Converting SVG file to map file for Therion with help of Inkscape

0. Begin with a small cave. Huge and complicated systems are not the best starting point for any cave driving program.

1. Download and install the therion extensions for Inkscape from Thomas Holder - https://github.com/speleo3/inkscape-speleo/

2. Open your svg file into Inkscape

3. Select all objects (Ctrl + A) and try to unlink all clones (*Edit -> Clone -> Unlink Clone*)

4. If the point symbols (stations, passage heights, etc.) were shifted you should to remember to **uncheck** *Symbols are centered* in *Save* dialog for Therion th2 format., *Undo* the unlink clones and continue. If they were not shifted, remember to **check** the *Symbols are centered* in *Save* dialog for Therion th2 format.

5. Unhide (*Object -> Unhide All*) and unlock (*Object -> Unlock All*) all objects.

6. Create new layer (*Layer -> Add Layer …*) and name it, for example, as *my_cave*

7. Click on the object of your drawing, you'll be switched to "root" layer. Select all objects (*Edit -> Select All*) and move all objects to layer *my_cave* (Shift+PgDown or *Layer -> Move Selection to Layer Below*). All objects should be now in layer *my_cave* and layer root disappeared.
If you have the layer structure in your svg file yet, just continue to next paragraph, but you will have to move all assigned objects to the created layer.

8. Add another layer above the layer *my_cave*, for example *my_cave_s1* (s1 means "scrap1"). Scrap is in Therion the small part of cave - about 100 m, from which the final map is joined. The scrap is the smallest part of cave for which you may export the particular map. Hide and lock the layer.

9. Click to your drawing, the selected layer should be *my_cave*. Select all objects (Ctrl+A) and ungroup them (*Object -> Ungroup* or Shift+Ctrl+G). Repeat it until you are sure all objects are ungrouped.

10. Select a station. Select from menu *Extension* the *Therion –> Properties*… dialog window. Set *Role* to *Point*, in field *Type* type Station and in field *Option* type -name xxx according to name of your station, in our case B211. Press *Apply*. After the "working" message disappear select the station again, press right button of mouse and select *Object Properties*. You should see in field *Label* "point station -name B211". Press Shift+PgUp (*Layer -> Move Selection to Layer Above*). The symbol of station should disappear and the layer *my_cave_s1* is selected now. Click on next station, the layer *my_cave* should be selected and repeat with next station name. Repeat for all stations. You may delete the names of stations and surveying lines too because Therion will draw it automatically.



11. Save the file as Inkscape's svg format with modified name, e. g. *my_cave_for_therion.svg*. You should save often, Inkscape is not rock-stabile application.

12. Select all passage heights with the same value and group them (Ctrl+G). Select from menu *Extension* the *Therion –> Set Point Type…* dialog window. Set *Type* to *passage-height* and type to *Option* field *-value x* where x is value of selected passage height symbols. Press *Apply*, wait, select again (all with one click now) and move them to layer *my_cave_s1* (Shift+PgUp). Repeat with another group of passage heights.
For depth of pit you should use *Height* symbol with -x value in *Option*. Analogous for steps or overhang use +x value, because what is lover and what is upper is clear from symbol itself.
If you want to create only advanced 3D model continue in paragraph 20.

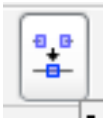
13. Do the same with other point symbols, you don't need to type the *-value* option. But you may write to *Option* field *-scale xs, s, m, l* and *xl* (*s* for small and *l* for large). So you may choose 5 symbol sizes in Therion.

14. Select all labels and move them to layer *my_cave_s1* (Shift+PgUp). They will be converted automatically.

15. Check in Inkscape preferences (*File -> Inkscape Preferences…* or Shift+Ctrl+P) if in *Tools -> Node* dialog the *Show path direction on outlines* is checked.

16. Select one line symbol, e.g. step and check if the small arrows are on side of empty space or air. If not you should reverse line orientation (*Path -> Reverse*). You may assign type of line symbol for Therion - select from menu *Extension* the *Therion –> Set Line Type…* dialog window and select the relevant line type. Press

Assign, select line again and move it to layer *my_cave_s1*. Do it with all simple line symbols excluding walls and complicated symbols as blocks or flowstone is.

17. Flowstone: you should create a single line from the semicircles. There is a trick to do it in Inkscape. Use *Edit path by nodes* tool (F2). Click with pressed shift on all semicircles you want to join to one line. Select all nodes (Ctrl+A), if there are symbols with two or more semicircles connected yet you should deselect inner nodes. Press button *Join selected nodes.*  . If everything is right you'll receive one line with all semicircles joined. Select all nodes again. Press *Make selected segments lines* button  . If everything is right you'll receive multisegment line. Check if all nodes are selected and press *Make selected nodes smooth* button  . You should receive smooth line you may assign as flowstone type now.

