WILDLIFE ACOUSTICS

Kaleidoscope Pro

Quickstart: Bat Auto-ID

Welcome to Kaleidoscope Pro.

This Quickstart guide is designed to show you the basics of using Kaleidoscope Pro software to analyze recordings of bats in just a few minutes. There is also an accompanying video tutorial that follows the steps described below.

Go to www.WildlifeAcoustics.com and follow the download links for Kaleidoscope. Download and install Kaleidoscope.

The first time you launch Kaleidoscope you'll be presented with a software license agreement window, and then a window takes you back to the Wildlife Acoustics website. Here you can request a 15 day trial for Kaleidoscope Pro. You will need to create a Wildlife Acoustics web account. Once you have created your account and requested a trial for Kaleidoscope Pro you will receive an email reply with a demo license code and instructions to activate the trial.

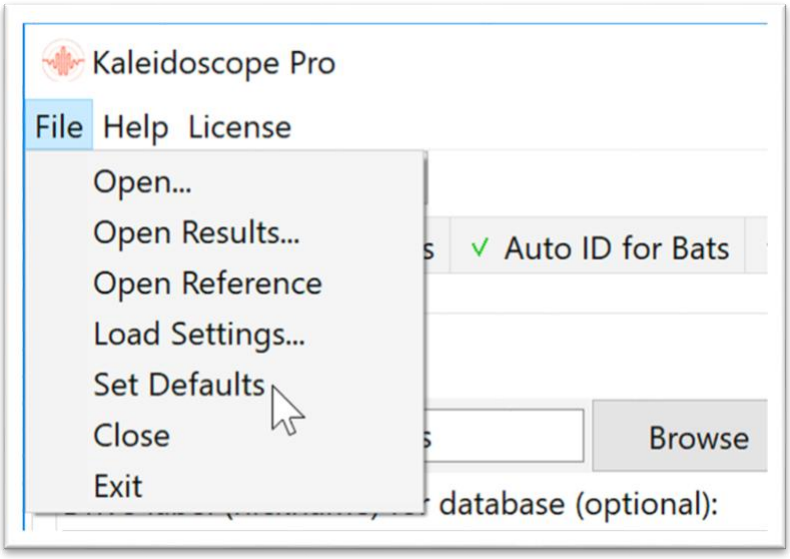
The next window that opens asks you to select Bat Analysis mode or Non-bat Analysis Mode. Because this Quickstart is about bat analysis, go ahead and check that option. Once the Kaleidoscope Control Panel window opens go to the License menu and choose the option to install the demo license. Type in the demo license you received in the email and that will activate the Kaleidoscope Pro features for the next 15 days. If you have already run the demo version and the trial period has expired, contact Wildlife Acoustics and we'll be happy to reset the trial period on your computer.

Download the Demo Data Files

Included with this Quickstart demo are sample bat recordings made with an SM4BAT recorder in Massachusetts U.S.A. Download and unzip the SM4BAT Examples file on your computer. Inside the downloaded folder will be a Data folder and a second folder named Outputs. The Data folder contains the raw bat recordings. The Outputs folder is empty.

Initialize Kaleidoscope Pro

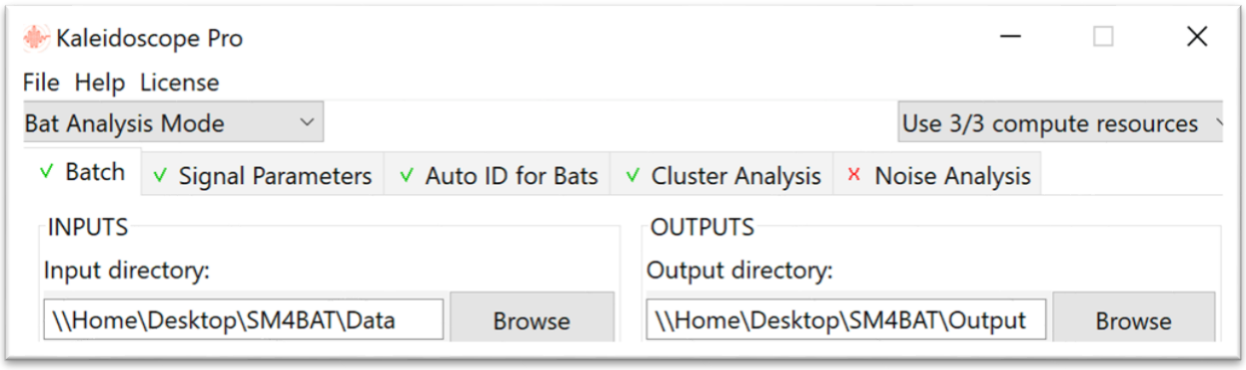
Go to the File menu and choose Set Defaults. This will initialize all settings within Kaleidoscope Pro. You will get the dialog box again asking about Bat or Non-bat Analysis. Choose Bat Analysis Mode.



Select Input and Output Directories

- Click on Browse under Input Directory on the left of the Control Panel. Navigate to the SM4BAT Examples folder on your hard drive. Select the Data folder and click Open (Mac) or Select Folder (Windows). Kaleidoscope Pro now knows where to look to find the input files.

