

Cave Maps by XaraX

by Tom Lounsbury



Introduction

Digital cave maps are now easier to draw than ever before. It appears almost everyone has a computer these days and there are a myriad of graphic programs available everywhere. I feel that Xara X is the cave cartographers dream come true. Xara X must be the most powerful, lowest costing, most intuitive, graphics drawing program out there with results far easier to obtain than with the other big programs. It brings the reluctant pen and ink cartographer into the digital age for a mere \$150.00 and a copy of this free tutorial. That is chicken feed pricing for a graphics program this powerful, capable of doing anything a cave cartographer can imagine. Lets compare Freehand, Canvas, Illustrator and

Corel Draw at \$400 to \$500 and never mind the CAD programs at thousands of dollars and a mind-boggling learning curve. Xara X will always win hands down. I have literally seen beginners drawing great maps in less than an hour of hands on training. Xara X is quite simply the best value vector graphics drawing package you can use at this time. I will attempt to provide yet another option for digital cave cartography through my own personal experience and methods using Xara X. Even though there are several methods that can be used to achieve the same result I will make all attempts to keep it as basic as I can. Xara X has an incredible help file. Xara X's help contains hundreds of pages of information. If you need a hand using the program or want to know how to do something, try searching the help. Not only are there pages describing what all the parts of the program do, there are overviews, pages explaining terms, step-by-step procedures to help you get your work done and many examples. You will also find that many pages have buttons you can click to run movies. To open the help, just press F1 on your keyboard.

Export formats:

- .BMP Windows Bitmap
- .DCX DCX
- .PCX PCX
- .GIF CompuServe GIF
- .GIF Animated GIF files
- .JPG JPEG
- .PCT PICT
- .PNG PNG
- .RAS Sun Raster
- .TGA TrueVision TARGA
- .TIF TIFF (RGB)
- .WPG Word Perfect Group (256 color)

Import formats:

- .301 Brook Trout
- .BMP Windows Bitmap
- .CAL CALS (2 color)
- .CUT Halo CUT (256 color)
- .DCX DCX
- .GIF CompuServe Graphics Interchange Format (see Importing transparent bitmap files)
- .GX2 Storyboard
- .ICA IOCA (2 color)
- .ICO Microsoft Windows Icon (16 color)
- .IFF Amiga IFF
- .IMG IMG (16 color)
- .JPG JPEG
- .KFX KOFAX
- .LV LaserView (2 color)
- .MAC MacPaint (2 color)
- .MSP Microsoft Paint (2 color)
- .PCD PhotoCD
- .PCT PICT
- .PCX PCX Paintbrush
- .PBM UNIX monochrome
- .PGM UNIX grayscale
- .PNG PNG (see Importing transparent bitmap files)
- .PPM UNIX color (up to 24 bit)
- .PSD Photoshop
- .RAS Sun Raster
- .TGA TrueVision TARGA
- .TIF TIFF (RGB, RGBA with alpha-channel transparency & CMYK)
- .WPG Word Perfect Group (256 color)

- .XBM X Windows (2 color)
- .XPM X Windows (256 color)
- .PAL PaintShop Pro Palette
- .ACT Adobe Color Table
- .ACO Adobe Color Swatch

EPS Export Formats:

- .AI Illustrator EPS
- .EPS Illustrator EPS
- .EPS ArtWorks EPS
- .EPS Xara X EPS

Other Export Formats:

- .XAR CorelXARA
- .WEB Xara Webster files
- .WMF Windows Metafile
- .EMF Enhanced Windows Metafile
- .CMX Corel CMX 5 & 6
- .HTM Image map
- .SWF Macromedia Flash

EPS Import Formats

- .AI Illustrator EPS
- .EPS Illustrator EPS
- .EPS CorelDRAW 3 & 4 EPS
- .EPS FreeHand 3.0 EPS
- .EPS ArtWorks EPS

Xara X cannot import Photoshop EPS files; use PSD files instead.

Other Import Formats

- .XAR CorelXARA (1.1 and 1.5)
- .ART Xara Studio
- .WEB Xara Webster files
- .AFF Acorn Draw
- .CDR CorelDRAW (3,4 & 5) (see Importing CDR files)
- .CDT CorelDRAW Template
- .CMX Corel CMX 5 & 6 (see Importing CMX files)
- .DRW Acorn Draw
- .HTM Graphics on HTML pages
- .WMF Windows Metafile
- .WIX For internal use by Xara

Palette Import Formats

- .CPL CorelDRAW Palette
- .PAL CorelDRAW Palette
- .PAL Microsoft Palette

Bitmap Export Formats

- .BMP Windows Bitmap (see Creating BMP files)
- .DCX DCX (see Creating DCX files)
- .PCX PCX (see Creating PCX files)
- .GIF CompuServe GIF (see Creating GIF files)
- .GIF Animated GIF files (see Creating animated GIF files)
- .JPG JPEG (see Creating JPEG files)
- .PCT PICT (see Creating PICT files)
- .PNG PNG (see Creating PNG files)
- .RAS Sun Raster (see Creating RAS files)
- .TGA TrueVision TARGA (see Creating TARGA files)
- .TIF TIFF (RGB) (see Creating TIFF files)
- .WPG Word Perfect Group (256 color) (see Creating WPG files)

EPS Export Formats

- .AI Illustrator EPS
- .EPS Illustrator EPS
- .EPS ArtWorks EPS
- .EPS Xara X EPS (see Xara X EPS Overview)

