



Anabat Insight

User Manual

Version 2.5



TITLEY SCIENTIFIC CONTACT DETAILS

Titley Scientific +61 7 3053 3403
Head Office (Australia) info@titley-scientific.com

General Support info@titley-scientific.com

Anabat Insight Support insight@titley-scientific.com

UK Office +44 (0) 781 875 6965
uk@titley-scientific.com

USA Office +1 (573) 442 8745
ask@titley-scientific.us

AUTHORS AND ACKNOWLEDGMENTS

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DOCUMENT HISTORY

Manual Version	Release Date	Software Version	Major Additions and Changes
1.0	01/02/18	1.0	-
1.1	30/04/18	1.0.2	Additional keyboard shortcuts; viewing and splitting zcas; trigger setting display
1.2	18/05/18	1.0.4	Brightness/contrast histogram; smoothness and zc threshold in searches; export species list; add files to projects; new metrics; batch run Bat Classify UK plugin
1.3	10/07/18	1.1.2	Species label hotkeys; moving noise files in zca conversion; new metrics; confidence metadata for BatClassify identification; histogram graph settings
1.4	02/08/18	1.1.3	Custom grouping; memo playback; grouping for species reports; adding folders to a project; BatClassify on Mac; scroll bar on time axis; change headings in project panel; customizable user metrics; marked column; spectrogram de-noising
1.5	30/10/18	1.1.6	Project panel headings; prevent inter-group scrolling; export to .zc; display of metrics; ridge detection trigger; histogram intensity; pulse count/percentage search; project file redundancy; spectrogram denoise
1.6	12/12/18	1.1.7	Power graph; triggering; full spectrum metrics; analysis settings; and/or search; metrics report
1.7	08/03/19	1.8.3	Metrics report; tile slope window; convert ZCA update; disperse report .csv; display call metrics; triggering; editing decision tree; Auto-scroll label; gpx in KML report; BatClassify % in reports
1.8	26/11/19	1.9.1	Adding criteria to decision tree; % pulse labelling in decision tree; keyboard shortcuts; hide filtered dots; adding a filter to searches; auto smoothness
1.9	04/03/20	1.9.2	Custom reports; filter updating in search/decision trees; slope transitions correction
2.0	18/05/20	1.9.3	Floating windows; analysis settings in searches; open last closed recording; edit custom metadata; duplicate species labels
2.1	27/08/20	1.9.5	Metadata lists; edit metadata in panel; cursor metrics; acoustic files; highlight call changes; further metrics details
2.2	08/12/20	1.9.9	Hotkey double labelling; compressed mode padding; support email; keep tree structure in export; cycles graph keyboard shortcut; restore panels; filter saving modification; add metadata; delete species in metadata panel; species Auto ID vs. Manual ID.
See over for more			

2.3	02/08/23	2.0.8	Stereo recordings; Toolbox instructions; project file legacy; Auto FS; font size; sort by; manual updates (latest & previous); FFT window change; ZCA conversion settings
2.4	18/06/24	2.1.2	Reference to grouping in folder display ; Undo/redo last batch metadata action; Opening multiple files at once ; Acoustic file sample rate ; Convert ZCA window screenshot and Settings instructions ; Convert Wav to ZC ; Time Split Wav Files ; Group by custom metadata ; Additional/updated screenshots throughout; Vertical tiling ; Additional trigger information ; Remove colour interpolation and add invert colours ; Fix errors and update colour histogram instructions ; manual FFT Window setting ; Turn on Power graph ; Anabat metadata prefix ; updating create metadata list instructions ; Removing metadata instruction update and warning ; Poor quality metrics warning ; Metrics definitions corrections ; Clarifying pulse vs call throughout; Remember action prompt ; Updated terminology throughout; Remove incorrect mark shortcut and add saving marks ; Hide filtered dots instructions ; Smoothness instructions ; Adding action instructions ; Updated decision tree instructions ; Added delete/trash instructions ; Updated crop file instructions ; Update custom report options ; Updated Toolbox instructions ; New FAQ call body .
2.5	28/08/2025	2.1.5	Acoustic recording FAQ ; Per pulse decision tree clarification ; IPG Metric update ; BTO Pipeline ; Toolbox updates ; FFT window settings access ; Audio settings access ; Example custom reports ; Naming user metrics ; Metrics tooltips ; Spectrogram de-noise default on ; Amplitude data ; Frequency lines UI update ; Group by UI update ; Custom reports date format ; Batch setup tool , importing a schedule into toolbox ; TERN Metadata Plugin ; Add metadata update ; Replace metadata ; Synthetic Filter .

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GLOSSARY


FFT Window	Fast Fourier Transform (FFT) relating to the time and frequency resolutions
Full Spectrum	Viewing a .wav recording, which includes the full spectral information of the sound
GUANO	Metadata system; Grand Unified Acoustic Notation Ontology for bats
Metrics	Predefined measurements taken from the zero crossing analysis
Off Dots	Zero crossing dots which are hidden (either manually or by a filter)
Oscillogram	A visual representation of a sounds intensity (y axis) over time (x axis)
Pass	The series of pulses which are contained in a file, typically from one bat passing the microphone
Pulse	A single echolocation pulse emitted from a bat
Spectrogram	A visual representation of a full spectrum file which displays the sound frequency (y axis), time (x axis) and intensity (using colour)
Trigger	When a sound meets defined characteristics in order to be classified as a 'pulse'.

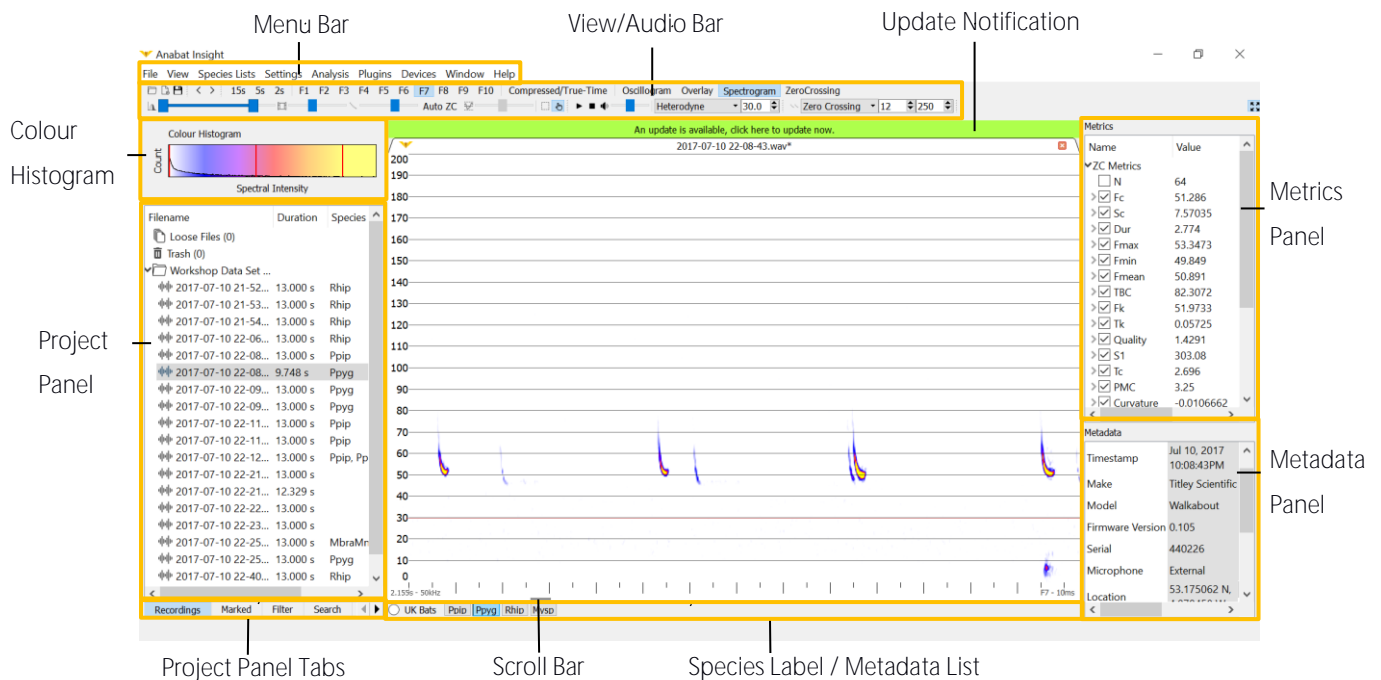
FEATURES OF ANABAT INSIGHT

Anabat Insight is a viewing and reporting software package for sound files which perfectly complements call analysis. The program offers the following features:

- Ability to view recordings in full spectrum and zero crossing
- Metadata management to keep all your files organised
- Metrics calculations for passes and individual pulses
- GUANO metadata support
- Customizable filters and scans
- Choose between multiple audio modes to listen to calls
- Inbuilt mapping to view tracks and file locations
- Supports open source Auto ID plugins (currently Bat Classify UK)
- Can be used on Windows or Mac

GETTING STARTED





The image below shows some of the main features and tools of Anabat Insight. To open Anabat Insight, double click on the  Anabat Insight icon on your desktop or program list.



OPENING & CLOSING FILES


You may open entire folders (including subfolders), or single files.

Once you have opened a directory, the files will be displayed with an icon indicating their file type in the Project Panel:


-  Full Spectrum (.wav)
-  Zero Crossings (.zc)
-  Folder or ZCA file*
-  Memos/Log Files/Other Files

*Please note: ZCA files are full-night files recorded on Anabat Express, which are best viewed split up into sequence files. We display each ZCA file as a folder, with the contents of the folder being the split read-only sequence files. These files cannot be labelled or altered. To put species labels on ZCA files, you first need to [convert zca to sequence files](#).

OPENING & CLOSING A DIRECTORY (FOLDER)


To open a folder, click the  in the View/Audio Bar, or click on File, then Open Directory. Navigate to the folder you wish to open, click on the folder, then press Choose. Alternately, you can navigate to the desired file, then double click on the file; this will open the folder which houses the selected file. Alternatively, you can drag and drop a folder, or files, directly into the program.

Once you have opened the folder, it will be displayed in the Project Panel. Click on > next to the folder to show the contents. Any subfolders will be displayed, and you can display/hide the contents of these folders by pressing the > next to the folder. Please note, if folders are not being displayed (when there are subfolders), you may need to change your grouping display option to Folders.

To open the spectrogram/zero crossing graph of a listed file, double click on the file in the Project Panel. The spectrogram will be displayed in the main panel, with the file name in a tab above the file. To close the file displaying in the main panel, click on  in the tab above the file.

To close the directory, right click on one of the folders displayed in the Project Panel and click Close Store.

OPENING & CLOSING A FILE

To open single files, click on  in the View/Audio Bar, or click on File, then **Open...** Navigate to the file you wish to open, then either click on the file, then press Open, or double click on the file itself. You can also drag and drop a file directly into the program.

To open the spectrogram/zero crossing graph of a listed file, double click on the file in the Project Panel. The spectrogram will be displayed in the main panel, with the file name in a tab above the file.

Please note: .zca files can only be opened in Read-Only mode, to edit or add metadata you will need to convert to sequence files first.

To close the file displaying in the main panel, click on  in the tab above the file.

To close single file/s from the directory, right click on Open Files in the Project Panel, then click Close Store.

To open the last closed file press the keyboard shortcut "L", or go to File and select Open last closed recording.

PROJECT FILES

Please note: We are no longer supporting the creation of new project files. You will still be able to open pre-existing project files, and add files/folders to them.


VIEWING MULTIPLE FILES

To open a second/third (etc.) file into the spectrogram window, right-click on the desired file in the Project Panel then select Open Selected in New Window. The file will automatically open in the spectrogram window. There will be a tab for each file displayed above the spectrograms, you can change between files by clicking on the corresponding tab.

To view multiple files at once, open two files in the Project Panel, click on Window, then select either Cascade or Tile. Cascade will show smaller windows on top of larger windows. Tile will display the windows next to each other, optimising the screen space.

SCROLLING THROUGH A FILE

Once a file is open in the main panel, you can scroll along the file in four ways:

1. Hover the mouse pointer over the main panel display and use the scroll wheel on the mouse.
2. Ensure  is selected in the View/Audio Bar, then use your mouse to click and drag the display left or right.
3. Use the arrow keyboard shortcuts < > to scroll left or right to the next trigger.
4. Drag the scroll bar along the time axis.

OPEN NEXT/PREVIOUS FILE

Once you have opened a directory, you can scroll to next/previous files using the < > arrows in the View/Audio Bar, or you can use the keyboard shortcuts "[" and "]". To view all of the files in quick succession, hold down the "[" or "]" key. If you have multiple folders open, and would like to prevent scrolling into the next folder, click Settings, then under File Navigation, check Prevent Inter-Group Scrolling.

Change speed

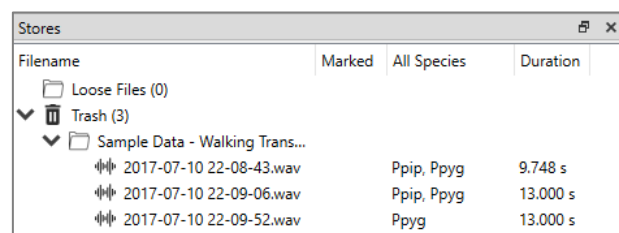
To change the speed that files are displayed when the "[" or "]" keys are held down, in the Menu Bar click on Settings, then File Navigation, then Next/Prev Speed. Select your desired speed.


OPEN LOG FILE

Log files can be found in the Other Files folder in the Project Panel. To view a log file, double click on the log file in the Project Panel. It will automatically open in the default program your computer is configured to use for .csv files.

DELETING FILES

You can choose to send files to trash, either manually by right-clicking on the file/s and selecting Send To Trash, or as part of an action. This will move the files to the Trash in the Stores panel (see below), at this stage the files have not been moved/deleted from your memory device.



Once files are in the trash, they are no longer included in searches/decision trees. You can still open files directly from the trash to view them. If you wish to restore a file/s from the trash to their original place right-click on file/s and click Restore Selected. If you wish to restore all of the recordings in the trash, right-click on the  Trash and select Restore All Recordings.

If you want to permanently delete the recordings in the trash, this will delete them from your memory device. You can right-click on an individual recording and select Delete Recording. Alternatively, to permanently delete all recordings in the trash, right-click on the trash and select Empty Trash. To avoid accidentally permanently deleting recordings, we recommend moving files to an alternate folder.

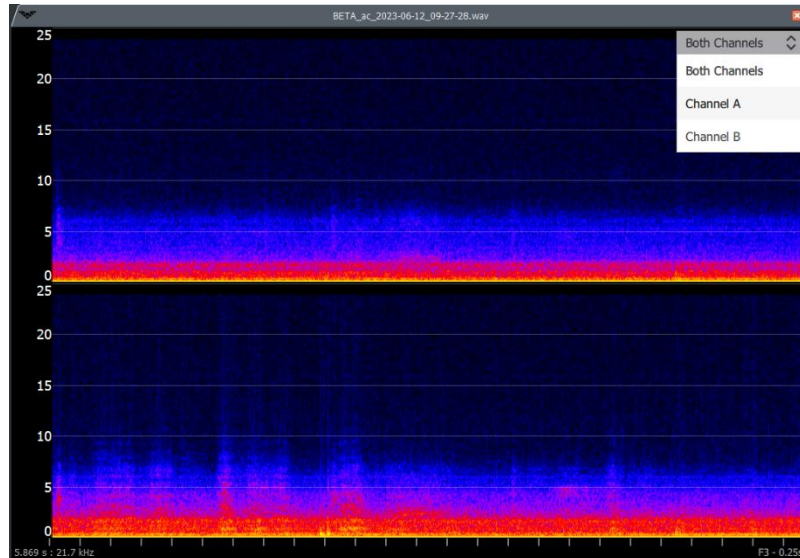
Please note: Deleting recordings from the Trash, or Empty Trash will PERMANENTLY DELETE the original recordings, this cannot be recovered.

ACOUSTIC FILES

Acoustic files (sample rate ≤ 96 ksps) will be listed in the Project Panel. In order to view/listen to acoustic files, they need to be recorded on a Titley Scientific device, or you will need to have the paid version of Insight.

STEREO FILES

Stereo files will open both channels tiled horizontally with Channel A on top. To view one channel only, click on the Both Channels dropdown menu in the top right of the spectrogram window. Select which channel you would like to view.



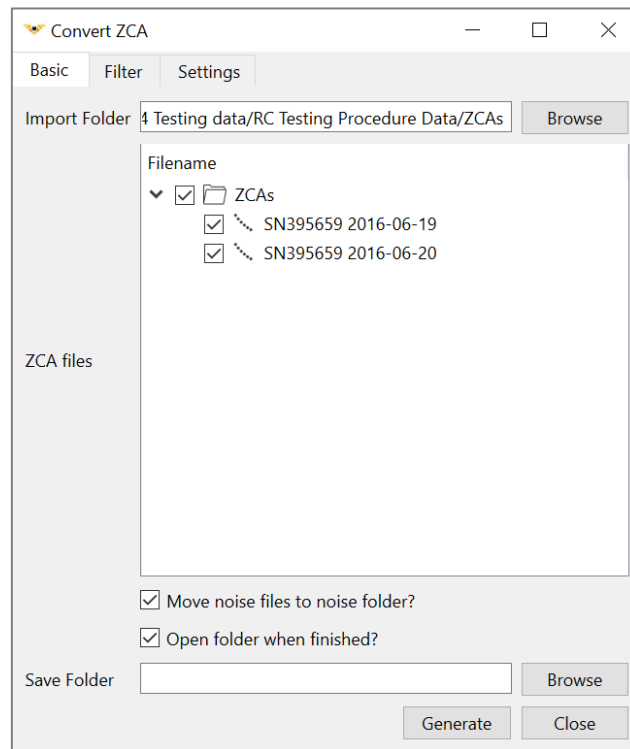
EXPORT/CONVERT/MOVE/COPY FILES

You have a range of viewing, exporting and converting functions available depending on your file type.

VIEW/EXPORT/CONVERT ZCA FILES

Anabat Express bat recorders record .zca files which contain a full night of recording. These files can be viewed as read-only sequence files in the file directory panel. To change the settings that split a .zca file for viewing only, go to Settings, then **ZCA Settings...**, where you can change the max recording time, recording window and minimum event time (for more information on these settings, see below).



