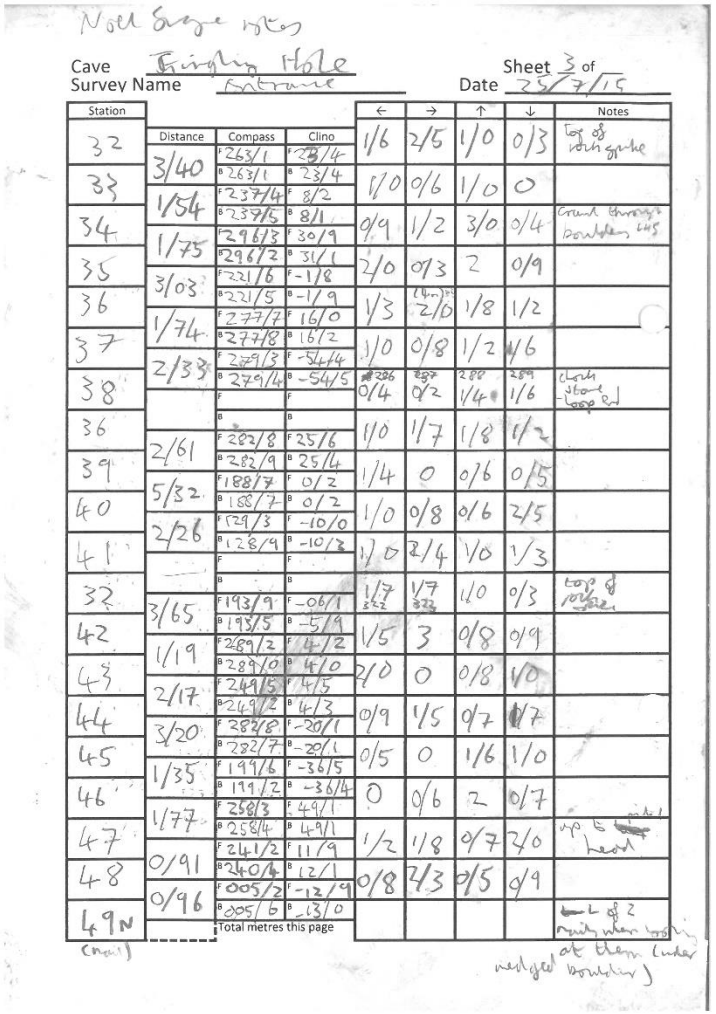
How To Create A Survex File

Brendan Hall

Note: This tutorial will require survex and notepad++ to already be installed on your computer, and a basic understanding of Survey data. i.e. compass, Clino, distance and LRUD readings.

How to turn this…



Noel Sage notes

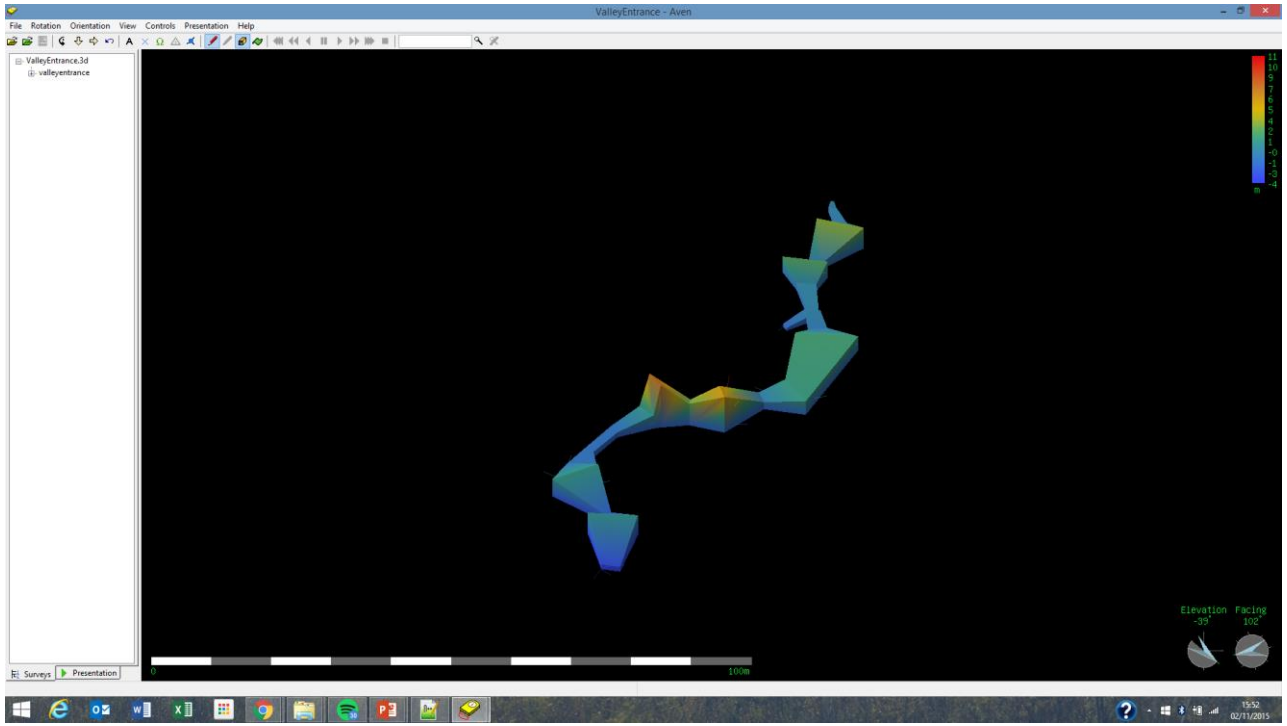
Cave: Ringing Hole
Survey Name: Entrance
Sheet 3 of
Date: 25/7/15