Other Export Formats

- .XAR CorelXARA
- .WEB Xara Webster files (see Creating Xara WEB files)
- .WMF Windows Metafile (see Exporting Windows Metafiles)
- .EMF Enhanced Windows Metafile (see Exporting Windows Metafiles)
- .CMX Corel CMX 5 & 6 (see Exporting CMX files)
- .HTM Image map
- .SWF Macromedia Flash (see Exporting Macromedia Flash files)
- .WIX For internal use by Xara

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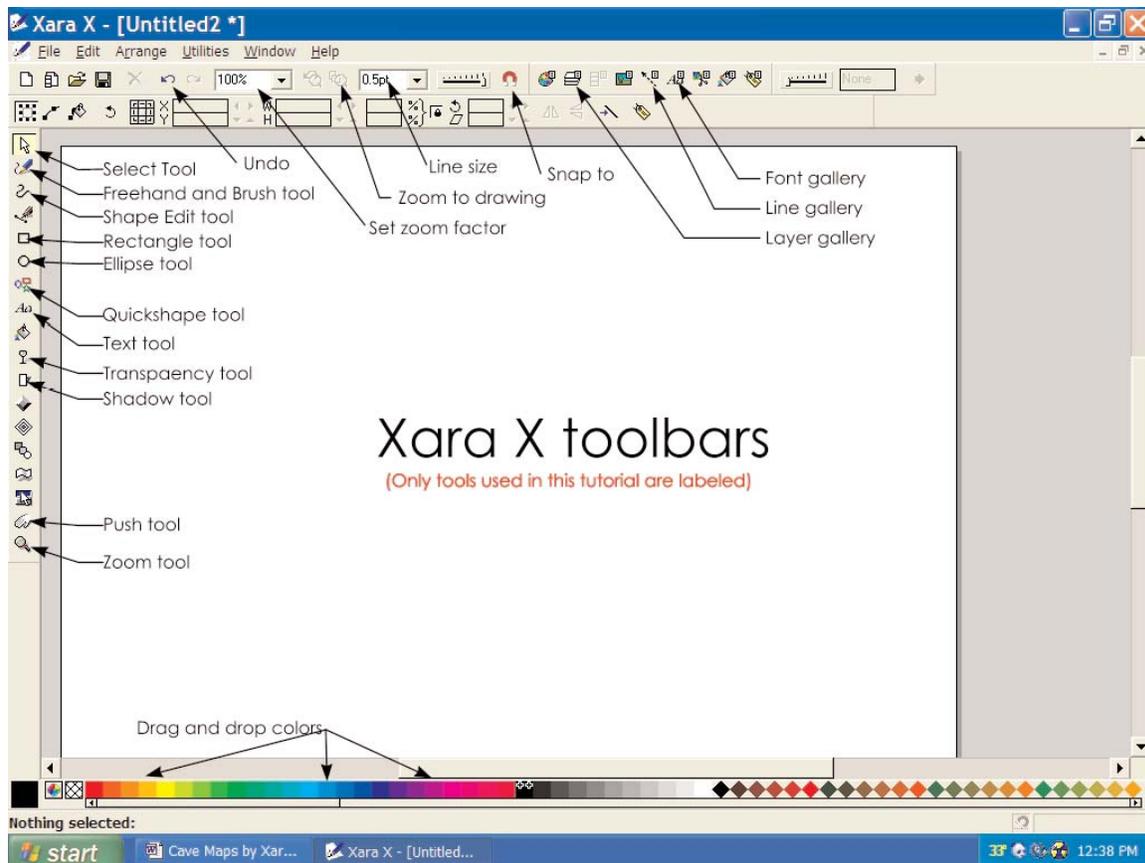
XARA X has many enhancements and improvements over its predecessor, CorelXARA. The pioneers of real-time on screen anti-aliasing and transparency now bring you a whole collection of new features to make Xara X an irresistible choice for the creation of vector graphics of any sort. <http://www.xara.com/products/xarax/>

You can find lots more information on Xara X, including tutorials, examples, discussions, hints, tips and featured artists at the XaraXone web-site. <http://www.xaraxone.com/>

Getting started

I must only assume you are operating Microsoft Windows 98 or better and have Xara X installed. A free 30 day trial version is available at <http://www.xara.com/products/xarax/>. You also must have the ability to export the line plot out of your favorite data reduction program as a common graphic form such as a bitmap, metafile, jpeg, tiff etc. I have recently changed from Compass to Winkarst because I like its ability to morph the sketches to the line plot. This now alleviates the need to actually draw the working map. The working map is created for you as you add your scanned sketches. When I am satisfied with all the sketches and the surveying is done I export the map (bitmap) into a folder on my desktop being sure the scale bar is also exported with it being line plot or morphed map. Don't worry Xara X handles gigantic bitmaps with ease and redraw (when the bitmap is rescaled, skewed, or moved) is almost instantaneous.

Xara X tools used to create cave maps



Layers

Xara X does permit multi-layer drawing so it is easy to produce highly variable maps just by turning on and off corresponding layers of your drawing to achieve the desired result. I use to import my scanned sketches into Xara then manipulate the sketch to fit my accurate line plot that I generated and exported from Compass. I now use Winkarst because of the saved step in creating a working map. Winkarst uses your scanned sketches to build a working map of the cave as you go. Morphing the sketch around the line plot so you don't have to move and rotate each separate sketch by hand. However you import your drawings, Xara X provides several ways to manipulate the drawings to achieve the last step in drawing your final map.

