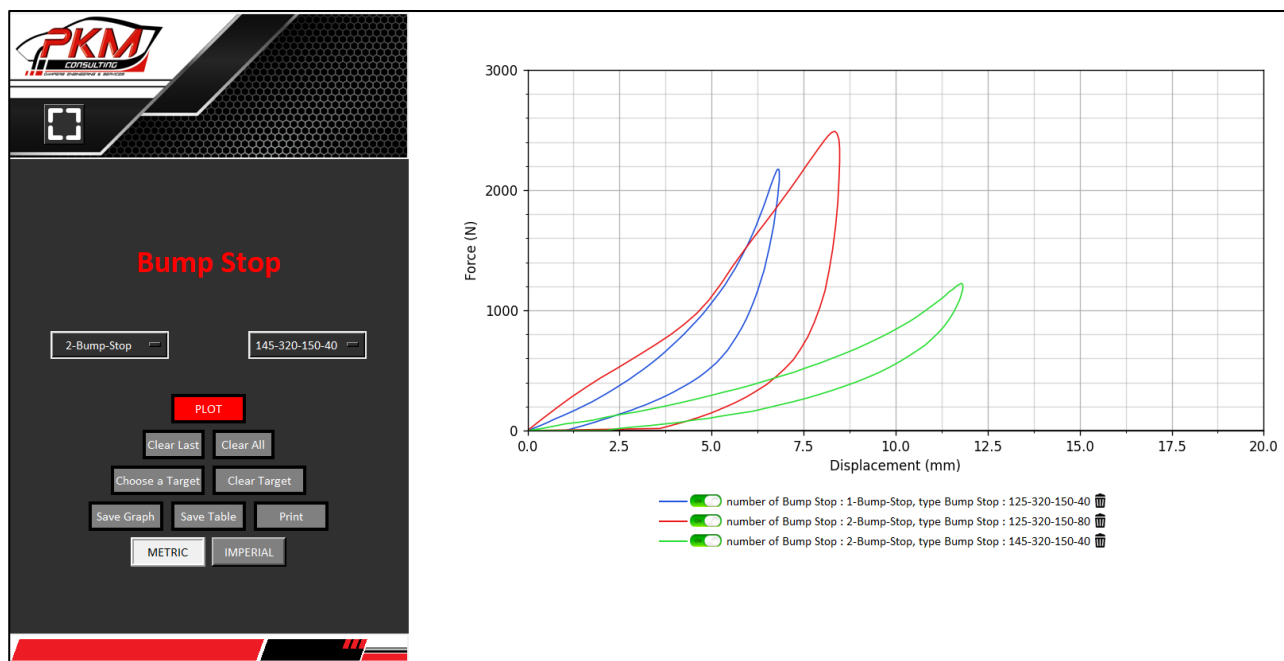


PKM Bump Stop

Software

Instruction manual



[IM]-PKM-SOFT-BUMP-SOFT-2.0
15/05/2023

Table of contents

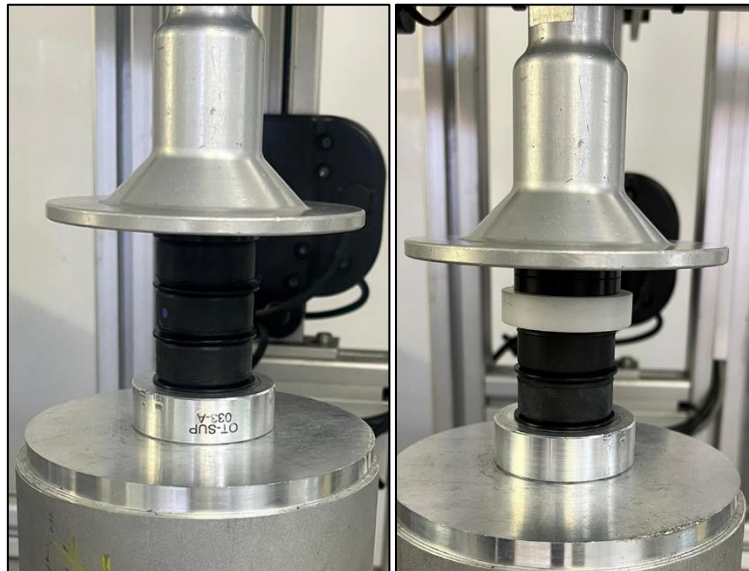
Chapt I :	Install	3
Chapt II :	Menu	4
1.	Presetting	4
2.	Setting.....	5
Chapt III :	Data exploitation	6
1.	Curves	6
2.	Target.....	7
3.	Legend	8
4.	Pointer	8
5.	Delete	8
6.	Save Table.....	9
7.	Save Graph.....	9
Chapt IV :	Window	9
1.	Keyboard shortcut	9
2.	Screen Size	9
3.	Scrolling menu	10
Chapt V :	Assistance	10
Chapt VI :	Uninstall.....	10
Chapt VII :	Versioning.....	11
Chapt VIII :	Notes	12