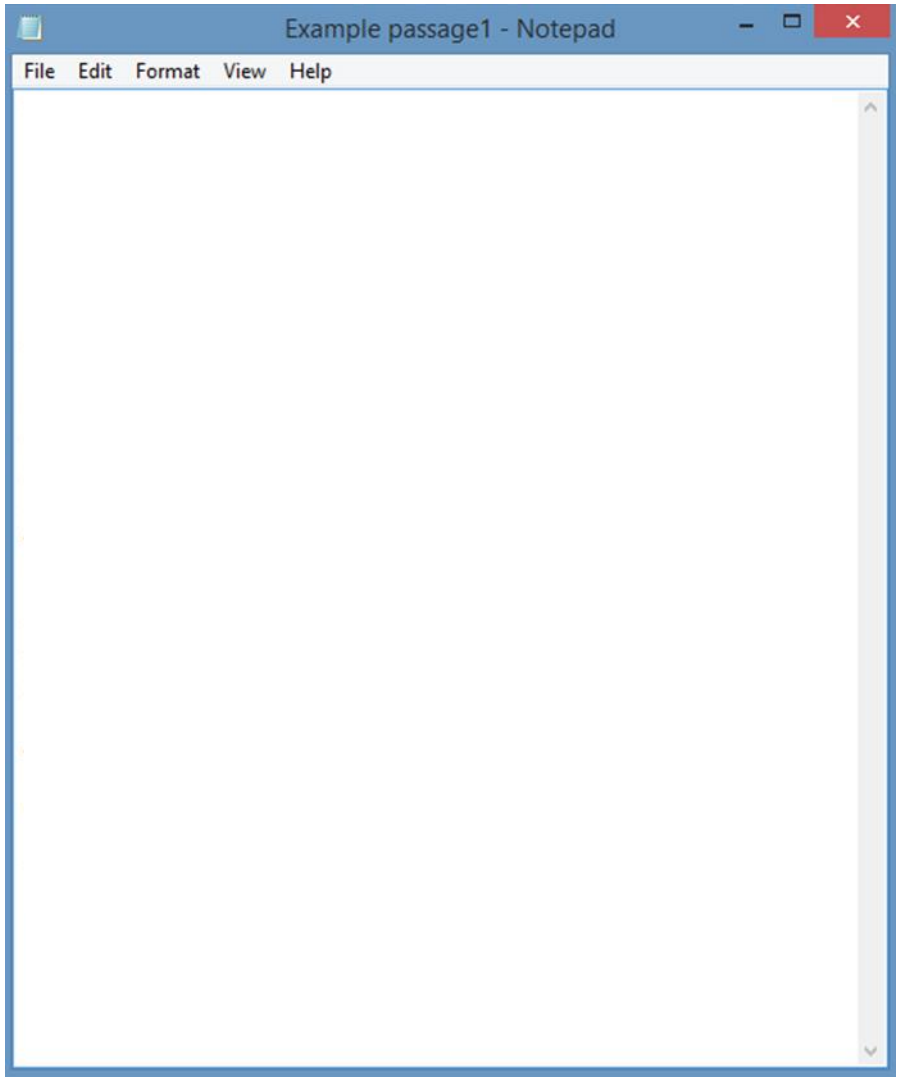
Station	Distance	Compass	Clino	←	→	↑	↓	Notes
32	3/40	F 263/1 B 263/1	F 23/4 B 23/4	1/6	2/5	1/0	0/3	Top of rock spike
33	1/54	F 237/4 B 239/5	F 8/2 B 8/1	1/0	0/6	1/0	0	
34	1/75	F 298/3 B 296/2	F 30/9 B 31/1	0/9	1/2	3/0	0/4	Crawl through to Powtless Cave
35	3/03	F 221/6 B 221/5	F -1/8 B -1/9	2/0	0/3	2	0/9	
36	1/74	F 277/7 B 277/8	F 16/0 B 16/2	1/3	(Up) 2/0	1/8	1/2	
37	2/33	F 279/3 B 279/4	F -54/4 B -54/5	1/0	0/8	1/2	1/6	
38		F B	F B	0/4	0/2	1/4	1/6	Climb through to Loop Rd
36	2/61	F 282/8 B 282/9	F 25/6 B 25/4	1/0	1/7	1/8	1/2	
39	5/32	F 188/7 B 188/7	F 0/2 B 0/2	1/4	0	0/6	0/5	
40	2/26	F 129/3 B 128/9	F -10/0 B -10/2	1/0	0/8	0/6	2/5	
41		F B	F B	1/0	2/4	1/0	1/3	
32	3/65	F 193/9 B 193/5	F -06/1 B -5/9	1/7	1/7	1/0	0/3	Top of rock spike
42	1/19	F 289/2 B 289/0	F 4/2 B 4/0	1/5	3	0/8	0/9	
43	2/17	F 249/5 B 249/2	F 4/5 B 4/3	2/0	0	0/8	1/0	
44	3/20	F 282/8 B 282/7	F -20/1 B -20/1	0/9	1/5	0/7	1/7	
45	1/35	F 199/6 B 199/2	F -36/5 B -36/4	0/5	0	1/6	1/0	
46	1/77	F 258/3 B 258/4	F 49/1 B 49/1	0	0/6	2	0/7	
47	0/91	F 241/2 B 240/4	F 11/9 B 12/1	1/2	1/8	0/7	2/0	up to Head
48	0/96	F 005/2 B 005/6	F -13/9 B -13/0	0/8	2/3	0/5	0/9	
49N		Total metres this page						L of 2

