ShotTrack VoD Monitor



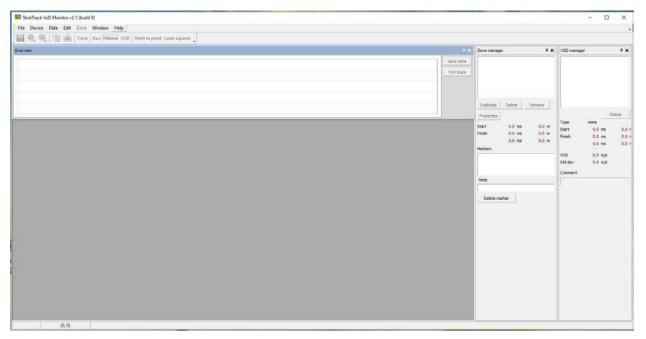
Operation Guide

USB download data operation:

Plug unit into USB Port with the supplied cable.

After the USB is recognized "double PC tone" is heard

Double click on the ShotTrack VoD Monitor Icon.



Clicking on Device will connect to the unit.

elect device	USB device		- 0		
SB connection		Cor	nnected		
Device				Connected	4
Connected	V6R1.4	•	Refresh		
Display units	Metres	•	Set units		
Repeat	0		Set repeat		
ime and Date					
		12.00.00	0-1 PTC	+	
26 June 2019		12:00:09	Set RTC		
26 June 2019		12:00:09	Set RTC		
26 June 2019					
26 June 2019 Cable factor			Set RTC		
26 June 2019 Cable factor					
26 June 2019 Cable factor	cable	1.594 •	Set cable factor		
26 June 2019 Cable factor	cable	1.594 🔶	Set cable factor		
26 June 2019 Cable factor Select standard of Cable length	cable 4 305.00 💼 m	1.594 €	Set cable factor		
26 June 2019 Cable factor Select standard of Cable length	cable	1.594 €	Set cable factor		
26 June 2019 Cable factor Select standard of Cable length	cable / / / / / / / / / / / / / / / / / / /	1.594 €	Set cable factor		
26 June 2019 Cable factor Select standard of Cable length	cable A 305.00 🗘 m calibration	Add E Cable factor	Set cable factor		

This screen is used to check the Battery condition, disk usage, version and revision of the software.

This is also where cable calibration is done. See later description.

Close this screen.

Click on Data:

Read ShotTrack					×
Select device		v	6		
Files				Directory Erase ALL	
Disk usage Battery Read file	2/127 50 <mark>%</mark>				
Connected Revision Ver 4, Rev 1.1 RTC clock 2/03/2016 1:00 Calibration factor 8.272):27 AM				
					Ŧ
			OK	Cance	el il

Disk usage, Battery condition, Revision version, RTC time and date, and current Calibration factor is displayed. Click on Directory

Read ShotTrack	×
Select device 🔹 💮	
Files VoD001, 2/03/2016 12:15:15 AM VoD002, 2/03/2016 12:17:33 AM	Directory Erase ALL
Disk usage 2/127 Battery 50%	
Read file	
Connected Revision Ver 4, Rev 1.1 RTC clock 2/03/2016 1:00:27 AM Calibration factor 8.272 Finished.	A
	-
0	K Cancel .:

The files currently stored on the unit is displayed in the Files dialog.

In this case there are two files stored on the 2nd March 2016 at 12:15:15 AM and 12:17:33 AM

These times are UTC format. They are acquired from the GPS module and will be accurate to a second if the GPS has "visible satellite reception". Otherwise it will be the time and date stored in the GPS modules RTC.

Click on file wanted and select read File.