Chapt I : **Measuring protocol**

To get all data required to plot “bump-stop” behaviour curves we have established a protocol:
We set bumps-stop on a specially designed base; each bumps-stop are separated by packers (see picture below):



This assembly is positioned in the Roeherig test bench as in the two pictures below:



Then we launch the bump-stop test program, in which there is first a “warming” stage which takes some seconds and during which small compressions are performed at low amplitude and low speed. The second stage is the main stage of the test program and includes two compressions of 7.5mm amplitude for one bumps-stop, 15mm amplitude for 2 bumps-stop and 22mm amplitude for 3 bumps-stop. We repeat this last stage 3 times at 3 different speeds: 20 mm/s, 100/s and 200mm/s. Finally, the displacement/effort table is extracted to be plot on the PKM Bump Stop Software.

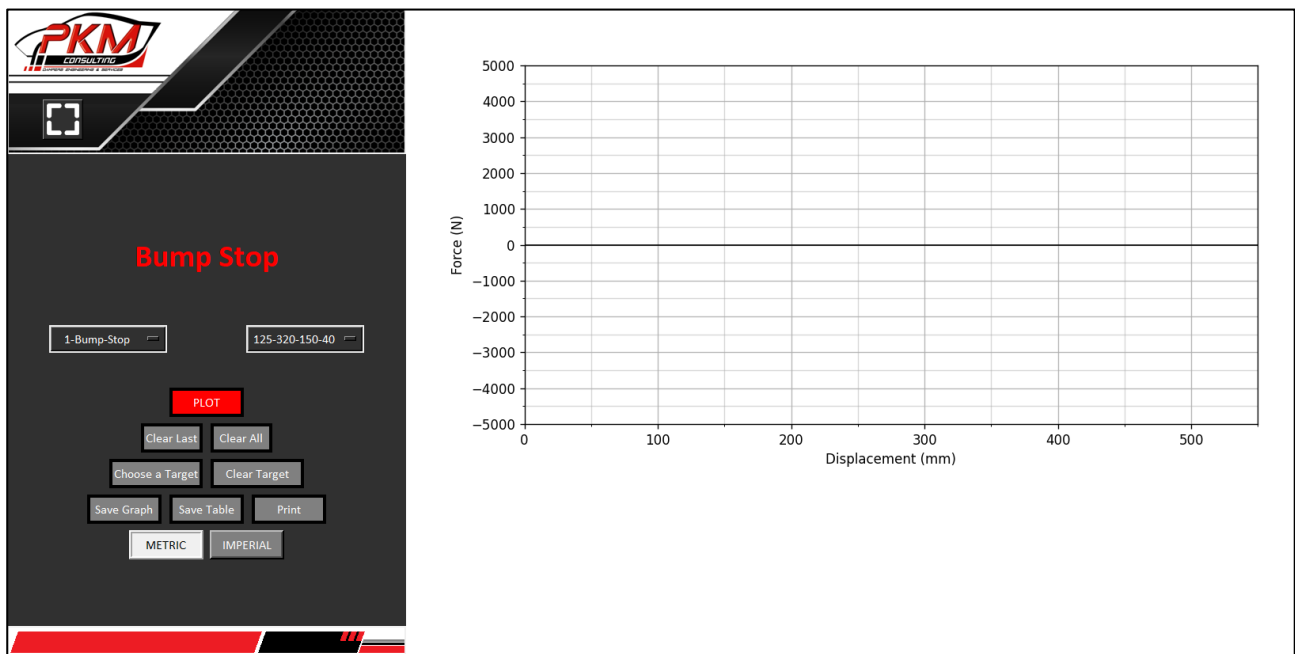
Chapt II : Install

To install the software correctly execute the installer: **"PKM Bump Stop software.exe"**

Click on the installer and allow the application to make changes on your computer.