(end)

merged boulders

Into this…

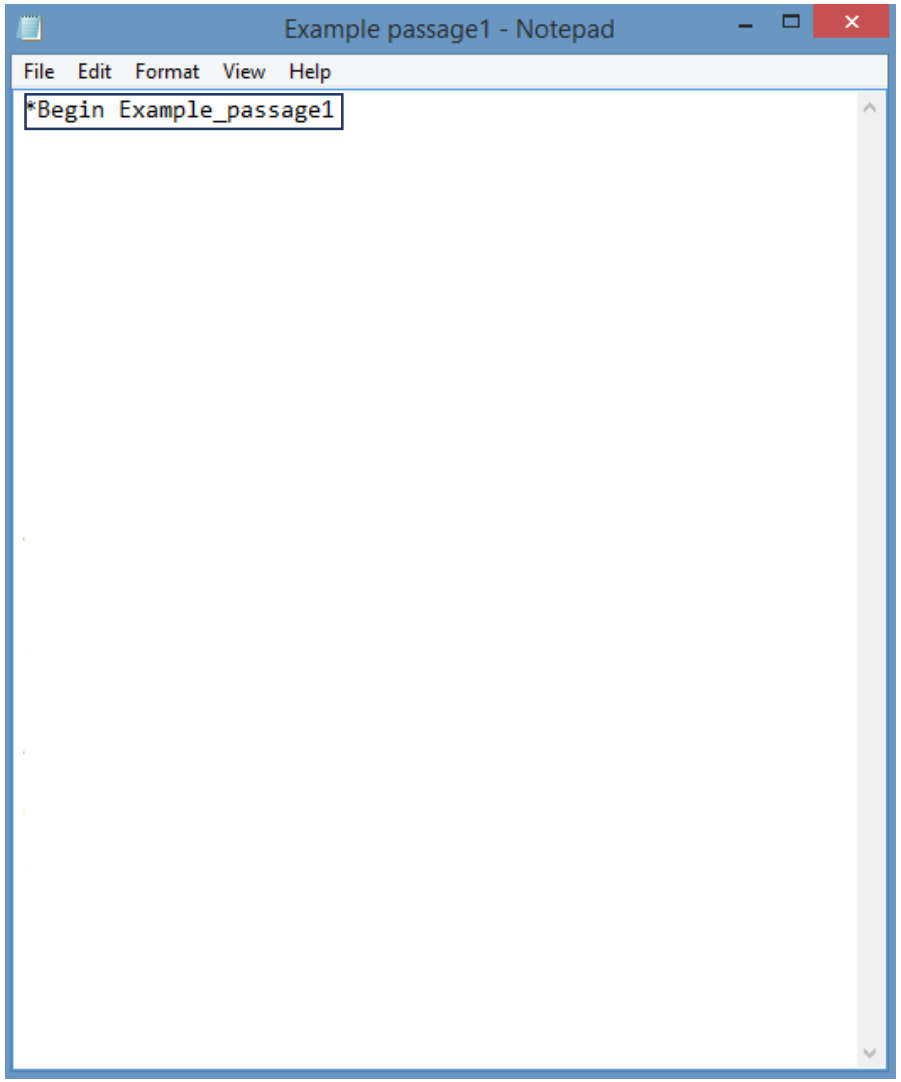




Step one: Open Notepad++

- Begin By opening a text editor, this can be either Notepad or Notepad++. Apparently you can use Any text editor as long as it is capable of writing A plain “ASCII text file”.

- I’ve only managed to get survex to work with notepad++



Step 2: Begin…

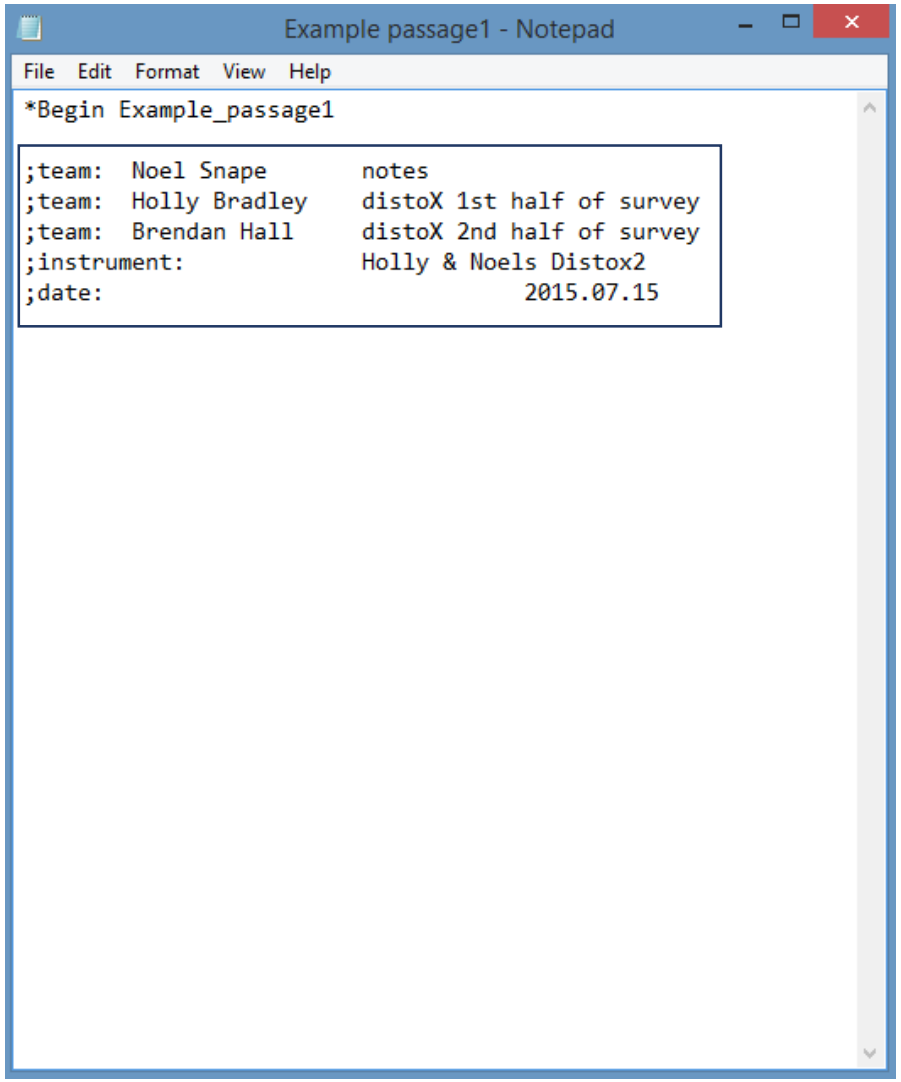
- Insert Command “*begin (Insert name of cave passage)”.