Tools

Each tool in Xara X has many attributes that can be manipulated in several ways. I will attempt to describe the actions and steps needed to gain the necessary results rather than fill this tutorial with many unnecessary screenshots or impertinent information. There are always several different methods that can be used to achieve the same results you're looking for. I am attempting to keep it simple so the most basic methods will be described.

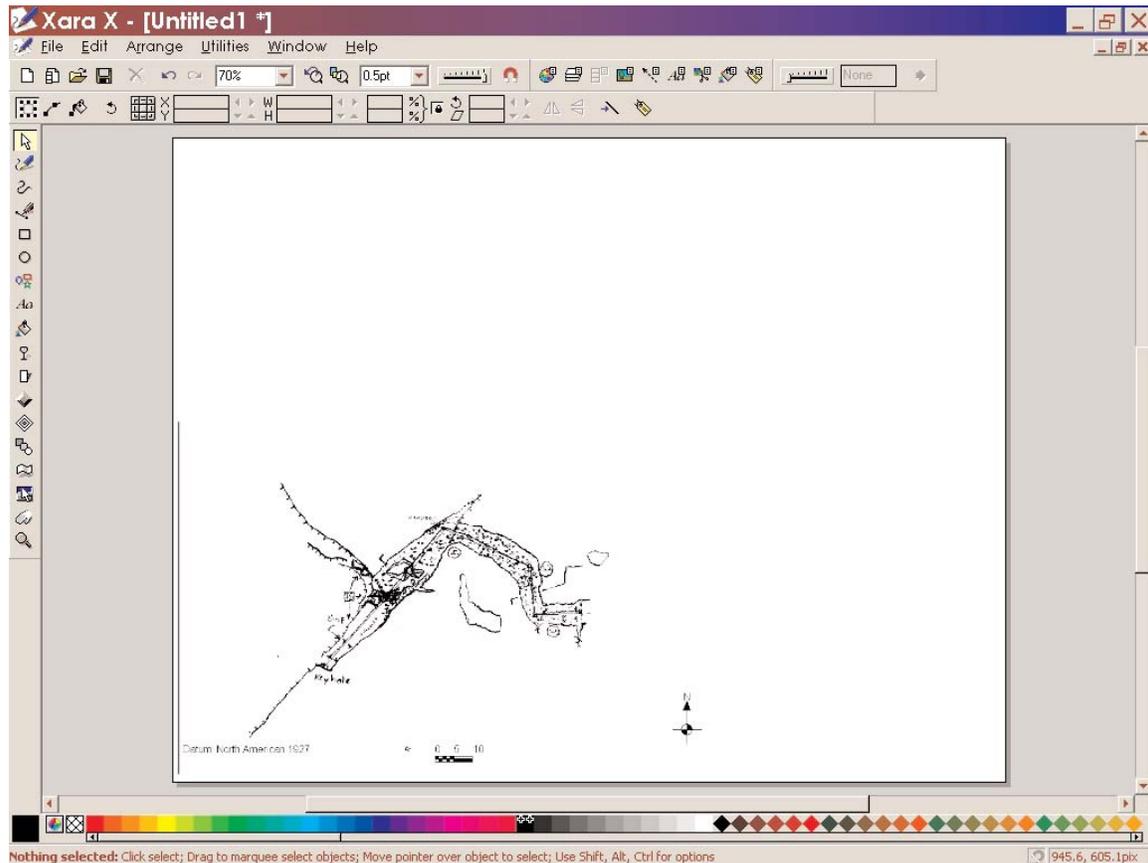
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Lets Begin

Open Xara X. You will see the default page is 800 x 600 pixels. This is where you will need to set the page parameters you will want to use for your new drawing. Go to **Utilities/Options** and choose the **units tab**. Change the units from Pixels to Inches hit **apply**. Then choose the **Page tab**. Here you can specify any page size you need to get the map on one page at the desired scale. Hit **apply** then **OK**. These settings can be changed later if you discover you need a larger page to accommodate your drawing.

Winkarst method:

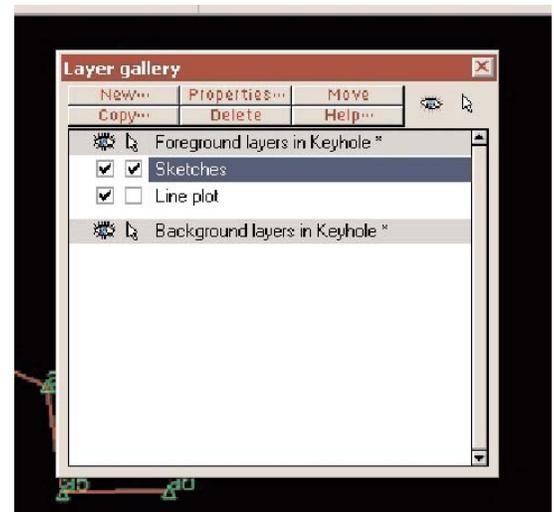
Next you will need to Import your saved bitmap of the line plot and/or the finished working map into this drawing. Go to **File/Import** locate your file and double click to finish the import process. Your file should be visible now as in the following screenshot. If you are not using Winkarst and only have the ability to export the line plot then you can assemble and align each individual sketch as well. This is much more time consuming and can be prone to error if your not very careful. This is called the Compass Method that is detailed below.



If you can't see the imported bitmap you are to close on the magnification scale. To change to full page view simply set your **Zoom factor** to **Page** or **Drawing** whichever display you prefer.