Read ShotTrack	×
Select device 🔹 🚱	
Files	
VoD001, 2/03/2016 12:15:15 AM VoD002, 2/03/2016 12:17:33 AM	Directory
	Erase ALL
Disk usage 2/127 Battery 50%	
Read file	Time remaining 3 sec
Connected Revision Ver 4, Rev 1.1 RTC clock 2/03/2016 1:00:27 AM Calibration factor 8.272 Finished. UNIT=STVOD001GPS= \$GNRMC,001515.00,A,3016.85788,S,15305.78596,E,0.205,,020316,,, STime=00:14:28SDate=02,03,16TTime=00:15:15TDate=02,03,16FW= HW=V6R1.0Temp=4.296875e+01Bat=50Len=2.1259e+04Calib=8.272 SRate=6.400000e+04Res=9.411158e-11	=V4R1.1
Stop Of	Cancel .::

The file data header information is displayed and the data is downloaded with the progress bar showing the download progress.

Clicking OK will display the file in the overview window.

. 气 (吉 倍) Tack										Zone manager		
	1	1							Save zone	core nanage		
-												
									Trim trace			
10	5		8	5	5	15		5				
15-COL	0.12	12-15-08	145.0	1213	us:n	12-15-12	121513	11214				
Sec		2		0.44		241					Delete Ra	tione.
										Properties		
										Start Prish	0.0 ms	0.0 =
										Contract of the local data	0.0 ms	0.0
										Harkers		
										Markers		
										Markers		
										Markers Note		
											ker	
										Note Delete ma		
										Note		
										Note Delete ma		
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										Note Delete ma		
										Note Delete ma		
										Note Delete ma		D
										Note Delete ma VOD Mana	none 8.0 ms	0
										Note Delete ma VOO Manaa	nger 0.0 ms 0.0 ms	0.0
										Note Delete ma VOO Mana VOO Mana Siart Finah	nger 0.0 ms 0.0 ms 0.0 ms	0.0
										Note Delete ma VOD Mana Start Freah	oone 0.0 ms 0.0 ms 0.0 ms 0.0 ms 0.0 ms	0.0
										Note Delete ma VOO Mana VOO Mana Siart Finah	nger 0.0 ms 0.0 ms 0.0 ms	0.0

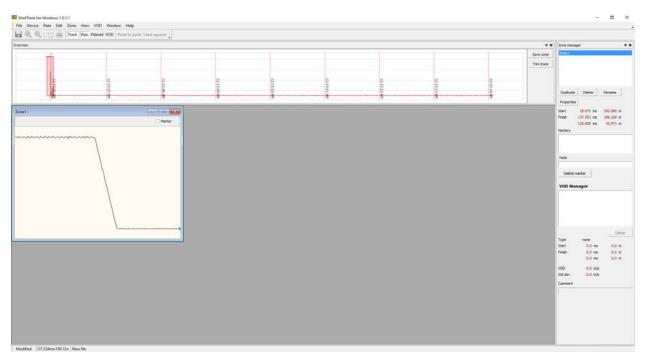
In this case this is one of our "Test Shot Equipment" files and uses a custom slope generator unit to mimic a shot. The unit is set to 64 KHz sample rate for this test.

As can be seen the GPS PPS data is displayed as a marker in the overview bar.

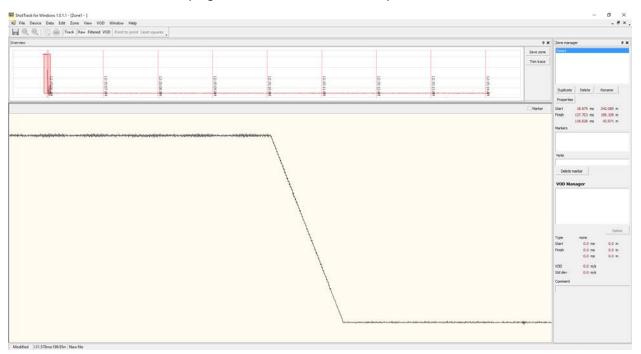
Select the region of interest by dragging the cursor from left to right with the right mouse button pressed.