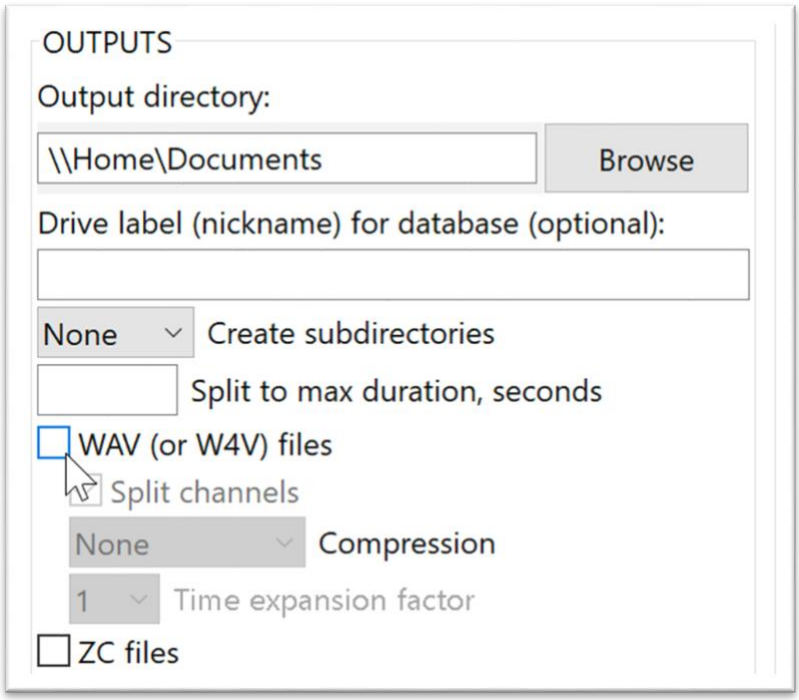
- On the right under Outputs click on the Browse button and navigate to the SM4BAT folder. Select the Outputs folder and click Open/Select Folder. Kaleidoscope Pro now knows where to create its output results.



Disable File Conversion

Kaleidoscope Pro can create full spectrum and zero crossing files when doing a batch conversion. This function is not required for bat auto-ID. To save disk space and processing time we'll disable the option to create these files when we scan the input files.

Under the Outputs section, uncheck the option for WAV (or W4V) files.

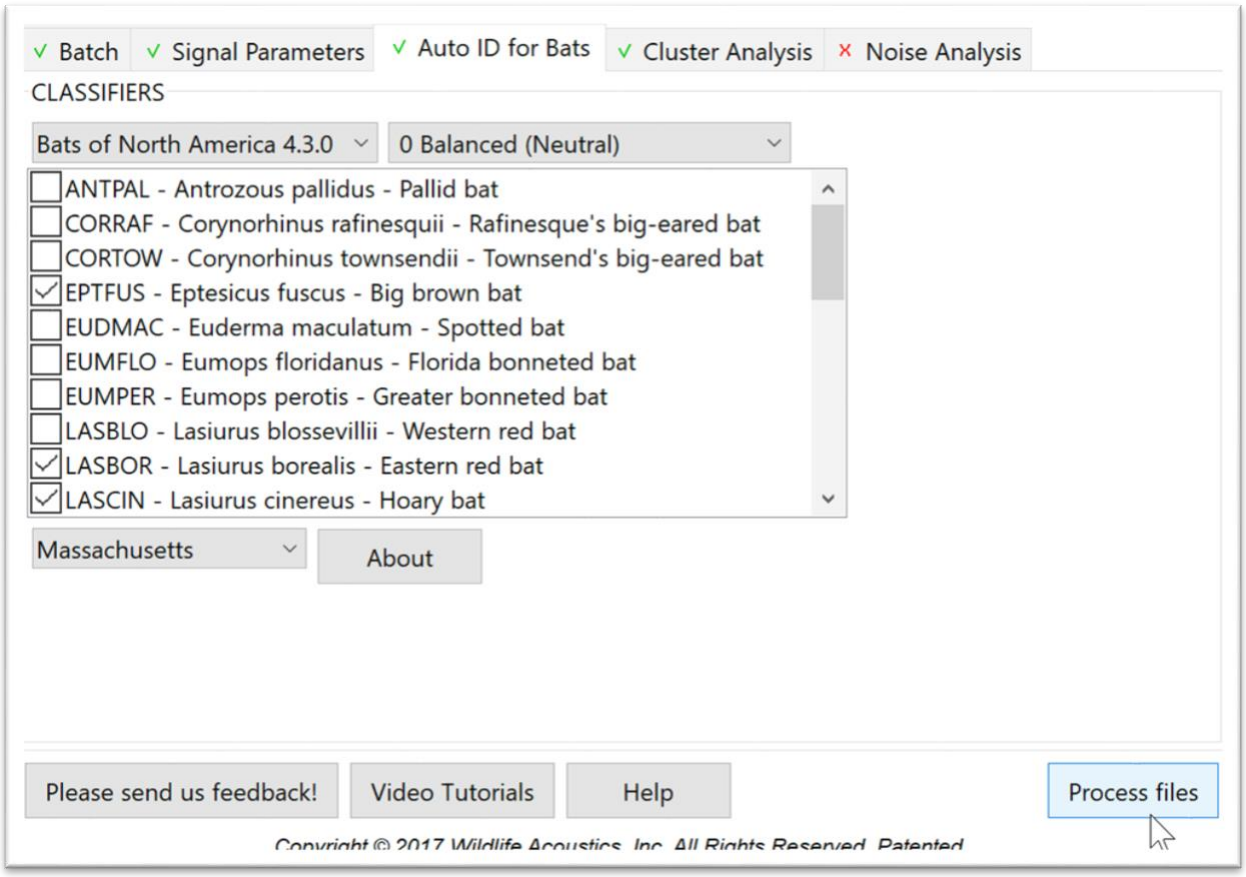


Select Geographic Classifier

Kaleidoscope Pro can analyze full spectrum and zero crossing files to look for evidence of bats.