If you wish to label bat species, add metadata or alter these sequence files, you will need to export the ZCA file. To export/split the ZCA, first close the store if it contains the ZCA files you wish to convert, then click on Analysis, then Convert ZCA. The Convert ZCA window will appear.



Use Browse to select the input folder (containing the .zca files), the ZCA files will be displayed, check the files you wish to convert. Use Browse to select the output Save folder (where the sequence files will be saved to).

Please note: The destination folder must be different to the import folder.

To automatically open the folder containing the converted sequence files, ensure the “Open folder when finished?” is checked in the Basic Tab.

During the conversion process, a standard “all bats” filter will be applied to identify bat sequences and filter noise files. To keep these noise files in a separate noise folder ensure “Move noise files to noise folder?” is checked in the Basic tab. You can alter or disable this filter, by clicking on the Filter tab at the top of the Convert ZCA window. To disable the filter, click the Enabled Button, it will change to Disabled. To select your own filter, click on the dropdown menu for Recently Used filters, or the  to open a previously saved filter, or click  to create a new filter on-the-spot. The conversion will also be based off your trigger settings, to view or change these, click on the Settings tab at the top of the Convert ZCA window, you can change the following:

- Maximum file duration: The maximum file length represents the maximum length of any recording and can be up to 20 seconds. When a recording is triggered, the recorder will record files up to the specified number of seconds in length before starting a new file.

- Recording window: This is the minimum amount of time recording will continue after a trigger event. Set this to be longer than the shortest time between bat pulses you want to record. This will prevent a bat pass being broken up into multiple files.
- Minimum event duration: This is the minimum duration sound that will trigger a recording.
- Minimum trigger frequency: This is the minimum frequency that can create a triggering event. Any sound below this will not trigger a recording.
- Maximum trigger frequency: This is the maximum frequency that can create a triggering event. Any sound above this will not trigger a recording.
- Smoothing: This applies a smoothness filter to the data for conversion.


To complete the conversion, click Generate. Each ZCA file will have a corresponding folder with the split sequence files.

Please note: We highly recommend the use of a noise filter during the conversion process.

MOVE OR COPY FILES

Anabat Insight allows you to export (move) or copy files. To do this, select the files/folders you wish to move or copy in the Project Panel, then right-click and choose Export Selected. Under Export Mode, select either Move or Copy.

You have the choice in Folder Structure to choose between Keep Tree Structure and Flat. Keep Tree Structure will use the Group By format of the viewing window for the export (eg. Folder or Species Manual ID), whereas Flat will just copy all the files without folder grouping. If you wish for the files/folders to be opened in the Project Panel once the conversion is complete, ensure Open when Finished is checked.

Choose your Export Location by clicking  then select Export.


Please note: The destination folder must be different to the current folder.

CONVERT WAV TO ZC FILES

Anabat Insight allows you to permanently convert full spectrum (.wav) files to zero crossing (.zc). To do this, select the files/folders you wish to convert in the Project Panel, then right-click and choose Export Selected.

Under Export Mode, select Copy and Convert to ZC, then choose your ZC Threshold or choose Auto FS (see [Trigger Settings](#) for more information).

You have the choice in Folder Structure to choose between Keep Tree Structure and Flat. Keep Tree Structure will use the [Group By](#) format of the viewing window for the export (eg. Folder or Species Manual ID), whereas Flat will just copy all the files without folder grouping. If you wish for the files/folders to be opened in the Project Panel once the conversion is complete, ensure Open when Finished is checked.

Choose your Export Location by clicking  then select Export.

Please note: The destination folder must be different to the current folder.

TIME SPLIT WAV FILES

You can split .wav files into multiple files by time in Anabat Insight. To do this, select the files/folders you wish to split in the Project Panel, then right-click and choose Export Selected.

Under Export Mode, select Copy and Time Split, then choose the Maximum File Length in seconds.

You have the choice in Folder Structure to choose between Keep Tree Structure and Flat. Keep Tree Structure will use the [Group By](#) format of the viewing window for the export (eg. Folder or Species Manual ID), whereas Flat will just copy all the files without folder grouping. If you wish for the files/folders to be opened in the Project Panel once the conversion is complete, ensure Open when Finished is checked.

Choose your Export Location by clicking  then select Export.

Please note: The destination folder must be different to the current folder.

CUSTOMIZE YOUR VIEW

Anabat Insight offers a range of features to customize the display to suit your preferences.

FLOATING PANELS

Floating panels can be isolated from the main program window. All of the panels are available as floating panels (Colour histogram, Stores, Marked List, Filter, Search, Results, Metadata lists, Species lists, Metadata

and Metrics panels). To float a panel click and drag on the panel heading, the panel will float and you can move it. To dock a panel, drag it back over the main window, which will highlight when the panel is hovered over a suitable area. Drop the panel in the desired area.

To close a floating panel, click on the  in the heading.

To restore a floating panel, click on Window, then hover over Dockable Windows. To restore all panels to their default position, select Restore All. To restore a specific panel, hover over Restore Panel, then click the desired panel. To get a closed panel to reappear, hover over Show Window then check the unchecked panel.

PROJECT PANEL HEADINGS

In the project panel, your files will be displayed under the heading Filename. Next to Filename will be the headings Duration, All Species and Marked. To change the order of these, drag and drop the heading across to the desired placing. To change the headings displayed, right-click on the heading panel, check the headings you wish to display, then click Resize to Contents. Alternatively, click on View, then under Store Headings, choose the panel, then the headings you would like displayed. To change the width of a heading, click and drag the edge of the heading.

You can customize the headings and order for each panel: Stores, Marked and Results. You can also reorder the Metrics and Metadata panels.

Please note: The header for Species has now been split into Auto and Manual Species ID or All Species.

PROJECT PANEL GROUPS AND SORTING

Grouping

By default, your store will be grouped into folders. You can change the grouping to File Type, Species Manual ID, Species Auto ID, All Species, Device ID, Date or Night. To change the grouping, right-click in the Project Panel and hover over **Group by...** then click on your preferred grouping from the drop-down menu.

Custom Grouping

Alternatively, you can create a custom grouping based on custom metadata (for example: 'Habitat') or custom multi-layer grouping (eg. 'Night, Manual Species ID'). To create a custom grouping, right-click in

the Project Panel and hover over **Group by...** then click on Add Custom Group to access the Custom Grouping Menu.

To add a single grouping based on custom metadata you've added. First the metadata must be added to the dataset. Click the Group By drop-down menu, then select the metadata type (eg. Habitat). Then click Add Group.

To add multi-layer grouping, first select New Grouping, then use the drop-down menu to choose the first level of the custom grouping (eg. Night), then click Add Group. Then select your second level of the custom grouping (eg. Species Manual ID), then click Add Group. You can add as many levels to the grouping as you like. Then click Save.

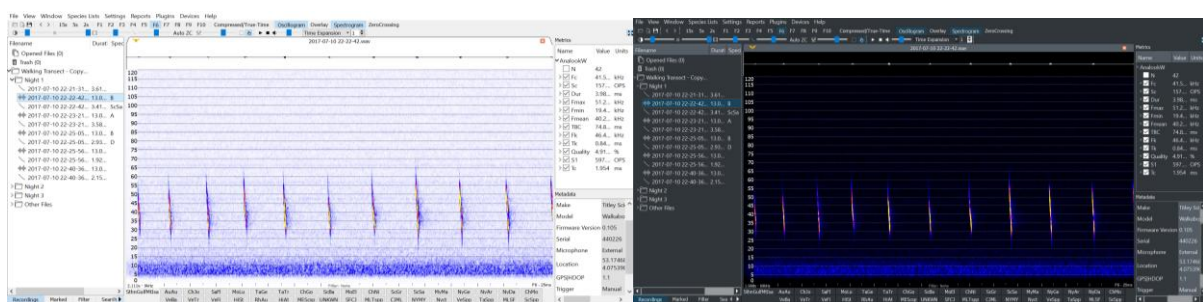
To remove custom groupings, open the Custom Grouping Menu following the instructions above. Select the group you wish to remove, and select Remove Group, then click Save.

Sort By

Within groups, you can choose to sort files by Time, Filename or Species, in ascending or descending order. This does not create groups, but will change the file order displayed in the group. To change the sorting right-click in the Project Panel and hover over Sort files by, then check Time, Filename or Species. Then check Ascending or Descending.

DARK MODE

Dark mode will change the program panels to a dark colour, this may reduce eye strain. To change to dark mode, select View in the Menu Bar, then check Dark Mode. To return to the original light mode, uncheck Dark Mode.



Light Mode

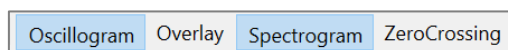
Dark Mode

FONT SIZE

You can choose the program and graph font size. Graph fonts include frequency axis and [Show Call Metrics](#). To change the font size, click on View in the Menu Bar, then hover over either Font Size or Graphs Font Size and check a font between 6pt and 22pt.

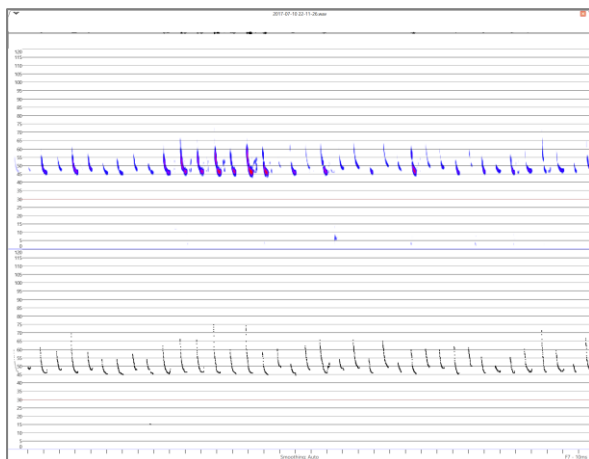
FULL SPECTRUM, ZERO CROSSING & OVERLAY

You have a range of options to view your files. If you are opening zero crossing files, they can only be viewed in Zero Crossing. If you are opening full spectrum files, then you can choose between Spectrogram, Zero Crossing, both, or an Overlay. Please note that if you are viewing full spectrum files in Zero Crossing, you need to ensure the ZC Sensitivity is set correctly (see [Trigger Settings](#) for more information). When both are displayed the spectrogram will be on the top, and the zero crossing graph at the bottom. When overlay is selected, the zero crossing dots will be overlaid on the spectrogram. To select your viewing mode, click on your preferred mode/s in the View/Audio Bar (see below); alternatively you can click on View in the Menu Bar, then check your preferred mode/s.

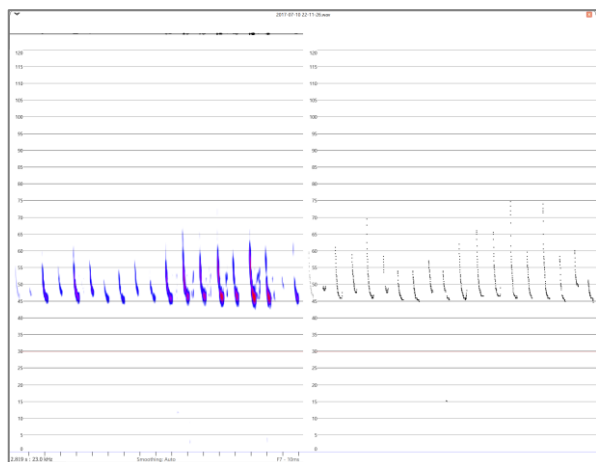


Horizontal Or Vertical Tiling

If you are viewing both Full spectrum and Zero Crossing graphs, by default they will be tiled horizontally (full spectrum above zero crossing; see below). You can change this to tile vertically (one beside the other). To do this, click on View in the Menu Bar, then check Tile Graphs Vertically.



Tiled Horizontally



Tiled Vertically

OSCILLOGRAM

To display the oscillogram on full spectrum recordings, click on Oscillogram in the View/Audio Bar; or you can click on View in the Menu Bar, then check Oscillogram. The oscillogram will be displayed above the spectrogram. Oscillogram is not available for native zero crossing recordings.

FREQUENCY SCALE

To change the frequency scale, right click anywhere on the spectrogram, then hover over Frequency Scale; alternatively you can click on View in the Menu Bar, then click on Frequency Scale. This will display some preset scales you can select from, or click on Edit/New Scale.

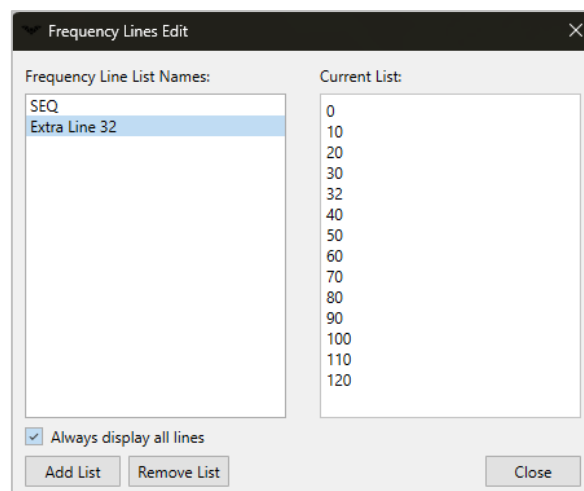
You can choose between Linear and Logarithmic, and set the minimum and maximum frequencies. To save your custom frequency scale, type a Name, then click Save. Your saved custom scales will be available to select from in the Frequency Scale menu.

Changing frequency axis lines

In addition to changing the frequency axis, you can choose where the frequency axis lines should be placed. To do this right click anywhere on the spectrogram, then click on Frequency Lines.

To create a new customized frequency line list, click Add List, then double click on the <new list 1> and type in your preferred list name. Click in the Current List box (see image below) and type in your preferred axis lines, pressing Enter after each entry. Click Save when you have completed the list. Click Close to return to viewing spectrograms with your selected frequency line list.

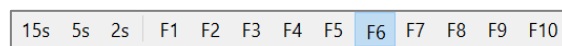
Depending on your screen size, some lines may not appear because the frequency axis is too compressed. If you wish to override this, check Always display all lines, please be aware this may crop some of the frequency numbers.



TIME SCALE

Standard Time Scales

You can select between pre-set timescales in the View/Audio Bar, displayed as the buttons F1 to F10 (see below). The time scales referred to the amount of time displayed between tick marks (divisions) on the time axis. You can also choose between 15s, 5s and 2s, which represent the number of seconds per 40 pixels. Alternatively you can go to View in the Menu Bar, then hover over Time Per Tick and select your preferred time scale. It should be noted that compressed mode does not affect the time scale.



F1 – 1 second

F6 – 25 milliseconds

F2 – 0.5 seconds

F7 – 10 milliseconds

F3 – 0.25 seconds

F8 – 5 milliseconds

F4 – 0.1 seconds

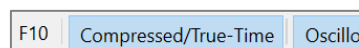
F9 – 2.5 milliseconds

F5 – 50 milliseconds

F10 – 1 millisecond

COMPRESSED & TRUE-TIME MODE

You can choose to view your files in either True-Time or Compressed mode. True-Time will display the entire contents of the file, whilst Compressed mode will remove the 'spaces' between pulses. In Compressed mode Anabat Insight will display pulses based on your trigger settings, so ensure these are configured correctly. Files will be displayed in Compressed mode by default, to change to Truetime mode, click on Compressed/True-Time in the View/Audio Bar (see below). When Compressed mode is selected, the button will be highlighted. You can use the keyboard spacebar shortcut to toggle between Compressed and True-Time modes.



Compressed Mode Padding

You can change the level of padding between pulses in compressed mode, this includes a millisecond buffer before and after each triggered pulse. You can choose between 0, 1, 3, 5ms of padding. This is not 'artificial' padding (blank space), it shows the actual .wav file for the selected number of milliseconds,

so it may include noise or echoes. To change the padding, go to View, then hover over Time Between Pulses and select the number of milliseconds of padding you prefer.

TRIGGER SETTINGS

Selecting Trigger Mode

A trigger is used to define when a bat pulse occurs. It is used in compressed mode, for rendering the zero crossing graph from a full spectrum file, and for calculating all metrics. Your trigger settings are displayed on the View/Audio Bar:




Alternatively, you can click on Settings in the Menu Bar, then click on Trigger Settings, this will open the Trigger Settings Menu.

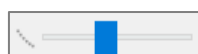
A note on triggers: Files recorded in zero crossing (.zc) cannot have the trigger adjusted as this was set on the recorder at the time of recording. You can only set the Smoothness filter on native zero crossing recordings. For full spectrum files, you can choose between the Auto Full Spectrum Trigger (recommended) or manually setting the Zero Crossing Threshold Trigger. A smoothness filter can additionally be applied to full spectrum files.

Auto Full Spectrum Trigger

The Auto Full Spectrum trigger will automatically detect bat pulses in your full spectrum files and render zero crossing (for metrics). Please note, this trigger is only available for full spectrum files, not zero crossing. This mode is selected by default, to turn it on (if you change modes) click on the Auto FS button next to the ZC threshold slider in the View/Audio Bar. The Auto FS feature works best when used in conjunction with Auto Smoothness.

Zero Crossing Threshold Trigger

The Zero Crossing Threshold trigger occurs every time the incoming signal crosses a preset amplitude level (sensitivity / trigger threshold). This level is adjusted so that quiet sounds (background noise) don't cause a trigger event, but loud sounds like bat calls do. This setting must be configured correctly to view full spectrum files as zero crossing graphs, and to calculate the metrics. To select this mode, click the Auto FS button in the View/Audio Bar to disable the Auto Full Spectrum Trigger. The Zero Crossing Trigger Threshold is controlled using the  slider bar in the View/Audio Bar (see below).



As you drag the slider bar, a corresponding number will be displayed in the bottom left of the program (eg. Adjust Zero Crossing Threshold: 12). To choose an appropriate threshold, open a file containing a bat pass then view the file in compressed mode. As you drag the slider, you will see more or less of the pass displayed, choose a level which displays all the pulses you deem necessary to see with as little noise as possible. This may not need to be reassessed for each file, but different devices and recording sessions will likely need different settings.

Triggering for Metric Calculation

Metrics are calculated based on what is visible in the spectrogram window, and also what trigger is selected. In the case of full spectrum files (.wav) the trigger determines both what is displayed in the window in compressed mode, and also how many zero crossing dots are rendered and available for zero crossing metric calculations (even if viewing in full spectrum only).