Chapt III : Menu

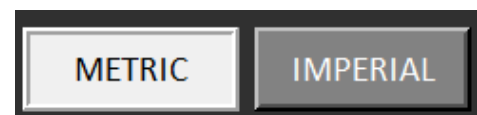
When you open the software, this is the first pargue you will see. Nothing is plotted. Metric is chosen by default like push damper. If you want to work in full screen, click on the button on the upper left corner.



1. Presetting

You must choose units you want to work with, metric or imperial. Metric is selected by default.

With metric, displacement will be in mm and force in Newton, in imperial displacement will be in inch and force in lbs. This preset can be moved at any moment.



2. Setting

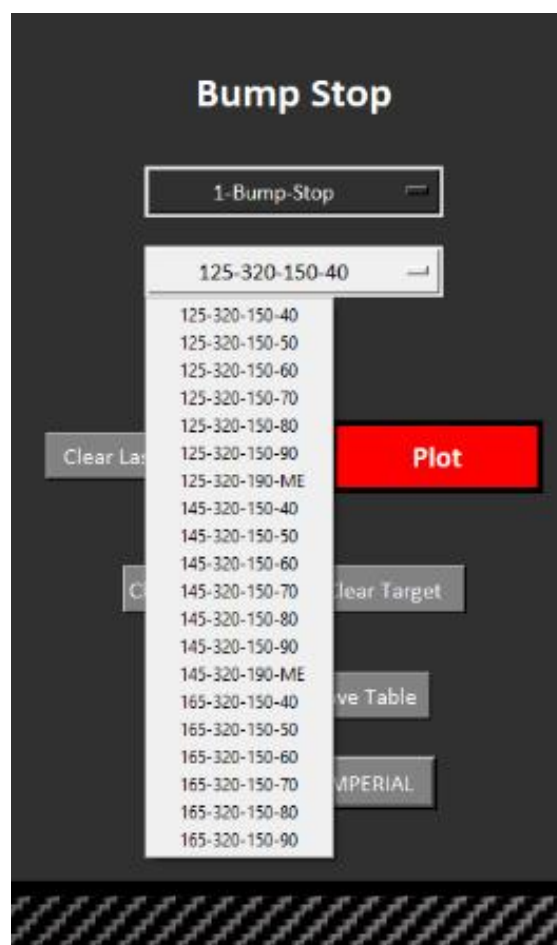
Now, you can create your setup.

First, set the number of Bump-Stop you want on your rod with the first folder. You can have 1,2 or 3 Bump-Stop at the same time on your damper.



Then, on the second folder, choose the Bump-Stop reference you would like to simulate.