The name of the cave passage should be unique and the same as the survex file name & it will later be used to tie two separate Survex files together.

- In Survex the * symbol indicates the beginning of a command.

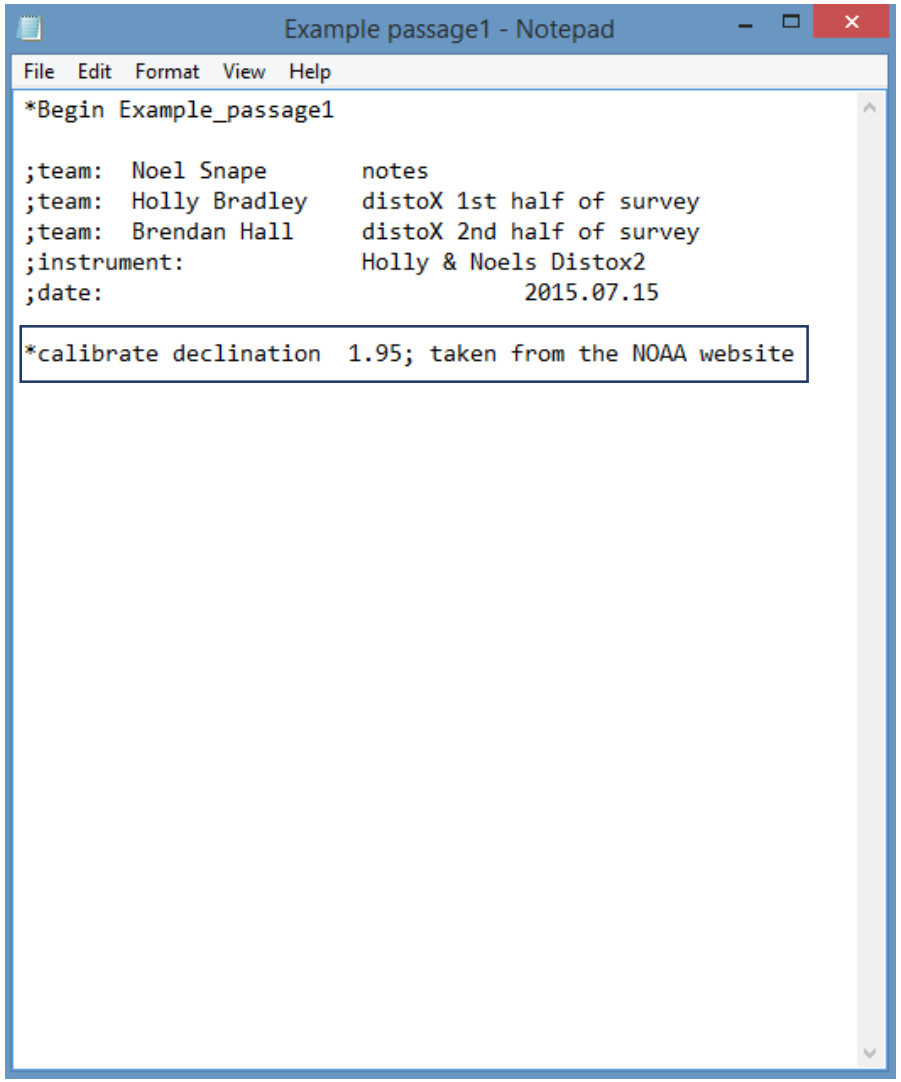
- In a similar way, the semicolon symbol **;** is used to indicate the start of a comment, i.e. information which people may find useful when looking at the survey data later but isn’t necessary in terms of creating a 3D file.
  - information such as station descriptions.
  - Team information (who was on book, who read compass ect.)

- **Important: the name of the file cannot contain a space, this leads to an error code when you come to process the file. Alternatively use an underscore _ instead.**



