- **Floor**
- **Fills**
- **Ceiling**
- **Artifacts**

SKETCH OUTLINE

This dialog is opened checking the sketch *Outline* button of the *Drawing References* dialog

Tapping a sketch on the list, displays its outline in the drawing canvas.

The *Merge* button [T] includes into the drawing the sketch displayed in the outline.

The *Clear* button removes the sketch outline from the canvas

DRAWING TOOLS PALETTE

The drawing tools bundled in the program include about 9 areas, 16 lines and 46 points.

When the app starts the first time it installs the drawing tools files in the "symbol" directory. There are files for points (iconic symbols, like "entrance", or "stalagmite"), lines (like "wall", or "pit"), and areas (regions shown with a transparent color).

New versions of the drawing tools are not automatically installed, but there is button to update them. The coming dialog tells you the installed and the current version and asks whether to update the drawing tools.

It is likely you do not need many of them, or maybe you need different ones. You can customize the drawing tools and the way you select them in four ways:

- with the choice of drawing tool dialog
- at the level of the sketch
- at the level of the project (directory
- on the file system

Drawing tool dialog

The tools buttom bar contains only six drawing tools (for each type). If you need another tool, you must go to the drawing tool dialog. There are three different interfaces,

- a tabbed list of the tools with their namesi [default]
- the tools arranged on a tabbed grid
- all the tools arranged on a triple-grid

Sketch palette

Each sketch has its own palette. When you close the sketch it is saved with a header listing its palette. When you reopen it, the palette is set to the sketch palette. If the sketch contains items which are not in the palette they are added. If a item is not among the drawing tools it is replaced with the "user" tool. The "user" tools (point, line and area) are always in the palette.

The sketch palette is specified through the *PALETTE* menu of the sketch window. This opens a dialog that

lets you decide which tool enable in the sketch palette. You switch on and off the tools to your needs then close the dialog (with the *BACK* button) to save the changes. You have to do this independently for points, lines and areas.

Global palette
Except for the "system" tools, TopoDroid loads the drawing tool from files stored in the "symbol" subdirectory of the base "TopoDroid" home. The system tools are the "user" and "label" points, "user" and "wall" lines, "user" and "water" areas. These are always enabled.

The *palette* button of the main window defines the drawing tool files to load. In the coming dialog you select the tools that are loaded. The list of files to load is saved in the project database. As for the sketch-level palette, you have to do this independently for points, lines, and areas

When the drawing tools are updated, TopoDroid does not install the new tools, automatically.

Custom drawing tools
At a even higher level, namely that of the base "TopoDroid" directory, you can customize the tool files. You can modify them, delete those you do not need, and add new ones (for tools not included in the program). Even if TopoDroid comes with many drawing tools preinstalled, it can happen that it does not contains the tools you need (or you do not like the provided ones). The tool files are plain text files, and you can write your own tool file(s). After you put them in the symbol subdirectories, TopoDroid will see and use them. The syntax of the tool files is described in a page on the website.

The "system" drawing tools cannot be modified, nor deleted.

LIST AND GRID TOOL PICKER

This dialog is used to select the current drawing tool.
It is opened with a longtap on the *Tools* button in the sketch window (in "drawing" mode), or with the rightmost button (with double-arrow) in the bottom toolbar.

The "triple grid" layout displays all the types at the same time. The "list" and "grid" layouts have three tabs at the top, **Point, Line, Area** to switch among the three types of tools.

The dialog displays the tools of the selected type,

- either as a **list**, with a selection checkbox, tool icon and name [default]
- or a as a **grid** with the tool icons
- or a as a **triple grid** (points, lines and areas) with the tool icons

To select a tool

- check its box in the list, and close the dialog (Back key)
- tap its icon in the grid, and close the dialog

A shortcut for these is a double-tap on the check-box or the icon.

The **Slider** sets icon orientation (orientable point tools, and area tools).

The +/- button changes the (global) default icon size cycling through XS, S, M, L, XL.

If canvas views [G] are enabled and the selected tool is associated only to disabled views, it is replaced by

the corresponding "user" tool.

DRAWING TOOL SETS

The drawing tools are divided in three *types*: points, lines, or areas (regions).