File Device Data Edit Zone W									
🔜 🔍 🔍 🗐 🎒 Tack R	taw Filtered VOD Point to po	pint. Least siguares							
verview									9
eth .					1				Save zone
									Trim trace
12	121	12:1	12:1	8	52:1	臣	12	121	

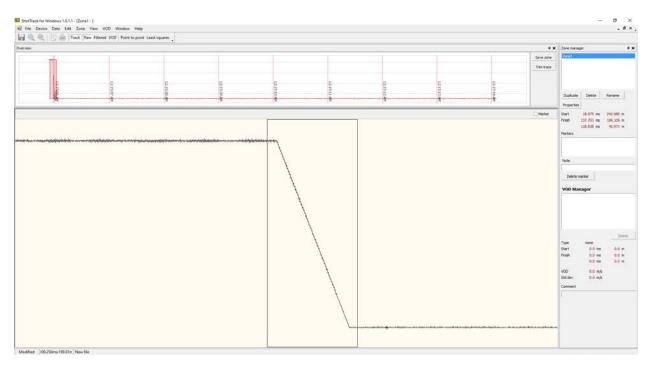
Clicking on Save zone will select a window with this "zone of interest"



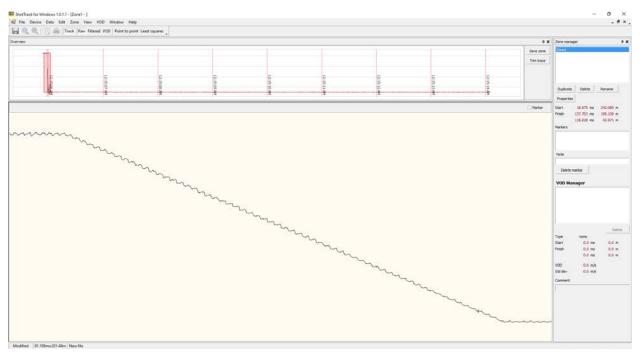
Click on the maximize button top right hand side of window will expand it to fill the main window



Drag a window over the area of interest:



Right click the mouse and select Trim region to get the area of interest.



Select File/Save as

-	🙋 Save ShotTrack 4 d	ata file						×
	$\leftarrow \rightarrow \cdot \cdot \uparrow$	« Dropbox > ShotTrack Commissioning > Sho	otTrack VoD Mini > VOD0000	1	∽ Ō	Search VOD00001		٩
	Organise 🔻 🛛 Nev	w folder						?
	🛃 ShotTrackPubl	lic ^ Name	Date modified	Туре	Size			
	🔐 Stefan 🍶 SVN_Projects 🌏 Websites	Slope_Test_Harmony_1_06_2.svm	2/03/2016 10:45 AM	SVM File	305 I	KB		
	 OneDrive Apps Documents Music Outlook Files Pictures Projects This PC 							
	File <u>n</u> ame:	Slope_Test_Harmony_1_7_0ksvm						~
	Save as <u>t</u> ype:	ShotTrack 4 files (*.svm)						~
	∧ Hide Folders					<u>S</u> ave	Cancel	

Browse to where you want to save the file and click Save.

File analysis

Open ShotTrack VoD Monitor and click on File/Open.

Navigate to the location you have saved the file you wish to analyze (you can do this immediately after downloading the data from the unit without opening the file).

Choose the file and click Open.

-	🚾 Open ShotTrack 4 data fil	e					×
	\leftarrow \rightarrow \checkmark \uparrow \square \ll Pro	ojects > ShotTrack > VoD_Mini > Software	> Documentation > Sar	nple Data 💊	÷ ۵	Search Sample Data	P
	Organise 👻 New folde	er					?
	🚽 ShotTrackPrivate ^	Name	Date modified	Type Siz	ze		
	ShotTrackPublic	Sample Shot 1.svm	18/02/2016 3:05 PM	SVM File	28 KB	3	
	💷 Stefan					-	
	SVN_Projects						
	🛃 Websites						
	ineDrive 🍊						
	Apps						
	ocuments						
	on Music						
	🔊 Outlook Files						
	Pictures						
	Projects						
ŀ	💻 This PC						
	💣 Network 🗸 🗸						
	File <u>n</u> a	ame: Sample Shot 1.svm			~	ShotTrack 4 files (*.svm) <u>O</u> pen Cance	 ✓ I

The file is loaded and the overview window shows the events captured along with the PPS markers.

