

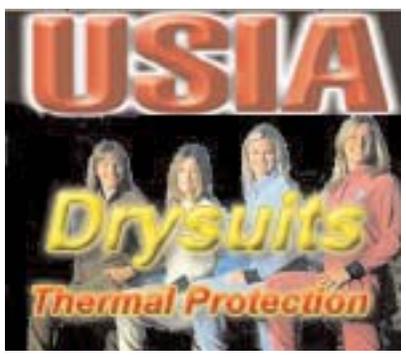
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Fonts that are created specifically for cave map drawing symbols facilitate many processes throughout many applications in Windows. This extends even further by expanding into tablet applications running Windows CE or other Windows operating systems that rely on True Type fonts.

The font sets once complete will allow those entering into the arena of digital map drafting to simply download a few files and install them. Instantly the user will have access across all windows applications to this array of symbols. This effectively cuts out the mundane task of each user having to re-create symbols that are fairly constant across all maps leaving more time to work on the original artwork that will make each map unique.

Each application is different but basically in a drawing application the goal is to initially choose the fonts/symbols you will use most often in your current project and move that "font object" to your projects.... symbols library, brushes, and swatches. Here they can be used to quickly push out relevant vector based working maps, and put the project well on its way to the drafting of the final map. Moving this further and as working maps become vector based rather than raster images facilitates the exporting of tiny zoomable .swf(Flash) and SVG files for display on the web. SVG carries much of the data with it and is used in a unique process called roundtripping in the cave survey program "Walls". I will have more on this in later issues but suffice it to say this feature in Walls really fast forwards the move to vectorization of the working map!! In addition changes in data of the survey simply remorph the now vector wall lines.

Vector Drawing in Cave

The fact still remains that in order to get to a vector based image one must first draw on paper in the cave then scan to a raster image. At some point and method then morph the rough sketches to a line/wall plot and draw or trace a vector based working map. Here is another place that in average to moderately difficult caves that fonts can quickly move things toward the final vectors we want in our working map and that will enable anyone to display massive and complex cave systems online with tiny zoomable files.

TABLET PC's....fonts and the symbols library

Tablets are quickly evolving so early 1st and 2nd generation machines will be available for a fraction of their original selling price. Depending further on what you are willing to spend/risk on a tablet pc will largely determine the speed and ruggedness of the unit. In our case we have chosen the PenCentra 130 by Fujitsu. These units can be found on Ebay for just over \$100 and run Windows CE 2.11. They are a bit slow and have only one vector drawing program available, but as a start they will suffice. You may still be able to get some new units from safestuff@safestuff.com for about \$110!



The drawing program we use is called One Cat Doodler which will install on the Pencentra perfectly and most other CE machines <http://www.onemanandacat.com>. It is a vector drawing program that by itself will export bitmaps, however I did contact the author of this software and was able to get a beta version of the desktop version of One

Cat Doodler. This allows you to save the in-cave sketches as One Cat files and transfer via Activesync to your desktop. The One Cat files can then be opened in the desktop version and cleaned up as needed before exporting as an .emf file that can be used in your main drawing program. The nice thing here is that all vector objects are saved for ease of editing in your regular drawing program!

Symbols/Fonts

Moving the fonts into the symbols library in One Cat Doodler on the Pencentra or other unit is fairly simple. Place the Cave Font .ttf files in the Windows directory of the Pencentra then in Cat Doodler create various libraries. Then type in a character and select it....then add to the selected library. When complete all of the fonts are now available as symbols in your drawing library to drop into your drawing as you sketch in-cave. I will be sharing my "libraries" for Cat Doodler as well at <http://www.caves.com/fonts> which can be downloaded and simply placed in your Pencentra or other unit running Cat Doodler in the Program Files/Doodler/Libs folder. Instantly the fully stocked libraries will show up and be ready to use!