Kaleidoscope Pro can then analyze the actual bat pulses and sequences or pulses to attempt to identify the bat species. A library of reference recordings are used for comparison and analysis.

At the top of the control panel window click on the Auto ID for Bats tab. Under Classifiers click on the menu and choose Bats of North America. Below that choose Massachusetts from the Region menu.



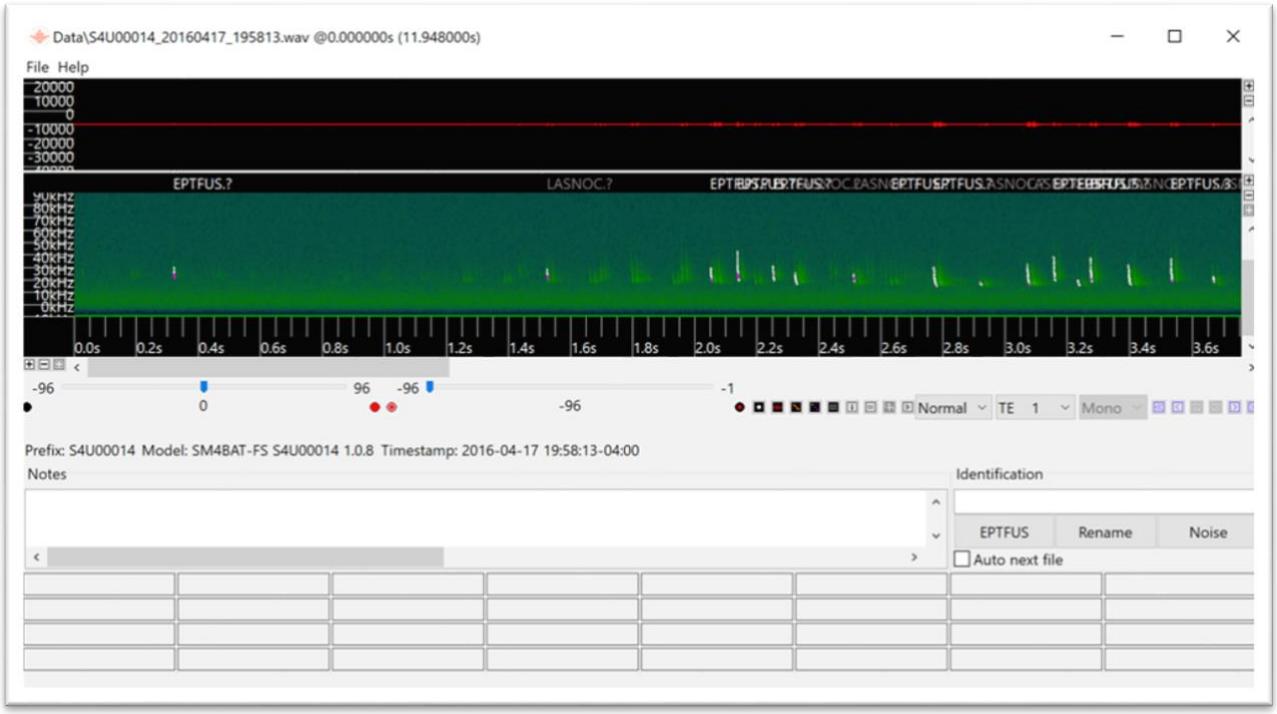
Run the Batch Process

In the bottom right hand corner of the Control Panel click the button to Process files.

Kaleidoscope Pro goes to work and analyzes the input files. The next thing that happens is the Viewer window opens to show you the first analyzed file from the Input batch. The Results window also opens with the Viewer. The Results window lists all the files from the batch process analysis.