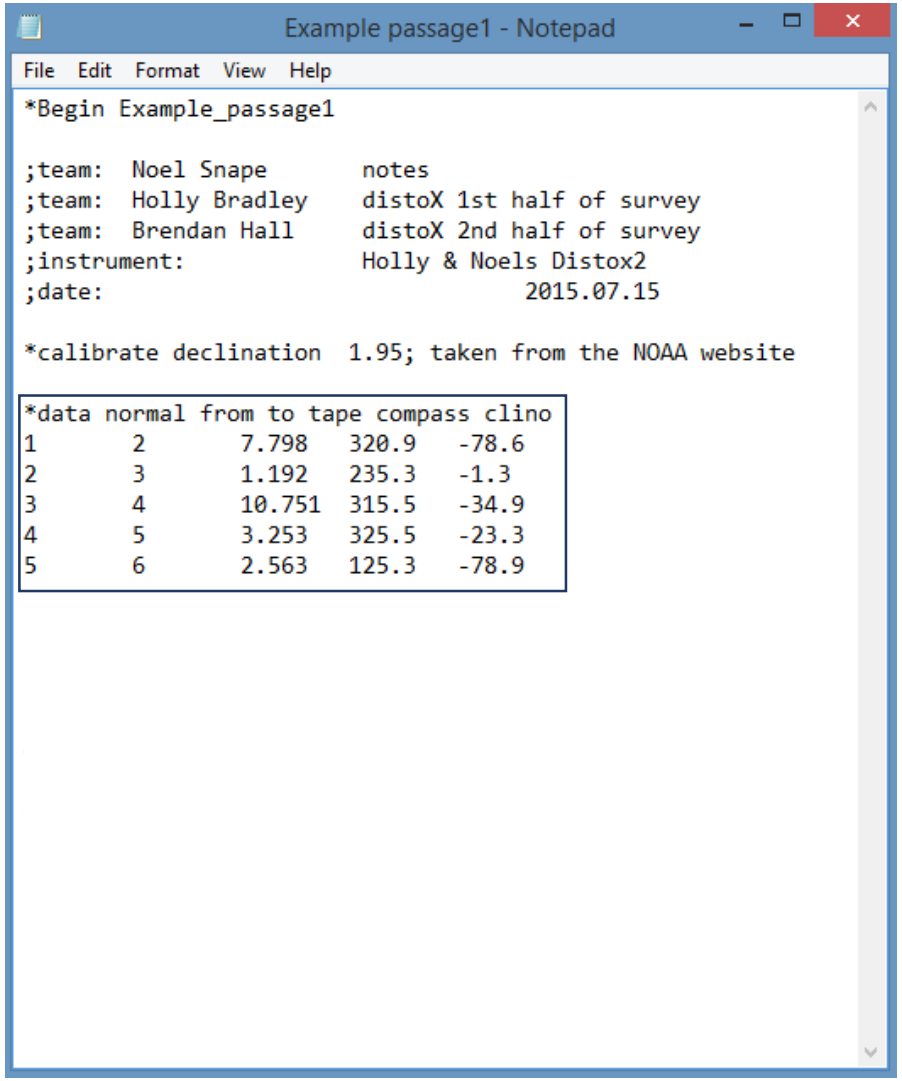
Step 3: Add trip info

- Add information about the surveying trip.
- This information won't be used by Survex to help create the 3D file, hence the line begins with a semicolon; instead of a star*.
- This data is important as it allows other parties to review the details of your trip and help them understand what has happened if issues arise in the future.
- For example if we wanted to clarify where specific survey stations are in a survey we know who to go to to ask.



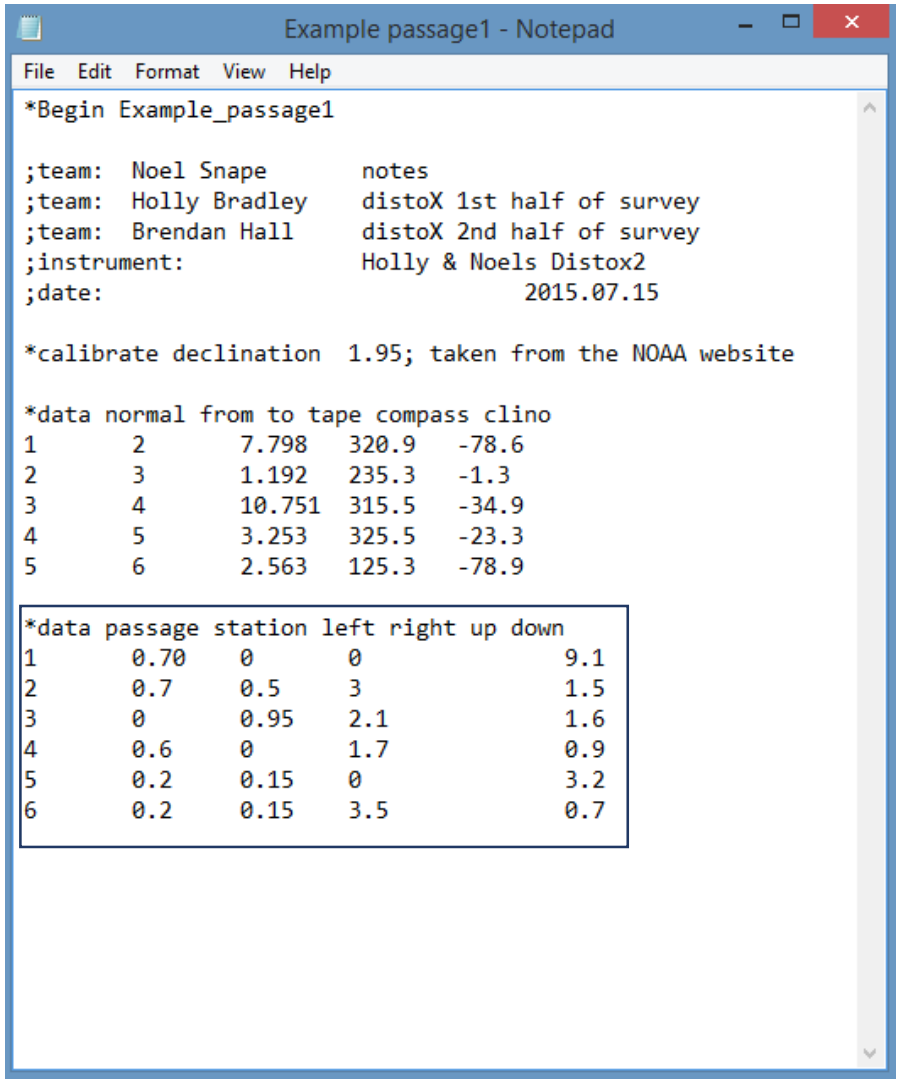
Step 4: Declination

- The earths magnetic field varies slightly depending on: date and location, therefore to avoid error in our data it is important we take this into account.
- Declination is the angle between magnetic north and true north, records can be found on various websites.
- To find out what the declination was for your trip go to http://www.ngdc.noaa.gov/geomag-web/#declination.
- The declination value should be around 1-2°, by convention a declination west of true north is +ve.
- Don’t worry if you cba doing this, so long as you record the date and cave, someone else can work it out later.



Step 5: Centerline Data

- Survex is pretty clever, you could input the stations in any order and as long as they all connect up, survex will still draw a 3D file for you.
- The convention is to put the data into survey as shown in the example.
- Tip: Use the Tab button instead of the space bar when inputting data, it'll neatly arrange the data into columns making it easier to understand.
- Note: see Survex manual for more ways of inputting centreline data.