Fonts clearly streamline the process across multiple applications for making the various cave symbols quickly available, but how it all ties together is where it truly becomes incredible. I will briefly go over a workflow, but remember this is only the very beginning and as more units become available at reasonable prices the evolution should be rapid for use in mapping easy to moderately difficult cave systems and passages.

Suggested Items to Get Started

- 1) Cave Fonts from <http://www.caves.com/fonts>
- 2) Pencentra 130 i.e. Ebay.com

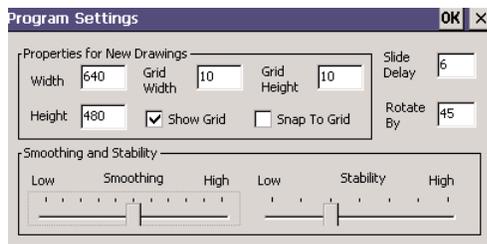
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3) One Cat Doodler CE version at <http://www.onemanandacat.com> and the desktop version at www.cavediggers.com/pencentra/oc_d303_companion.zip

4) Microsoft Activesync from <http://www.microsoft.com>

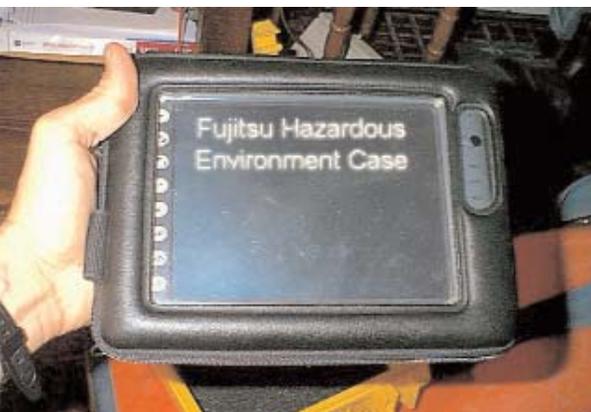
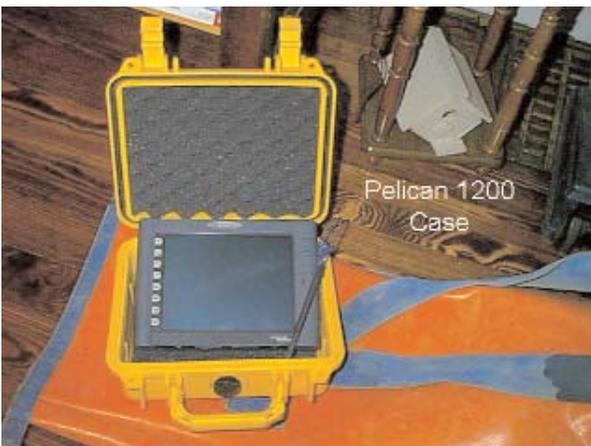
5) Female to Female Null Modem Cable for connecting Pencentra to your Desktop. Once connected activesync will pick right up and allow you to quickly transfer files back and forth from the desktop to the Tablet. Available from most cable suppliers online or contact me.

6) Drawing program i.e. Illustrator, Freehand etc. NOTE: Walls SVG roundtripping requires Adobe Illustrator 10.0.



WORKFLOW MODEL:

Once the Pencentra is up and running with all the symbols libraries ready to go in Cat Doodler... the unit is ready to go underground. We use a Pelican 1200 box to transport the unit and a harsh environment case.

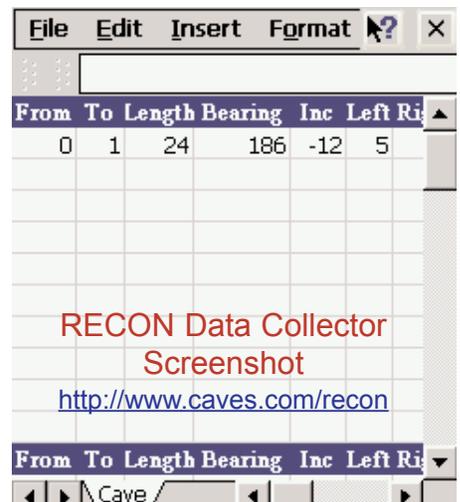


I have my Program Setting in Cat Doodler on the Pencentra set to a grid width and height of 10 and checked to "show grid" when drawing. You will want to tweak the Smoothing and Stability slider bars to fit your drawing strokes.