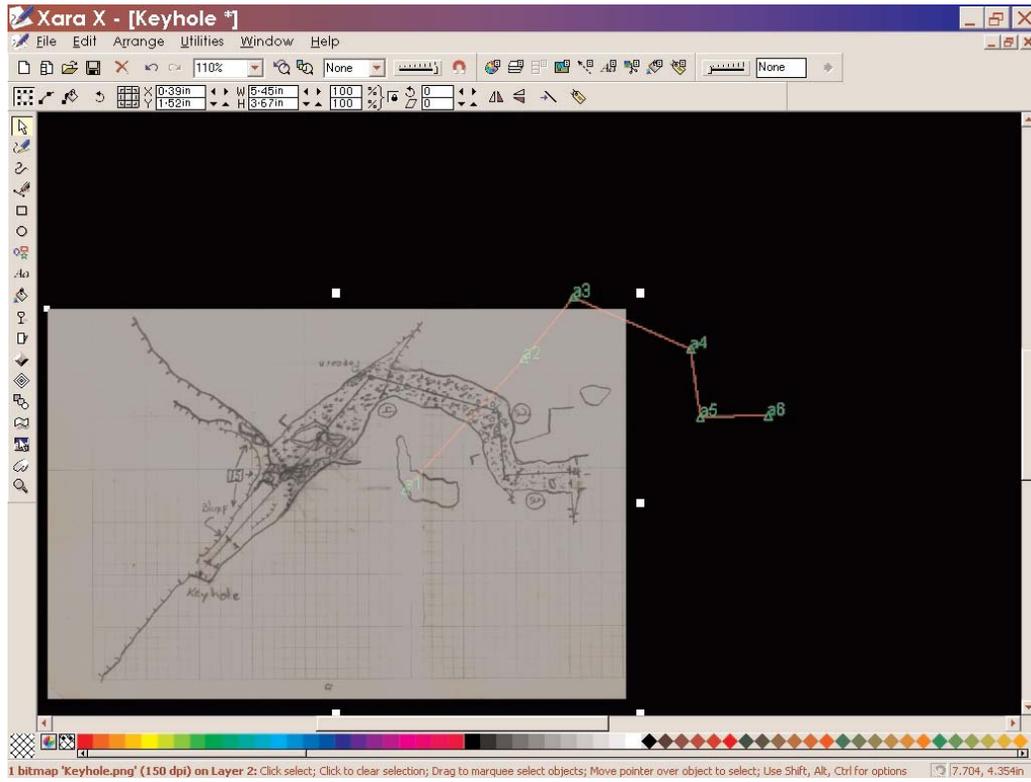
Compass method:

Begin by scanning all of your sketches as bitmaps and storing them in a separate folder labeled Sketches. Create the line plot in Compass being sure to adjust your scale and export it into a folder as well. Next import the line plot. Next open the **Layer gallery**. You will see that there is only one layer called Layer one. Go to the **Properties tab** and rename this layer **Line plot**. Next create a **New** layer called **sketches** it will default to the layer just above the Line Plot layer. you should see two layers in the layer gallery. The two check boxes next to each layer indicates weather the layer is visible or editable. The following screenshot shows the line plot layer visible but not editable and the sketch layer both visible and editable with this being the active layer. This is needed to easily edit the different aspects of your map without affecting other features. Complex cave maps can appear quit busy when all layers are visible so turning off separate layers is vital in sorting out all the different features of a cave map.