TopoDroid comes with one default set of drawing tools, and other eight additional sets [T]. Overall that makes more than 200 points, 60 lines, and 30 areas. The basic speleology set has about 40 points, 15 lines, and less than 10 areas.

The drawing tool files are stored in the subfolders of *TopoDroid/symbol*. These files can be edited and modified, or even deleted. Furthermore, if other custom tool files are placed in the proper subfolder, TopoDroid will load and use them.

Eight *system* tools are always present: the three "user" symbols, points "label" and "section", lines "wall" and "section", and area "water". These tools are not stored as files, and cannot be changed. A custom tool file with the same name as one of these tools is skipped.

By default only the speleology tools are installed. The installation of additional tools is enabled through a setting [G]. A few tools are included in more than one set. The additional symbol sets are provided mostly as examples of custom symbols.

To install additional tool sets tap the the *PALETTE* menu [G] of the main window. The coming dialog lists the sets of tools. Check the tool sets you want to add and press the button *Install*.
If you press the button *Replace* the currently installed tools are removed before installing the tool sets you selected.

After installing new tool sets you must enable the tools you need, using the *Palette* button of the main window. The choice of enabled tools is stored in the database and is not lost when tool files are removed, therefore you will find them enabled if you re-install the set later.

Tool groups The tools of each type are further divided in *groups* (classes). A tool can belong to a group or have no group.

Groups are used in two ways.

1. when a sketch is opened, and an item type is not found, TopoDroid tries to substitute it for another type in the same group. If there is none, the "user" tool is used.
2. line continuation and joining can occur only with lines of the same group.
3.

The tools groups are displayed in the tool enabling dialog. Group names are in English.

SKETCH RELOAD

This window is opened by the Reload menu of the sketch window.

TopoDroid maintains backup copies of sketch files, from which the sketch can be recovered.
TopoDroid keeps a set of backup copies for each sketch file. These are named with suffixes "bck", "bck0", "bck1", and so on. They are stored in the *tdr* subdirectory (binary sketch files). Whenever a sketch is saved

the backup copies are rotated (eg, "bck1" is renamed "bck2", and so on; "bck" is renamed "bck0"), the old "tdr" file is renamed with suffix "bck", and the sketch is saved to a new "tdr" file.

A sketch is saved whenever it is closed, or you toggle between plan and profile view, or open a x-section, or switch to another sketch.
It is also saved whenever it is modified (eg, a new item is added, or part of the sketch is erased) while it is open. Upon a modification a timer is started and when it expires the sketch is saved. The wait-time is a setting (default 60 seconds).
The number of backups is another setting.

The Sketch Backup window displays a preview of the sketch backups. One backup at a time is displayed. Some info about the backup are shown in the title:

- how long ago it was written, with suffixes for minutes (m), hours (h), days (d), months (M) and years (Y)
- size of the file, in square brackets, in bytes
- backup number

There are two buttons to move back and forth in the backup list.

The menus are

- *close* the window without reloading the sketch from a backup
- *reload* the sketch from the displayed backup (and close the window)
- *help*

THE UNDO STACK

TopoDroid implements undo/redo with a stack of draw/erase/edit actions. When you draw something a draw action is put at the top of the stack. Undoing amounts to moving the stack pointer down the stack (beside affecting the sketch drawing). Redoing moves the stack pointer up (and add the drawing to the sketch).

The effect of the "continuation" drawing on the undo stack is that a new line is not created, and the line that has been continued is moved on top of the undo stack.

Erase and edit actions can also be undone/redone. However their effect on the stack is not as straightforward as for drawing.

Erasing is a raster operation while the drawing is made of vector items. The points of the vector items that come under the erased region are removed. This affects the undo stack in two way. Is an item is completely erased (eg, a point item), it is dropped from the stack. Undoing the erase action puts the item back, but at the top of the stack. Erasing the middle of a line remove the line object from the stack and replaces it with two lines that are added on the top of the stack.

For example, erasing can change the position of a line in the undo stack. Erasing the middle of a line drops the line from the stack and puts the two end pieces at the top of the stack. A following "undo" removes the two pieces and puts the line back, however at the top of the stack.