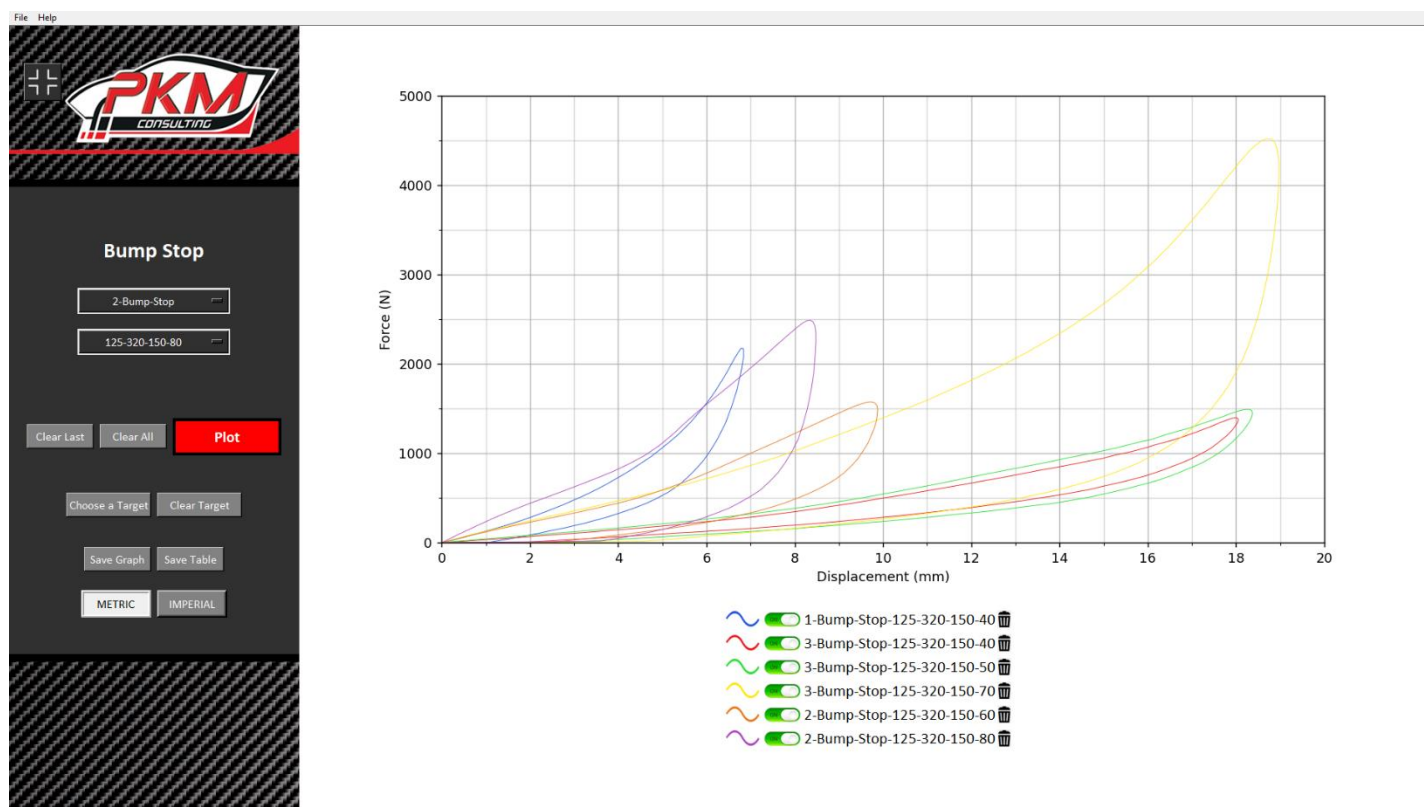
Plot your result.



Chapt IV : Data exploitation

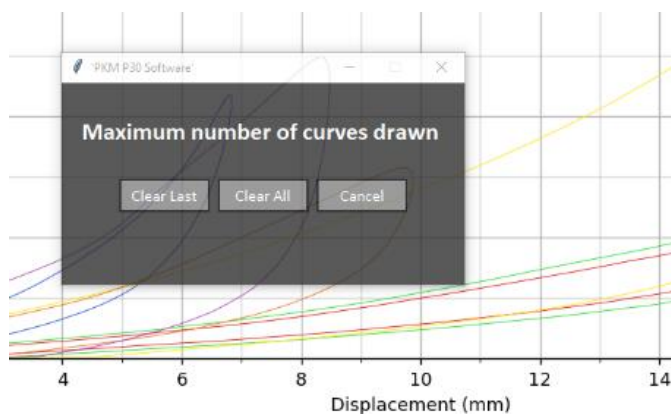
1. Curves

You can plot a maximum of 6 curves, all of them have different colors. The legend is behind the graph.



In the legend you can decide to hide a curve by clicking on the on/off button. Also, you can delete one by clicking on the trash bin. You can delete the last curve plotted by clicking on the button "Clear Last", or "Clear All" if you want to delete everything.

If you already plotted the maximum number of curves a message will appear. You can choose between "Clear Last" and "Clear all" to be able to draw again or cancel if you just want to come back.