Step 6: LRUD's

- In order to make the final 3D file appear 3D, you need to include passage dimensions.
- The convention is to take readings of the distances to the: Left, Right, Up and Down of the station it relates to and to note them down in this order.
- Note: the necessity for LRUD's is controversial, as a safe bet if everyone else in the survey project is using them, just keep a record of them anyway. A limitation of the software is that it can't create a 3D file which isn't just a centreline, without LRUD's.

LRUD's Part 2

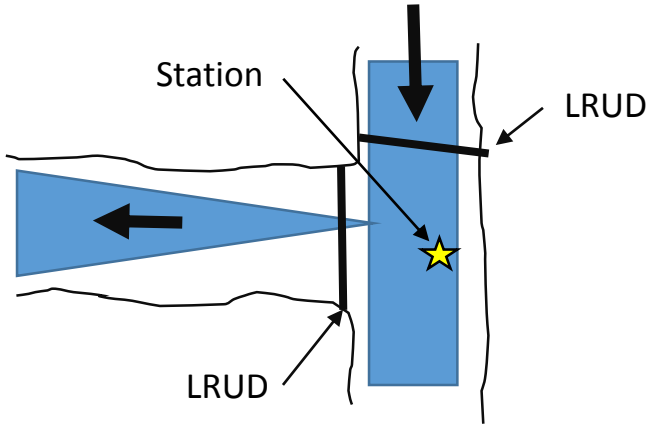
Example_Passage1 - Notepad

File Edit Format View Help

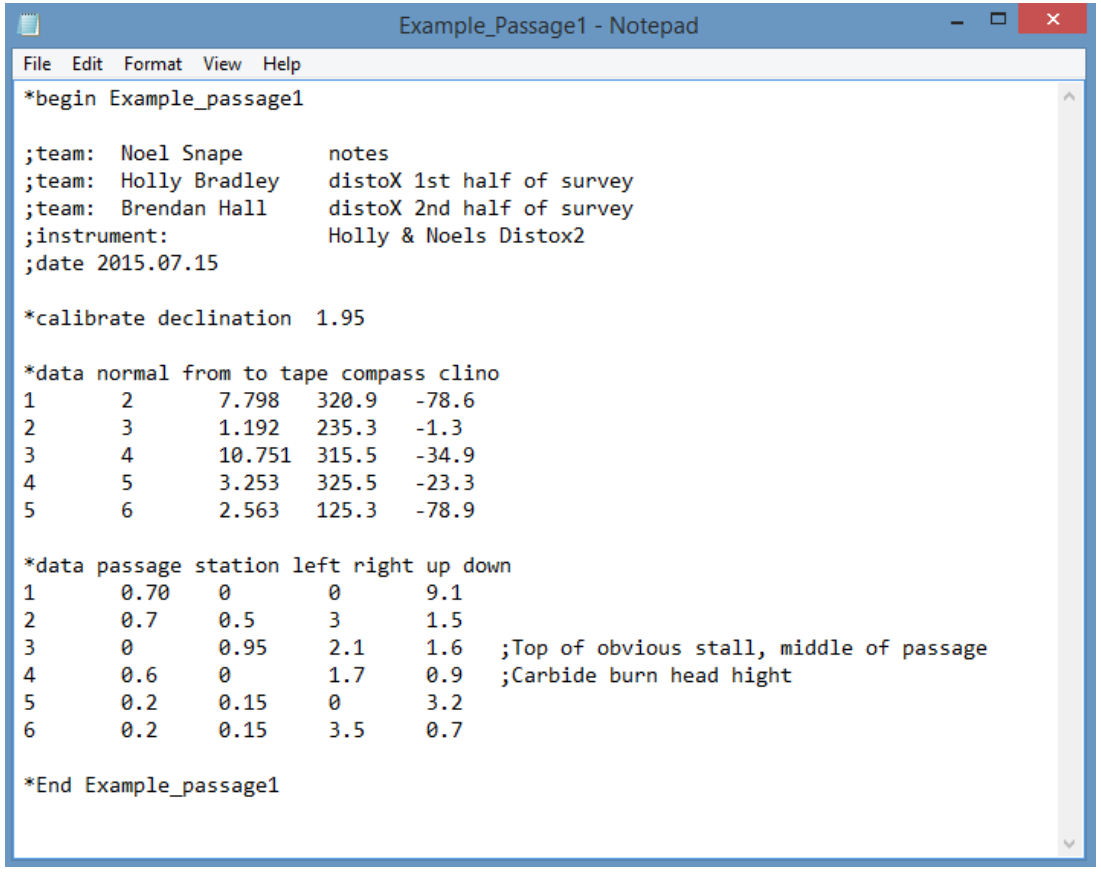
```
;team:  Noel Snape       notes
;team:  Holly Bradley    distoX 1st half of survey
;team:  Brendan Hall     distoX 2nd half of survey
;instrument:             Holly & Noels Distox2
;date 2015.07.15

*calibrate declination  1.95

*data normal from to tape compass clino
1       2       7.798   320.9   -78.6
2       3       1.192   235.3   -1.3
3       4       10.751  315.5   -34.9
4       5       3.253   325.5   -23.3
5       6       2.563   125.3   -78.9

*data passage station left right up down
1       0.70    0       0       9.1
2       0.7     0.5     3       1.5
3       0       0.95    2.1     1.6   ;Top of obvious stall, middle of passage

*data passage station left right up down

3       0       0.95    2.1     1.6   ;Top of obvious stall, middle of passage
4       0.6     0       1.7     0.9   ;Carbide burn head hight
5       0.2     0.15    0       3.2
6       0.2     0.15    3.5     0.7
```

This is a bit of a bad example but would make more sense if there was a junction in the passage, it just illustrates how you'd Split up the LRUDS in the survex file.