18. Blocks: in Therion the blocks are composed from two kind of lines. The rock-border and rock-edge. Rock-border is outline of block according to projection. Rock-edges are rock edges on visible surface of block. So you should to redraw all rocks after this scheme and assign appropriate line types for them.

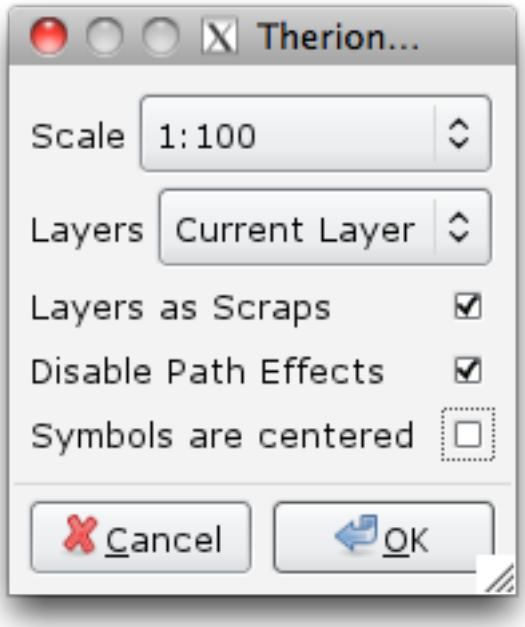
19. Areas. There is no way to define areas in Inkscape (water, sand, …, color). One should to define instead the border of such area with line type *border (-visibility on/ off).* You may add near such border the text label described the type of area. It will be much easier to add to such border the area type in Therion later. You may not care about the passage shape, walls will clip off everything poked out of the passage.

20. Walls: Check first the orientation off all wall lines. Arrows must be on side of air. Select all outline walls which are not type *presumed*, *unsurveyed*, *blocks, ….* Assign them the type wall and move them to layer *my_cave_s1.* For *presumed* walls add to *Option* field -subtype presumed, analogous for *unsurveyed*, *blocks, etc.* For all possible subtypes you should check the TherionBook, page 24:
- *wall:* invisible, bedrock (default), sand, clay, pebbles, debris, blocks, ice, underlying, unsurveyed, presumed ;
- *border:* visible (default), invisible, temporary, presumed;
- *water-flow:* permanent (default), conjectural, intermittent;
- *survey:* cave (default), surface (default if centreline has surface flag)

or Marco Corvi's *Therion by examples*, chapter 2.6 (http://marcocorvi.altervista.org/caving/tbe/index.htm).
Attention: for pillars (columns of bedrock inside passage) you should add the option -outline in!

21. You should have all the objects moved to layer *my_cave_s1* and after final save as Inkscape SVG you may save it as Therion's 2D map file .th2 which you may open in XTherion's map editor and edit areas, etc.

Switch to layer *my_cave_s1* choose *Save As…* and format *Therion 2D (*.th2)*. In pop-up dialog set *Current Layer*, *Layers as Scraps* and *Disable Path Effects*. Option *Symbols are centered* depends on result of test in paragraph 4.
There is one more not solved problem yet. The conversion will add to all point symbols *orientation.* It means all point symbols will be rotated for 270 (180, 90) degrees. To remove these *-orientation* options you should open th2 file in plain text editor and simply search/replace all *-orientation xxx* with empty string.



22. If you need only advanced 3D model visible in 3D viewer Loch you may convert only stations, walls and passage heights. Then create in XTherion's compiler window new thconfig file. Save it as e.g. thconfig.my_cave into the same directory as your *my_cave_for_therion.th2* file is.

Type there something as:

```
source  my_cave_for_therion.th2
source
  centerline
  fix 0 123488 78910888 1244
  data normal from to compass clino tape
  0 1 100 -10  10
  1 2 200 -20  15
  station 0 "Main entrance" entrance
  station 2 "Second entrance" entrance
  endcenterline
endsource

export model -output my_cave.lox
```

and press button *Compile*  or use command *File -> Compile*. If everything OK,

you should find your file *my_cave.lox* in your directory.

This is only example, you should modify the file according to your data. The line *data normal from to compass clino tape* define the order of the surveying data, but you may change it as you need. Check Survex user guide for more informations about the syntax (http://survex.com).

Good luck

Martin Sluka