Now you are ready to draw! Firstly though, I would recommend keeping the lighted background as low as possible to conserve battery life and become familiar above ground with the processes of selecting symbols libraries, placing and resizing symbols, grouping and ungrouping symbols and objects as well as moving items quickly within the Doodler drawing environment.

1) Start as you normally would by collecting data i.e. compass/distance/clino and LRUD. In this case

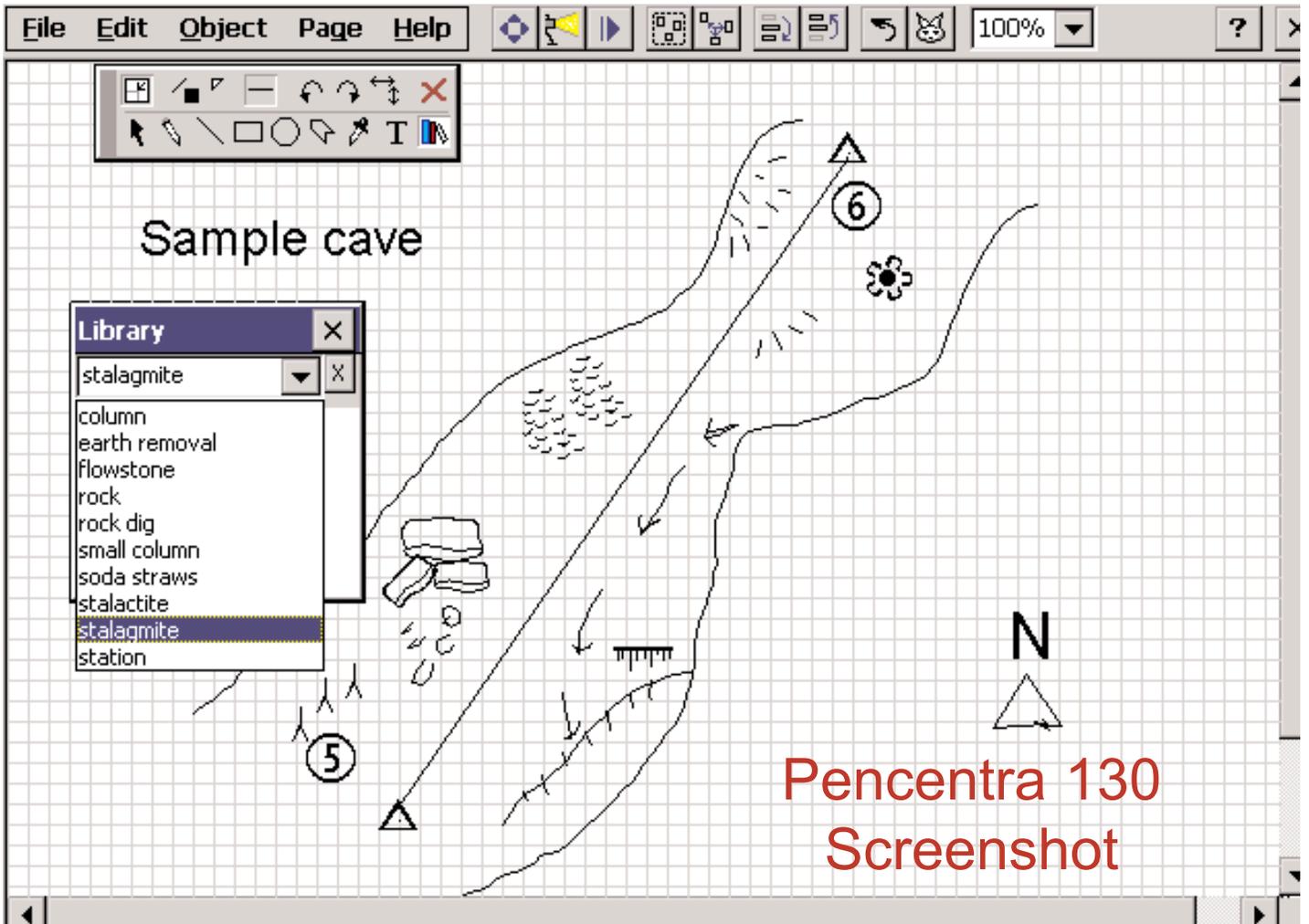
you may use a book, but we have began experimenting with using the RECON by TDSway www.tdsway.com/handhelds. This super tough ruggedized handheld can and does withstand full immersion in water, mud, dropping and extreme environments. It is entirely capable of handling even the toughest underground trips. The new RECON units are shipping with Pocket PC software, but our unit is running Windows CE with a small spreadsheet application laid out to simply