📆 🎰 Track Rao (Flarent VCO Point to point Leaft oppoint			Zone numager
- Li Differenti Torrette	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Size zon	Duplicate Delete Rev Properties
			Note no Marker VOD Manager
			Type Least squares Start mi Prath mi mi VOD n/k Still dev n/k

Enter Shot properties:

If this hasn't been done when loading the data from the unit, the Shot properties should be entered now.

From the task bar select Edit/Shot properties

Edit shot parameters			×
General Cable Bla	ast Defaults		
Box header	STVOD002		
GPSHeader	Lat: 37° 07.64040' S 4/02/2016	Long: 174° 59.31422' E 22:08:56	
Shot description			
Blast date	5/02/2016 💌		
Time of firing	9:08:56 AM		
		OK Cancel	

Enter the Shot description.

E	dit shot parameters			×
	General Cable Blast	Defaults		
	Box header	STVOD002		
	GPSHeader	Lat: 37° 07.64040' S 4/02/2016	Long: 174° 59.31422' E 22:08:56	
Ł	Shot description	Sample Shot		
	Blast date Time of firing	5/02/2016 ▼ 9:08:56 AM ◆		
			OK Cancel	

Edit shot parameters	
General Cable Blast D	efaults
Initial return time	1001.1 🔺 nsec
Cable factor	8.546
Initial cable length	117.15 <u>*</u> m
Resolution	0.09 🔔 nsec
Sample rate	25600000 samples per second
Arm time	4/02/2016 💌 9:57:03 PM 🌲
Trigger time	4/02/2016
	OK Cancel

The cable screen shows the state of the shot at the time of the trigger.

The Arm and Trigger times are in UTC and the shot was fired 12 min after the unit was set.

The Trigger time has a seconds decimal point value that is calculated from the GPS PPS and is accurate to the sample period of 0.00000390625 seconds.

Fill in Blast information.

E	dit shot parameters		×
		1	
	General Cable Blas	st Defaults	
	Shot ID	Number 1	
	Operator	Roy Miller	
	Mine	Big top one	
	Rock	Granite	
	Hole diameter	110 🛖 mm	
	Hole depth	20, 📫 m	
			OK Cancel

Fill in default product and positioning info.

_				
E	dit shot parameters			X
	General Cable Blast	Dofruita		
	General Cable blast	Defaults		
	Product	STD Anfo 1234		
	Stemming length	2.0 🗘 m		
	Primer offset	1.0 🗘 m		
		,		
1				
-				
			OK Cancel	

As can be seen the relevant data is at the start of the recorded data in four sections.

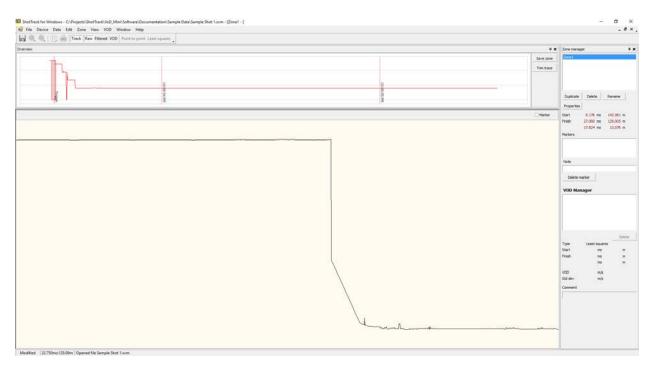


Select the regions of interest by holding the left button down and dragging the cursor selecting the area of interest.