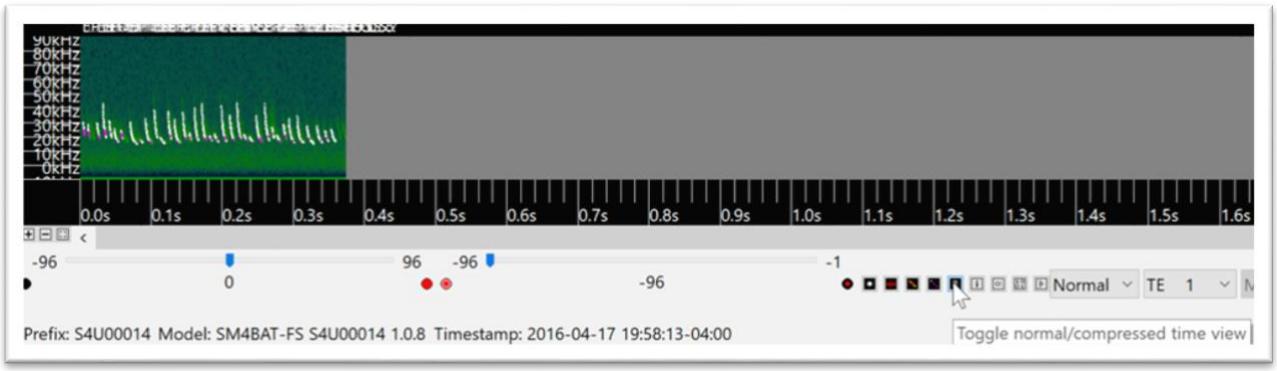
Examine Files with the Viewer

The Viewer window shows graphic representations of the sequence pulses and also allows for audible playback of these signals. The Viewer works in combination with the Results window. The Results window lists all the files that have been analyzed and their initial auto-identification. It is possible to use the Viewer and Results window to manually review the auto-analysis and to add manual identification and other notes to the data.



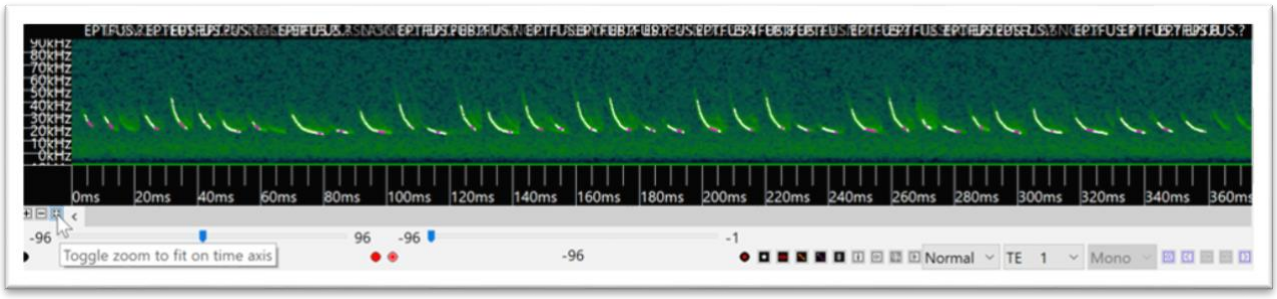
Show Compressed View

Click the button to compress the view. This will remove any blank space from between the individual pulses, so more pulses can be viewed simultaneously.



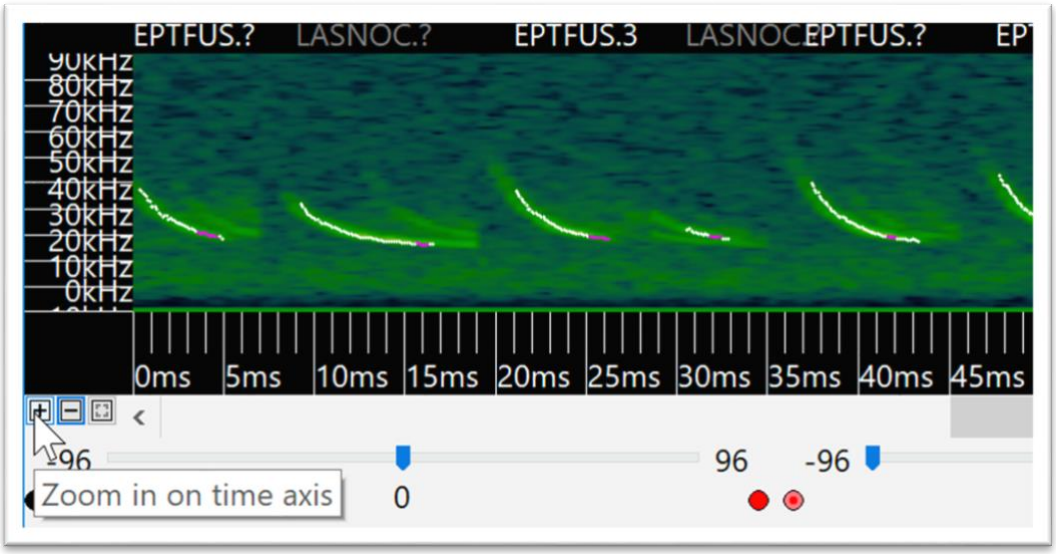
Expand to Fit to Window

Press the button to zoom to fit to window.



Zoom In to See a Detailed View

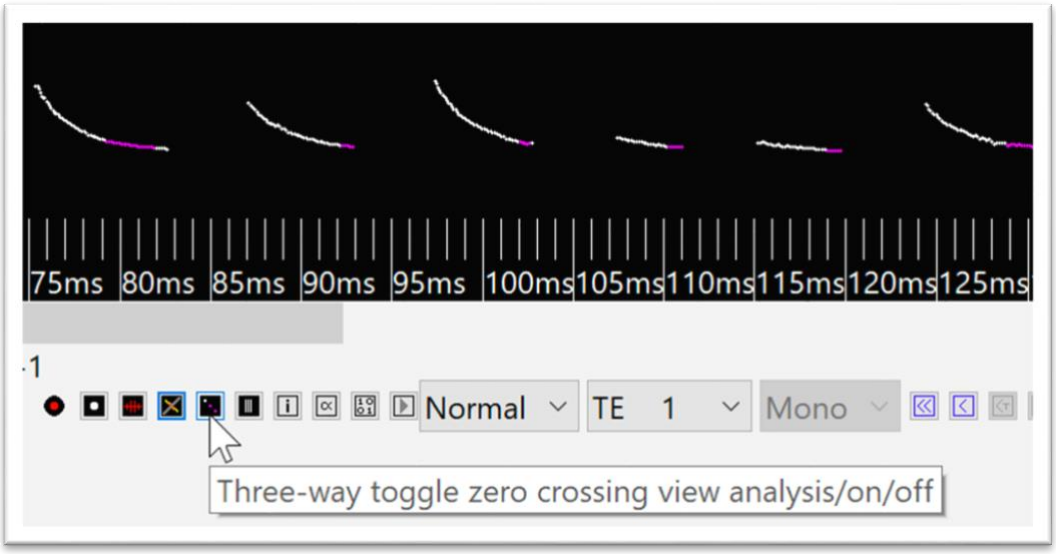
Use the zoom buttons in the lower left corner of the Viewer to zoom in for more detail.