2. Target

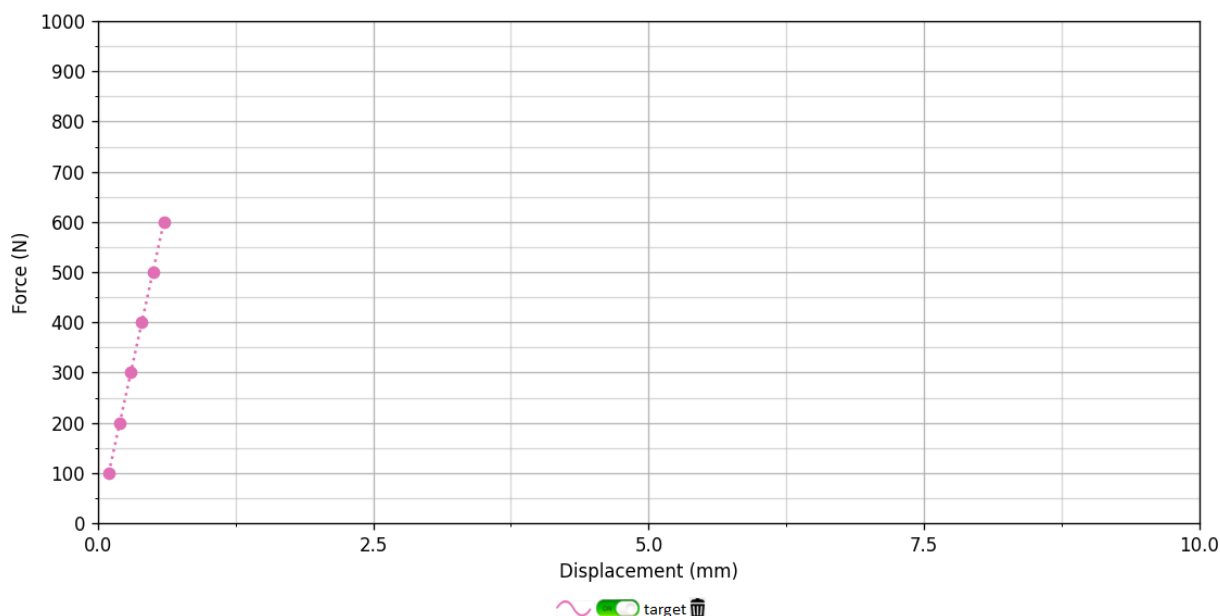
You can display the target you want to reach by clicking on the button choose a target. A window will open to find the file you want to display.

If you want to use this function, you must create a file dedicated to. This file is yours and must be fill by you. It needs to be a .csv file with “,” as separator. It can be generated by Excel of any word processor. Header must be displacement and Force. The data must be classified in the order you want to plot them.

On the right side, an example of a target file:

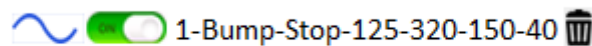
```
displacement,Force
0.1,100
0.2,200
0.3,300
0.4,400
0.5,500
0.6,600
```

Select the target throughout the window you just opened, and the curve will be plotted automatically in pink with the point you wrote. The “Choose a target” button will change and show the name of the file you choose. If you want to delete the target, use the button “Clear Target”.