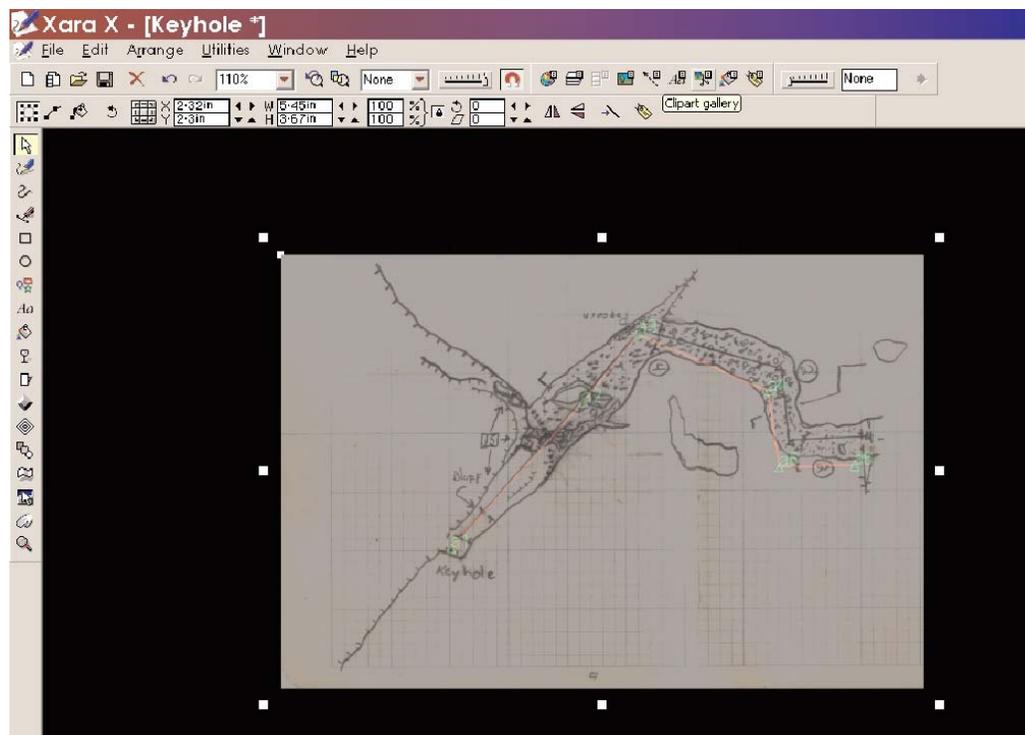


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Now import the first sketch being sure that the sketch layer is highlighted. Your sketch should now be visible. The line plot should not be visible where it is covered by your first sketch. To make the line plot visible use the **Select tool** and select the sketch you just imported. Now select the **Transparency Tool**. Adjust the transparency of the sketch until your satisfied with the transparency level you can affectively see the line plot under your sketch as in the following screen shot by moving the transparency scale bar (visible when the transparency tool is selected) to around 50%. You will do this to each sketch as you need them.



Next you will need to turn off editable on the line plot layer so you can move the sketch over the line plot without moving the line plot. This is done by un-checking the edit box on the line plot layer in the layer gallery. Start with the first sketch and place it where it belongs in accordance with the line plot by putting the cursor on the first station hold down on the left button of your mouse and drag it to align the first station on the sketch with the first station of the line plot release the mouse button and repeat where necessary.

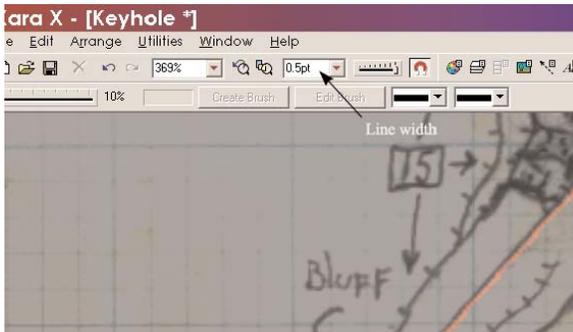


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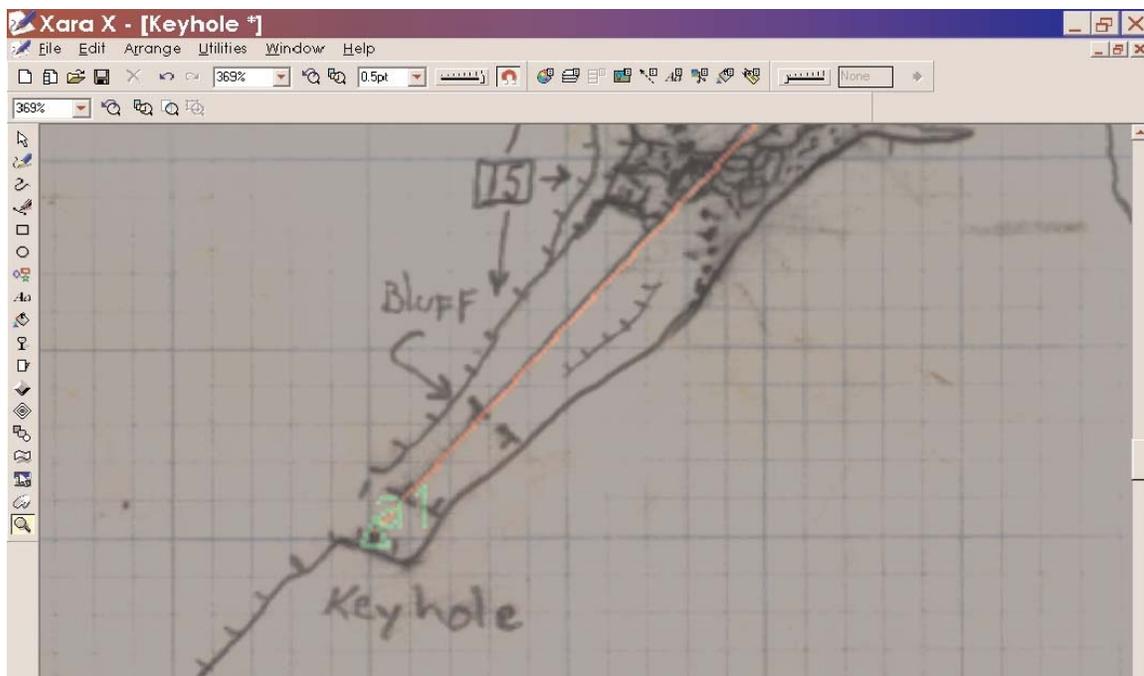
You may notice some discrepancies in the sketch as you align the sketch over the line plot. This is normal because it isn't a perfect world and no sketch is as perfect as a reduced line plot.

Drawing walls:

Begin your drawing by adding a new layer to the **Layer gallery** called **Walls**. Turn off the other layers but leave them visible. Highlight the walls layer and make sure both boxes are checked and the Sketch layer and the line plot layer have only the visible box checked and the editable box un-checked. Close the layer gallery. Next choose the **Zoom tool** and select an area of the drawing by holding down the left



mouse button and drag it down to create a rectangle of the area you will need to zoom in on. Release the left mouse button and you should be much closer now and ready to trace the walls for the first few stations. Start by selecting the **Freehand and Brush tool**. Set the **Freehand smoothing bar** down to almost 10%. The smoothing bar is directly above the select toolbox and becomes visible when you select the freehand and brush tool. Xara X has the ability to smooth out your lines to alleviate the harsh jagged line you would draw using a mouse. I like my walls rough because cave walls are rarely perfectly smooth. Now trace the wall for the first 2 stations. If the line thickness needs changed simply change it by selecting it, then change it using the **Line width bar** or changing its properties in the line gallery. I use 2.0 for walls.