Show or Hide Zero Crossing View

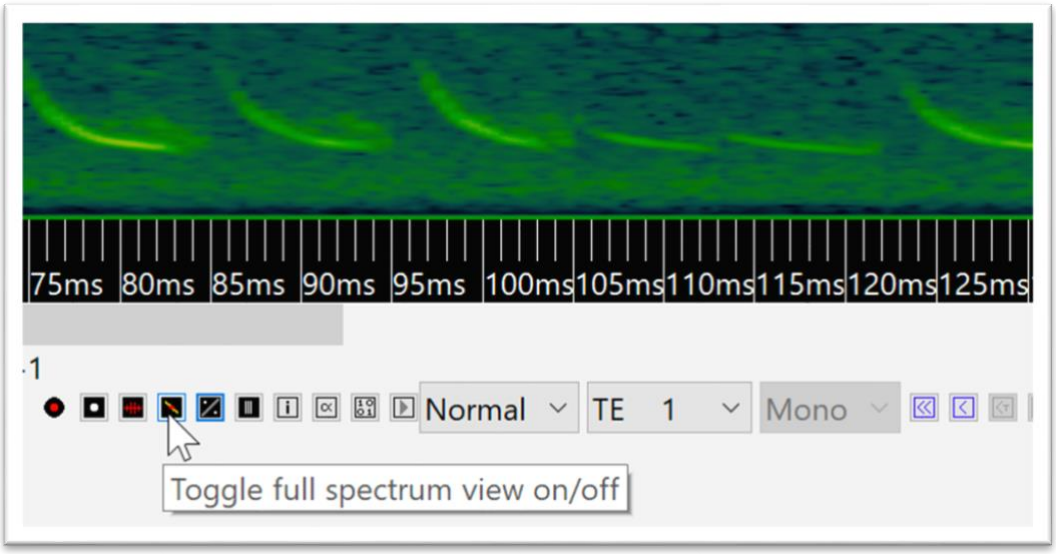
The zero crossing button has three states.

- It can disable the zero crossing view.
- It can show zero crossings.
- It can show zero crossings with analysis for the body of the pulse.



Show or Hide Full Spectrum View

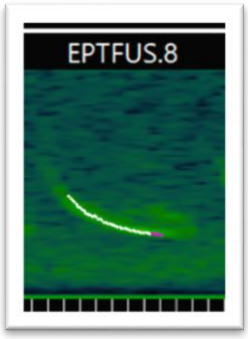
The Viewer can hide or show the full spectrum view.



Check the Auto ID

Kaleidoscope Pro compares each pulse with the selected classifier reference libraries. After the batch process scan, pulses that match pulses from the reference library are labeled.

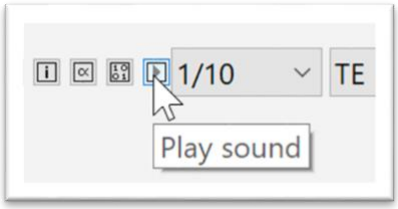
Kaleidoscope Pro looks at individual pulses and the overall sequence of pulses and then make a single classification for the overall pulse sequence. Pulses that match the sequence level classification are highlighted.



If Kaleidoscope Pro sees a pulse that does not match the sequence level classification, that classification will not be highlighted.