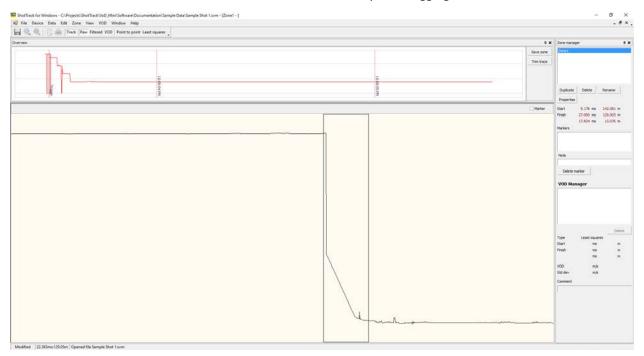
Overview			
-			Save zone
			Trim trace
	10	10	
E	854	8	
	2	1	

Click on Save zone and a window opens showing this selected area.

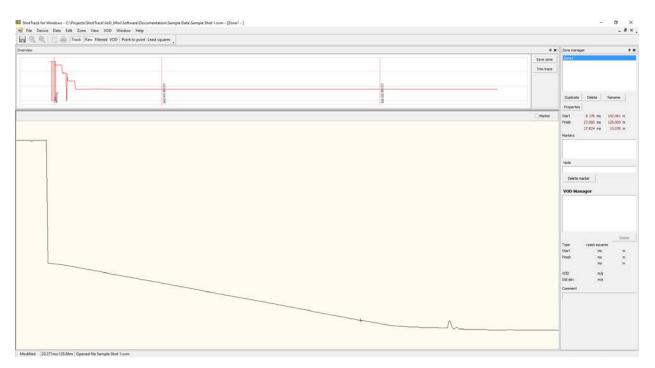
Click on enlarge to fill window.



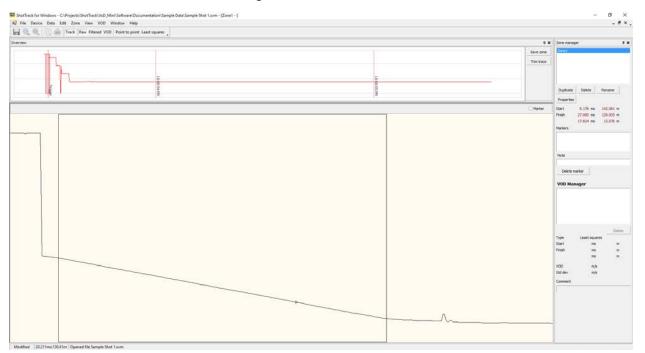
We can now further zoom in on the area we are interested in by left dragging the cursor over what we want.



And then right click to select Trim region.



To select an area to calculate a VoD left drag cursor to select it.



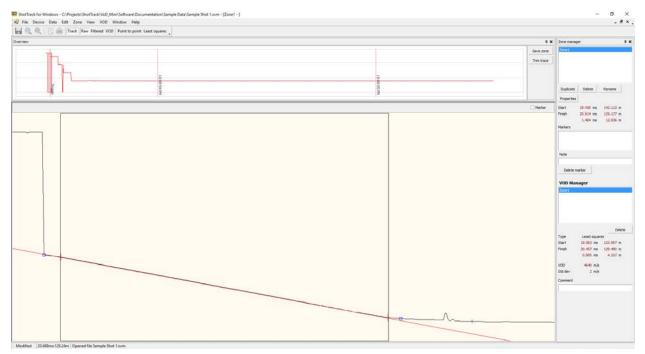
In this case I have noticed a area at the beginning of the trace where the VoD is lower than over the rest of the trace. I have positioned my selected are to start after this.

Press right mouse button and click on Leaste squares.

You will be asked to confirm this.

Confirmation							
VOD = 4640 m/s +/- 2 m/s, save this result?							
Yes	No						

After pressing Yes the VoD is calculated and a red line indicates the "slope".