RECON Data Collector Screenshot
<http://www.caves.com/recon>

tap and type to collect data. This effectively avoids double entry of data and the numerous errors that occur in that process. More can be seen on the RECON at <http://www.caves.com/recon>

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Pencentra 130 Screenshot

NOTE: Rich Finley is developing an application called Compass Injector that operates on Pocket PC's that combines a graphical user interface that allows for ease of entering data with a final export of a .dat file that will open in Compass. You can contact Rich at rich@caves.com

2) Begin drawing on the Tablet as you normally would in a book but use the symbols libraries to add vector quality detail(see example on next page). Things like a measurement bar, directional compass etc. can be added to each page as well to assist in the process as well as cross sections, added freehand drawing and notes to use later. As the survey goes simply add pages using the Page menu at top. These page images can later be neatly placed together in your drawing program....grouped, ungrouped, moved around and aligned to the surveys data plot.... all quite simply.

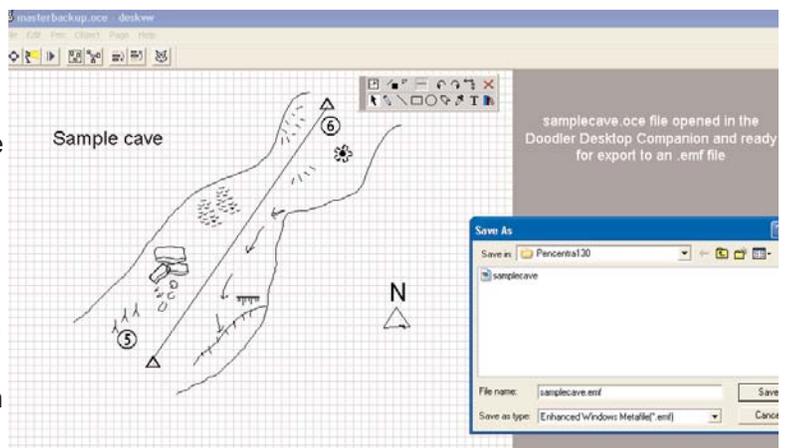
SAVING

I tend to "save" alot and occasionally save a backup just in case I do something unexpected that I can't back out of easily. As I indicated this is really first generation trial and error so saving and backing up is critical. However, if the need arises