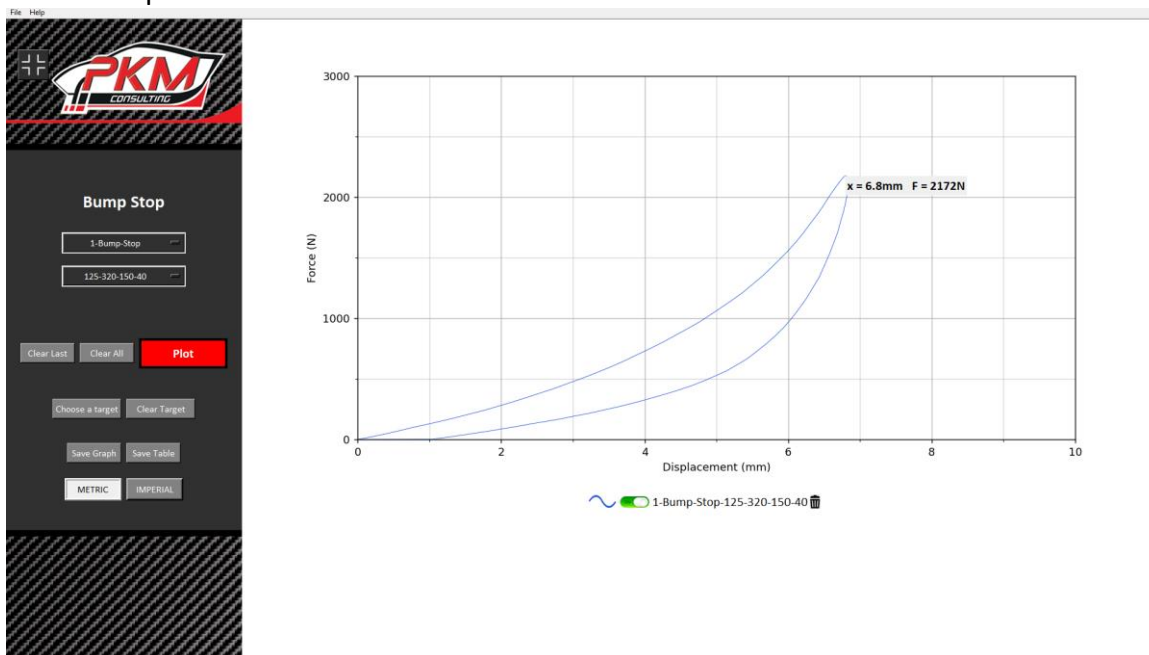
3. Legend

The legend behind the graph will show you all informations needed. In this order, number of Bump-Stop, inner diameter, outer diameter, thickness and stiffness in shore.



4. Pointer

If you want to know displacement and force at any place in the graph, just click on it, a frame will be displayed with displacement and force. If you stay clicked and move the mouse, the frame will follow the pointer.



5. Delete

If some curves don't fit with your exigence, you can of course clear them. Few methods can help you.

- You can delete precisely one curve by using the trash corresponding at his legend.
- You can clear the last curves drawn by using the button "clear last"
- You can also clean every curve of your graph by using the button "clear all"
- For the target, you must use the button "clear the target"

6. Save Table

The software allow you to save your data easily by generating a “.csv” file. Click on the button “Save Table” to open a window to decide which place and which name you want to give to your file.

7. Save Graph

If you want to save the graph, it is also possible. Just click on the button “Save Graph” to open a window to decide which place and which name you want to give to your file. You can also decide what kind of file you want to create as “.pdf” and “.jpeg”.

Chapt V : Window

1. Keyboard shortcut

You can also use the software with keyboard shortcut as follow:

- **Enter** : Plot
- **F11** : Fullscreen/Minimised Screenshot
- **Ctrl + s** : Save Graph
- **Ctrl + t** : Save Table
- **Ctrl + z** : Clear Last
- **Ctrl + r** : Clear All
- **Escape** : Close

2. Screen Size

You can set the size of your screen by clicking on the button on the upper left side.

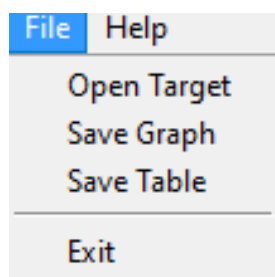
This button will allow you to Fullscreen the software.



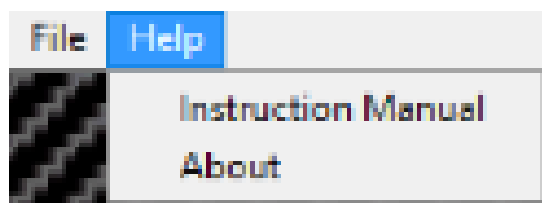
This one allows you to minimize the screen.

3. Scrolling menu

On the upper left side, you can find scrolling menu with command.



Help menu will give you the copyright and this instruction manual.



Chapt VI : Assistance

For any problems, please contact us at contact@pkm-consulting.com.

Chapt VII : Uninstall

To uninstall the software, right click on the Shortcut, click open file location.

lib	08/06/2022 12:21	Dossier de fichiers	
[IMJ]-PKM-Soft-Bump-Stop	08/06/2022 12:01	Chrome HTML Do...	795 Ko
PKM_Bump_Rubber_Software	08/06/2022 12:11	Application	140 Ko
python3.dll	23/03/2022 22:22	Extension de l'app...	61 Ko
python310.dll	23/03/2022 22:22	Extension de l'app...	4 342 Ko
unins000.dat	08/06/2022 12:21	Fichier DAT	1 809 Ko
unins000	08/06/2022 12:21	Application	3 086 Ko

On file location double click on unins000 to remove the software.

Chapt VIII : **Versioning**

REV	NAME	DATE	CHANGES
A	RICORD	24/05/2022	Creation
B	RICORD	05/07/2022	Update
C	ETTORI	15/05/2023	

Chapt IX : Notes

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....