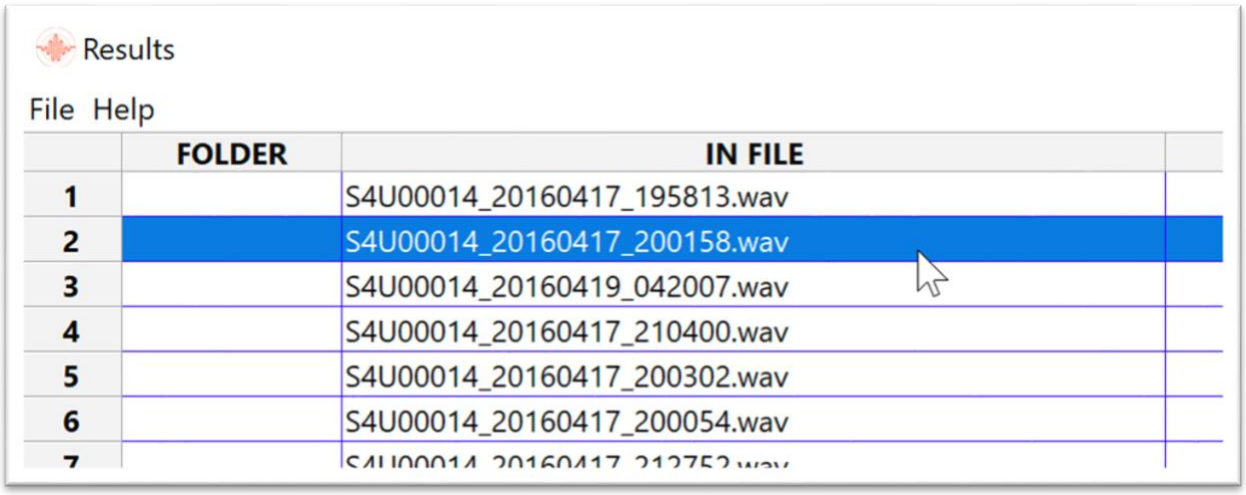
Audition the Bat Pass

You can audition the sound of the pulse sequence in the Viewer. There is a play button in the bottom-center of the Viewer window but at normal playback speed you won't be able to hear the ultrasonic bat sounds. To the right of the Play button is a speed adjustment menu. Click on this menu and choose 1/10. This will cause the audio to be played back at one tenth of its original speed. Click Play to hear the echolocation call over your computer speakers. If you want to hear the pulse sequence with its natural timing, disable the compressed view before playback.



Select Files in the Results Window

The Results window works in combination with the Viewer. Select a file in the Results window and that file will be displayed in the Viewer. You can use the up and down arrow keys on your computer keyboard to quickly toggle between files.

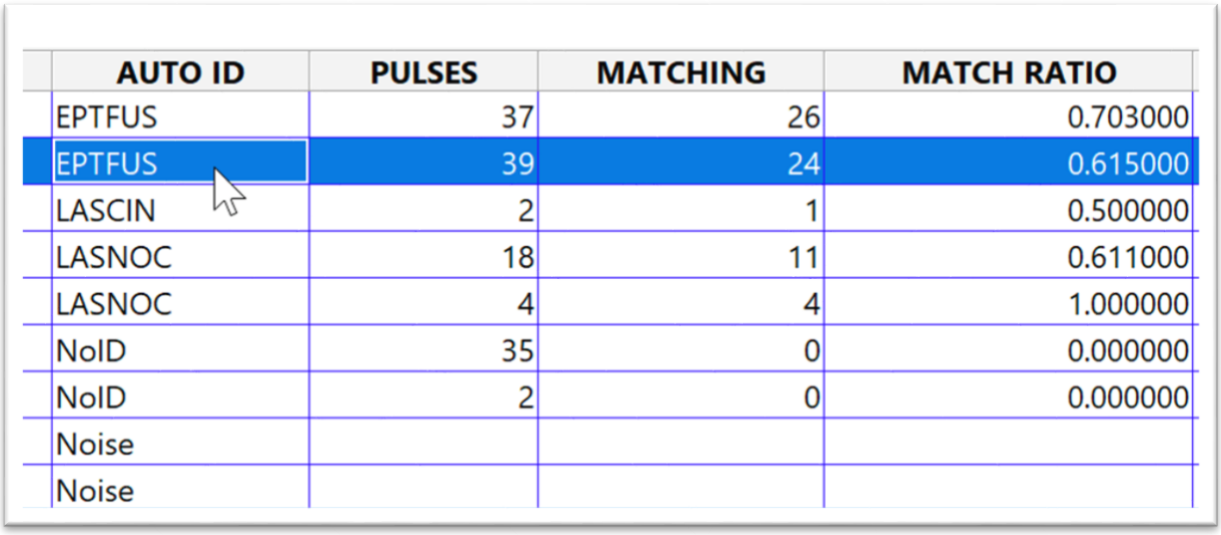


Select Files in the Viewer

Use the next and previous file buttons to toggle between files.

Check Auto IDs in the Results Window

The Results window represents an underlying id.csv spreadsheet file. Initially the Results window and id.csv file contain the auto ID scan results.

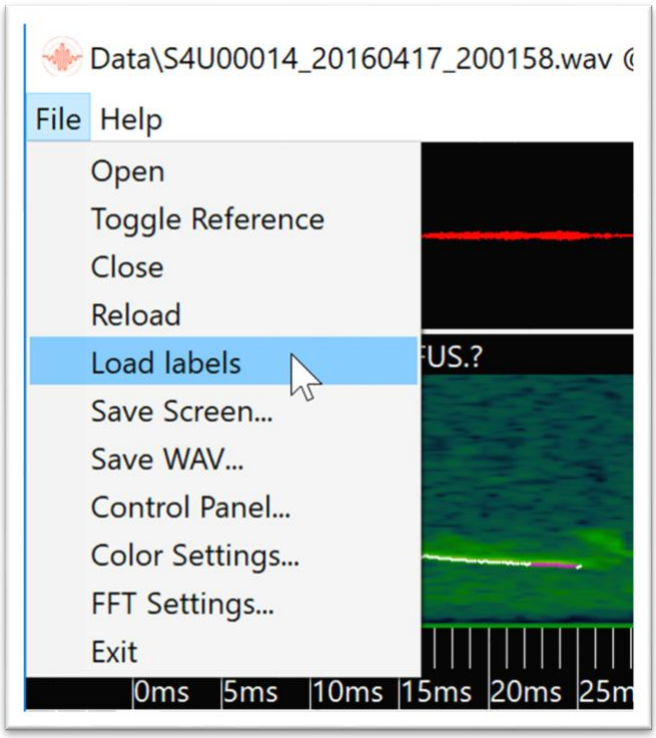


AUTO ID	PULSES	MATCHING	MATCH RATIO
EPTFUS	37	26	0.703000
EPTFUS	39	24	0.615000
LASCIN	2	1	0.500000
LASNOC	18	11	0.611000
LASNOC	4	4	1.000000
NoID	35	0	0.000000
NoID	2	0	0.000000
Noise			
Noise			