Minimum and Maximum Trigger Frequency

You can set the minimum and maximum frequencies that a sound can be triggered. Usually, you would set the minimum trigger frequency at the lowest frequency bat call, this will reduce low frequency noise triggering. The maximum trigger should be above the highest frequency bat call. You can also use the minimum and maximum trigger frequencies like a filter if you are only looking for a specific bat species.

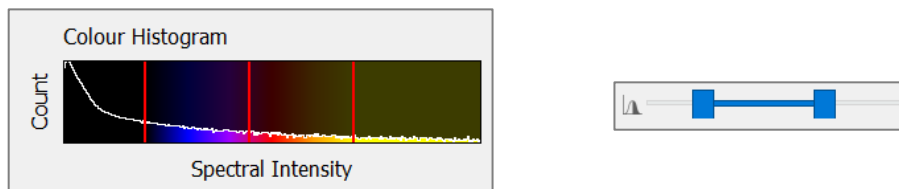
GRAPH COLOURS


To change the graph colours, right click anywhere on the spectrogram, then click on Graph Colours; alternatively, you can click on View in the Menu Bar, then click on Graph Colours. You can change the colours of the background (black and white), oscillogram, spectrogram colour map, ZC dot, ZC body and Off Dots. ZC dots refer to the dots rendered by the zero crossing analysis, the ZC Body refers to the dots which are determined to be the 'call body' for metrics, and the Off Dots are the dots hidden (by a filter or manually). In addition you can change the ZC Dot Size. Select your preferred colours and click on Save.

You can also Invert Colour and change the Maximum Intensity. By checking Invert Colour, this will invert the Colour Map selected. The maximum intensity refers to the highest amplitude where the spectrogram will still distinguish between colour values. In simpler terms, the maximum intensity is where the colour becomes constant (anything above that value will be the same colour). You can select a custom value (between 1 and 16,000) or select "Auto" (recommended) and this will be automatically calculated based on each spectrogram.

COLOUR HISTOGRAM, BRIGHTNESS & CONTRAST

You can change the brightness, contrast and spectral intensity of full spectrum spectrograms using colour histogram window and slider bar in the View/Audio Bar. If the Colour Histogram is hidden, right-click on the Stores header and check Colour Histogram.



The  slider can be used to control the brightness, contrast and colour spectral intensity. Dragging the centre of the blue slider or the middle red line on the histogram to the left will decrease the brightness. Dragging the centre to the right will increase the brightness. Decreasing the distance between the bars (the blue slider ends, or the outer red lines) will increase the contrast, increasing the distance will decrease the contrast (see below for a diagram).



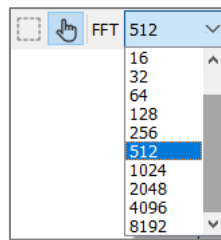
As you move the slider bar, a corresponding number range will be displayed in the bottom left of the program (eg. Adjust spectrogram range: 35 - 53). This may assist in viewing faint pulses, or increasing pulse clarity; you may wish to optimize this setting for each file, device or recording session.

SPECTROGRAM DE-NOISE

You can reduce the amount of visual noise in a full spectrum spectrogram using the spectrogram de-noise tool. This will be on by default, to deactivate this, click on View, then uncheck Spectrogram De-Noise. Spectrogram De-Noise will not affect the metrics or triggers, only the view/rendering.

FFT WINDOW SETTINGS

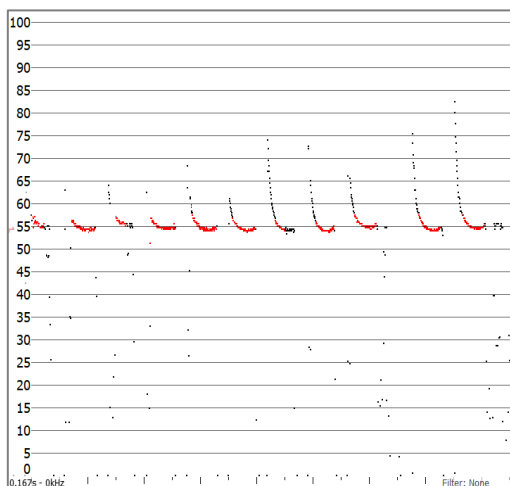
The FFT dropdown menu allows you to set the 'samples per window' of the Fast Fourier Transform (FFT). This setting is a trade-off between time resolution and frequency resolution. A smaller window will produce more accurate results in timing, at the expense of precision of frequency representation. A larger window will provide a more precise frequency representation, at the expense of precision in timing representation. Large FFT windows will also be slower to process. Typically a larger window will be better for viewing constant frequency bat calls and a smaller window is better for frequency modulated bat calls. To change the FFT window click on the FFT dropdown menu or click on Settings in the Menu Bar, click on FFT Window Settings, and select the number of samples per window.



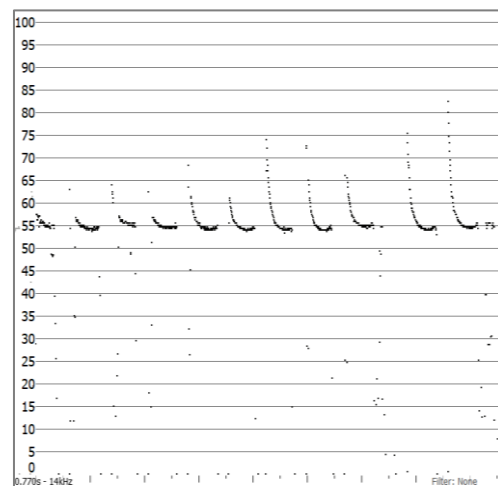
You can choose to limit the FFT window width to powers of 2 (on by default and recommended), which will speed up the rendering of spectrograms. To change this, click on Settings in the Menu Bar, click on FFT Window Settings, and uncheck Limit FFT width to powers of 2. This will also allow you to set a custom FFT window size.

HIGHLIGHT CALL BODY

When your files are displayed in zero crossing, you can choose to highlight the call body to display what the program is identifying as the 'body' of the pulses. See below for a file with and without the call body highlighted. For more information on call bodies, [see our frequently asked question here](#).



Call Body Highlighted



No Highlight Call Body

To highlight the call body, right click on the spectrogram and click on Highlight Call Body. Alternatively, you can use the keyboard shortcut of 'm'. To change the colour of the highlighted dots, see [graph colours](#).

VIEW POWER GRAPH

The power graph is calculated from the spectrogram, and it shows the distribution of energy across the frequency range, averaged across the time displayed on the screen. To view the power graph, click on View in the Menu Bar, then check on Power Graph.

Please note: The power graph can only be viewed/calculated from .wav files. As such it will be displayed next to the full spectrum window.

VIEW SLOPE GRAPH

The slope graph is calculated from the zero crossing analysis, it will display the speed at which the call changes pitch over time, and is shown in octaves per second. To view the slope graph, click on View in the Menu Bar, then check Slope Graph. To change slope settings, see [slope transition settings](#). By default, the slope graph will be displayed below the spectrogram/zero crossing window. If you wish to view the slope graph next to the zero crossing window, click on View in the Menu Bar, then uncheck Position Slope Graph Below ZC.

VIEW CYCLES GRAPH

The cycles graph is calculated from the zero crossing analysis, it will display a graph of the frequency (kHz) against the energy (based on the amount of time spent in each frequency band). To view the cycles graph, click on View in the Menu Bar, then check Cycles Graph. Alternatively, use the keyboard shortcut 'V' to toggle the cycle graph on/off. To change cycle settings, see [cycle settings](#).

METADATA

All current Titley Scientific recorders and software (Anabat Insight) record metadata in the GUANO (Grand Unified Acoustic Notation Ontology) format. This format is now the standard across bat acoustic fields.

VIEWING METADATA

The metadata associated with each file is displayed in the Metadata Panel. This may include (but is not limited too; see over):

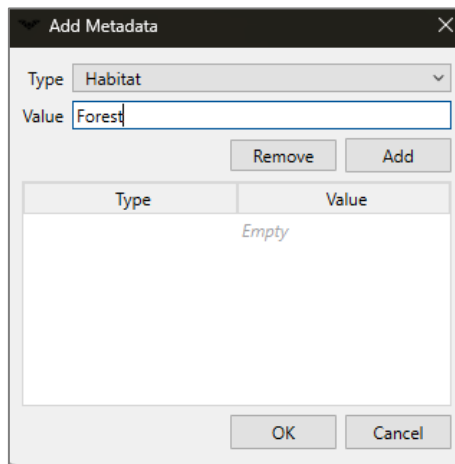
- Timestamp
- GPS location
- Recorder make and model
- Recorder firmware version
- Recorder ID (serial number)
- Microphone input
- Temperature and humidity at time of recording
- Trigger settings
- Manual ID Species labels
- Auto ID Species labels and confidence

CREATING, CHANGING AND REPLACING METADATA

In addition to the metadata which was recorded by the device, you can also add custom metadata.

Please note: If you would like to add metadata specific to the TERN database standards, please enable the [TERN project plugin](#).

To add custom metadata to a single file, open a file and scroll to the bottom of the Metadata Panel. Click in the last blank row where it states 'Click to add...'; this will open the Add Metadata window (see below). Click in the Type field to add a Type (eg. Weather, or Site). Alternatively you can use the dropdown arrow to select a pre-existing Type. Then click in the Value, field. Type in your value (eg. Raining, or National Park). Then click Add, you can repeat this process to add multiple metadata entries, then click OK. When you scroll to the next file, it will ask you if you would like to save the changes. You can also check the box to save without asking in future. If you click Save, the metadata will be saved with your file.

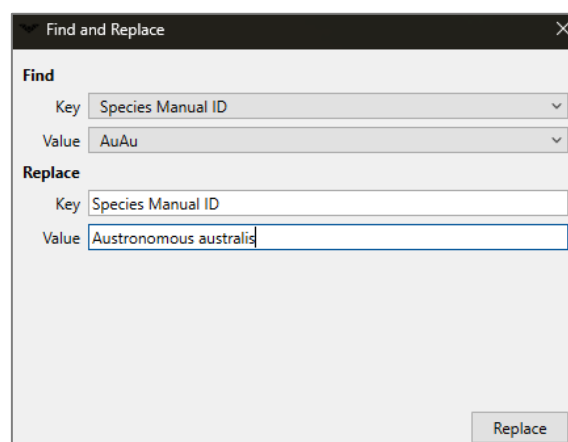


To add metadata in a batch (multiple files at once) select the desired files, or folder in the Project Panel, then right-click on the folder/files. Select Add Metadata, this will bring up the Add Metadata window (see above). Click in the Type field to add a Type (eg. Weather, or Site). Alternatively you can use the dropdown arrow to select a pre-existing Type. Then click in the Value, field. Type in your value (eg. Raining, or National Park). Then click Add, you can repeat this process to add multiple metadata entries, then click OK. This metadata field and value will be added to all of the selected files.

Please note: You may receive a warning pop-up stating **X selected file's** metadata is not editable. This warning is most likely referring to .gpx or log files contained in the folder, and does not need to be a concern. To check, you can click Show Details to see which files could not have metadata added.

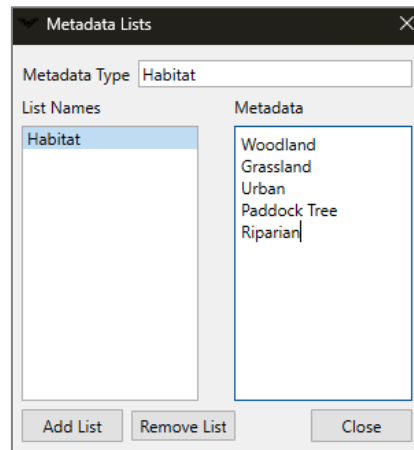
To change a custom metadata field or entry on one file, just click on the corresponding entry in the Metadata Panel and retype it.

To replace a metadata type or value, right click on the selected file/s then click Replace Metadata. Enter the Key and Value type you wish to replace, and then the Key and Value you want to replace them with. Then click Replace.



CREATING METADATA LISTS

In addition to adding metadata manually, you can create metadata lists with labels [like a species list](#). First you will need to create a metadata list, click on Metadata List from the Menu Bar, then select New/Edit. Click Add List and give the list a name (eg. Habitat) and enter the same name (eg. Habitat) into the Key field, then you can type in metadata labels (eg. Forest, Grassland); pressing Enter between labels. Click Close to save your list.



To remove or edit a metadata list, click on Metadata Lists in the Menu Bar, then click on New/Edit. Select the preferred list and double click to change the list name, or click on the labels in the metadata column to edit, or click Remove List to delete the selected list.

By default, a newly created list will be automatically displayed. To display a previously saved metadata label list, click on Metadata Lists in the Menu Bar, check the desired metadata list/s, then check Shown. Your selected list/s should now be displayed below the spectrogram.

To apply a metadata label, follow the same instructions as [Labelling a File](#).

REMOVING METADATA

You can batch-remove metadata from multiple files, including species labels. To do this, select the relevant files/folders/groupings in the Project Panel, right-click on the files and select Remove Metadata, a dialog box will appear. You can select the metadata type and value from the drop-down boxes to be removed, click Select, this will add the metadata to the To Be Removed list. You can add multiple metadata removals to one batch. If something was added to the To Be Removed list by mistake, click on it then click Deselect. To complete the batch removal process, click OK.

If you used a Metadata List, you can remove the metadata label by clicking on the label a second time in the metadata list.

Please note: You may receive a warning pop-up stating **X selected file's metadata is not editable**. This warning is most likely referring to gpx or log files contained in the folder, and does not need to be a concern. To check, you can click Show Details to see which files could not have metadata removed.

You can also remove metadata from an individual file by erasing the type/value in the Metadata Panel.

METRICS

Anabat Insight calculates a range of metrics for your files, based on the zero crossing analysis. The trigger settings must be optimized for metrics to be accurately measured.

Please note: Poor quality recordings, those with loud background sounds, or with strong echoes are likely to result in poor metric calculation.

Metrics are displayed in the Metrics Panel. You can hover your mouse over a metric name in the panel to view the metric definition/formula. The table below describes all of the metrics:

Metric	Definition
N	This is not a metric, but the number of pulses detected for metrics in the file.
Fc	Characteristic Frequency; the frequency (kHz) at the right-hand end of the portion of the pulse with the lowest absolute slope (<u>the body</u>).
Sc	Characteristic Slope; the slope of the <u>body</u> of the pulse, measured in Octaves Per Second (OPS).
Dur	Pulse Duration; the duration of the pulse, measured in milliseconds (ms)
FMax	The Maximum Frequency (kHz) of the pulse.
FMin	The Minimum Frequency (kHz) of the pulse.
FMean	The Mean Frequency; which is a weighted mean, $F_{Mean} = (N - 1)D/2d$, where N is number of points counted in the display, D is the division ratio and d is the duration of the pulse.
IPG	Inter-Pulse Gap; the time from the end of one pulse until the start of the next pulse.
TBCS	Time Between Call Starts; the time from the start of one pulse until the start of the next pulse.
Fk	Frequency of the Knee; frequency (kHz) of the junction (point of greatest change in slope) between the initial section and <u>body</u> .
Tk	The time from the Start of the pulse to the Knee, measured in milliseconds (ms).
Quality	The average smoothness for the whole pulse. Smoothness is the absolute value of the difference between the frequency of any point and the average of the frequencies of the points either side of it, divided by the frequency of that point. These values are summed over the whole pulse, and the result divided by the number of intervals in the pulse (number of dots minus 1).
S1	The Slope of the First five points in a pulse, measured in Octaves per Second (OPS).
Tc	The Time from the start of the pulse to the Characteristic section, measured in milliseconds (ms).

PMC	The Proportion of Maximum Frequency to characteristic frequency. $PMC = 100 \times (F_{Max} - F_c) / F_c$
Curvature	A measure to characterize the shape of bat pulses. If the value is a positive number the pulse is upward curving, if the value is a negative number the pulse is downward curving. This is calculated by logging time and frequency then performing a linear regression.
FStart	The Frequency at the Start of the pulse. I.e. the frequency of the first ZC dot of the pulse.
Fend	The Frequency at the End of the pulse. I.e. the frequency of the last ZC dot of the pulse.
Smin	The Minimum amount of Slope occurring over 2 to 5 ZC dots within the pulse, relating to the flattest part of the pulse.
Smax	The Maximum amount of Slope occurring over 2 to 5 ZC dots within the pulse, relating to the steepest part of the pulse.
Send	The Slope of the last 5 ZC dots in each pulse.

USER CUSTOMIZABLE METRICS

In addition to the metrics supplied by the program, you can also create custom derivative metrics. To create a custom metric, click on Analysis, then Edit User Metrics. Click in the Name field to name the group of custom metrics (eg. "South-east identifiers"). Double-click where it states **Add Expression...** then type in the expression for your custom metric, then type Enter. Expressions may use the following: * / () + - and the names of all the current metrics. An example expression would be:

$$(2 * F_c) / S_c$$

You can add multiple new metrics, and save the list of user metrics. To remove a metric expression, click on it then select Remove Line. Click OK when complete and it will prompt you to save your changes. The new metrics will be displayed at the bottom of the Metric Panel.

VIEWING METRICS

Pass Metrics

The Metrics Panel displays the average metrics for the pass displayed (only what is visible on the screen). If you change the display (for example the time axis), or move the call, then the metrics will change to reflect the average for what is displayed on the screen.