Do not draw all the walls yet. You will need to move the sketch around to align the corresponding stations that were not perfectly aligned to begin with. To rotate a sketch just click on the sketch twice to bring up the rotation handles. You may also move the pivot point so you can rotate the sketch around any point that you choose by holding down the left mouse button while you drag the rotation point. I normally rotate my sketch around a survey station, draw some wall, then repeat as necessary until I am satisfied the sketch walls have been adequately traced.

Creating the interior:

As you begin the next step in filling in your map I would like to stress here how critical it is to keep the details of the cave separated using the **Layer gallery**. Normally I begin by adding the floor detail to the map by creating a new layer called **Floor**. I found out through a few trial an error maps that its better to put this layer beneath the walls layer. Just drag it down in the layer gallery. This layer sits just below your walls layer. This is so any feature on the floor will not sit atop the walls lines. Sometimes using a brush stroke can cause certain features like cobbles to spill a little onto the wrong line. This is a good time to make sure the visibility is on and the editable is off for you walls layer.

Sand:



Sand floors are a monotonous part of cave floors and there can at times be a great deal of it in our Ozark caves. To create sand use the same procedure you did for Cobbles only reduce the size of your cobbles to look like sand grains. Or do what I do. I select the **Text tool** and create three or four periods from the default font which is of course is new times roman. I then place them in a random appearance and group them with the **selector tool**

selection rectangle. Again choose the **freehand and Brush tool**. Select the **Create brush**

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stroke button. Name this new brush stroke **Sand**. To paint your floors takes a little practice so it does not give the appearance of uniformity. Again overlapping and random patterns give the best results for this and do not let your imagination hold you back. It is easy to get your map to look its best when the sand is not exactly evenly distributed with even blank places to represent almost featureless floors, not in my maps.

Clay and silt:

----- This was a daunting task to do in the old days of pen and ink. To get the pattern just right is as easy as drawing a line.
----- Using the **Freehand and Brush tool** select a dashed line pattern out of the line gallery and its size to .25 with a round
----- cap. Next hold down the Alt key while dragging out horizontal line that is the proper length to cover the width of your area.
----- Next using the **Selector tool** select the line and duplicate it by holding down the Ctrl key and D. You will notice that Xara
----- has duplicated your line and it now sits just below and to the right of your first line. If this space (duplication distance) is to
large you can change it by going to **Utilities/Options** and on the **General tab** at the bottom is the duplication distance. It can be set to any
desirable distance to fit your individual needs. Try subtracting half of the value to start until you have achieved the results you want. Next you
will need to trim them so each line fits into its designated position. Using the **Selector tool** select a line and grab one of the middle resize
handles on either end of the line. Resize the line by dragging the handle to lengthen or shorten the length of the line to fit your needs.

Cobbles:



Again cobbled floors can be tedious work if done by hand. Xara allows this feature to be drawn as a brush stroke. Start by selecting the **Freehand and Brush tool** and set a line width of .25 and a pure white fill. The fill color bar is located across the bottom of your Xara screen. Left click it, the "+" means it is now going to fill anything drawn by this line that closes will be a filled shape. Next draw three different cobble shapes close together. When you see the + sign when your close to completing the circle it means when you release the left mouse button Xara closes the circle for you. Now we group these three cobbles together by selecting our selector tool and dragging a selection rectangle around the three of them. When done correctly all three shapes will show a handle, letting you know that it has been selected. Next go to **Arrange/Group**. Now select the **Freehand and Brush tool**. Choose **Create Brush button**. Name this brush stroke Cobbles. Now each time you want to add an area of cobbles or small breakdown piles you can select this brush and literally watch Xara paint the cobbles for you. I normally use a small tight figure 8 pattern to get it just right. This brush doesn't take a lot of imagination to realize the possibilities of brush strokes are limitless. We use brush strokes for a great deal of drawing in Xara X. All brush strokes are fully editable and various attributes can be added or subtracted through the use of the **Edit brush** button. Play with it when you want to experiment a little for various attributes can be spectacular and beyond your expectations. Xara X is made for cavers.



Breakdown:

Drawing breakdown using Xara X is a breeze. Any shape you can dream up is a great piece of breakdown. Look at a rock, notice its shades and shadow lines. Make all attempts to stray away from standardizing your breakdown. Its random variations are what gives depth to your map. Start by drawing a closed shape. Choose your **Freehand and Brush tool**. Next choose line size of .50 and fill color of 20% black. Next hold down the Ctrl key and D to make an instant duplicate. Using your selector tool grab a corner resize handle and shrink the second shape just a little. Now drag a 10% black fill box up to this shape. It's now filled with a slightly lighter shade of gray. Next move it so it sits on top of your first shape. It should look like a slab of breakdown. Now we group these two shapes together by dragging a selection rectangle with the **Selector tool** around them both and then going to **Arrange/Group** now resize, skew, or rotate as needed. Next we will apply shadows to just the biggest blocks and the shadow parameters. This can quickly get out of hand if you're a new Xara user. Its just to easy. Xara will apply a shadow to any shape you select. First we will select a block of breakdown. Next choose the **Shadow tool**. When selected a new attribute bar becomes visible. Just above the Selector tool is 4 choices of shadows. Choose **Wall Shadow**. Next you will see a shadow has been applied to you breakdown block. Now you can use the **shadow blur bar** to sharpen the shadows edge if you like. Also by clicking on the shadow you can drag adjust the shadow to any angle of observation. Shadows should not necessarily be applied to small breakdown. It can greatly affect your printers ability to print at a reduced scale and besides it just makes little sense. Big breakdown benefits from shadows, small breakdown does not.