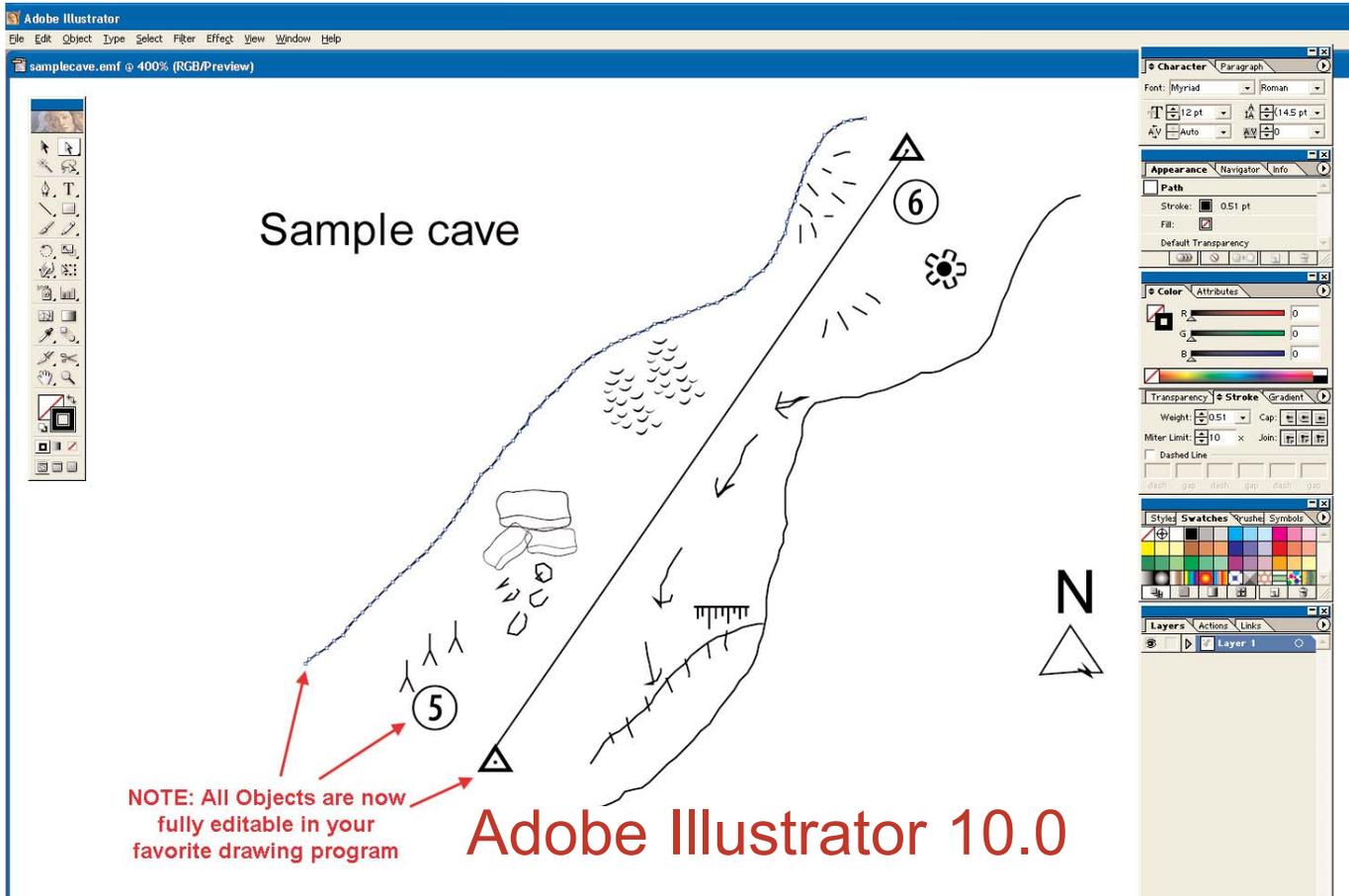
to change the battery have no fear....no data will be lost in these Pencentra units.

3) Upon exiting the cave simply connect the Null Modem cable to the Pencentra or Tablet and the

Desktop to establish an activesync connection. Transfer the surveys .oce(One Cat Doodler) file to your desktop project folder and open in the Desktop Companion to One Cat Doodler. Here you can use your mouse to make some quick edits etc. and export an .emf file.



