#### 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	Sug	e pro	2							4
	Cave Survey N	Fing	hing 1 Entr	the			Date	Sheet	3 of 77/15		
	Station	1			<i>←</i>	→	<u>↑</u>	4	Notes	3	
	32	Distance	Compass F263/1	Clino	1/6	2/5	1/0	0/3	top of in gr	he	
1-	33	5/40	1237/4	* 23/4 * 8/2	10	0/6	1/0	0			. 7
	34	1/54	237/5	1 8/1/ 1 30/9	9/9	1/2	3/0	0/4-	boulde	Lus	
	35	2/02	296/2	B 31/1	2/0	073	2	0/9		1	
	36	1/21	1221/5 1277/7	B-1/9 F16/0	1/3	2/0	1/8	1/2		$\cap$	
	37	7 122	*277/8 *279/3	B 16/2 F-5444	1/0	0/8	1/2	46			
	38	2/55	8 279/4 F	8-54/5 F	#286 0/4	297	1/4	289	start		
	36	7/61	B F 282/8	B F25/6	110	17	[/8]	1/2			
	39	5/27	188/7	= 25/4 F 0/2	1/4	0	076	0/5	1	23	
	40	5/52	B188/7- F129/3	B 0/2 F-10/0	1/0	0/8	0/6	2/5			
	41	420	8128/9 F	B -10/2	170	2/4	10	1/3	1.1.2		
	32	3/15	B F193/9	B F_06/1	1/7	1/7	10	0/3	top of		
	42	1/19	=195/5 =2:89/2	<sup>e</sup> -5/9 F 4-/2	1/5	3	0/8	0/9	-	1	
	43	2/17	1289/0 1249/5	14/5	210	0	0/8	10	-		
	44	3/20	=24912 = 28218	1-20/1	0/9	45	9/7	\$7	1	1	
	45	1/35	* 282/7: * 19976	-20/1 -36/5	0/5	0	1/6	1/0	đ.	9	
÷	46'	1/72.	# 199/2 F Z58/3	5 49/1	0	0/6	2	0/7		in he 1	
	47"	0/91	= 258/4 = 241/2	= 4-9/1 = 11/9	1/2	1/8	0/7	2/0	up 6 0	N.	
	48	0/96	1005/2	12/1	0/8	43	0/5	0/9			
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#### 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++

	Example passage1 - Notepad 🛛 🗕 🗖	×
File Edit Format View	Help	
*Begin Example_pase	sage1	$^{\wedge}$
·		
		~
·		

## 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.

	Example passage1 - Notepad –	×
File Edit Format View	Help	
*Begin Example_pass	age1	^
;team: Noel Snape ;team: Holly Bradl ;team: Brendan Hal ;instrument: ;date:	notes ey distoX 1st half of survey l distoX 2nd half of survey Holly & Noels Distox2 2015.07.15	
		>

## 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.

Example passage1 - Notepad –	×
File Edit Format View Help	
*Begin Example_passage1	$\sim$
<pre>;team: Noel Snape notes ;team: Holly Bradley distoX 1st half of survey ;team: Brendan Hall distoX 2nd half of survey ;instrument: Holly &amp; Noels Distox2 ;date: 2015.07.15</pre>	
*calibrate declination 1.95; taken from the NOAA website	
	~

# **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 <u>http://www.ngdc.noaa.gov/geomag-web/#declination</u>.
- 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.

	Example passage1 - Notepad
File Edit Format View	Help
*Begin Example pass	sage1
8	8
;team: Noel Snape	notes
;team: Holly Bradl	ley distoX 1st half of survey
;team: Brendan Hal	II distox 2nd hait of survey
:date:	2015.07.15
,	
*calibrate declinat	tion 1.95; taken from the NOAA website
×	1.
1 2 7 7	to tape compass clino
2   3   1.1	192 235.3 -1.3
3 4 10.	.751 315.5 -34.9
4 5 3.2	253 325.5 -23.3
5 6 2.5	563 125.3 -78.9