Load Button Labels for Manual ID

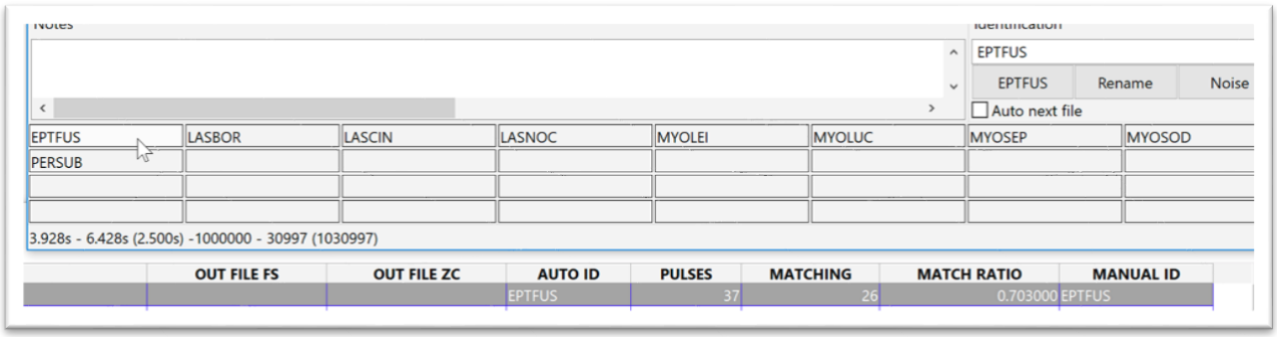
It is possible to assign manual IDs to the Results window. This is done via the Meta Data Panel below the Viewer. Buttons can be used for quick manual ID assignment. It is possible to load in the species names from the Control Panel window as button labels.

In the Viewer go to the File menu and choose Load Labels.



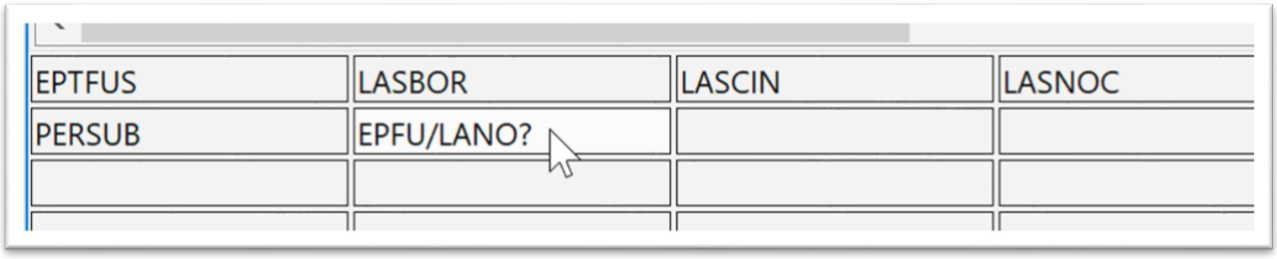
Assign a Manual ID

Press one of the labelled buttons to add a manual ID to the file. The manual ID will now also show up in the Results window.



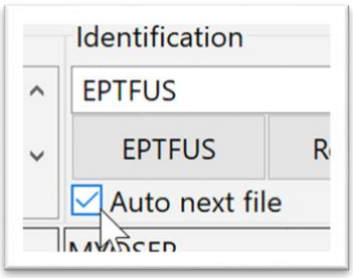
Create a Custom Button Label

Right click on an empty button window and type to create a custom label.



