is 5m on pdf scale
         (c) 1:250 2cm on ruler is 5m on pdf scale
         (d) 1:100 1cm on ruler is 1m on pdf scale
      ii) The pdf should "fit" exactly.
   c) Optional: Once the pdf centre line is in position the text at the base can be removed. Right click over the centre line and Ungroup. Click off the picture and repeat. Delete the parts not required. Group what's left. Move it as required. Make it a different colour if necessary (right click a colour at the bottom).
7) Lock the *centreline* layer.
8) Import a sketch (a scan, .dxf or .the file) into the *sketch or dxf* layer (visible, unlocked and selected).

a) For a dxf (and Therion file?): There may have to be a lot of editing, eg removing red arrows and thinning lines before the next stage. See *Appendix 3*.
b) The .dxf or .the file might have to be rotated by the declination value if this wasn't taken into account in *PocketTopo*. Use Object / Transform / Rotate.
c) A scan or dxf might have to be altered in size. Use Object / Transform / Scale and try an integer as the scale factor, eg x 2 to start with.
d) Using the Speleo extensions in Inkscape allows scale choice, so centreline and .dxf or .the at 1:500 should ensure perfect registration when overlain and possibly rotated.

9) Lay the scan, .dxf or .the over the centre line and ensure perfect registration. Lock the *sketch or dxf* layer.
10) The *centreline* layer can be made invisible, or deleted. It should no longer be required.
11) Everything is now set up to draw the smooth lines over the sketch.

Drawing

1. It is possibly best to make the *sketch or dxf* layer less than 100% Opacity. Drag the Opacity slider.
2. Unlock the *passage* layer and lock all other layers.
3. **STROKE STYLE** In the Edit/Preferences menu ensure that Tools / Pencil and Tools / Pen are set to Style of new objects is the last used style.
    a. Choose either the *Draw freehand lines* icon or the *Bezier curves* icon and draw anything. Select this and open the Fill/Stroke dialog box: Shift+Ctrl+F or right click on the bottom left of the screen. For passage edges use 1pt (0.35mm) and black (or a colour). If drawing freehand, use Ctrl + L on the selected object to simplify the path.
4. Passages underneath another can be drawn in a dashed line or 50% grey or both. Within a layer, objects can be moved on top or below others: see Object menu. If vertical position is unclear from the sketch or dxf file, view the 3d file in Aven.
5. When the passage edges are complete: Lock the passage layer and unlock the passage detail layer. Draw objects on this or use items brought in on the template. The Inkscape Speleo extensions have an Objects/Symbols library, including various rock types and a *Cave plan* set. See *Appendix 4*.
6. **OBJECTS** These can be duplicated (Ctrl + D); dragged; rotated and enlarged / made smaller. Use the *Cave plan* set of symbols where appropriate. See *Appendix 4*.
7. Some passages may be better represented with **FILL** - a pale shade to differentiate from other passages.
    a. Select the passage lines that best enclose the area; duplicate them; add a Fill to each (a "rainbow convention" appears to be common – higher to lower passages: red, orange, green, blue.
    b. Expert users can blend say orange into green on a slope) ; select the Edit paths by node icon (top left); and Join selected nodes until the fill fills the area. Make the stroke 0pt wide in the Stroke style dialog window.
    c. Don't use Opacity as the pdf driver can't seem to cope with them. Use a light shade instead from the bottom colour bar. It may be easier to use the *shades* layer for the fill. Objects can be cut from one layer (Ctrl + X) then pasted into another (Ctrl + V)
8. Use the *sections* layer for cross sections and use a stroke width of 0.5pt (0.18mm).
9. Examples of suggested text sizes can be found in the template. Duplicate and move the text around. Arial 12pt is used for headings, eg entrance and passage names. Arial 8pt is used for labels. If the label cannot be put in a convenient place a connector line with a blob at the end seems to be a neat way of labelling, rather than an arrow. (See the template.)
10. The style of an object can be pasted onto another: Select the original, copy the original (Ctrl + C), select the target, press Ctrl + Shift + V.

11. *Appendix 4* provides details of the extra features that the CaveInk Speleo extensions add to InkScape. In brief, some of the extra features are
    a. direct import of 3d files
    b. grid production, including coordinates
    c. scale production
    d. a symbol library of cave survey items (draught, straws, etc)
    e. area fills for sand, rocks, etc
    f. special lines for pits and avens
    g. survey can alter if centre line alters due to loop closure or mistakes

Finishing

1. The file is saved in svg format which can be read in a text editor and is viewable in a browser. Currently, it would seem better to save another copy of the file as a pdf – this is easier to print out and can also be viewed in all browsers (as long as there is no Opacity). The production of the pdf is not perfect: some objects may not appear exactly the same as in the svg version.
2. The paper size is probably A4 and, to produce a reasonable online pdf, the paper edges should be adjusted to just fit around the drawing.
    a. File / Document Properties will show a *Resize page to content* line. Click the + icon to shown the margin adjustment boxes and alter these as appropriate. Click *Resize page to drawing or selection*.
3. File / Save As and Save as type: Portable Document Format (*.pdf). The file name must also have .pdf added to it.

Juan Corrin, May, November 2013; February 2014
Incorporating notes from Simon Cornhill and CaveInk Speleo extensions, 4th September 2016.

Appendix 1
Cave survey drawing extensions to Inkscape by Mateusz Golicz are detailed here
http://jaskinie.jaszczur.org/caveink-beta1/
or from
http://www.matienzocaves.org.uk/surveying-help/Introduction.html

Inkscape version 0.91 including these extensions for cave survey drawing can be downloaded from
http://jaskinie.jaszczur.org/caveink-beta1/download/Inkscape-0.91-1.exe
or from
http://www.matienzocaves.org.uk/surveying-help/Inkscape-0.91-1.exe

Any previous versions of Inkscape should be deleted before installing the above exe file.