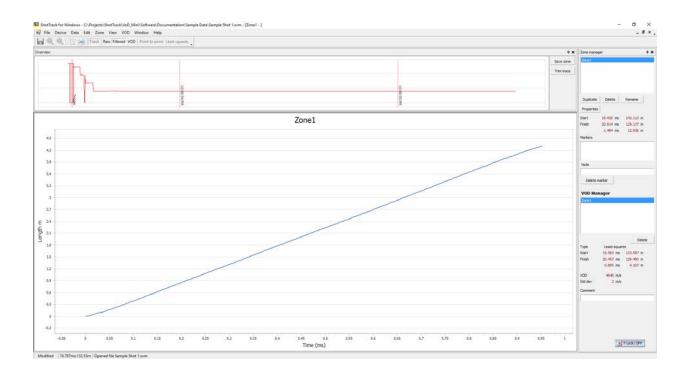


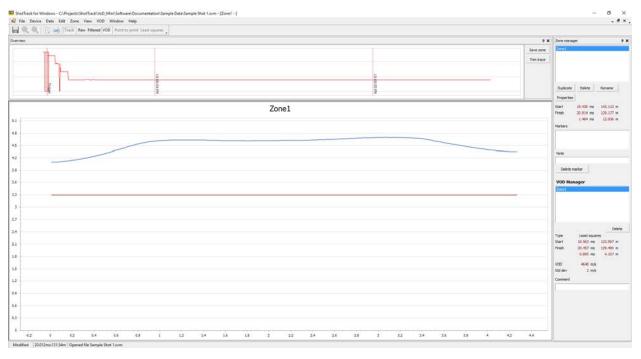
The software assignes blue dots to indicate the area it thinks is of interest.

These blue dots are used to select the area for Filtered data and continuous VoD calcuations.

These dots can be moved by left clicking on them and dragging with the mouse.

Clicking on Filtered in the task bar calculates a filtered graph of the area of interest.





The zone details should now be entered:

Zone manage	er						×
Zone 1							
Duplicate	Delete		Rer	name			
Properties							
Properues							
Start	19.430						
Finish	20.914						
	1.484	ms	12	2.936	m		
Markers							_
Note							
Note							-
I							
Delete ma	arker						
VOD Man	ayer						_
Zone 1							
				D	elet	e	
Туре	Least s	quare	s				
Start	19.563			3.597	m		
Finish	20.457	ms	129	.490	m		
	0.895	ms	4	ł. 107	m		
VOD	4640	m/s					
Std dev		m/s					
Comment							

Clicking on Properties opens the dialog box.

Blast Explosive		
Shot ID	Number 1	
Operator		
Mine	Big top one	
Rock		
Hole diameter	0 € mm	
Hole depth	0.0 🜩 m	

Pressing Copy from Shot parameters uses the default values entered earlier.

dit region parameter	5	>
Blast Explosive		
Shot ID	Number 1	
Operator	Roy Miller	
Mine	Big top one	
Rock	Granite]
Hole diameter	110 🔺 mm	
Hole depth	20.0 🛉 m	
Copy from Shot par		OK Cancel

Blast Explosive		
Product	STD Anfo 1234	
Hole ID	24-25-001	
Deck No	1 🚔	
Charge length	7.0 💂	
Stemming length	2.0 🛉 m	
Primer offset	1.0 🛖 m	

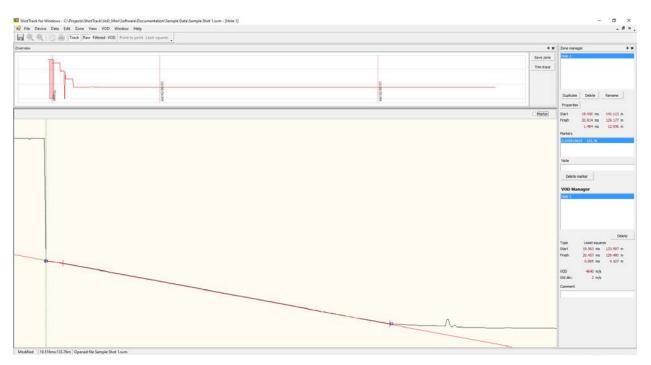
In the explosive tab enter Hole ID deck number and charge length. Edit the default Stemming length and Primer offset if needed.