POINT TOOLS

The "point" tools are defined in text files.

Two point tools, "user" and "label" (text), are built in the programs. The others are loaded from the TopoDroid subdirectory *symbol/point*. This directory is populated with the point tools packaged in the distribution apk. You can delete the tools you do not need, edit the ones you want to change, and add new ones that are not provided in the apk.

The point tool file contains lines specifying the property of the drawing tool.

- "symbol point" [mandatory]
- "name NAME", where NAME is the point default name [mandatory]
- translated names, eg, "name-es ..." [translated names are optional]
- "th_name NAME", where NAME is the Therion name. The filename must be the same as the Therion name, witout the possible prefix "u": [mandatory]
- "color rgb" (rgb in hex format, for example red is '0xff0000') [mandatory]
- "orientation FLAG" [optional, false if missing, true if FLAG is '1' or 'yes']
- "has_text FLAG" [optional, false if missing, true if FLAG is '1' or 'yes']
- "roundtrip VALUE" [optional, for SVG-roundtrip, VALUE can be 1 (walls_shp), 2 (walls_sym), 3 (detail_shp), 4 (detail_sym) - default 4]
- "level" view_flag [optional, viewing level of the point; if missing level is set to 1]
- "path" begins the point symbol path. This is specified with the following commands
    - "moveTo X Y"
    - "lineTo X Y"
    - "cubicTo X1 Y1 X2 Y2 X Y"
    - "addCircle X Y R": (X,Y) center, R radius
    - "arcTo X0 Y0 X1 Y1 FROM_ANGLE SPAN_ANGLE": (X0,Y0 - X1,Y1) bounding rectangle, angles in degrees, 0 along X-axis, direction is CW
- "endpath" marks the end of the tool path
- "endsymbol"

Name

The English point "name" is mandatory.
Translation of the name in otther languages are optional.
Names must not contain spaces; use underscore '_' in their place.
The Therion name must coincide with the filename. This may cause a problem when the Therion name contains a dash '-' and this is an illegal character in filenames. In this case use the equal character '=' in the filename, the script that creates the zip archive of the symbols files replaces '=' with '-' in the filenames.
Therion names and filename must not contain spaces.

Orientation

If the attribute "orientation" is set, the point symbol can be drawn at an angle, and it can be rotated.

Level

The "level" attribute takes value the flag for the views enabled on this point items.
The flag is a number sum of 1 (base), 2 (floor), 4 (fills), 8 (ceiling), and 16 (artifacts).

LINE_TOOLS

The "line" tools are defined in text files.

Two line tools, "user" and "wall", are built in the programs. The others are loaded from the TopoDroid subdirectory *symbol/line*. This directory is populated with the line tools packaged in the distribution apk. You can delete the tools you do not need, edit the ones you want to change, and add new ones that are not provided in the apk.

The line tool file contains lines specifying the property of the drawing tool.

- "symbol line" [mandatory]
- "name NAME", where NAME is the line default name [mandatory]
- translated names, eg, "name-es ..." [optional]
- "th_name NAME", where NAME is the Therion name. The filename must be the same as the Therion name, witout the possible prefix "u": [mandatory]
- "group GROUP", specifies the group this line belongs to [optional, default no group]
- "color rgb alpha" (rgb and alpha in hex format, for example '0x00ff00' is green, and '0xff' is fully opaque) [rgb mandatory, alpha is optional, if not specifed 0xff is taken]
- "width SIZE", line width in units of the *line width* setting [optional, default 1]
- "dash PATTERN", example "15 5" [optional dash pattern]
- "style STYLE" where STYLE can be 'straight' or 'xN' [optional]
- "effect" begins the line path-effect and is followed by path commands, and closed by
- "endeffect"
- "roundtrip VALUE" [optional, for SVG-roundtrip, VALUE can be 1 (walls_shp), 2 (walls_sym), 3 (detail_shp), 4 (detail_sym) - default 3]
- "level" view_flag [optional, 1 if missing]
- "endsymbol"

Name

Refer to the Point Tool for how to specify the names.

Group

Line tools in the same group can be joined together by "continuation".