Good reasons to use the software
direct import of 3d files
grid production, including coordinates
scale production
a symbol library of cave survey items (draught, straws, etc)
area fills for sand, rocks, etc
special lines for pits and avens
survey can alter if centre line alters due to loop closure or mistakes

etc

However, the software is still "beta" - although all original Inkscape features will work if problems arise.

Appendix 2
There are a few ways in which the *PocketTopo* dxf sketch export files can be made readable in *Inkscape*.

1) A dxf file has to be taken into *AutoCad* then resaved as a AutoCad 2000/LT2000 file.
2) The dxf file can be converted to a .pdf or .svg using an online converter, eg http://www.dxfconverter.org/
3) Probably best : Use the ODA *Teigha File Converter* (a program to download and install) to alter the exported dxf files to *Inkscape*-compatible .dxf files.
4) Another option is to export a Therion file from *PocketTopo*. The .txt extension needs altering to .the and this file can then be directly imported into *Inkscape*. There appears to be less info exported in this format.

Appendix 3
There may be annoying red arrows all over the *PocketTopo* plan and elevation, to remove these in *Inkscape*:

1) Lock all layers except the *sketch or dxf* layer and Edit>Select All (or Ctrl A)
2) Keep doing Object>ungroup (Ctrl U or Shift&Ctrl G) until each red arrow is individually selected.
3) Select only one arrow and go to Edit>XML Editor
4) In XML Editor select style and copy the style value, is should be something like this: fill:#ff0000;stroke:#ff0000
5) Go to Edit>Find and paste into the style box, then click Find
6) Hit delete
7) Edit>Select All (Ctrl A) and then Object>Group (Ctrl G). You may have to do this again to get everything grouped back together properly.

Appendix 4
The following is a copy of the help file produced by Mateusz Golicz at http://jaskinie.jaszczur.org/caveink-beta1/ and/or
http://www.matienzocaves.org.uk/surveying-help/Introduction.html that should still have working hyperlinks to external resources.

Introduction

Caveink is a set of Inkscape extensions for drawing cave maps.

It is developed from my similar, previous project that is already well tested and has been used to produce many beautiful drawings. However, as of now, **it is still work in progress** in an early stage. The functions described below are there and - principally - work, but need **extensive testing**. Any help in that is appreciated.

DISCLAIMER: These extensions have not yet been extensively tested. It means that all that is described here may not work for you, make your Inkscape crash or make it run painfully slow. **Do not** use the methods described here for any serious work. It is all not yet ready for that.

Installation

If you are using *Microsoft Windows*, it is easiest to use the self-extracting installer: Inkscape-0.91-1.exe. It installs both Inkscape **and** the extensions. Before running it, remove any former Inkscape versions from your system.

As an alternative, you can download just the extensions as a zip file: caveink-1.0beta1.zip. Copy files from the *symbols*, *patterns*, *keys* and *extensions* subdirectories into the relevant directories in your Inkscape installation directory (could be */usr/share/inkscape* or *C:\Program Files\Inkscape* or something similar). You also have to install the *SpeleoUIS3* font on your system (from *fonts* subdirectory in the archive) in order for the line styles to work.

Workflows

***caveink* can help you ...**

Draw a simple cave map from a paperless survey

Import your paperless sketch from PocketTopo or any other paperless surveying software as a SVG file. Draw a clean copy of your sketch using standard Inkscape drawing tools, as well as the symbol library, fill patterns for carpeting areas and line styling.

Draw a simple cave map from a paper sketch

Scan your paper sketch and load it into inkscape. Draw a clean copy using all the tools mentioned above. Mark where your stations are on the drawing. Process your survey data using Survex and morph your drawing to the real centerline.

Collaborate

After everyone has finished drawing their section in their own file, combine these files into one SVG document and merge fragments that are not intersecting. Find symbols of the same kind and make sure they are all uniformly styled.

Layout and manage complex cave maps

Add offset windows to clearly show intersecting passages on your map. Generate a neat scalebar and coordinate-annotated grid. Split the drawing into multiple pages. Should you close a loop or find yourself using the wrong magnetic declination figure, load a new centerline and adjust your drawing automatically.

For best results...

Choose your scale wisely

Even in the digital age, we still draw cave maps to scale. Zooming in or out is very difficult, because the symbols usually have to *retain their sizes* independently of the scale.

Because of that problem, you need to select your scale carefully at the very beginning of your work.

Use fill patterns

Generally, the more distinct objects you have in your drawing, the slower Inkscape responds.

With this in mind, if your five kilometer long cave is filled with sand, it is a very poor idea to indicate that fact with thousands of little circles. Better use the sand pattern fill. Being only a handful of distinct objects repeated many times, it is much faster for Inkscape to process!

Never embed paper sketches

When importing images (such as scans of paper sketches) into Inkscape, you are always asked whether to just *Link* to the included file in your drawing, or rather to *Embed* the image inside the SVG document. Always opt for *linking*!

It is about how Inkscape extensions internally work. Unfortunately, it is extremely simple: every time you use an extension, your whole drawing is saved in a temporary file and then passed to the selected extension for further processing.

Raster files are often very large, and embedding them into your drawing will result in a large amount of data being packed and unpacked every time you use one of the *Extension / Speleo* menu items. And this essentialy means you will have to wait longer!

Remove paperless sketches from your main drawing

Importing paperless sketches as vector graphics is very convenient. These sketches, however, usually contain an enormous amount of data that is not really useful after the sketch has been traced.

I am not suggesting to throw away these sketches! I just say that there is no point in keeping them in the clean copy file. If you need to fix an error or re-work something, you still have them in their original files - and you can always import them again.

Contents of this guide

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