Online User Guide

Download this guide at
www.wildlifeacoustics.com/resources/user-guides

Tutorial Videos

Visit www.wildlifeacoustics.com/support/tutorial-videos to view
tutorial videos for the Echo Meter Touch 2 .

Frequently Asked Questions

https://www.wildlifeacoustics.com/resources/faqs

Contacting Support

For technical queries contact the Wildlife Acoustics support team:

> https://www.wildlifeacoustics.com/contact-us
> North America (toll-free): 1-888-733-0200
> Outside North America (toll charges may apply): +1 978-
> 369-5225

Don't miss out on Important Updates

We continually add features to the Echo Meter Touch 2. Stay up
to date with the newest features and receive important technical
support bulletins by signing up to our mailing list at:

http://www.wildlifeacoustics.com/mailinglist

1   Overview

The Echo Meter Touch app with an Echo Meter Touch Ultrasonic Module allows you to listen to, record, and identify bats with your Apple iPad, iPhone, or iPod Touch. The Echo Meter Touch offers exclusive features and unprecedented ease-of-use for a handheld bat detector.

Echo Meter Touch Ultrasonic Modules are available from www.wildlifeacoustics.com/products/echo-meter-touch

This guide is available for printing at: www.wildlifeacoustics.com/support/documentation

1.1   Echo Meter Touch Ultrasonic Modules

Since the first Echo Meter Touch Module was released in 2014, there have been multiple different modules with different types of connectors.

Modules with Lightning connectors were produced between 2014 and 2022.

Modules with Micro-USB connectors were first released in 2017, and modules with USB-C connectors were released in 2022. These were initially labeled "for Android" and until 2024 were incompatible with all iOS devices.

In April 2024, a new firmware update for Echo Meter Touch modules with Micro-USB and USB-C connectors enabled compatibility with iOS devices that have USB-C ports. For instructions on installing this firmware update, see section 5.2.

Echo Meter Touch (original)

The original Echo Meter Touch was released in 2014 and discontinued in early 2017.

This module was only available with a Lightning connector, and it is only compatible with iOS devices.

Echo Meter Touch 2

Echo Meter Touch 2 ($179) is intended for nature enthusiasts and batting hobbyists.

Versions of this module have been released with Lightning, Micro-USB, and USB-C connectors. The USB-C version is in current production.

Echo Meter Touch 2 Pro

The Echo Meter Touch 2 Pro ($349) is designed for bat professionals and features a higher quality microphone, adjustable gain, and higher sample rate.

Versions of this module have been released with Lightning, Micro-USB, and USB-C connectors. The USB-C version is in current production.

1.2 App Features

Listen to bat echolocations in real time

Echo Meter Touch translates bat echolocations into frequencies that are audible to humans using two technologies.

Wildlife Acoustics' patented Real Time Expansion (RTE) allows you to listen to bats in real time with unparalleled fidelity. RTE maintains the timing and tonality of the original echolocations.

Heterodyne (HET) listening is also available, for those accustomed to that way of hearing bats. Manual and automatic tuning is available.

View the echolocations on a spectrogram

A real-time spectrogram shows the frequencies and timing of the echolocations. Scroll back in time and zoom in on previous "bat passes."

See most likely bat species in real time

The Auto ID feature analyzes the echolocation calls and shows the two most likely bat species matches in real time. In North America, a portrait of each bat taken by renowned bat expert Merlin Tuttle will be show as well. This is the same technology used in our professional Kaleidoscope Pro Bat Auto Identification software. Currently, the app can identify 38 species in North America, 31 in Europe, 63 in the neotropics and 20 in South Africa. For more information on Kaleidoscope and a full list of species, visit our website.

AUTO-ID FINE PRINT: Because bats vary their echolocation calls in response to a wide variety of needs, no automated call identification can achieve 100% accuracy in species identification. Nevertheless, in the hands of well-trained experts, bat detector recordings can be used to identify many species, providing invaluable discoveries. The Echo Meter Touch allows high quality recording suitable for analysis by experts. The built-in Auto-ID feature also suggests the two most likely bat species for each recording, for the enjoyment of enthusiasts hoping to learn more about bats. These automated identifications, though largely accurate, should not be relied on as a basis for scientific research. Auto-ID is intended for use in analyzing recordings of single bats in free flight in low clutter environments. Recordings of roost emergence, multiple or captive bats,

bats in high clutter environments, or bat social calls are not suitable for Auto-ID. In addition, the Auto-ID feature does not include every possible bat for each of the covered regions. Therefore, if a bat that is not included is recorded, it will be identified by the app as a species with a similar echolocation call type. In North America, there are seven species included in the species list that do not have classifiers. They are included so as to allow the user to learn about every species that occur in their state.