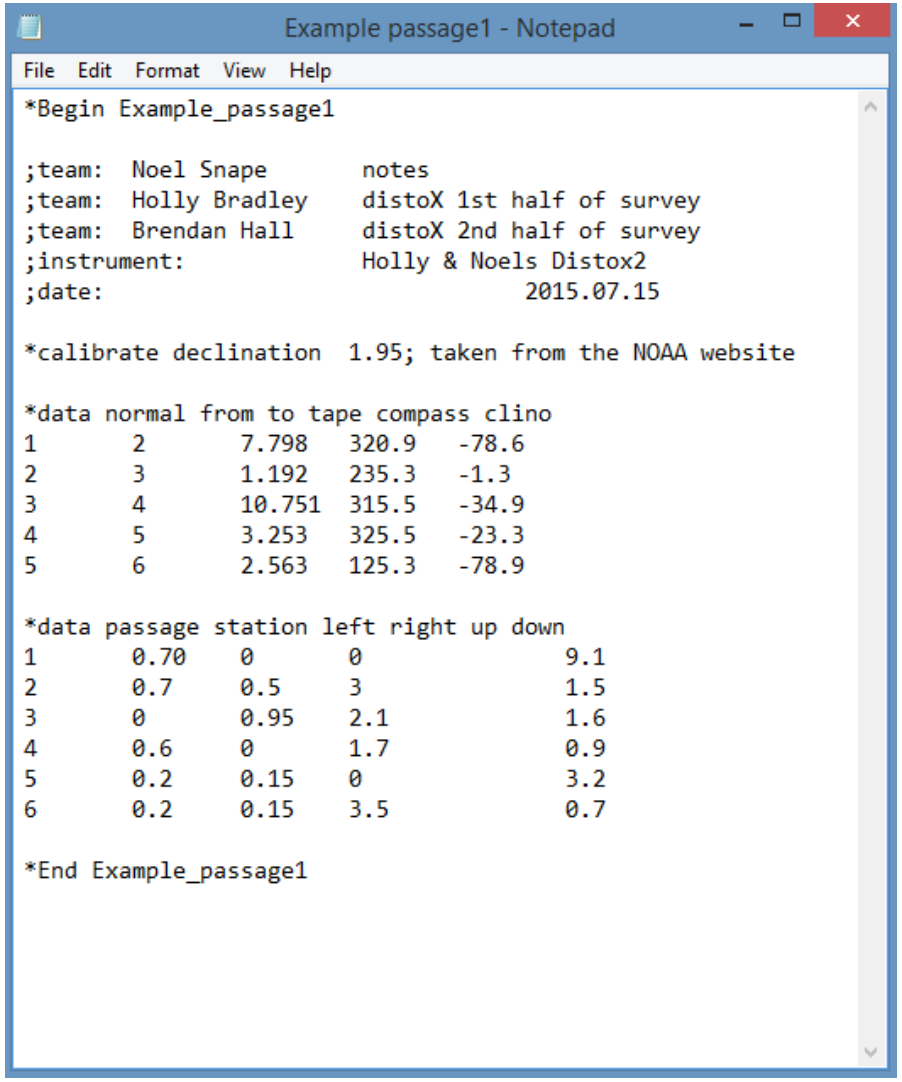
- This examples only considers a straight passage.
- LRUD's get more complicated when junction's are involved.
- In order to prevent 3D passages (from above) looking like the blue diagram
- It is important the split the passage into "tubes".
- Meaning you need to take LRUD's multiple times at stations at a junction.
- To do this simply begin a New line of LRUDS with new Ones that take into account the Passage at the junction.



Step 6: Station Descriptions



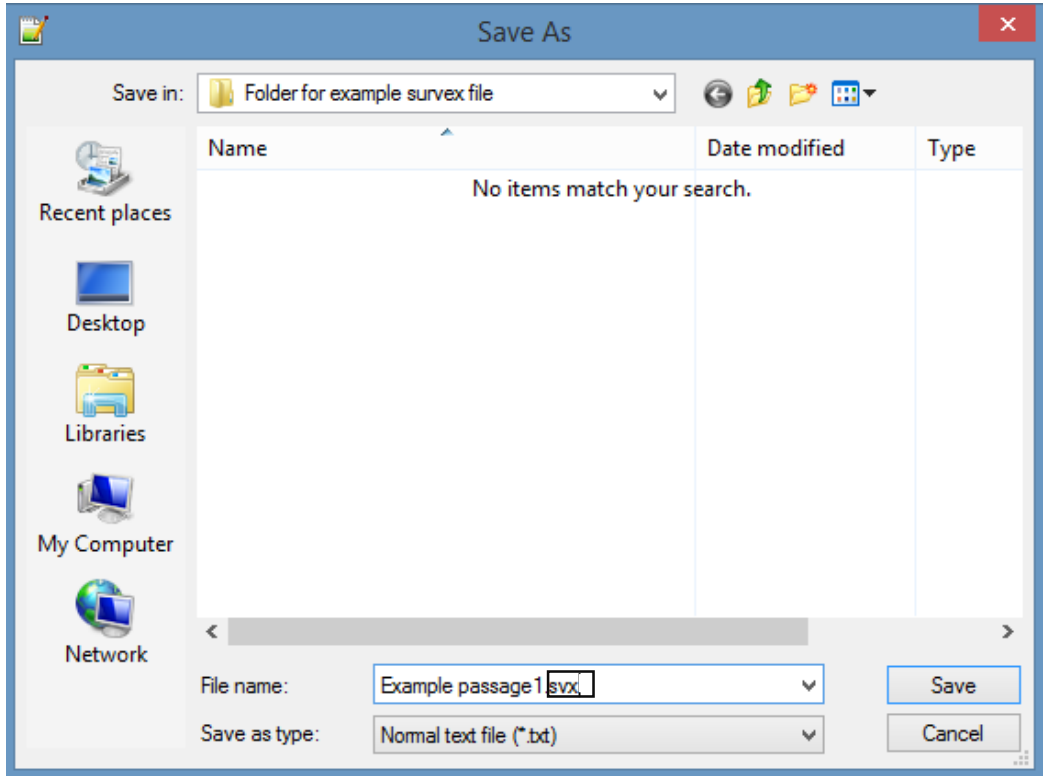
- In order for other people to be able to easily pick up where you left off on a surveying trip it is important to keep a detailed record of where your survey stations are.
- This is particularly important at the end of a surveying trip or at a junction.
- To do this simply add a comment after the passage dimensions for a passage.