Floor ledges:



Ledges on floors look there very best when it looks uniform and almost machine made. Xara gives the cartographer an easy means of drawing floor ledges with again the use of a brush stroke. Begin by selecting your **Freehand and Brush tool**. Select a line size of .50 and in the line gallery choose Round Cap. Hold down the Alt key on your keyboard and draw a short horizontal line. Repeat the process only this time drawing a short vertical line. By holding down the Alt key Xara draws a perfectly straight line instead of a freehand line. Now select the **selector tool** and select the short vertical line. Move this line so it intersects the horizontal line it the middle with one end of the vertical line forming a T. Next go to **Arrange/Group**. Selecting the **Freehand and Brush tool** click on the create Brush button and name this brush stroke **Hatch**. Next, draw the floor ledge where you need it on your map. It may not look correct at first so using the Edit brush button it is easy to rotate the hatches so they all line up perfectly. You may also need to adjust the spacing so each hatch just touches its neighbor hatch forming a great looking floor ledge. Hit save when your satisfied and from now on all of your floor ledges will be perfect with little to no editing needed.

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Ceiling ledges:



Ceiling ledges are as easy to create as floor ledges and in fact the **Hatch** brush you created earlier for floor ledges is a simple means of creating ceiling ledges as well. Start by selecting the **Freehand and Brush tool**. Next locate the hatch brush in the drop down box located next to the edit brush button. Draw a length of floor ledge then select the Edit Brush button. On the spacing tab you can simply move the slider bar and Xara will separate each hatch for you. When you obtain the desired look click on **save as new**. Name this brush Ceiling. Keep in mind everything associated with a ceiling feature should be separated to its own layer. Open the layer gallery to add and rearrange layers as needed.

H2O:



Color is a wonderful thing if it is not too distracting. I now use a transparent blue along with a flat transparent line fill to create nice water features. I have seen several different methods on Xara for creating pools and streams and I will describe a few ways to create the three samples here. The nice thing also is once you have a design you like just save it as a Xara template. It becomes available for all your future drawings and can be manipulated with ease to accommo-

date
any

• Pools:



I generally start by selecting the **Freehand and Brush tool**. I apply a blue fill color and a line size of .25. I draw the shape of the pool in accordance with the sketch I am tracing. Next I duplicate it (Ctrl, D) and apply a no color fill that I drag up onto the duplicated shape. It will now be colorless. Using the **Freehand and Brush tool** draw a .25 horizontal line just above the pool shape and then duplicate it with the Ctrl +D keys on your keyboard. If the lines are not close enough to achieve the desired result you can change the duplication distance with **Utilities/Options**. On the general tab at the bottom is the duplication distance

parameter settings. These two numbers can be changed to increase or decrease the amount of distance between duplicated objects. I normally use a 5pix separation for the desired affect.

• Streams:



Streams are quit common features that in some cases will be the focal point of the map because of its distinct look or size. It can be easy to draw the stream if you want to use the standard symbols for water. I however like to see the stream looking as if flow was occurring. To do this is as easy as it comes. I start by selecting the **Freehand and brush tool**. I next choose the **VanGogh** brush and make it blue by selecting this color on the color bar at the bottom of the screen. I begin to paint the stream changing the line thickness to best suit the need of the drawing. Small streams can be a line

size of 4 or 5 while large rivers could get as big as 10 or 12. It is your scale of the drawing plus the size of the stream that will best dictate the line size for your needs. Next select the **Transparency tool** and adjust the shade so the rocks can be seen beneath your water if you so desire.

desired affect your looking for in later drawings.



Flowstone:

Nothing more than a letter C, Flowstone that often coats the walls or floors is drawn by using the **Text tool** to create the letter C using a font that has a wide opening and is symmetrically shaped. I use Century Gothic. Next create a brush called Flowstone and drag out a length of C's so you can begin to edit the brush so it is configured to your own personal taste. Next you will want to activate the brush edit button by selecting the **Freehand and Brush tool** and here is where the final shape of your new brush is acquired. By first selecting the **Rotation** tab you can drag the rotation bar until all the letter C's are lined up side by side. Then on the **Spacing** tab again slide the spacing bar over to get the letters to just touch. When your satisfied dick save and close the edit box and begin to draw your flowstone.

Exterior:



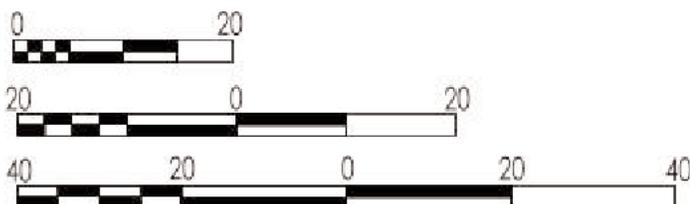
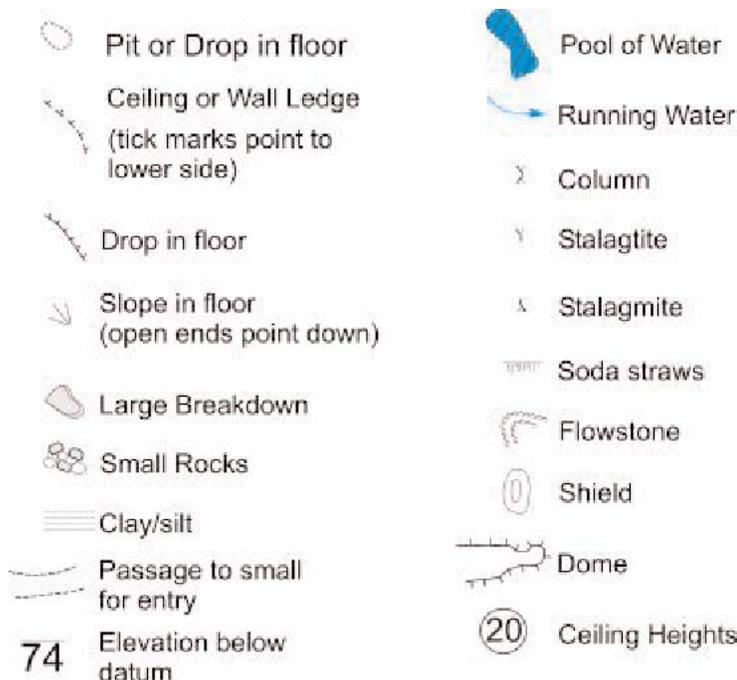
The exterior parts of a cave map normally include the crosssections, profiles, offsets, and any pertinent technical information about the cave including the scale and north arrow. Cross sections are as simple as tracing the sketch cross-section then re-size it for the correct scale. To add the cross-section locator lines is a matter of holding down the Alt key while drawing a straight line using the **Freehand and Brush tool**. Drawing this line directly across the section of cave you wish to portray you can easily add another directional leg by holding the tip of the pen on a handle when you see the + its ready to resume drawing and will attach another leg directly onto your existing line. When you have the length you need just release the left mouse button. Now you will need to remove the section of line that intersects the cave passage and remove all of it contained between the cave walls. This requires you to actually make two

cuts in your line. The process is this simple. With your **selector tool** select the line and then select the **Shape editor tool**. Use this tool to cut your line by moving the cursor over the line and when it changes into the arrowhead click on the line. You will notice a small red box attached to the line where you placed

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the cursor. Now move the cursor up to the Break at Points button. Click it to make the cut. Now repeat this process for the other wall. Once you have completed that cut now using the **Selector tool** select the line between your two cuts. Now delete it using the delete button in Xara or the delete key on your keyboard. You can add arrowheads to the end of your lines if you like by selecting one of many in the **Line Gallery**. Just open it up and open the folder labeled Arrowheads. If it points the wrong direction just flip it using the flip buttons located directly above your drawing on the first bar.

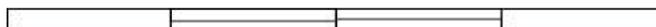
Some Xara Examples:



Scale:

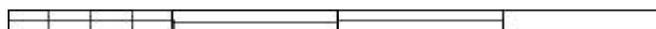
Lets see how easy it is to create a very nice scale that will need to be saved as a template so you never need to recreate it. Just import it and rescale it according to the scale imported on your line plot. To begin this project you will select the **Rectangle tool** and drag out a long thin rectangle. To make it easy just copy it length to the scale length on your line plot. Next make a duplication by using **Ctrl + D** on the keyboard. Now at the top of the drawing along the

first bar you should see a closed padlock button that is depressed. Click on this button to open the padlock. This unlocks the drawing aspect ratio setting so we can physically enter the ratio of reduction you desire. Its simple mathematics. To divide the length of the original rectangle so we have 4 equal parts we need to reduce the duplicate by 50% in length and 25% in width on the first set. Use **Ctrl + D** to create 3 more duplicates. Now making sure the Snap to Objects button (the red magnet) is active and using the **Selector tool** drag one smaller rectangle



and align it on top of the first. When you see the mini-magnet show up for your cursor it means they are aligned and snapped to the next object. Your drawing should look like this.

Next we need to duplicate the smaller boxes and again reduce there size to 25% in length and 50% in height this will again give us a total of



4 equal size 1/4 scale of the parent box. Again we are ready to select one of the 4 smaller boxes and align them with the box directly below. Now your scale should look like this.

Next the black squares. Using the selector tool select on of the squares you want to color black. Once selected left click on the solid black fill color at the bottom of the Xara



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screen. It is now filled with black. Repeat the process for each additional box you want filled. It should now look something like this.

Next we add the numbers by selecting the Text tool and then choosing the font and the font size. Anywhere drag your mouse to the right to create the text line. Type your numbers you need for the scale. (0, 10, 20, 40, etc.) now using the selector tool drag each number where you



need it in relation to the scale. Its finished. This can be used over and over just by saving it as a template. And importing it when you need it for future maps.

Conclusion:

I believe that this tutorial, as simple as I could make it, is a complete testament to the ease and simplicity Xara X has become. I also believe that all of the real basics are covered well enough that you can use Xara to advance your own talents quickly and without a 50 hour learning curve. Try to understand the basic philosophy of the program. Its simple point and click drawing make it one of the easiest programs to master even for the most inept computer user. I am no graphic artist by anyone standards and it would not be difficult for a real pro to work some real map magic using Xara X. Your only limit seems to be your own imagination. Xara makes you a better cartographer while still allowing your own personal styles to come out in your maps. Xara files are tiny and easily attach to most emails and will print at any size with clear crisp lines.

Exporting to other formats is also a joy. I have never seen Xara lock up or tell me I am out of memory. Like I said before, Xara X is the cave mapper dream program come true. Tom Lounsbury NSS 38646