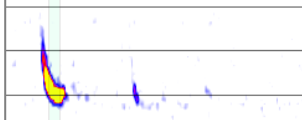
Name	Value	Units	Display
▼ ZC Metrics			
<input checked="" type="checkbox"/> N	60		<input checked="" type="checkbox"/>
> <input checked="" type="checkbox"/> Fc	49.7...	kHz	<input checked="" type="checkbox"/>
> <input checked="" type="checkbox"/> Sc	19.1...	OPS	<input checked="" type="checkbox"/>
> <input checked="" type="checkbox"/> Dur	2.09...	ms	<input checked="" type="checkbox"/>
> <input checked="" type="checkbox"/> Fmax	51.5...	kHz	<input type="checkbox"/>
> <input checked="" type="checkbox"/> Fmin	49.5...	kHz	<input type="checkbox"/>
> <input checked="" type="checkbox"/> Fmean	33.8...	kHz	<input type="checkbox"/>
> <input checked="" type="checkbox"/> TBC	137....	ms	<input checked="" type="checkbox"/>
> <input checked="" type="checkbox"/> Fk	51.5...	kHz	<input checked="" type="checkbox"/>
> <input checked="" type="checkbox"/> Tk	0.07...	ms	<input type="checkbox"/>
> <input checked="" type="checkbox"/> Quality	0.32...	%	<input type="checkbox"/>
> <input checked="" type="checkbox"/> S1	121....	OPS	<input type="checkbox"/>
> <input checked="" type="checkbox"/> Tc	1.90...	ms	<input type="checkbox"/>
> <input checked="" type="checkbox"/> PMC	3	%	<input checked="" type="checkbox"/>
> <input checked="" type="checkbox"/> Curvature	-0.0...		<input type="checkbox"/>
> <input checked="" type="checkbox"/> Fstart	51.5...	kHz	<input type="checkbox"/>
> <input checked="" type="checkbox"/> Fend	50.0...	kHz	<input type="checkbox"/>
> <input checked="" type="checkbox"/> Smin	-23...	OPS	<input type="checkbox"/>
> <input checked="" type="checkbox"/> Smax	234....	OPS	<input type="checkbox"/>
> <input checked="" type="checkbox"/> Send	0	OPS	<input type="checkbox"/>

Pulse Metrics

To view the metrics for individual pulses, click on the drop down arrow next to the metric of interest, and a list of pulses in the file will be shown, along with the metric for each individual pulse. The metrics which are greyed out are from pulses which are not currently being displayed. To remove erroneous pulse metrics from the pass average, simply uncheck the box next to that metric. To view which pulse is associated with the metric, click on the metric and the call will be displayed with the pulse of interest on the left of the display. To uncheck, or recheck all of the pulse metrics, check/uncheck the box next to the average metrics.

Metrics		
Name	Value	Units
▼ ZC Metrics		
<input checked="" type="checkbox"/> N	100	
▼ <input checked="" type="checkbox"/> Fc	50.1292	kHz
<input checked="" type="checkbox"/> 1	49.382	kHz
<input checked="" type="checkbox"/> 2	50.632	kHz
<input checked="" type="checkbox"/> 3	50	kHz
<input checked="" type="checkbox"/> 4	50	kHz
<input checked="" type="checkbox"/> 5	50.632	kHz
<input checked="" type="checkbox"/> 6	50.632	kHz
<input checked="" type="checkbox"/> 7	50.632	kHz

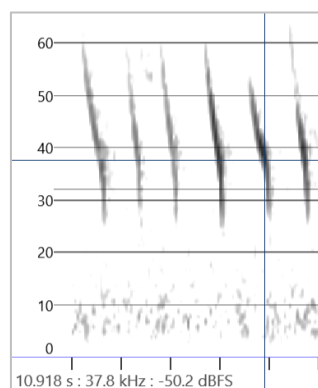
ZC Metrics	
N	2
Fc	50 kHz
Sc	22.4 OPS
Dur	2.55 ms
TBC	84 ms
Fk	51.9 kHz
PMC	3 %



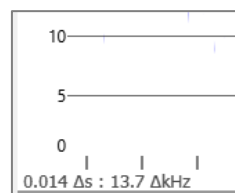
Alternatively you can right click on the spectrogram and check Show call metrics. Then as you hover your mouse pointer over pulses, the metrics for that pulse will be displayed. To choose which metrics are displayed using Show call metrics, check the box in the Display column in the Metrics Panel next to the metric you want displayed on the spectrogram.

CURSOR METRICS

You can use the cursor to take measurements on the spectrogram. In the bottom left of the spectrogram window, the time, frequency and amplitude (for full spectrum files) of the cursor point will be displayed.



To take a measurement of the change in time or frequency, choose the box select tool [] in the View/Audio menu and draw a box from the start to the end of the area of interest. The change (Δ) in time and frequency over that area will be displayed at the bottom of the spectrogram (see below).



LISTENING TO FILES

Bat calls are typically ultrasonic and outside of the human hearing range, Anabat Insight offers a variety of audio modes which will make the ultrasonic calls audible.

AUDIO MODES

You can choose between Heterodyne, Pitch Shifting, Comb Filter, Frequency Division and Time Expansion.

Heterodyne: This mode shifts down a portion of the ultrasonic band into the human hearing range by mixing the signal with an internal reference frequency. This reference frequency is adjusted by the user to suit the frequency of bat calls of interest. The bandwidth of the heterodyne mixing is about ± 8 kHz, so bats calling at a significantly different frequency to the reference frequency will not be heard.

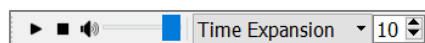
Pitch Shifting: This mode compresses the ultrasonic spectrum down into an audible band by shifting the pitch of the sound. Harmonic components and amplitude of the bat calls are kept in this process.

Comb Filter: This mode can be thought of as multiple heterodyne recorders operating simultaneously, all tuned to different frequencies to cover more of the ultrasonic range.

Frequency Division: This audio mode divides down frequency of the incoming ultrasonic signal by a preset ratio (typically 16) so as to allow ultrasonic sounds to be heard by the human ear. This mode is based on zero-crossing and thus only the loudest frequency component will be heard. No harmonics can be heard and the amplitude of bat calls is not retained, so all sounds will be of the same volume level.

Time Expansion: This mode works by playing back a recorded sound at a slower than normal speed (typically 1/10th). This has the effect of lowering the frequency of the sound. All amplitude and frequency components are retained.

To select your preferred audio mode, click on the audio drop down menu in the View/Audio Bar, or click on Settings in the Menu Bar, then click on Audio Settings. If you select Pitch Shift, Heterodyne, Frequency Division or Time Expansion an additional menu will appear next to or below the audio mode. This can be used to tune or control the audio playback, for example in Time Expansion you will select the time expansion factor. You can then use the audio controls to ► play and ■ stop the audio. The volume bar controls the volume of the audio playback.



To play the call from a specific start point, ensure the oscillogram is displayed above the spectrogram. Then click at the desired start location in the oscillogram then press ►.

VOICE MEMOS

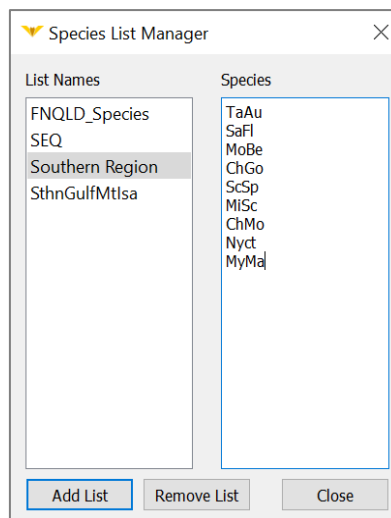
If there is a voice memo recording in your folder, it will automatically be recognized as such. When you open the file, the voice memo spectrogram will be displayed, but when played back, it will automatically play without downshifting.

SPECIES LISTS AND LABELING FILES

Anabat Insight allows you to create or import species lists to label files. Lists created in AnalookW can be opened directly in Anabat Insight.

CREATING A SPECIES LIST

To create a new species Manual ID list, click on Species Lists in the Menu Bar, then click on New/Edit. Select Add List then type your list name (eg. Southern Region). Click in the Species column and type in your species, one label per line (see below). Click Close when complete, it will automatically be saved.



To remove or edit a species list, click on Species Lists in the Menu Bar, then click on New/Edit. Select the preferred list and double click to change the list name, or click on the species in the species column to edit, or click Remove List to delete the selected list.

To export a species list, click on Species Lists in the Menu Bar, then click on Export. Select the list you wish to export, then choose your destination folder/location. The list will be saved as a .ars file.

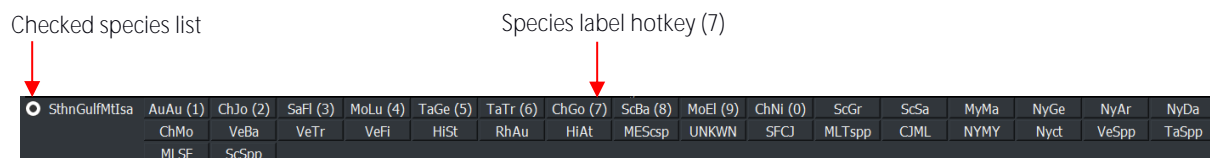
OPENING & DISPLAYING A SPECIES LIST

By default, when you create a new list it should automatically be displayed below the spectrogram. To display another species label list, click on Species Lists in the Menu Bar, check the desired species list/s, then ensure Shown is checked. Your selected list/s should now be displayed below the spectrogram.

LABELLING A FILE

To apply a manual species label to a file, with the file open in the spectrogram window, click on the desired species label from the list. You can add more than one label per file. When you move to the next file, a prompt will appear to ask if you would like to auto-save your changes, check Remember this action then select Yes to save your species label to the metadata of the file. The species label will be displayed next to the file duration in the Project Panel (if Manual Species ID is a selected heading), and also in the Metadata Panel.

You can also use species label hotkeys, which are keyboard shortcuts to your first 10 species labels. You will notice on the checked species label list, a series of numbers in brackets (1 – 0; see below), these hotkeys correspond with the 1 – 0 keys on your keyboard. For example, using the species list below, pressing the “7” key would automatically label the file with “ChGo”. If the bracketed number hotkeys do not appear after each label, ensure the list is checked.



To add duplicates of the same label (eg. [2] ChGo), hold the Shift key while clicking on the species label or pressing the hotkey.

You can also use the auto-scroll feature to speed up your labelling. To activate this feature, go to Settings, then File Navigation, and check Next on Species Label. This will automatically scroll to the next file after a species label is selected (either by clicking the label button, or by using the hotkey). If you are using this feature and wish to return to the previously labelled file, use the keyboard shortcut ‘L’.

REMOVING A SPECIES LABEL

A species label can be removed in exactly the same way as removing other metadata. By manually erasing it in the Metadata Panel, or right clicking on the field in the Metadata Panel and clicking on Delete Selected. Alternatively, click on the label in the species list with the file open.

You can also batch remove species labels, see [removing metadata](#).

PLUGINS

Currently Anabat Insight has the following plugins:

- Bat Classify UK: Bat Classify is developed as an open source auto-ID tool.
- Import Tool for BTO Pipeline: Allows users to import BTO Pipeline results.
- TERN Project: A standardised metadata tool for data being uploaded to the TERN acoustic database.

Other plugins may become available at a later date.

BAT CLASSIFY UK

To enable the Bat Classify plugin, click on Plugins in the Menu Bar, then hover over Bat Classify UK Auto ID and click Enable. Ensure a full spectrum file is open in the spectrogram window, and the Bat Classify toolbar will appear below the spectrogram window (see over).



To identify one file, open the file and click the <Run> button in the Bat Classify toolbar below the spectrogram, the potential species and a confidence percentage will appear as buttons, you can then click the button to apply the species label (you can select more than one), scrolling to the next file will save the species label/s.

To batch run Bat Classify UK plugin on a group of files, right-click on the folder, or select multiple recordings in the Project Panel. Select Run Species Auto ID Plugin, then select Bat Classify UK Auto ID. Choose your ID Tag Certainty Threshold; this means that any species with a certainty percentage above that number will automatically be labelled. The higher the threshold percentage, the more certain the results, by default this is set to 70%. If more than one species label is present above your certainty threshold, then multiple species labels will be added to the file. Then click Run Auto ID, it may take several minutes, depending on the size of your dataset and where the files are stored (eg. SSD, HDD, Cloud etc.). Your files will automatically be labelled with the species identified by Bat Classify UK. When viewing the species metadata in the Metadata Panel, it will also include the confidence level after the Auto ID species, eg. Ppip (98%).

Please note: Bat Classify can only run on full spectrum files, and you cannot run the Bat Classify UK plugin on project files. Bat Classify will now run on a Mac.

If you wish to produce a report which includes the Bat Classify % confidence, select a report based on species Auto ID. The example below shows the .csv based on a metadata extract report, with multiple species labels per file.

	A	B	C
1	File	Species Auto ID	Species Auto ID
2	2017-07-10 22-08-30.wav	Ppip (93.2%)	Ppyg (82.9%)
3	2017-07-10 22-08-43.wav	Ppip (83.2%)	Ppyg (85.2%)
4	2017-07-10 22-09-06.wav	Ppip (84.4%)	Ppyg (97.1%)
5	2017-07-10 22-09-52.wav	Ppyg (97.0%)	

IMPORT BTO RESULTS

The BTO Pipeline is a third party automated identification system for the UK. BTO Pipeline results are presented in .csv format. You can use the BTO Results Importer Tool to automatically label all of your files with the BTO results.

Please note: In order to label files, the file names must match exactly those processed by the BTO Pipeline. If you used the BTO Pipeline to split long files, then you will not be able to open/label these files in the free version of Anabat Insight. To keep your files compatible with both BTO and the free version of Anabat Insight, please time split your files to the appropriate length in Anabat Insight before processing in BTO Pipeline.

Firstly, ensure your dataset is open in the Store. Open the BTO Results Importer Tool by clicking on Plugins, then Import BTO Results. Click Browse to navigate and select the results .csv produced by the BTO Pipeline. Choose the minimum confidence level (Min Confidence) you would like labels to be applied. This means that any species with a certainty percentage above that number will automatically be labelled. The higher the threshold percentage, the more certain the results, by default this is set to 70%. If more than one species label is present above your certainty threshold, then multiple species labels will be added to the file. Use the check boxes to select any other BTO Pipeline metadata you would also like added to your files: Classifier, Species Group or Warning. Then click Import. It may take a minute to apply the labels, depending on how large your dataset is.

TERN PROJECT

If you are planning to upload data to the TERN acoustic database, it's essential to ensure that your metadata is consistent with the naming conventions used in the database. We've created the TERN Project plugin to assist with this.

To begin, turn on the TERN Project plugin by clicking on Plugins, then select TERN Project. This will enable the following:

- Preset metadata lists
- Tooltips explaining metadata fields
- Preset metadata value options for certain metadata Types.
- Example metadata values

Once the TERN Project plugin is turned on, you can display the TERN metadata lists you choose. To do this go to Metadata Lists and check the lists you want displayed. All TERN metadata lists will begin with the Namespace TERNbat|

You can also add metadata manually by right-clicking on the selected file/s, then choose Add Metadata. The Type dropdown menu will contain the TERN fields. For certain fields (eg. Record Context) there are preset dropdown values you can choose from. For other fields (eg. Collected By), it will supply an example value so you can ensure the correct format is followed.

MARKING FILES

In Anabat Insight, you can 'mark' files to perform actions on later such as view, export, view in external application, add metadata or send to trash.

MARKING A FILE

To mark a recording you can right click on the recording filename in the Project Panel, then select Mark Selected. Alternatively, if the recording is open in the spectrogram window you can use the keyboard shortcut 'x'. To unmark a recording, either use the keyboard shortcut again, or right click on the file and select Unmark Selected. You can also mark/unmark multiple files by selecting more than one file/folder in the Project Panel.

When a file is marked an M will appear next to the file in the Marked column in the Project Panel.

When you exit Anabat Insight, if you have Marked recordings, a pop-up will ask 'Would you like to save your markings? Otherwise marks will be lost upon closing Anabat Insight session.'. Selecting Yes will save your marks, selecting No will mean your markings will be lost.

VIEWING MARKED FILES

To view your marked files, click on the Marked tab at the bottom of the Project Panel. A list of marked files will be displayed, which you can open and scroll through. You can also group/sort and customise the headings of the Marked tab the same ways you can for the Stores tab.

ACTIONS ON MARKED FILES

To perform actions on marked recordings, select the recordings in the Marked tab (to select all, click Marked List folder at the top), then right click on the selected recordings; this will display the options menu.

- To open the files in new tabs: click Open Selected in New Tab, each file will be opened as new tabs in the spectrogram window. This is not recommended for large numbers of files.
- To view files on a map: click Show on Map. The files will be displayed on Open Street Maps in a new window tab.
- To copy/move/export to zero crossing/time split .wavs: click Export Selected and follow the prompts.
- To delete the files: click on Send to Trash. This will send the selected recordings to the trash (visible from the Stores Panel), you will need to empty the trash to permanently delete the recordings.
- To unmark recordings: click Unmark Selected.
- To invert your markings (this will remove markings from currently marked files and instead mark all unmarked files): Select Invert ALL Marked then click Yes.
- To add metadata: click Add Metadata, then follow the prompts.
- To remove metadata: click Remove Metadata, then follow the prompts.
- To add a Manual ID species label: hover over Add Species, then select the appropriate species label. If no species are displayed, ensure you have selected a species list.

If you have only selected one file, you will have the following additional options:


- To view the file in their source folder: click Show in File Explorer.

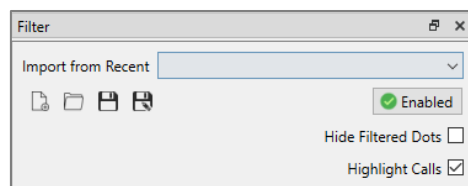
FILTERS

Filters can be used in a number of ways to streamline your analysis. You can use filters to compress your files to only see pulses of interest, remove noise from view, observe which pulses in a file meet certain





metric conditions, search for certain species/pulses in a dataset, and build custom decision trees for auto-identification. It is important to ensure that the trigger is set correctly for filters to work well.

LOADING A FILTER



To load a pre-existing filter, click on the Filter tab under the Project Panel. Click on , then select your filter. Anabat Insight can load filters created in AnalookW. Once a filter is loaded, the filter metrics will be displayed in the panel. Anabat Insight will remember your recently used filters, to load a recent filter, click on the Recent Filters drop-down menu and select the relevant filter.



CREATING A FILTER

To create a filter, click on the Filter tab under the Project Panel. Click on  to begin creating a new filter. Enter the range of metrics, ensuring the filter is enabled  and the relevant metrics are checked . For example, if you are looking for a species that typically calls at 64kHz, then you could create a filter based of Ec 61-67kHz. As you enter the metrics, you can observe what is passing the filter in the spectrogram window if you have selected either compressed mode or highlight call body (see [viewing with a filter](#)). To save the filter, click  and follow the prompts.

EDITING A FILTER

To edit a filter, first load the filter you wish to change, then alter the relevant metrics. You can then save these changes by clicking , or save the changes as a new filter by clicking .

Please note: If the filter is being used in a Search/Decision Tree, you will need to update the filter in the search/decision tree, this will not happen automatically.

VIEWING WITH A FILTER

There are three ways you can view a filter working: 1) compressed mode, 2) highlight call, and 3) hide filtered dots.