Step 7: *End

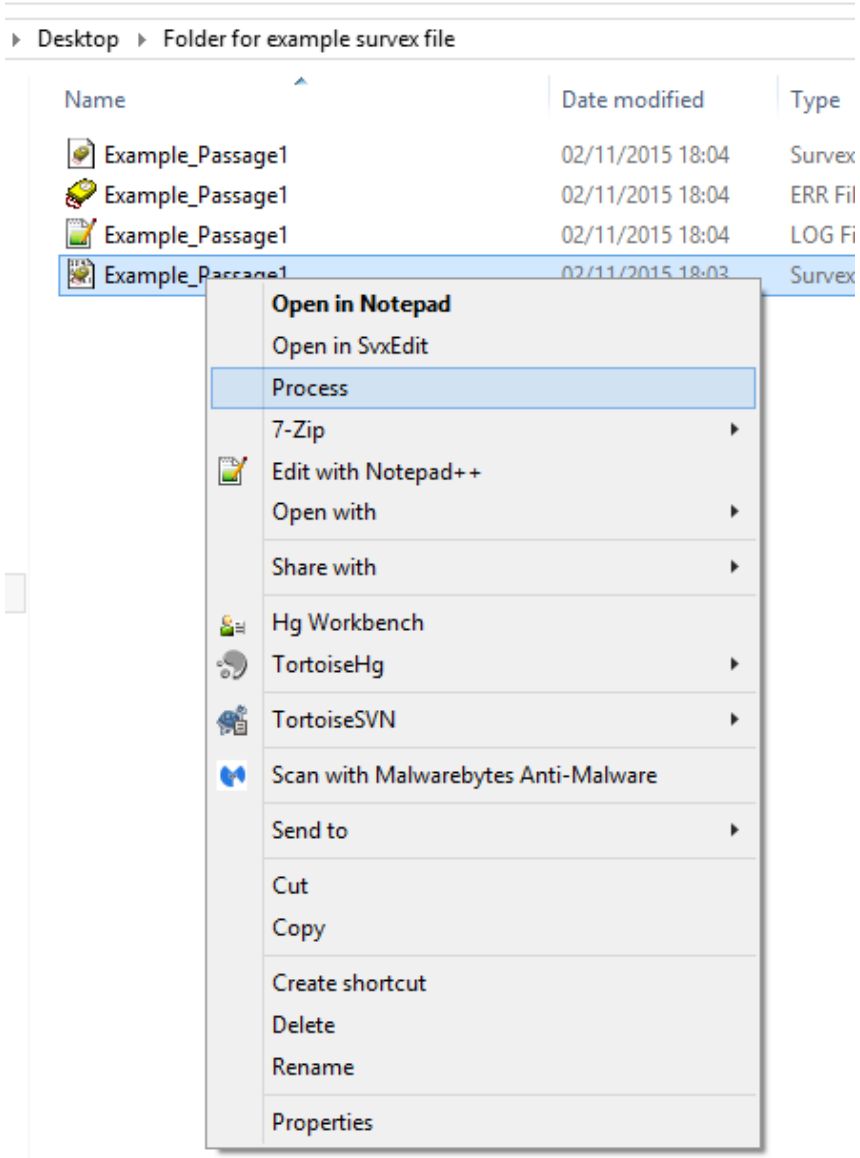
- Similarly to *begin, you need to let survex know when you've finished inputting the data.
- Enter "*End (the name of the survex file, same as the one at the start after *Begin)

Step 9: Create 3D file



- To create a survex file do the following
- Save as .svx (in this case Example passage1.svx)
- Process the file by right clicking on the file and clicking process

Step 10: Process the 3D file



- Finally right click on the file once it as been saved as .svx
- Click on process
- The file should automatically be processed into a 3D file and a log file
- If something has gone wrong with the file, you will get an error file (ERR file). This is useful as it gives you an indication of what has gone wrong with your survex file
- E.g. Passage1.svx:1:16: error: End of line not blank
  passage1.svx:28:14: error: End of line not blank

  This means that the 16th character of the 1st line & the 14th character of the 28th line has something wrong with it, in this case I left a space in the name of the passage.

Examples

There’s more than one way to make a survex file, I’ve attached some examples of some very different survex files which all essentially do the same thing.

For more details about survex and how to do more fancy stuff either look at the survex manual (see Attached) or wait for the next instalment of Brendan’s surveying Tutorials.

These files will be a bit more complicated as they’re involved in a larger system of files (see next slide) and it seems people have different styles when it comes to making a survex file.

If you’re just starting out, it’s probably best to just find a template and stick to that.

This is a really simple introduction, I’ve probably missed out quite a lot but it’s probably enough to help you if your using survex or something.

https://drive.google.com/open?id=0B0zxkZdXB7vUMkU0emRLbm1QSTg

Next time… Cave Jigsaw

- Each survey trip will have it's own individual **survex file** associated with it.
- These files are typed up in text format and can be processed, to give a 3D version of the file viewable in Survex's 3D cave viewing software - Aven.
- Survex files can be 'stitched' together to produce a larger 3D model comprising of several survex files tied together.
- Survex files are tied together using a hierarchical system which I will go into in the next tutorial.