The Zone can be renamed if wanted, in this case we called it Hole 1

Marker insertion:

In the top right hand corner of the zone screen there is a check box named Marker.

Checking this box allows you to place a marker at any point on the screen.



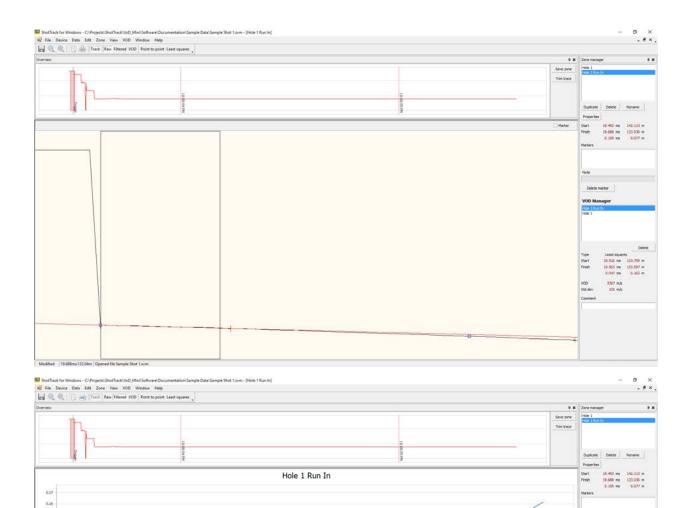
This marker is time stamped to the GPS calculated time and date.

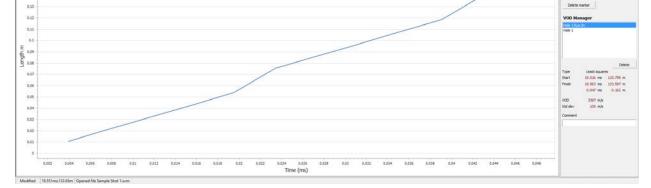
Other notes can be added and we now have a Zone manager filled in for the first hole.

Zone manage	er		ч X
Hole 1			
Duplicate	Delete	Rename	
Properties			
Start		142.113	
Finish		129.177	
	1.484 ms	12.936	m
Markers			
0.01951562	5 133.76		
Note	A		
Cut of cable	first hole		
Delete m	arker		
VOD Man	ager		
Hole 1			
		D	elete
Туре	Least squ	lares	
Start	19.563 m	s 133.597	m
Finish	20.457 m	s 129.490	m
	0.895 m	s 4.107	m
VOD	4640 m	/s	
Std dev	2 m		
Comment			
Hole 1 was v	wet		

As I had noticed that the looked like a "run to detonation" period that I am interested in I have clicked on Duplicate to get a copy of the zone. I have renamed this to Hole 1 Run In.

I have selected a closer look at the beginning of the trace and done a "leaste squares" calculation on this.





0.15 0.14

To have a look at the continuous VoD I need to change the VOD averaging width to fit the data points recorded with the filter.

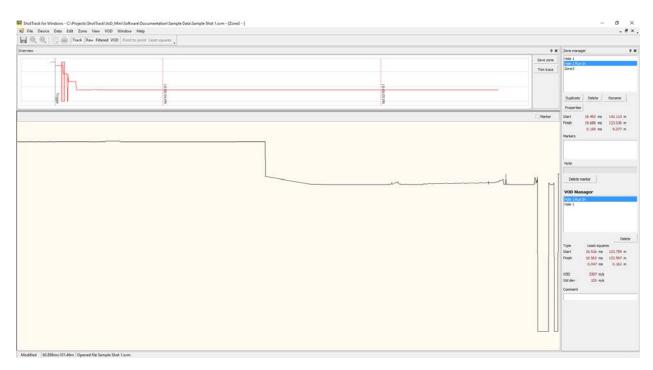
Edit application options			×
			^
Calculations Company General	Filters		-
Language	VOD averaging width	10 🜩	
-	Extended filtering		
	Auto-create zones		
	Length change	1.0 🛖 m	
-	Flat zone	10.00 🗭 ms	
-	Filter width	10 🜩	
-	Get defaults		-
-			-
-			-
1		OK Cancel	
-		ii	

In this case I choose 10.