The "group" attribute is used to specify that the various "wall" line types can be joined together.

Dash

The "dash" directive specifies that the line is drawn with a dashed scheme. For example, "dash 15 5" means that the line is drawn with segments of 15 units, separated by 5 units spaces.

Style

The "style" directive is used to draw lines using sparse points.
A "style x3" means that the line is drawn using one every three points. The effect is that the line is less "curvy".
If you want straight segments us "style straight".

Effect path

This option is used to define lines with complex style.

Level

The "level" attribute takes value the flag for the views enabled on this line items.

The flag is a number sum of 1 (base), 2 (floor), 4 (fills), 8 (ceiling), and 16 (artifacts).

AREA TOOLS

The "area" tools are defined in text files.

Two area tools, "user" and "water", are built in the programs. The others are loaded from the TopoDroid subdirectory *symbol/area*. This directory is populated with the area tools packaged in the distribution apk. You can delete the tools you do not need, edit the ones you want to change, and add new ones that are not provided in the apk.

The area tool file contains lines specifying the property of the drawing tool.

- "symbol area" [mandatory]
- "name NAME", where NAME is the area default name [mandatory]
- translated names, eg, "name-es ..." [optional]
- "th_name NAME", where NAME is the Therion name. The filename must be the same as the Therion name, without the possible prefix "u": [mandatory]
- "color rgb alpha" (rgb and alpha in hex format, for example '0x0000ff' is blue, and '0x99' is semi-transparent) [mandatory]
- "close-horizontal" [optional, false if missing]
- "orientable" [optional, false if missing]
- "level" view_flag [optional, 1 if missing]
- "bitmap WIDTH HEIGHT X_TILE Y_TILE" starts of the bitmap pattern. The tile modes can be M (mirror) or R (repeat). This line must be followed by HEIGHT lines of length WIDTH with the bitmap pixels (1: foreground, 0: background).
- "endbitmap" marks the end of a bitmap
- "roundtrip VALUE" [optional, for SVG-roundtrip, VALUE can be 1 (walls_shp), 2 (walls_sym), 3 (detail_shp), 4 (detail_sym) - default 3]
- "endsymbol"

Name

Refer to the Point Tool for how to specify the names.

Close-horizontal

If this attribute is set the area border is closed horizontally in the profile view and in the x-sections.
If the Y coordinate of the last point of the drawn line is close to that of the first point, the area border is interrupted at the first point that has Y coordinate close to that of the first point. By this means you can draw areas with a flat horizontal top (or bottom) profile.
If the Y coordinates of the drawn line endpoints differ too much, the border is closed with a slant segment.

Currently, this attribute it is only set for the built-in "water" tool.

Bitmap pattern

With this option you can specify a background pattern, eg, for differentiating rock formations.

This attribute is not used in any tool packaged in the apk.

Orientation

If the attribute "orientable" is set, the area pattern can be rotated through the area edit dialog.
Area patterns are not used in the default symbol set. Shading is preferred for performance.

Level
The "level" attribute takes value the flag for the views enabled on this area items.
The flag is a number sum of 1 (base), 2 (floor), 4 (fills), 8 (ceiling), and 16 (artifacts).

DRAWING LABELS

This dialog is opened when you insert a label, in drawing mode of the sketch window.

Label properties:

- **size**: one of XS, S, M, L, XL
- **text**
- **layers**, canvas views [T]
- additional Therion **options**

By default labels belongs to the canvas views "base" and "artifact". It is possible to switch off some views. Beware that, if the label is not assigned to a visible view, it will not appear in the canvas even if it is actually added to the sketch.

Labels are orientable.

DRAWING PHOTO ITEM

This dialog is opened when you insert a photo, in drawing mode in the sketch window.

Photo properties:

- **comment**

PHOTO-ITEM EDIT

This dialog displays the properties of sketch points of type "photo".

- **thumbnail** of the photo
- **orientation** (azimuth and clino) of the photo, for photos taken with TopoDroid
- **date and time** of the photo
- **comment** (editable)

Buttons:

- **Save** saves the changes to the comment

The image is displayed when you tap on the thumbnail. The full image is not reoriented to portrait.

The Android *BACK* button closes the dialog.