Please note: If the filter is enabled, even if you are viewing from other tabs (eg. Stores panel) you will still be viewing with the filter on.

- 1) Compressed mode: This will remove the gaps and pulses which do not meet the filter parameters from the display, this will include a buffer around the pulses, Highlight Calls will still show what has passed the filter. Select Compressed mode, and ensure your filter is enabled.
- 2) True Time mode with Highlight Calls: This will highlight the pulses which pass the filter (in green or red, depending if you are in Dark or Light mode). First ensure you are in True Time mode, and then ensure the Highlight Call box is checked in the Filter tab.
- 3) Zero crossing with Hide Filtered Dots: If you are viewing in zero crossing and in True Time mode, you can check Hide Filtered Dots in the Filter tab, this will hide the dots that do not pass the filter.

SMOOTHNESS FILTERS

There are built-in smoothness filters which can be applied to your calls to help remove noise and poor quality pulses. Smoothness is calculated by looking at adjacent dots and seeing how 'connected' they are. Ideally the 3 (previous, current and next) dots will make a straight line for perfect smoothness, but you can set the threshold on how 'smooth' or 'line-like' they need to be. To select a built-in filter, click on Settings, then Smoothness. Select the level of smoothness filter (from None to 9). A smoothness filter of 1 is the weakest, whilst 9 is the harshest.

Alternatively you can select Auto Smoothness (recommended), which is optimized to each file. The Auto Smoothness filter works best when used in conjunction with Auto FS Trigger. To select Auto Smoothness, click on Settings, then Smoothness, select Auto; alternatively use the keyboard shortcut Alt+-.

SYNTHETIC FILTERS

The synthetic filter feature is adapted from AnalookW and is designed to be compatible with existing synthetic filters built in AnalookW. A synthetic filter allows you to create a dynamic filter based on the relationship between two different metrics.

To create a synthetic filter, first load a pre-identified dataset (eg. reference calls) – ideally with two species that are difficult to separate using existing metrics. Ensure no other files are open in your project panel. Then go to the Analysis menu and select Synthetic Filter. It will plot all of the files with two metrics (by default this will start with Fc vs Fc).

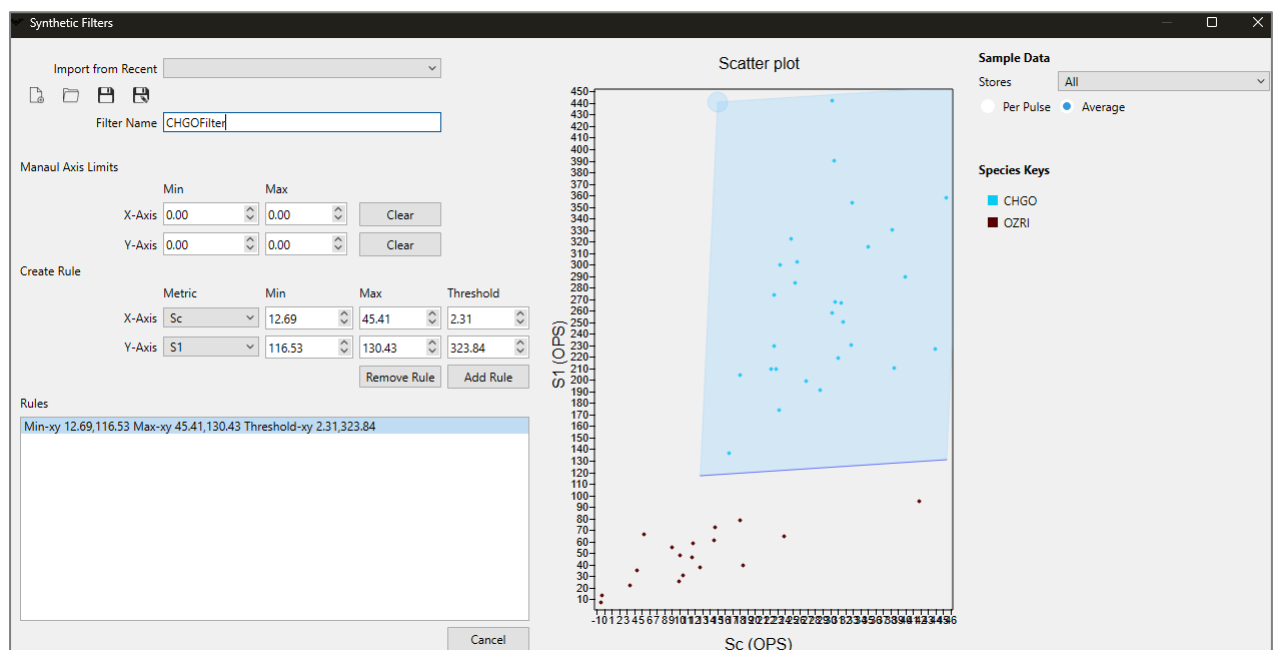
Choose the dataset you wish to have plotted, in the top right select the dropdown menu next to Stores. Choose between All, Marked List, Loose Files and specific folders. Then you can choose to plot every pulse (Per Pulse) or the average metric for each file (Average). You can choose the colours assigned to each species by clicking on the coloured box under Species Keys.

Please note: We recommend choosing Average unless you are using a reference dataset that has been meticulously cleaned or erroneous pulses and dots.

On the left of the synthetic window under Create Rule, you can assign the X and Y axis to different metrics. In the example below, the X axis is set to Sc and the Y axis is set to S1. If you wish, you can manually set the axis minimum and maximum limits under Manual Axis Limits, if left blank it will use default values suited to the dataset and metrics chosen.

Once you have found two metrics which separate out the two species of interest, then click Add Rule. Click and drag a line across the scatter plot dividing the two species. Then under threshold, increase one of the threshold values (choose Y axis if you want the box to move vertically, and X axis if you want the box to move horizontally). This will increase the filter area relative to the rule line. You can then click and drag the corners of the filter box to encompass all/most of the pulses by one species.

Enter a Filter Name, then click the Save icon near the top left. You now have a saved synthetic filter you can use to search your unlabelled datasets and you can close the Synthetic Filter window.



To use a saved synthetic filter, you can:

1. Use it like a visual filter, it will appear at the bottom of the Filter tab.
2. Import it into a Search or Decision Tree, under Criteria Type choose Synthetic Filter.

SPECTROGRAM DE-NOISING

We have developed a tool which can visually reduce the ambient noise in a spectrogram. To activate the de-noising filter, click on View, then check Spectrogram De-Noise. Please be aware that spectrogram de-noise may reduce the appearance of constant frequency bat calls (eg. Rhinolophus sp.). The de-noise filter will not affect the zero crossing conversion of a spectrogram or triggering, it is purely visual.

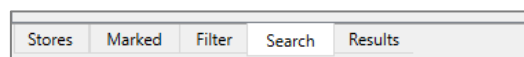
SEARCHES & DECISION TREES

You can use the search tool to search for files in your dataset based on a filter, metadata or pulse information. For example, you can use the search tool to search for any files recorded in a particular date range, or to search for all the files which pass an “All bats” filter. The decision tree tool can be used to create a customisable key to automate the analyse your calls.

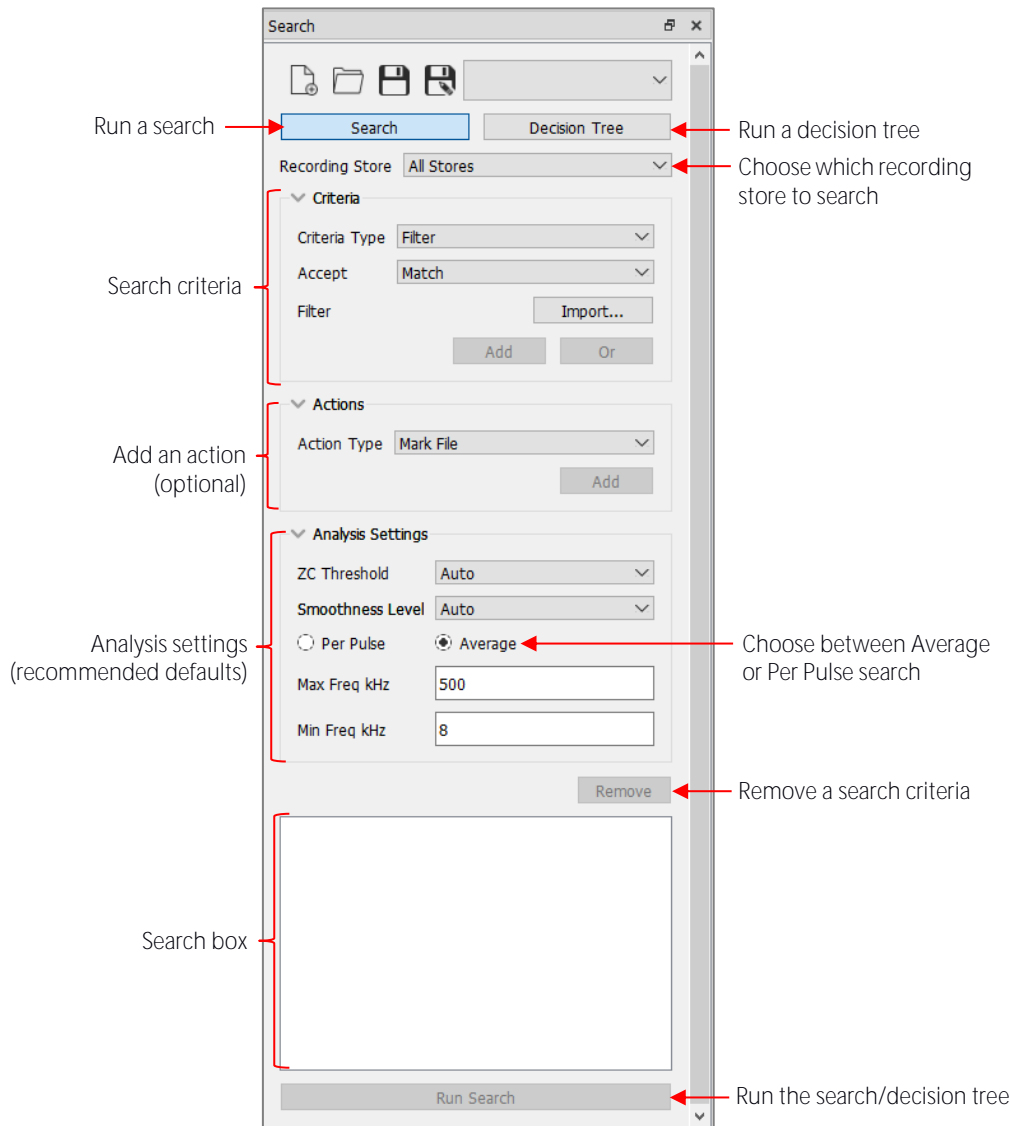
For some important tips on creating a decision tree see [decision tree tips](#).

CREATING A SEARCH

To begin, click on the Search tab under the Project Panel (see below).



Ensure the Search button is selected at the top of the search tab.



Select the Recording Store you would like to search using the drop down menu (eg. All stores, marked list, specific folders). Choose your Criteria Type using the drop-down menu (eg. filter, synthetic filter, species, time, date, device ID, pulse count, pulse percentage). Parameter windows relating to your criteria will appear. For a filter or synthetic filter criteria, click Import:

- The most recently used filters will appear in the Select Filters drop-down menu;
- To open an older saved filter, click **Load Other...** in the Select Filters drop-down menu;
- To create a new filter for this search, enter the metric parameters, give the filter a name, then press Import.

Then use the Accept drop-down menu to select whether you want to see results which match your criteria, or do not match. Then click Add. Your search criteria will appear in the search box, you can add multiple search criteria to one search.

Please note: If you change the filter in the Filter tab, or a synthetic filter in the Synthetic Filter window, this will NOT change the filter in the search. You need to Remove the current filter search criteria then reimport the filter with correct parameters.

If you wish to apply multiple filters to a single search, you can choose to see files which pass both filters (select And) or files which pass either filter (select Or).

Please note: If you select Or, the results will not indicate which filter the file passes, for this functionality use the decision tree.

ADDING ACTIONS TO SEARCHES AND DECISION TREES

The following actions can be added to a Search or Decision Tree:

- Mark file
- Move to trash
- Add Manual species ID
- Add note
- Add humidity
- Add temperature
- Add light
- Add custom metadata

To add an action, first enter the search/decision tree criteria, then click on the relevant search criteria in the Search Box. If you don't click on the search criteria in the search box, you will not be able to add the action. Then select an Action Type from the dropdown menu. A relevant action box will appear to select the specific action (eg. choose a manual species label). Click Add, and the action will appear beneath the selected search criteria in the Search Box. You can add different actions for different search criteria. When you save a search, the actions will also be saved.

Please note: You cannot add actions to .zca files, they first need to be converted to .zc files.



ANALYSIS SETTINGS FOR SEARCHES AND DECISION TREES

The Analysis Settings will determine your trigger and zero crossing rendering of the files to be searched (which may have a significant effect on filter results), for more information see Trigger Settings. In practice, your search analysis settings should match your viewing settings so that you produce the results you expect. By default the search Analysis Settings will match your viewing settings.

You also need to choose between Per Pulse or Average searching. With Average selected (default), it runs the search based on the average metrics for the entire file. Whilst Per Pulse will run each pulse in the file through the filter, and if one pulse passes, then the file will pass. This may be further refined by adding a pulse count or percentage criteria, so while the file may pass – an action will only be applied if enough pulses end up at that node.

Please note: Per Pulse decision trees may result in files being displayed more than once in the Results Tab.

Click Run Search, this will take you to the Results tab, where all the files which pass your search criteria are displayed.

You can save search parameters to use again another time by clicking . To load a search you have previously saved, click .

CREATING A DECISION TREE

A decision tree is a tool which passes files through a dichotomous tree. Each file or pulse either ‘passes’ or ‘fails’ criteria, before moving down to the next branch of the decision tree. At each branch of the decision tree you can assign actions. You can use this tool (in combination with filters) to create your own Auto-ID tree.

To begin, click on the Search tab under the Project Panel, and ensure the Decision Tree button is selected. Select the Recording Store you would like to search using the drop-down menu.

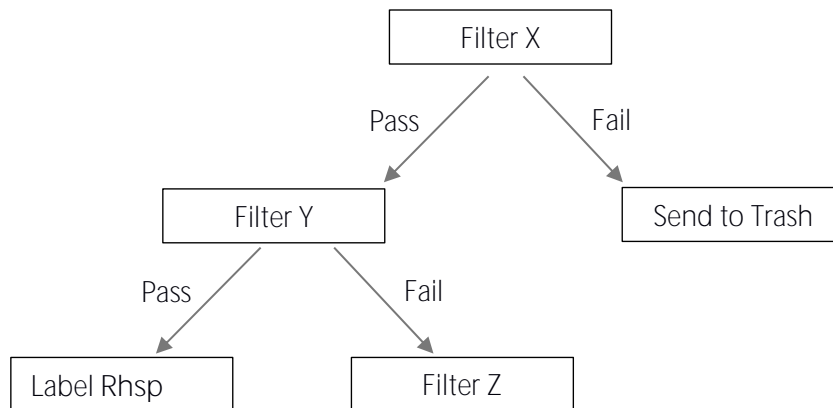
It is strongly recommended to write/draw/create your decision tree before creating it in Anabat Insight. Start with the first branch of the decision tree. Choose your Criteria Type using the drop-down menu (eg. filter, synthetic filter, pulse count, pulse percentage, species, time, date, device ID). Parameter windows relating to your criteria will appear. For a filter or synthetic filter criteria, click Import:

- The most recently used filters will appear in the Recent Filters drop-down menu;
- To open an older saved filter, click **Load Other...** in the Recent Filters drop-down menu;
- To create a new filter for this decision tree, enter the metric parameters, give the filter a name, then press Import.

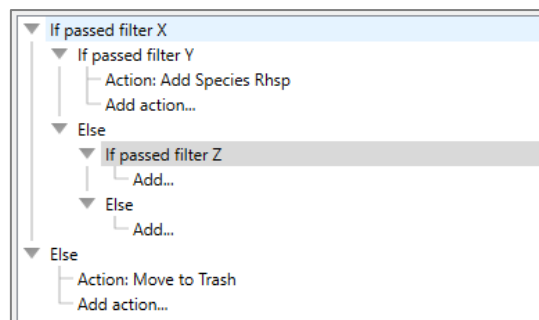
Then use the Accept drop-down menu to select whether you want to see results which match your criteria, or do not match. Then click Add. You will see several lines appear in the search box:



If you would like to add a second branch, or action, to the files passing the first criteria, then click Add below the first “If Passed...”, then you can add an action or another search criteria. If you would like to add a second branch, or action, to the files which fail the first criteria, click Add below the first “Else”, then you can add an action or another search criteria. Here is an example tree:



The decision tree above would look like the following in the search box:



Then click Run Search, this will take you to the Results tab, where all the files from the selected store are displayed under the branch node where they end. Remember, if you chose Per Pulse, then files are likely to appear at multiple nodes.

You can save a decision tree by clicking . This will save the decision tree and all of its associated filters in one file. To load a decision tree you have previously saved, click .

When you save a search or decision tree, the analysis settings will also be saved so the search/decision tree can be replicated. If you open a saved search/decision tree, it will prompt you to change the viewing settings to match the analysis settings.

EDITING A DECISION TREE

To edit a decision tree, firstly click on the criteria or action you wish to change/add in the Search Box, the criteria or action will open in the relevant section of the search panel.

- To edit a filter or synthetic filter search criteria: click Import, change the metrics and/or name, then click Import again, then click Update.
- To edit the other criteria parameters (eg. pulse count): change the criteria and then click Update.
- To edit an action: Change the action type or details, then click the Update button.
- To add an additional criteria (and move other criteria down the tree): enter the new search criteria then click Insert. It will prompt you **"Where would you like to attach '*previous criteria*' onto new search item '*new criteria*'?** Choose if you want the previous criteria to be on the If passed branch or Else failed branch.

After clicking Update or Insert, you will see the decision tree change in the Search Box.

Please note: If you change a filter in the Filter panel or Synthetic Filter window, you will need to manually update the filter in the decision tree.

To remove a criteria or action, click on the relevant criteria/action in the decision tree, then click the Remove button.

Please note: This will remove everything below that branch on the decision tree.