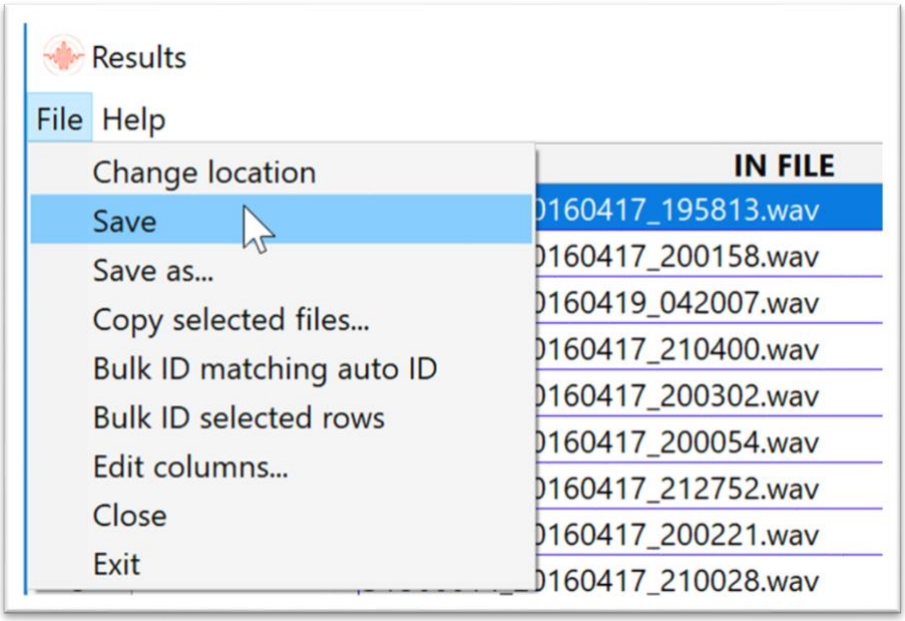
Automatically Advance to the Next File

Check the box for Auto next file. Each time you add a manual ID, Kaleidoscope Pro will then advance to the next file.



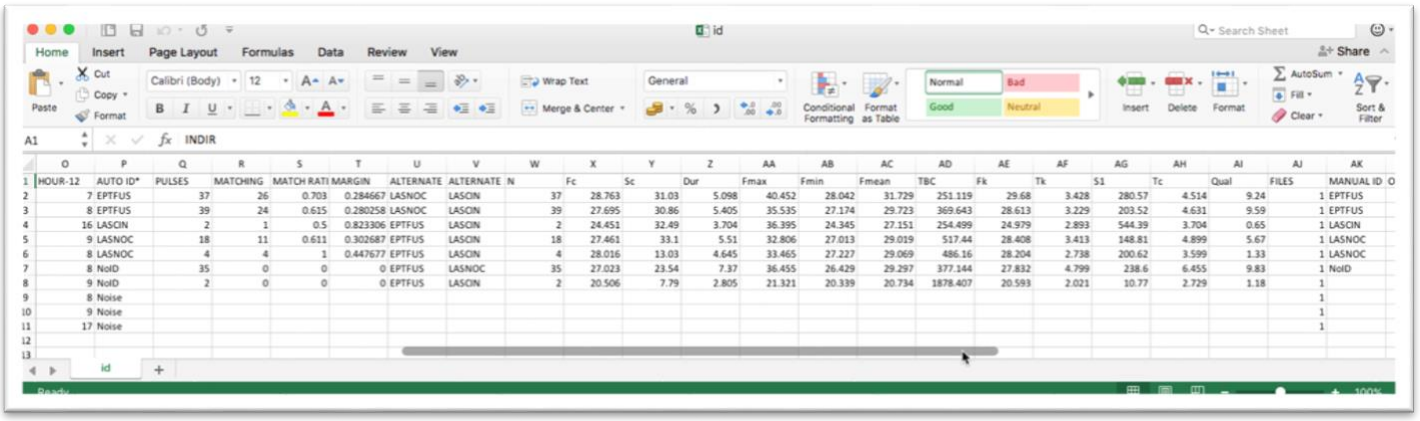
Save Results

Go to the File menu in the Results window and choose Save. This will save the manual ID results to the underlying id.csv file.



Check the id.csv File

Go to the Outputs folder in the SM4BAT Examples folder you'll find the id.csv file in this location. This file can be opened and viewed in a spreadsheet application. The id.csv contains a great deal of information about the analyzed echolocation call, including the manually assigned ID.



	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
1	HOUR-12	AUTO ID*	PULSES	MATCHING	MATCH RATI	MARGIN	ALTERNATE	ALTERNATE	N	Fc	Sc	Dur	Fmax	Fmin	Fmean	TBC	Fk	Tk	S1	Tc	Qual	FILES	MANUAL ID
2	7	EPTFUS	37	26	0.703	0.284667	LASNOC	LASCIN	37	28.763	31.03	5.098	40.452	28.042	31.729	251.119	29.68	3.428	280.57	4.514	9.24	1	EPTFUS
3	8	EPTFUS	39	24	0.615	0.280258	LASNOC	LASCIN	39	27.695	30.86	5.405	35.535	27.174	29.723	369.643	28.613	3.229	203.52	4.631	9.59	1	EPTFUS
4	16	LASCIN	2	1	0.5	0.823306	EPTFUS	LASCIN	2	24.451	32.49	3.704	36.395	24.345	27.151	254.499	24.979	2.893	544.39	3.704	0.65	1	LASCIN
5	9	LASNOC	18	11	0.611	0.302687	EPTFUS	LASCIN	18	27.461	33.1	5.51	32.806	27.013	29.019	517.44	28.408	3.413	148.81	4.899	5.67	1	LASNOC
6	8	LASNOC	4	4	1	0.447677	EPTFUS	LASCIN	4	28.016	13.03	4.645	33.465	27.227	29.069	486.16	28.204	2.738	200.62	3.599	1.33	1	LASNOC
7	8	NoID	35	0	0	0	EPTFUS	LASNOC	35	27.023	23.54	7.37	36.455	26.429	29.297	377.144	27.832	4.799	238.6	6.455	9.83	1	NoID
8	9	NoID	2	0	0	0	EPTFUS	LASCIN	2	20.506	7.79	2.805	21.321	20.339	20.734	1878.407	20.593	2.021	10.77	2.729	1.18	1	
9	8	Noise																				1	
10	9	Noise																				1	
11	17	Noise																				1	
12																							
13																							