## 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.

-		Evar	nolo pace	2021	Note	nod	_	
_		Exar	npie pass	ager	- Note	pad		
File Ed	it Format	View Help						
*Begin	n Example	_passage1	L					
;team	Noel S	nape	notes					
;team	Holly H	Bradley	disto)	(1st	half	of surve	÷y	
;team	Brendai	n Hall	disto/	(2nd	halt	ot surve	2y	
;instr	rument:		HOILY	& NO	2015 D1	STOX2		
;date					2015	.07.15		
*cali	orate deci	lination	1.95; t	taken	from	the NOAA	\ websi	te
*data	normal f	rom to ta	ne compa	ass c	lino			
1	2	7.798	320.9	-78	.6			
2	3	1.192	235.3	-1.3	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			
×			- C+					
ruata 1	0 70	a action i	a numerica	ic up	down	1		
2	0.70	05	3		1	5		
3	0. <i>1</i>	0.95	21		1	6		
4	0.6	0	1.7		ē	.9		
5	0.2	0.15	0		3	.2		
6	0.2	0.15	3.5		e	).7		

## 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.

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<u> </u>				Example	_Passage1 - Notepad 🛛 🚽 🗖 📕
File Edit	Format	View Help			
;team:	Noel Sr	паре	notes		
;team:	Holly E	Bradley	disto	(1st ha	lf of survey
;team: Brendan Hall distoX 2nd half of					lf of survey
;instru	ment:		Holly	& Noels	Distox2
;date 2	015.07.1	15			
*calibr	ate decl	lination	1 95		
Caribi	ace det		1.75		
*data n	ormal fr	rom to ta	pe compa	ass clin	0
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 p	assage s	station l	eft rig	nt up do	wn
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 n		tation 1	oft nig	at un de	
	abbage :	station 1	ere rigi	ic up uu	
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	
L					
		-			

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.

## LRUD's Part 2

- 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**

📃 Example_Passage1 - Notepad – 🗖 🔼							
File Edit	Format	View Help					
*begin	Example_	passage1					
;team: Noel Snape ;team: Holly Bradley ;team: Brendan Hall ;instrument: ;date 2015.07.15			notes distoX distoX Holly				
*calibr	ate decl	ination	1.95				
*data n	ormal fr	om to ta	pe compa	ss clin	0		
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 p 1	assage s 0.70	tation l 0	eft righ 0	t up do 9.1	wn		
2	0.7	0.5	3	1.5			
3	0	0.95	2.1	1.6	;Top of obvious stall, middle of passag	e	
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			
*End Ex	ample_pa	issage1					

- 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.

		Exar	mple passage1 - Notepad 🛛 🗖 🗖		
File Edit	Format	View Help	)		
*Begin	Example_	_passage1	L		
;team:	Noel Sr	паре	notes		
;team:	Holly E	Bradley	distoX 1st half of survey		
;team:	Brendar	n Hall	distoX 2nd half of survey		
;instru	ument:		Holly & Noels Distox2		
;date: 2015.07.15					
*calibr	rate decl	lination	1.95; taken from the NOAA website		
*data r	normal fr	rom to ta	ape 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 p	bassage s	station l	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		
4	0.6	0	1.7 0.9		
5	0.2	0.15	0 3.2		
6	0.2	0.15	3.5 0.7		
*End Ex	kample_pa	assage1			

## 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

2		Save As		×
Save in:	Folder for example	nple survex file 🗸 🗸 🗸	G 🤌 🖻 🛄 -	
œ	Name	^	Date modified	Туре
Recent places		No items match your s	earch.	
Desktop				
Libraries				
My Computer				
Network	<			>
	File name:	Example passage1.svx	¥	Save
	Save as type:	Normal text file (*.txt)	~	Cancel

- 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

▹ Desktop ୬ Folder for example survex file

Name		*	Date modified	Туре
Example_P	assag	ge1	02/11/2015 18:04	Survex
Example_P	assag	ge1	02/11/2015 18:04	ERR Fil
📔 Example_P	assag	ge1	02/11/2015 18:04	LOG Fi
📓 Example_P	) 200 20	1=1	02/11/2015 18:03	Survex
		Open in Notepad		
		Open in SvxEdit		
		Process		
		7-Zip		
	2	Edit with Notepad++		
		Open with		
		Share with	•	
	å≅	Hg Workbench		
	9	TortoiseHg	•	
	۹ŝ	TortoiseSVN	•	
	M	Scan with Malwarebytes An	ti-Malware	
		Send to	•	
		Cut		
		Сору		
		Create shortcut		
		Delete		
		Rename		
		Properties		

- 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 16<sup>th</sup> character of the 1<sup>st</sup> line & the 14<sup>th</sup> character of the 28<sup>th</sup> line has something wrong with it, in this case I left a space in the name of the passage.



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.



This Lesson focuses

Individual survex files are tied together another text file is created instructing Survex on which files/stations to tie together Survex files Organized into different files according to which cave they came from Individual caves tied together - another text file is made instructing survex on which caves/stations to tie together