If you have edited your decision tree, you will need to rerun the search for the updated criteria/actions to apply. However, please remember to remove any metadata/markings/species labels and restore the trash before rerunning.

VIEWING SEARCH & DECISION TREE RESULTS

Your search or decision tree results are shown in the Results tab under the Project Panel. If using a decision tree, the files will be displayed at the nodes they ended at. If you used a Per Pulse decision tree, the same file is likely to be shown at multiple nodes.

You can open a file by double clicking on it in the list. Then when you scroll through files using [and], you will be scrolling through the search results. You can also open/export/delete/add metadata to the recordings directly in the Results tab. Simply select the desired recordings (to select all, click one recording, then press CTRL+A), then right click; this will display the options menu.

- To open the files in new tabs: click Open Selected in New Tab, each file will be opened as new tabs in the spectrogram window. This is not recommended for large numbers of files.
- To view files on a map: click Show on Map. The files will be displayed on Open Street Maps in a new window tab.
- To copy/move/export to zero crossing/time split .wavs: click Export Selected and follow the prompts.
- To delete the files: click on Send to Trash. This will send the selected recordings to the trash (visible from the Stores Panel), you will need to empty the trash to permanently delete the recordings.
- To mark recordings: click Mark Selected.
- To invert your markings (this will remove markings from currently marked files and instead mark all unmarked files): Select Invert ALL Marked then click Yes.
- To add metadata: click Add Metadata, then follow the prompts.
- To remove metadata: click Remove Metadata, then follow the prompts.
- To add a Manual ID species label: hover over Add Species, then select the appropriate species label. If no species are displayed, ensure you have selected a species list.

If you have only selected one file, you will have the following additional options:

- To view the file in their source folder: click Show in File Explorer.

DECISION TREE TIPS

Here are a few helpful tips when creating/using decision trees:

3. If you are using metrics (eg. characteristic frequency filter) as a main criteria, ensure every frequency is covered in the tree. For example, one filter should cover characteristic frequencies 10khz – 30khz, another filter should cover 30khz – 60khz. If the second filter started at 31khz, then any file with Fc of 30.XX would not pass through the decision tree.
4. When using an average decision tree, **add a 'catch-all' to every empty Else statement** to check for decision tree errors. For example, if you add an action to Mark files, then you can check all your marked files after running a tree to see what is being missed. Do not do this on per pulse decision trees.
5. If you change your decision tree, ensure you do the following before rerunning the search:
 - Remove any metadata or species labels you added
 - Unmark recordings
 - Restore the trash


Otherwise you will end up with multiple labels, incorrect labels/markings from the previous search, and/or not searching all the files.

6. When you add a filter to a decision tree, this adds all the metrics associated with that filter. However if you change the filter using the filter tab, this filter will not automatically be updated in the decision tree, you will need to manually update the filter yourself.

FILE EDITING

You can edit a file by cropping it, or in the case of zero crossing files you can also Hide/Show ZC Dots and Show Off Dots. You can use the Hide ZC Dots to improve the metric calculations by removing erroneous dots.

CROP A FILE


To crop a file, choose the box select tool  from the View/Audio Bar. Then draw a box over the area you wish to crop on the spectrogram. Right-click on the spectrogram and select Crop File.

Please note: This will only crop the time scale, not the frequency.

The cropped file will replace the existing file in the spectrogram window. If you scroll to the next file, you will be prompted to save the cropped file. If you click Save, then the cropped file will be saved as a new file with the suffix _modified in a location of your choice. If you select Discard, then the cropped file will be discarded and you will continue to scroll to the next file in the list.

Please note: You can also time split a .wav file based on a certain number of seconds.

HIDE/SHOW ZC DOTS

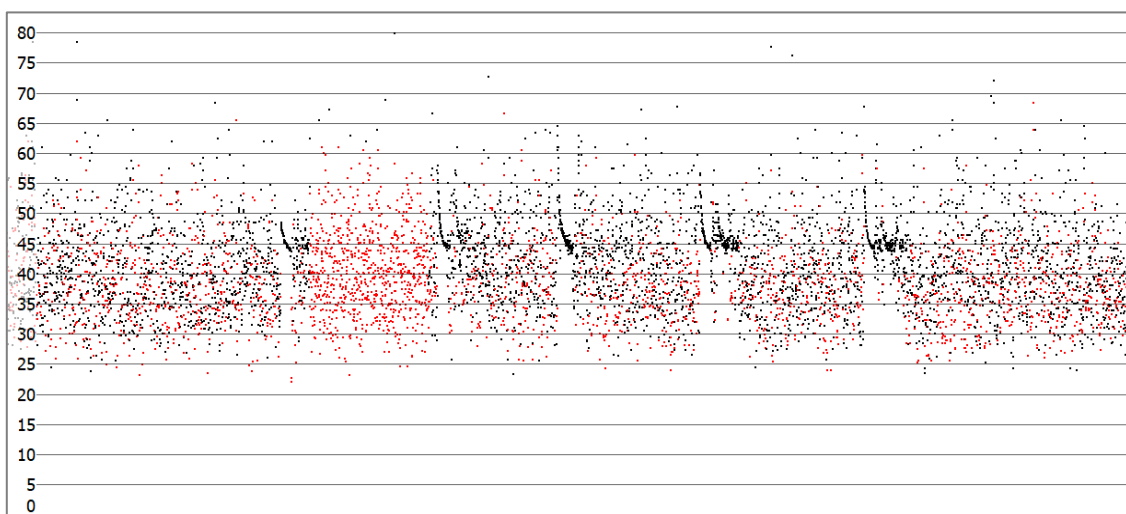
To hide/show ZC dots, ensure you are viewing the file in Zero Crossing, and choose the box select tool  from the View/Audio Bar. Then draw a box over the dots you wish to hide/show in the display window. Right-click and select either Hide ZC Dots or Show ZC Dots, when you scroll to the next file a window will appear to ask if you would like to Save or Discard your changes, if you choose to save the file will be saved as a new file with the suffix _modified.zc in a location of your choice.

Please note: Even if it is a full spectrum file, you can only save the modified file as a zero crossing (.zc) file.

To reset the dots to the original file, right-click on the display and select Reset All Dots.

SHOW OFF DOTS

When you have a [filter](#) or [smoothness filter](#) applied to a file, or have [manually hidden ZC dots](#), you can choose to show the Off Dots (the hidden dots) in a different colour (see figure below, with Off Dots in red). This may be helpful to check if bat pulses are being filtered out. To show Off Dots, right-click on the display and select Show Off Dots. If you are in Compressed mode, the Off Dots will still only be shown if within a triggered pulse or its [buffer](#), to view all of the Off Dots, you will need to [change to Truetime mode](#). To change the colour of the Off Dots, see [graph colours](#).



SAVE AN IMAGE

You can choose to save the spectrogram window as an image (.png). Simply right-click on the spectrogram, select Save as Image, and choose the destination folder for the image.

SETTINGS

The settings menu allows you to change the [trigger settings](#), [smoothness filter](#), change the [slope transition](#) and [cycle settings](#), [change the FFT Window settings](#), [change ZCA viewing settings](#), [choose a file navigation speed](#), [prevent inter-group scrolling](#), [automatically skip to the next file on labelling](#) and [reset to default settings](#).

SLOPE TRANSITION SETTINGS

The slope transition settings refer to how many transitions the slope graph uses to display data. The transitions are in practice an averaging of the zc period dots whilst accounting for their division ratio. For example a 80 transition setting, with division 8 zc periods, would average 10 periods for a single slope point. To change your slope settings, click on Settings in the Menu Bar, then hover over Slope Transitions and then choose between 40, 80, 160, or 320.

CYCLE SETTINGS

The cycle settings refer to how many dots are averaged for one data point in the cycle graph. To change your cycle settings, click on Settings in the Menu Bar, then hover over Cycle Settings and then choose between 1, 3, or 5. In addition, you can check Cycle Dots/Time, which changes whether the cycles graph is showing total dots or total time.

RESET SETTINGS

If you would like to reset all settings to the factory defaults, click on Settings in the Menu Bar, and then click Reset Settings, then select Yes. This will not close your store or change any pre-existing Search/Results.

REPORTS

Anabat Insight currently offers a number of default reporting features, and the option to [create custom reports](#). To generate a default report, click on Analysis in the Menu Bar, then click Generate Reports.

Next to Recordings, you can select the store which you would like to generate a report for; All (everything in the store), Loose Files (files which are individually listed in the Loose Files section of the Stores Panel), Marked List, or specific folders. You can then choose which type of report to generate:

- **Metrics:** Generates a .csv file which shows the average metrics for each file. You can also generate the metrics for each pulse in files by checking the Per Pulse box. You will need to set your analysis settings for the metrics report, these settings will default to your viewing settings. For more information on choosing your analysis settings, see [Trigger Settings](#). You can also choose to include columns for species labels (Manual ID and/or Auto ID).

- **Species Count:** Generates a .csv file displaying each of the species identified in the dataset and how many files attributed to each species. You can choose to break the species counts up into Time Period (1, 5, 10, 15, 30mins, and 1hr), and also Group By folder, file type, device ID, night, date or custom metadata. You can also choose to include columns for species labels (Manual ID and/or Auto ID).
- **Metadata Extract:** Generates a .csv file showing each file, and the selected metadata associated with that file (species, location, temperature etc.).
- **KML Map:** Generates a .kml file containing all of the GPS information in the selected store, including waypoints and tracks. Each file is stored in the KML file with species labels. This file can be opened by Google Earth or any GIS application.
- **Custom Report:** Create a custom report template or choose from preset customs.

Please note: If you would like to produce a Disperse report, select Custom Report and then choose Example Count by Columns.

CREATING CUSTOM REPORTS

To access custom reports, under Report Type, select Custom Reports. There are a number of preset custom reports including Example Species Count (produces Species Count report), Example Count by Columns (produces Disperse report), Example ECO OBS, or recent report templates. Use the Report Template drop-down menu to select these preset options. You can also select these options and modify them.

To create a new custom report select New Template in the Report Template drop-down menu. This will open the Report Template Editor window. You can add Input Columns and select your Output Column/s, a live Example Report Layout from your data will be displayed. You can drag and drop

columns in the Example Report Layout to change the format. Click Add... to choose input columns. To remove an input column, click on it, then click Remove. Use the output columns Type drop-down menu to select an output. You can drag and drop columns to reorder.

- Input columns refer to every column before an output column/row. Includes: metadata, filename, folder, day/night, date, location, time, timegroup. See the table below for more information and options.
- Output columns refer to the final column/columns in the spreadsheet. Includes: total count, count per time period, count per metadata, and count per species. See the table below for more information and options.

Click Save to save the report template, select a location, and give the report template a name, then click Save. Then click Generate to produce the .csv report.

Alternatively, you can load a pre-existing report template click Load, find the report template file, then click Open.

Input and Output Column Options

Input Columns		
Type	Options	Explanation
Filename	Without extension (default)	Display each file name only
	Include Extension?	Display each file name with extension (eg. .wav)
Folder	Folder Path	Display the folder path (eg. Survey/Site1)
	Expand Folder Path? (default)	Displays each folder level as separate columns
Day/Night	Day	Date column (midnight to midnight)
	Night (default)	Date column (midday to midday; best for bats)
Date	Format	Year – Month – Day
		Month – Day – Year
		Day – Month – Year
Location	One column	Display lat. & long. in one column
	Separate column for lat. & long.? (default)	Display lat. in one column, and long. in another
Time	Time only	Timestamp column
	Include Date? (default)	Date and timestamp in one column
Time Group	Period (mins)	Group by time period (default 5mins)
	Start time	Enter when time periods to start (eg. 17:00)
	End time	Enter when time periods to end (eg. 06:00)
	Include missing times?	Include columns for time periods with no output
Channels		Which channels were used for recording
File Duration (s)		Duration of each file (seconds)
Firmware Version		Firmware version of recorder at time of recording
Make		Make/Brand of recorder (eg. Titley Scientific)
Model		Model of recorder (eg. Chorus)
Sample Rate		Sample rate at time of recording
See over for more options		

Species Species Auto ID Species Manual ID	Row per individual species Row per unique species combination	One row for each species (eg. Ppip) One row for each label combo (eg. Ppip, Ppyg)
Sunrise		Time of sunrise on date/location of recording
Sunset		Time of sunrise on date/location of recording
Temperature		Temperature at time of recording
Recording Metadata		Metadata included at time of recording (eg. Anabat Filter HP) which will include recording settings.
Custom Metadata		Custom metadata added post-recording
Output Columns		
None		No count data included in spreadsheet
Total Count		Total number of files
Count per time period	Time period (5 mins default) Start and End Time Include missing times?	Number of files per time interval (eg. 5 mins) Choose the start and end time for each recording period (eg. 18:00 – 05:00) Include columns for time periods with no output
Count per metadata	Metadata Fields (eg. Temp. or Site) Include all metadata? Add non-listed column	Count per metadata field (eg. Site A, Site B) Include metadata columns, even if it does not contain bats Manually add a new metadata column
Count per species	All Species/ Manual ID/Auto ID Include confidence levels? Include all species? (default) Add non-listed column	Choose which species labels to use or both Create a second column per species for Auto ID confidence level (requires Filename as an input) If not checked, select the species to include Manually add a new metadata column

See some example reports below.

	A	B	C	D	E
1	Habitat	Bbar	Paur	Ppip	Ppyg
2	Hedgerow	0	0	48	28
3	Urban	0	2	0	16
4	Woodland	68	6	24	344

Input columns: Habitat (custom user-added metadata)

Output columns: Count per Species.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Species	18:00 to 19:00	19:00 to 20:00	20:00 to 21:00	21:00 to 22:00	22:00 to 23:00	23:00 to 00:00	00:00 to 01:00	01:00 to 02:00	02:00 to 03:00	03:00 to 04:00	04:00 to 05:00	05:00 to 06:00
2	Bbar	0	0	34	0	0	0	0	0	0	0	0	0
3	Paur	0	3	0	0	1	0	0	0	0	0	0	0
4	Ppip	0	0	26	0	3	0	5	0	0	0	0	2
5	Ppyg	1	53	31	28	24	7	5	0	2	0	30	7

Input columns: Species

Output columns: Count per time period – 1 hour; 18:00 – 06:00, include missing times.

	A	B	C	D	E	F
1	File name	Location	Make	Model	Sunset	Species
2	2018-02-27 20-31-24	52.023000,-4.731110	Titiley Scientific	Swift	17:54:00 UTC	Ppip
3	2018-02-27 20-31-42	52.023000,-4.731110	Titiley Scientific	Swift	17:54:00 UTC	Ppip
4	2018-02-27 20-31-55	52.023000,-4.731110	Titiley Scientific	Swift	17:54:00 UTC	Ppip
5	2018-02-27 20-32-01	52.023000,-4.731110	Titiley Scientific	Swift	17:54:00 UTC	Ppip
6	2018-02-27 20-32-07	52.023000,-4.731110	Titiley Scientific	Swift	17:54:00 UTC	Ppip
7	2018-02-27 20-32-14	52.023000,-4.731110	Titiley Scientific	Swift	17:54:00 UTC	Ppip
8	2018-02-27 20-32-35	52.023000,-4.731110	Titiley Scientific	Swift	17:54:00 UTC	Ppip


Input columns: Filename, Location, Make, Model, Sunset, Species.

Output columns: None.


MAPPING


Anabat Insight comes with built-in mapping features using Open Street Maps and the ability to export GPS data.

Please note: To use Open Street Maps the computer needs to have an internet connection.

To view where a file was recorded: open the file from the Project Panel, once the file is open in the spectrogram window, click on  in the Metadata Panel next to Location. This will open a new tab in the spectrogram window, showing the location the file was recorded.

To view a .gpx track: double-click on the track in the Project Panel (it is shown under Other Files by default). This will open a new tab in the spectrogram window, showing the track on the map.

To view all the GPS data in a folder (waypoints and tracks): right-click on the folder in the Project Panel, select Show On Map. Files will be shown as , and the track will be displayed in green on the map.

To view a file from the map: click on the corresponding , a grey bar will appear listing the file name/s, select Click to Open. The selected file will open as a new tab in the spectrogram window.

To export the GPS data to a KML: see Reports.

TOOLBOX

To access Toolbox, click on Devices from the Menu Bar and then select Toolbox. Toolbox can be used for the following (click shortcut below to skip to instructions):

- [Check the serial number and firmware version of your recorder](#)
- [Set up or add a digital asset tag](#)
- [Update recorder firmware](#)
- [Set the clock/time zone](#)
- [Change the recording settings/profile](#)
- [Set a schedule](#)
- [Estimate the battery life](#)
- [Estimate data usage](#)
- [Batch setup multiple recorders](#)

To use Toolbox with your recorder, you will either need an SD card, or to connect the recorder via USB to your computer. For certain functions (changing recorder settings, checking the device info), you need to connect to the PC via USB cable.

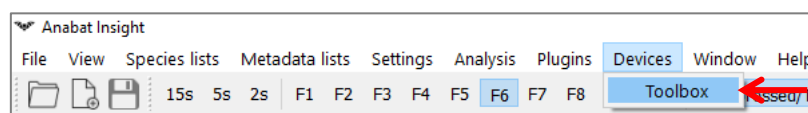
Please note: Active detectors (Walkabout and Scout) have limited functionality in Toolbox, they can only have firmware updated via SD card.

CONNECT VIA USB

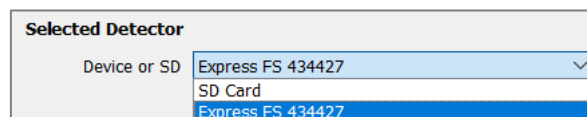
To connect the recorder to a computer follow these steps. Do not connect the recorder to your computer before installing the Anabat Insight software.

Please note: You must use a USB cable with a data line (these cables are typically thicker than the 'charge only' cables).

1. Turn on your recorder and connect the USB cable from the recorder to the computer.
2. Open Anabat Insight, under the Devices menu, select Toolbox.



3. Your recorder should automatically be detected (see over), it may take several moments to load when you first connect your recorder while the drivers are setup.



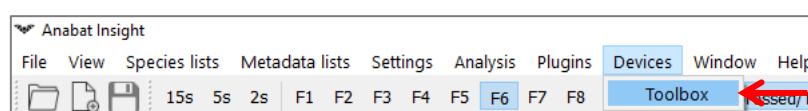
Please note: Active detectors (Walkabout and Scout) can only have firmware updated in Anabat Insight using a SD card.