R Tax Raw Filtered VCO Point to point Least squares		
	4 ×	Zone manager
	ve zone	Hole 1
	m tace	
197 - 197 -		Duplicate Delete Rename Properties
Hole 1 Run In		Hoperes 3 Start 15:492 ms 142.113 m Prish 15:688 ms 133.036 m 0.395 ms 9.027 m Markers
		Note
		Note
		Delete marker
		V00 Manager
		Hole 1 FLH 10 11
	_	
	_	Del
	1	Type Least squares Start 19.555 ms 133.759 m Prish 19.563 ms 133.997 m 0.047 ms 0.363 m
		VOD 3397 m/s
		Std dev 105 m/s Comment
	_	
	-	

Next I want to look at the next hole.

I reselect the area around the next event.



And then followed the same procedure to get a VoD for the hole.

Track Raw Filtered VOD Poi	re to point. Least squares			
			* ×	Zone numager
			Save zone	Hole 1
			Trim trace	Hole 1 Run In
The second secon				
	1	5	1 A A A A A A A A A A A A A A A A A A A	
17	8	8		
§ U I	4 204	1		Duplicate Delete Renam
14.5 ×	T.o.	15		Properties
			D Marker	Start 55.328 ms 129.46
				Prish 56.629 mt 100.24
				1.501 ms 29.22
1				Markers
				0.05529453125 105.48
				0.055304533125 105.48
				Note
				Cut of cable at hole 2
				Delete marker
				V00 Manager
				Hole 1 Run In
				Hole 1
				A REAL PROPERTY AND A REAL
1				
1				
1				
				Type Least squares
3				Start 55.395 ms 105.4
				Finish 56.477 ms 100.50
				1.082 ms 4.9
				V0D 4695 m/s
				Std dev 3 m/s
				Comment
1				This hole not wet
w				I HAR NOT WELL
			0-	
				(

I then did the same for the remaining holes.

					-	-		
Zone manag	jer			1	ļ	×		
Hole 1 Hole 1 Run Hole 2 Hole 3	In							
Hole 4								
Duplicate	Delete	•	Rename					
Properties								
Start	115.262	ms	72.065	m				
Finish	116.738	ms	42.732	m				
	1.477	ms	29.332	m				
Markers								
0.1153593	75 47.53	3						
Note								
Cut hole 4								
Delete m	arker							
VOD Manager								
Hole 1 Run	In							
Hole 1								
Hole 2								
Hole 3								
Hole 4								
_				elete				
Туре		quares						
Start	115.371							
Finish	116.316		43.228					
	0.945	ms	4.258	m				
VOD	4588	m/s						
Std dev	2	m/s						
Comment								
Run to deta	onation no	t obvio	JS					

When finished a report can be generated.

From the task bar select File/Export report.

🗖 Save As		×
- < > ~ ^	« Projects > ShotTrack > VoD_Mini > Software > Documentation > Sample Data 🗸 💍 Search Sample Data	Q
Organise 🔻 Ne	ew folder 🔠 🔻	?
 ShotTrackPut Stefan SVN_Projects Websites OneDrive Apps Documents Music Outlook Files Pictures Projects 	s No items match your search.	
File <u>n</u> ame:	Sample Shot Report	~
Save as <u>t</u> ype:	Excel files (*.XLSX)	~
∧ Hide Folders	Save Can	cel

Navigate to directory wanted and enter file name, click save.