Cat Doodler Desktop Companion
www.cavediggers.com/pencentra/ocd303_companion.zip



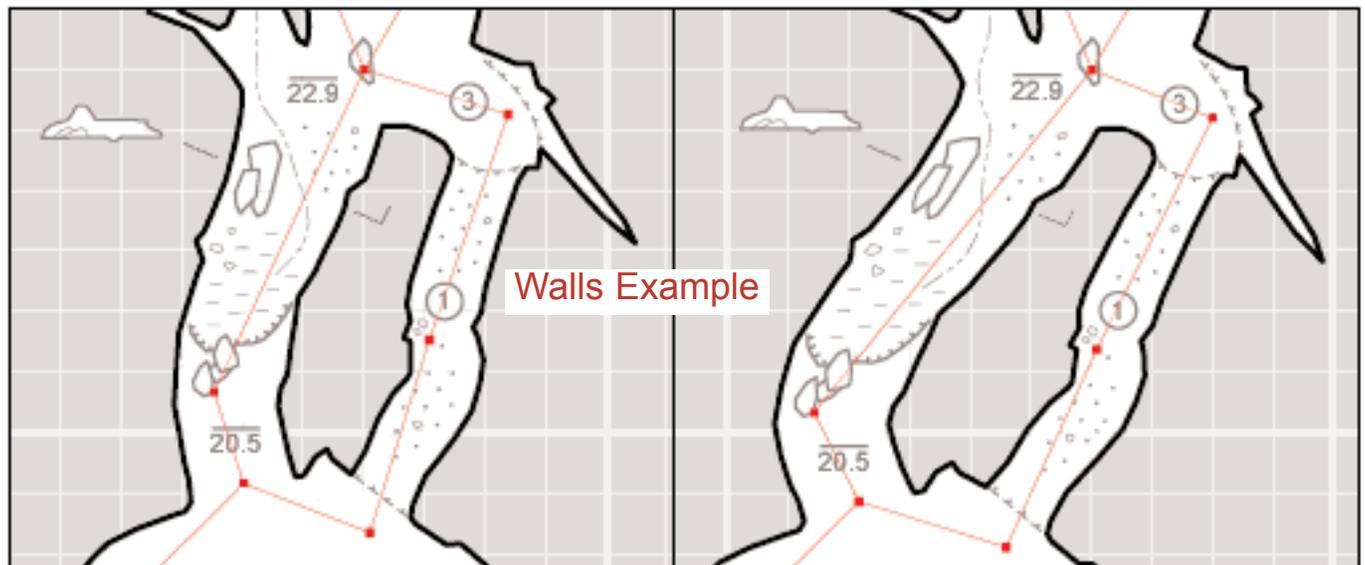
Adobe Illustrator 10.0

4) By now all of the sketch pages from the Pencentra have been transferred to the desktop....opened in the Doodler Desktop Companion....touched up and edited a bit and exported to an individual .emf files that can now be opened in your favorite drawing program(see above). We have chosen to use Adobe Illustrator 10 because of its ability to import/export SVG files that facilitate roundtripping in the survey program Walls.

Roundtripping

Walls now features a set of functions called roundtripping which basically moves an SVG file in and out of Walls as it is edited in Adobe Illustrator 10. However, depending on which layers you place items on in Illustrator facilitates what will be morphed as data changes in the survey as the result of loop closures and data adjustments. The program accomodates the concept of building a working map with vector graphics

rather than monstrous raster images. The image at the bottom of this page is from the Walls Help section and illustrates how a data change in the working map will shift and morph the walls but leave other objects undistorted and not reshaped. We have just now converted the data from Middle Earth to a Walls project so I will have more on this process and actual vector working maps displayed on the web in both SVG and SWF format. If you haven't downloaded Walls.....you should.



Walls Example