SETUP AN SD CARD

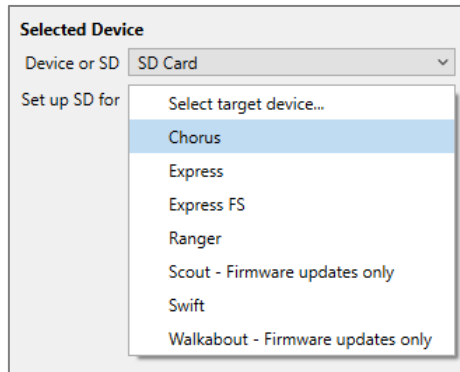
Please note: There is limited functionality to setup your passive recorder via SD card. For full functionality, connect your recorder via USB cable.

To set up an SD card for your recorder:

1. Insert a blank SD card into your computer.
2. Open Anabat Insight, under the Devices menu, select Toolbox.



- Under 'Setup SD for', select your recorder from the dropdown menu.

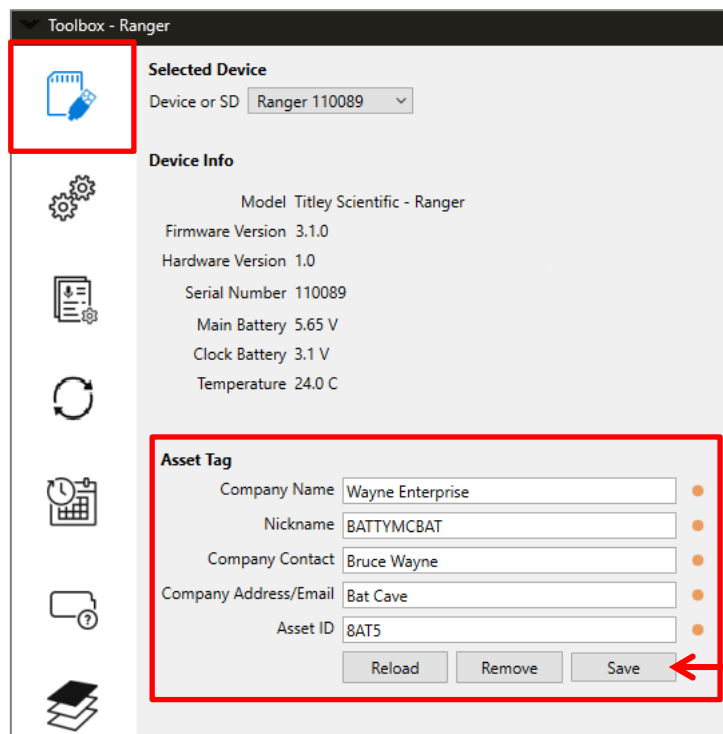


ADDING A DIGITAL ASSET TAG (requires usb connection)

You can add a digital asset tag to your passive device (excluding Anabat Swift and Anabat Express) which will save asset information in the metadata of all files recorded. This can include company name, device nickname, company contact, company address and asset ID. The device nickname may also be displayed on the recorder (depending on your device).

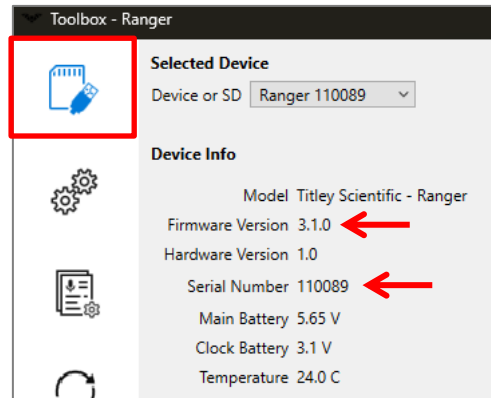
Please note: The device nickname is limited to 10 characters.

To add/edit/view an asset tag connect the recorder to your computer via USB cable. Under the Selected Device tab of Toolbox the Asset Tag is displayed. Click and type in any of the fields to add or change the asset tag. Any unsaved changes will have an orange dot next to them. Click Save to apply the tag to the device. Click Remove to delete any pre-existing tags. Click Reload if you have typed changes but wish to reload the pre-existing tag on the recorder.



CHECKING SERIAL NUMBER AND FIRMWARE VERSION (requires USB connection)

To check the serial number and firmware version using Toolbox, connect the recorder to your computer via USB cable. Under the Selected Device tab of Toolbox the Device Info shows the recorder type, the serial number (SN:), firmware version, hardware version, main battery voltage, clock battery voltage and current temperature.



UPDATING RECORDER FIRMWARE

It is important to keep the firmware on your recorders up to date to ensure trouble-free operation. Passive recorder firmware can be updated through Toolbox using an SD card, or via USB cable to your PC. Active detector (Walkabout and Scout) firmware can only be updated via SD card.

If your recorder is connected via USB cable and your PC is connected to the internet, Toolbox will automatically check for firmware updates. If an update is required, an exclamation point will appear on the Update tab (see over).

Please note: This prompt will not appear for SD card updates.



Update required

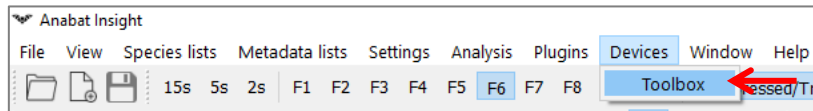



Recorder is up to date

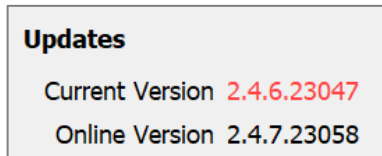
To update via USB cable:

Please note: You must use a USB cable with a data line (these cables are typically thicker than the 'charge only' cables).

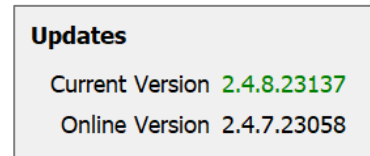
1. Connect the recorder to the computer via USB cable, then turn recorder On.
2. Under the Devices menu, select Toolbox.



3. Click on the Updates tab  on the left of Toolbox.
4. Toolbox will state the current firmware version and the most recent online version. If the firmware needs to be updated, your current version will be displayed in red.



Update required

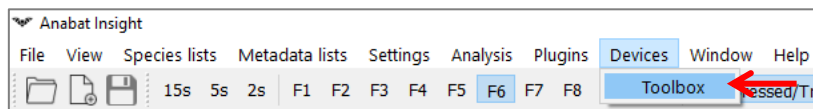



Recorder is up to date

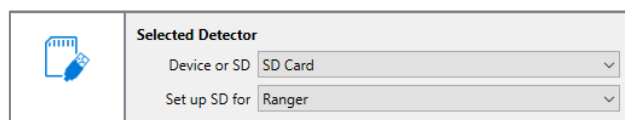
5. To update your recorder to the latest firmware, click Apply to Recorder. A progress bar will appear in Toolbox, and the recorder LEDs will cycle to indicate the update is occurring. Once complete a message will appear in Toolbox stating 'Firmware update complete'.
6. When the update is finished the recorder will restart.


To update via SD card:

1. Insert a blank SD card into the computer. You can use the same SD card to update multiple devices.
2. Under the Devices menu, select Toolbox.



3. Choose the Selected Device tab , for Device or SD use the dropdown menu to select SD Card. Next to Set up SD for, choose your device from the dropdown menu.



4. Click on the Updates tab  on the left of Toolbox.
5. Click Apply to SD to save the most recent firmware to the SD card. Once completed, it will state 'Update copied'.

Please note: You need to save the update file to the root of the SD card, not a subfolder. Do not change the name of the update file.

6. Safely eject the SD card from the computer.
7. Insert the SD card and fresh batteries into your device then turn it On. Depending on the recorder it will automatically apply the firmware update or will prompt you to update on-device. The recorder LEDs will cycle to indicate the update is occurring, the device will restart once update is complete.
8. You can now delete the update file from the SD card or use the card again to update several devices.

Please note: You will need to remove the update file from the SD card to use the card for recorder recording.

VIEWING AND CHANGING DEVICE SETTINGS (requires USB connection)

You can view and change the device settings on passive recorders, this includes language, regional & display settings, logging and external power cutoffs. The settings available will depend on which recorder is connected. To view/change settings, click on the Device Settings tab on the left of Toolbox.

Device Settings

Language

English

Second Language

Region

Clock

Time zone

Date Format ☒ D-M-Y ☐ M-D-Y

Temperature Scale ☒ Celsius ☐ Fahrenheit

Distance Units

Display

Display Timeout ☐ Never ☒ 1 minute

Navigation Buttons ☐ Left ☒ Right

Red Screen

GPS Warning Speed

Logging

Logs Start At ☒ 12:00 ☐ 00:00

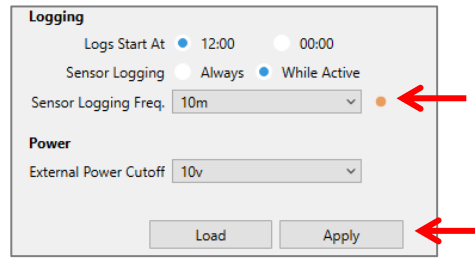
Sensor Logging ☐ Always ☒ While Active

Sensor Logging Freq.

Power

External Power Cutoff

When you change a setting, ● will appear next to the setting (see below), this means the setting change has not been saved to the device yet. To save the change, click the **Apply** button at the bottom of the window. If you make any changes and would like to reload the currently saved recorder settings, click the **Load** button.




Please note: For a description of device settings, as well as recommended settings, please see your device user manual ([available on our website](#)).

Updating Clock and Time Zone

Within the Device Settings tab, you can set the recorder Date & Time, as well as the time zone.

To set the clock, press the Set Date & Time button, this will synchronise the recorder to your computer's clock. You will also need to set the time zone by pressing the dropdown menu next to Time zone. Ensure you click Apply once you've selected the correct time zone.

VIEWING AND CHANGING RECORDING SETTINGS

You can view and change the recording settings and profiles on passive recorders within the Recording Settings tab . The settings available will depend on which recorder is being used. If your detector utilises profiles, there will be a drop-down menu with default profiles, or you can click the Import button to load a previously saved profile.

Please note: For a description of recording settings/profiles, as well as recommended settings, please see your device user manual ([available on our website](#)).

Profiles

Profile: Ultrasonic

Delete Use New

Device Settings

Name: Ultrasonic

Color: [Pink]

File Type: ☒ wav ☐ ZC

Microphone: C (Ultrasonic Microphone)

Sample Rate: 320 ksp/s

Ultrasonic Activation: ☐ Constant ☒ Trigger

Microphone Sensitivity: 17

Min Trigger Frequency: 12.0kHz

Max Trigger Frequency: 250.0kHz

Min Event: 2ms

Min Recording Duration: 1s

Max File Duration: 1h

File Name Prefix: Recording Type

10kHz High Pass Filter: ☒ On ☐ Off

Noise Filter: Overwrite Noise Files

Transect Mode: ☐

Metadata Key: Site

Metadata Value: Wood End


Import Export Apply to Device Load from Device

When you change a setting, ● will appear next to the setting, this means the setting change has not been saved to the device yet. To save the change, click the Apply to Device button at the bottom of the window. If you make any changes and would like to reload the currently saved recorder settings, click the Load from Device button. Alternatively you can upload the recording settings to your recorder via SD card, by clicking the Export button.

Please note: Do not change the name of the profile file. If you wish to batch-apply recording profiles to multiple recorders, you will need to use the Export button to save the profile .json to your computer.

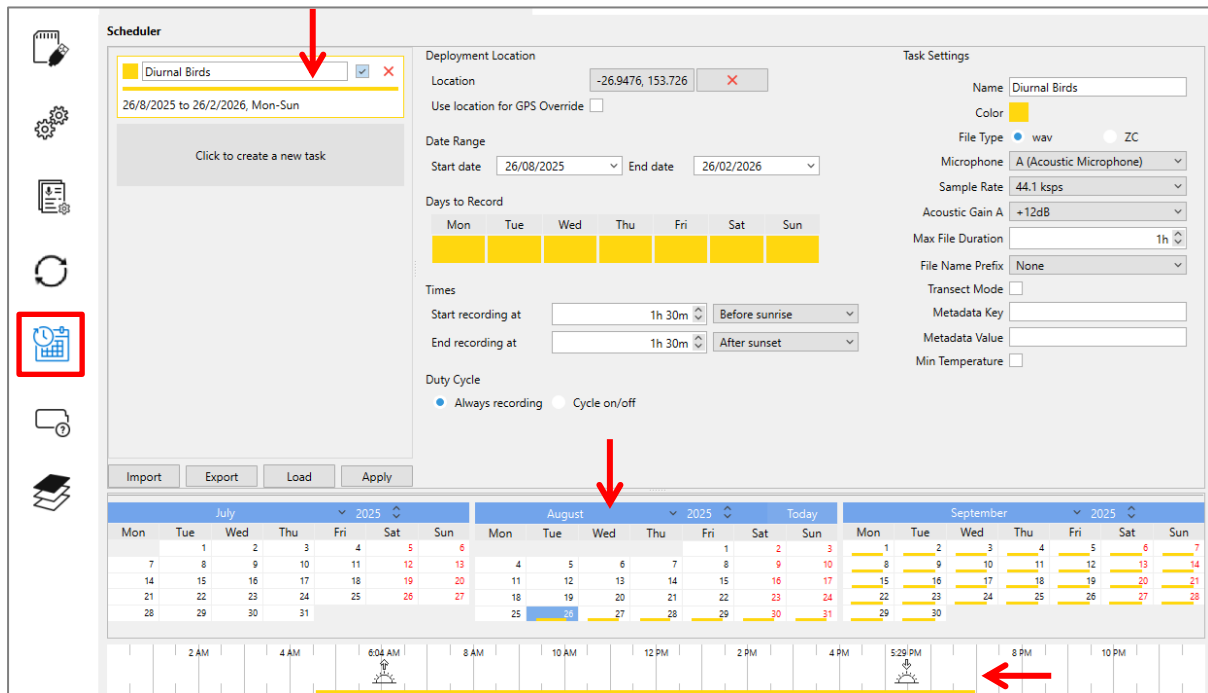
CREATING A SCHEDULE

You can create a custom schedule for your recorder. Options and settings will vary slightly for each recorder. Instructions shown below are for Chorus/Ranger.

1. Click on the Schedule tab  on the left side of Toolbox.
2. Click the button Click to create a new task, give it a name and choose a task colour. To help pre-fill some recording settings, the type of recording may automatically be surmised from the task name. For example, if the name contains the word “bats” or “ultrasonic” then default

ultrasonic microphone settings will be pre-filled. If the name contains “acoustic”, or “birds” then acoustic microphone settings will be pre-filled. Then click OK.

3. This task will be shown in the Scheduler window, and you can edit the task on the right. The calendar and daily schedule will display what tasks are running and when (see below). The sunset and sunrise times displayed below the calendar are based on the deployment location specified.





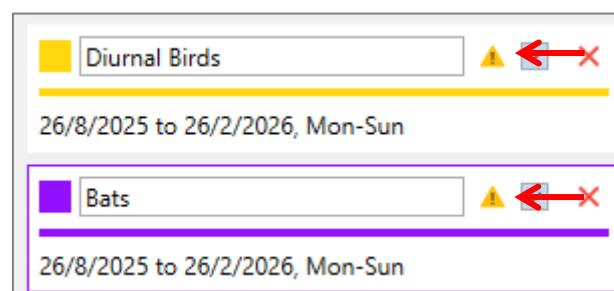
4. You can choose the following:
 - a. Deployment Location: Set the deployment location to calculate sunset/sunrise times. This location can also be used to override GPS location in the case of expected poor GPS reception (eg. inside a cave).
 - b. Date Range: By default, it will start on today's date and end 6 months in the future. Click on the Start and/or End date dropdown arrows to choose custom dates.
 - c. Days to Record: By default, it will record every day, to change this, click on the days of the week you do not wish to record on (the colour will disappear from that day).
 - d. Times: You can choose when to Start and End a recording session. If you want to have multiple periods per day, these should be created as separate tasks. You can choose when to start/end relative to sunset, sunrise, an absolute time, as well as end relative to start time (e.g. end 3 hours after start time).
 - e. Duty Cycle: If you wish recording to start and stop for fixed periods within your schedule (e.g. record 5 mins on, then 5 mins off). By default a scheduled task will be Always Recording. To enable a duty cycle, check Cycle on/off, then choose the amount of time on and off.

5. Check the task schedule by clicking on specific days on the calendar – coloured lines (corresponding with your task colours) will show when the recorder will be on.

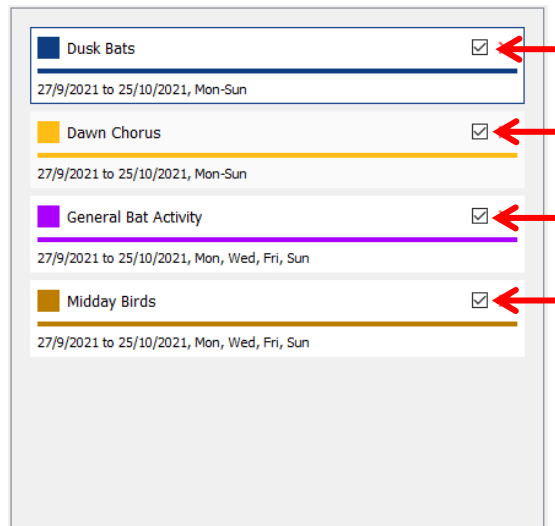
Please note: If you select Always Recording for the Duty Cycle, this means the recorder will either be 'listening' ready to record when triggered for the period specified, or constantly recording for the period specified depending on which Activation is chosen in the task settings.

6. Each task has its own recording settings under Task Settings. This allows you to use different recording settings for different tasks. See your [device user manual](#) for more information on task settings. Enter your preferred task settings.
7. Once you have finished creating your schedule task, you can add another task (repeat steps 2 – 6). To remove a task, click the **✗** button next to it in the Scheduler. Ensure all schedule tasks you would like enabled are checked in the Scheduler (see below). You can click and drag to reorder the tasks (see note below).

Please note: If you are recording multiple tasks simultaneously (on a Ranger), Toolbox will require you to select specific sample rates by displaying the  icon next to the tasks. Click the  icon to reset the sample rate.



Please note: The order of tasks decides the priority of any conflicting schedules. For example, if two tasks are supposed to record during overlapping windows with different settings, the top task will be chosen for recording during the overlap.



From here you can choose to apply it directly to a recorder, or export it to your computer or an SD card. To apply the schedule directly onto your recorder, ensure your recorder is connected via USB then click the Apply button.


Please note: You must use a USB cable with a data line (these cables are typically thicker than the 'charge only' cables).


To export the schedule to your computer or SD card, click Export, then choose your save location folder (either on your computer or on the SD card you wish to use in the recorder), then press Select Folder. You can copy this schedule onto multiple SD cards to use on multiple recorders, or use the [Batch Setup Tool](#).

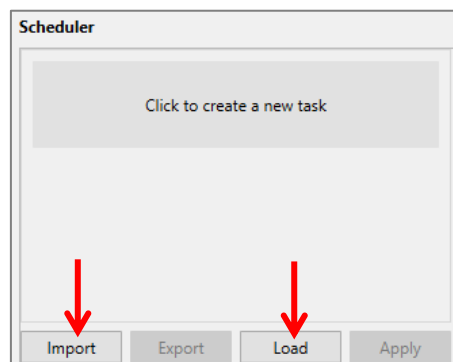
Please note: Your schedule file must be saved as "schedule.csv" (for Anabat Swift & Anabat Express) and "schedule.json" (for Chorus, Ranger, Express FS) on the SD card to be recognized by the device as a schedule, do not change the file name.

Please note: The Anabat Express and Anabat Swift require the SD card to contain the schedule during the deployment, all other passive recorders can have a schedule imported. See your [recorder user manual](#) for more information.

Importing a schedule into Toolbox

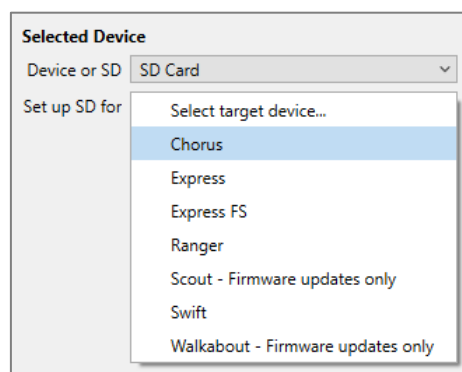
You can choose to import a previously saved schedule from your computer or SD card, or load a schedule from a Ranger, Chorus or Express FS into Toolbox. Click on the Schedule tab  on the left side of Toolbox. Click the Import button, then navigate to your schedule.json or schedule.csv file location, then click Open.

To load a schedule currently saved to a Ranger, Chorus or Express FS, connect the recorder to the computer via USB. Click on the Schedule tab  on the left side of Toolbox, then click the Load button (see below).



ESTIMATING BATTERY AND DATA USAGE

You can use Toolbox to estimate your battery life and data usage to ensure your batteries and SD card/s are sufficient for your survey. To begin, ensure you've chosen the correct recorder in the Selected Device tab.



Please note: You cannot estimate battery life or data for active detectors (Walkabout and Scout).

Then choose the Battery Estimator tab .

Battery and Data Usage Estimator

Battery Type: Carbon Zinc, **Alkaline**, 1.5v Lithium, 12v SLA, NiMh / NiCd

Battery Capacity: 2800 mAh

Battery Count: 4, **8**

Recording Mode: Night (12.6 hours)

SD Card Capacity: 512 GB

GPS Transect Mode: ☐

Recording Type: Full Spectrum

Sample Rate: 500 ksps

Activation: ☐ Constant, ☒ Trigger

Activity Level: Medium

Deployment Location: -27.2606, 152.32

Sunrise & Sunset Times: 6:10 AM, 5:34 PM

Deployment Start: Tuesday, 26 August 2025 (35 days deployed)

Deployment End: Tuesday, 30 September 2025

Battery Estimate: 108.1 days

Data Estimate: 159.0 GB

Estimates are based on new/full-charged batteries

Select your Battery Type and Battery Capacity, the capacity will automatically fill based on standard battery types. Choose your Recording Mode and SD Card Capacity.

Please note: If you choose Schedule for the Recording mode, it will be based off the schedule created in the Schedule tab.


Select your anticipated SD Card Capacity. Check the box if you are using GPS Transect Mode. Select your Recording Type, Sample Rate and Activation. If Trigger Activation is chosen, select your anticipated Activity Level, this refers to the amount of bat activity or other triggering noise you anticipate. For noisy environments, or a generous data estimate, choose High, for off-season/quiet deployments choose Low. To set sunset and sunrise times you can either chose your deployment location or manually input Sunrise & Sunset Times. To set your deployment location, click Find. You can type a location into the search bar or double-click on the map to create a waypoint, then click Set Location. If you would like to determine the data estimate for a set period, chose the Deployment Start and End dates using the calendar tool.

Please note: Changing the recording settings in the battery/data estimator will not change the settings on your recorder or schedule. You will need to change these yourself either on device or via the Recording Settings tab.

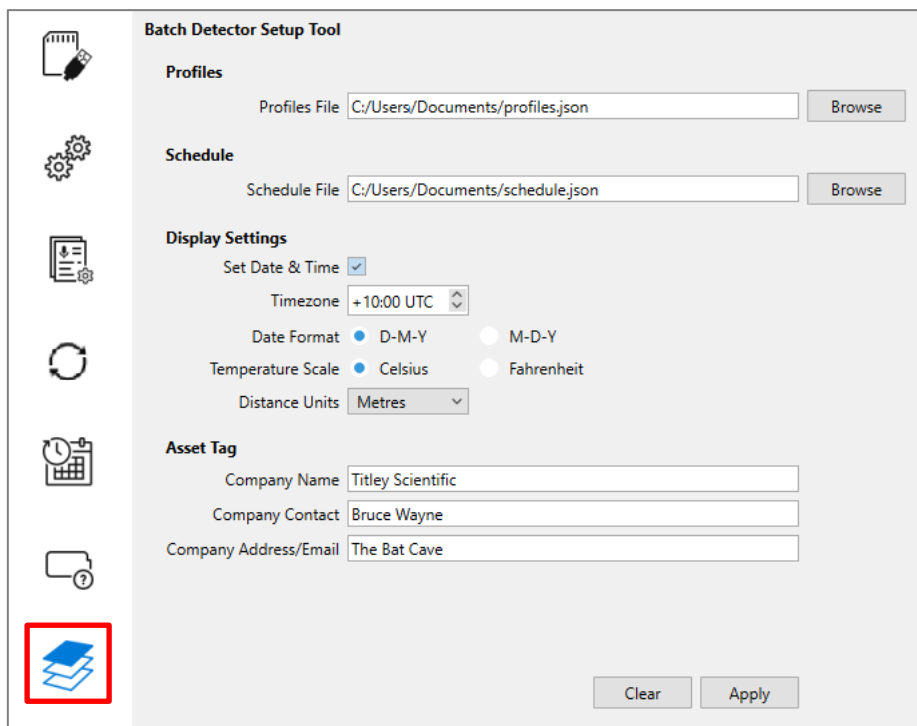
The battery life and data estimation will be displayed. If the batteries are sufficient for the deployment dates and recording settings, then the estimate will be displayed in green. If the estimated runtime is longer than the battery life, then it will appear in red with a warning to reduce your recording rate or limit deployment dates. The same will occur for the data estimate, where it will warn to use a larger SD card if the data estimate is larger than the card capacity selected (see below).

Battery Estimate	21.9 days
WARNING: Estimated battery runtime is less than scheduled deployment. Reduce Recording Rate or limit Deployment Dates to avoid running battery flat.	
Data Estimate	41.8 GB
WARNING: Estimated recording is larger than SD card capacity. Increase SD card to avoid filling SD card.	

BATCH SETUP TOOL

You can use the batch setup tool to efficiently update multiple recorders. With one click per recorder you can load recording profiles, schedules, time and display settings, as well as asset tags. To begin, you'll need to have exported your desired recording profile and schedule to your computer. Then choose the Batch Setup Tool tab .

Under Profiles, click Browse to select your saved recording profile file (.json). Under Schedule, click Browse to select your saved schedule file (.json). Under Display Settings, check the Set Date & Time option, then choose your preferred display settings. Under Asset Tag, enter your company name, contact and address.



The image shows the 'Batch Detector Setup Tool' window. On the left is a sidebar with icons: a USB drive, gears, a document with a download arrow, a circular arrow, a calendar, a speech bubble with a question mark, and a red box around a stack of blue papers. The main area has sections: 'Profiles' with a text field 'C:/Users/Documents/profiles.json' and a 'Browse' button; 'Schedule' with a text field 'C:/Users/Documents/schedule.json' and a 'Browse' button; 'Display Settings' with a checked 'Set Date & Time' checkbox, a 'Timezone' dropdown set to '+10:00 UTC', 'Date Format' radio buttons for 'D-M-Y' (selected) and 'M-D-Y', 'Temperature Scale' radio buttons for 'Celsius' (selected) and 'Fahrenheit', and a 'Distance Units' dropdown set to 'Metres'; and 'Asset Tag' with text fields for 'Company Name' (Titley Scientific), 'Company Contact' (Bruce Wayne), and 'Company Address/Email' (The Bat Cave). At the bottom right are 'Clear' and 'Apply' buttons.

Connect your recorder via USB, then click Apply. After a few moments a message will appear stating Successfully setup detector, then click OK. You can now unplug your recorder and repeat this process for other recorders.

Please note: You must use a USB cable with a data line (these cables are typically thicker than the 'charge only' cables).

SOFTWARE VERSION & UPDATES

Anabat Insight is regularly updated to improve features and address any issues. If you do find a problem, please report it to us, and include the software version you are using.

CHECK THE SOFTWARE VERSION

To check which version you are running, click on Help in the Menu Bar, then click About. A dialog box will open displaying the version number.

CHECK FOR UPDATES

If you are connected to the internet, Anabat Insight will automatically check for updates. If there is an update available, a green bar will appear above the spectrogram window stating "Update Available. Click to Update". To update, click on the green bar and follow the prompts.

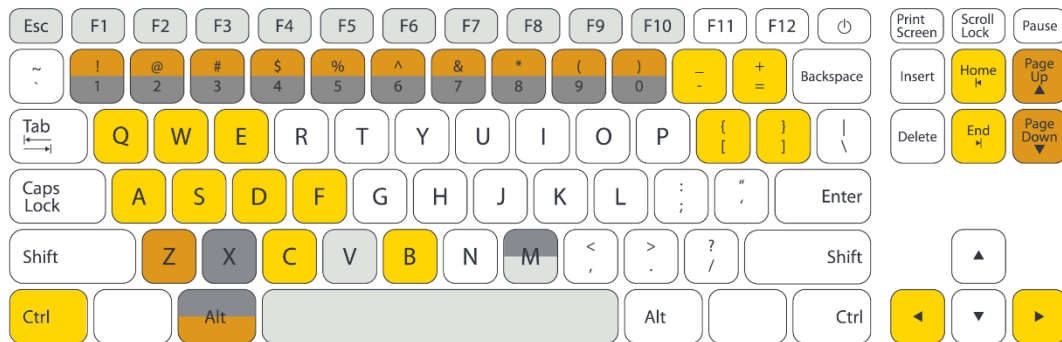
To manually check for updates click on Help in the Menu Bar, then click Check for Updates. A dialog box will open displaying the current and online version numbers. You can also choose between the Latest and Previous software version. Only choose previous if you are having issues with the latest version. If an update is available, you can select Yes to update now.

INSTALL YOUR LICENCE

If you have purchased a full licence for Anabat Insight, you will need to enter your licence activation key. To do this, click on Help in the Menu Bar, then click Licence Management, enter your activation key and click Activate. You must be connected to the internet to activate your licence.

KEYBOARD SHORTCUTS

There are a range of keyboard shortcuts you can use with Anabat Insight to streamline your analysis.



Display	
Escape	Reset to default display
Space	Toggle true/compressed mode
M	Toggle call body on/off
V	Toggle cycles display on/off
Horizontal zoom (time per tick)	
F1	1s (zoomed out)
F2	500ms
F3	250ms
F4	100ms
F5	50ms
F6	25ms (optimal)
F7	10ms
F8	5ms
F9	2.5ms
F10	1ms (zoomed in)
Filters	
Alt+ 1...9	Load built-in noise filters 1 to 9
Alt+ 0 or Page Down	Clear filter
Page Up	Load previous filter
Z	Increase call smoothing only
Shift+ Z	Decrease call smoothing only

Marking/Labelling Files	
Alt+ M	Mark/unmark current file
X	Mark/unmark current file
1...0	Species label hotkeys

Navigation between and within files	
Q or [Go to previous file
W or]	Go to next file
-	Go to previous marked file
+	Go to next marked file
Shift+ [Go to previous labelled file
Shift+]	Go to next labelled file
◀	Go to previous trigger
▶	Go to next trigger
Ctrl+ A, S, D, F	Jumps forward/back along time axis: A 1/8, S 1/4, D 1/2, F full screen width
HOME	Jump to start of file
END	Jump to end of file

TROUBLESHOOTING AND FAQs

Jump to a question here:

[I can't update Anabat Insight](#)

[I can't add an action to a search/decision tree](#)

[What is the call body?](#)

[I can't get the red highlight bar to appear](#)

[My map isn't working, the waypoint is appearing in a grey "ocean"](#)

[Compressed mode isn't working](#)

[The filter doesn't seem to be working](#)

[I can't put species labels on my Express files](#)

[Bat Classify UK plug in isn't working](#)

[One of my panels has disappeared \(eg. Species Labels\)](#)

[What is the difference between the free version and full licence?](#)

I can't update Anabat Insight

Check if Insight has access to the internet by selecting Help, then Check for Update. If the window appears with an error message, Insight is being blocked from the internet or you are not connected to the internet. Ensure your internet connection is working, if it is, then try disabling any antivirus software or firewalls. Once they are disabled, see if the maps load. You may need to create exceptions for Anabat Insight in your antivirus software.

Can I use Anabat Insight for acoustic/audible analysis?

Yes! Anabat Insight can open files of any sample rate, including [acoustic recordings](#). You can even analyse [stereo acoustic recordings](#). Here are some helpful tips and features for acoustic analysis:

- [Choose which channel](#) you want to view and/or listen to from stereo recordings, or have both.
- Here are some recommended settings for acoustic analysis: [Timescale of F3](#), [Frequency scale of 0-20kHz](#), [Truetime mode](#) and [viewing Spectrogram only](#).
- [Time split recordings](#) into shorter sections to make processing easier
- [Crop files](#) to just sections of interest
- [Add species labels](#) directly to the metadata of recordings, no need to worry about separate spreadsheets/documents.
- [Add other important metadata](#) to files like site names, habitats, weather etc.
- [Optimise FFT window size](#) for viewing your recordings.

Please note, the free version of Anabat Insight will only open acoustic recordings from Titley Scientific's range of recorders including the Ranger, Chorus and Swift. To view/open/analyse recordings from other brands, you will need to purchase a full licence.

I can't add an action to a search/decision tree

Before you can add an action, you need to ensure the search criteria is clicked/selected in the search bar. Once selected, the Add button will be available.

What is the call body?

A bat pulse can be divided into 3 sections: the initial section, the call body, and the tail. The call body is determined by the flattest (lowest slope) section of the pulse. This is often also referred to as the 'characteristic section', especially in reference to metrics. Anabat Insight will calculate the call body automatically. To see the call body ensure you have zero crossing display enabled, then press the keyboard shortcut 'm' and the body will be shown in red dots.

I can't get the red highlight bar to appear

First, check that you are in True-Time Mode; second, ensure a filter is enabled; thirdly, ensure Highlight Calls is checked in the filter tab. Also try checking other files, just in case the file you are viewing doesn't have any elements which pass the filter.

My map isn't working, the waypoint is appearing in a grey "ocean"

This is most likely due to Insight being blocked from the internet by antivirus software or firewalls. Here are a few troubleshooting points to try:

1. Try scrolling on the map to zoom in and waiting a few minutes for the map to load.
2. Go to Settings, then select Reset Settings (this will change your display settings back to factory default).
3. Check if Insight has access to the internet by selecting Help, then Check for Update. If the window appears with an error message, Insight is being blocked from the internet or you are not connected to the internet. Ensure your internet connection is working, if it is, then try disabling any antivirus software or firewalls. Once they are disabled, see if the maps load. You may need to create exceptions for Anabat Insight in your antivirus software.

Compressed mode isn't working

The most likely reason it appears compressed mode isn't working is because the trigger is set incorrectly, try using the Auto Full Spectrum Trigger , lowering the sensitivity for a manual trigger, or changing the trigger settings. If these are set correctly and compressed mode is still not working, try

[applying a smoothness filter](#) or [create a noise filter](#). If everything seems to be compressed out, check you have [disabled any filter](#) that may be running.

The filter doesn't seem to be working

Firstly, ensure the [filter is enabled](#), then ensure the relevant filter metrics are checked. Also make sure you are using a [suitable filter viewing mode](#). Also consider whether you are wanting to [view in compressed mode](#) (remove information which doesn't pass the filter), or use the [Highlight Calls](#) tool to observe what does and doesn't pass the filter.

I can't put species labels on my Express files

If you have opened a .zca file from an Anabat Express in Anabat Insight, but have not yet converted the file(s) to .zc sequence files, it will be displayed as [Read Only](#) in the project panel. You will not be able to add species labels, metadata or alter these files until they are [converted to sequence files](#).

Bat Classify UK plug in isn't working

You cannot run the Bat Classify UK plugin on a zero crossing file or [project file](#); it only runs on full spectrum data (.wav). If you would like to use Bat Classify UK, then you will need to run it on files stored directly on your drive. Secondly, [ensure the Bat Classify UK plugin is enabled](#). Once a file is open in the spectrogram window, the Bat Classify UK button will appear beneath the window.

One of my panels has disappeared (eg. Species Labels)

Sometimes a floating panel may disappear off the screen if using multiple monitors, or may be accidentally closed. To bring back a panel, see [Restore Docked Panels](#).

What is the difference between the free version and full licence?

All of the features in a full licence are available in the free version; the only difference is that the full licence allows you to open/view/analyse files from any recorder (including non-Titley-Scientific recorders). The free version will only open files from the following recorders: Ranger, Chorus, Walkabout, Scout, Swift, Express FS and Anabat Express (after a firmware update is performed on the device – this was released over 5 years ago).

FURTHER INFORMATION

For further information please visit the Titley Scientific website: www.titley-scientific.com