Record to WAV files

Use triggered recording to automatically save bat passes to full spectrum WAV files for analysis on a computer or to view on your iOS device. Or use manual record mode to control start and stop of recording. View the recording spectrogram and add voice or text notes. Listen to the recording using RTE, HET, or traditional Time Expansion Playback (playback at fractional speed to make the ultrasound audible).

See your path and recording locations

View your path, including recording locations in satellite or road map view. View identified species codes directly on the map. Go to the recording's spectrogram from the map view. Transfer to your computer to view in Google Earth. Your iOS device must have GPS capability or you must use a Bluetooth GPS receiver for this functionality.

NOTE: This feature requires an iPad or iPhone with a GPS capability or a Bluetooth GPS receiver.

Transfer recordings to your computer

The Echo Meter Touch can transfer full spectrum WAV recordings to your computer over a wireless network or direct cable connection. Using Wi-Fi, the app bundles the recordings in a .zip folder and allows download by entering a URL in any web browser. The recordings can also easily be uploaded to iCloud or other online storage services.

Share recordings via email or MMS messaging

You can share recordings via email or MMS messaging and import and open files that have been shared with you.

1.3 Leave Feedback or Review the App

Please contact us with any suggestions, issues, questions, or comments. We are always looking for ways to improve the app for you. Tap **Email Feedback** on the Information page of the app to send your feedback.

If you like the app, please let others know by selecting **Review this App** from the Information page.

2 Using Echo Meter Touch

This section describes how to use the Echo Meter Touch app to monitor bats.

> NOTE: The display examples in this guide were composed on iPhone in portrait orientation. You can also view the app in landscape mode. On iPad, there are minor differences in layout due to the larger display size. In addition, the app supports Apple's Split View which allows you to display two apps on an iPad's screen at the same time. You can view Echo Meter Touch at the same time as another app, for example a GPS app, a weather app, or a notes app.

2.1 Connecting the Ultrasonic Module

The Echo Meter Touch Ultrasonic Modules sense ultrasonic signals, digitize the signal, and transmit the ultrasonic data to the iPad, iPhone or iPod Touch.

Plug an Ultrasonic Module into the Lightning connector of your iOS device and you can immediately start listening to, recording, and identifying bats.

1. Plug the Ultrasonic Module into the Lightning connector of your iOS device.
2. The iOS device asks you to open the Echo Meter Touch app if it is not already open.
3. Press the START button to begin streaming the ultrasonic data.

2.2 Navigating the app

To navigate through the app, press the main menu symbol. You can go to other sections of the app while still hearing and recording bats. You can even continue to monitor and record bats in the background while using other apps.

The main menu symbol
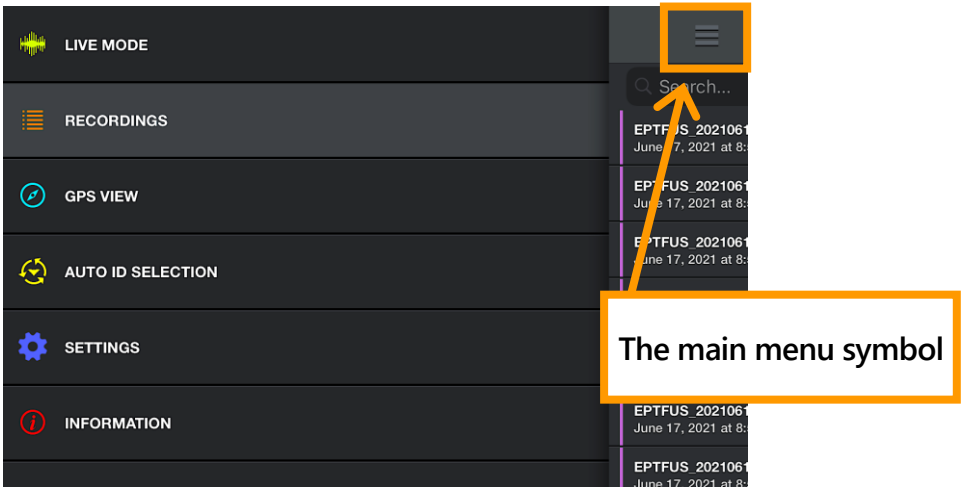
2.3 Monitoring in Live Mode

In LIVE MODE, ultrasonic data is streamed to your iPhone or iPad. The frequency and duration of the bat echolocation calls are visually represented in a scrolling spectrogram.
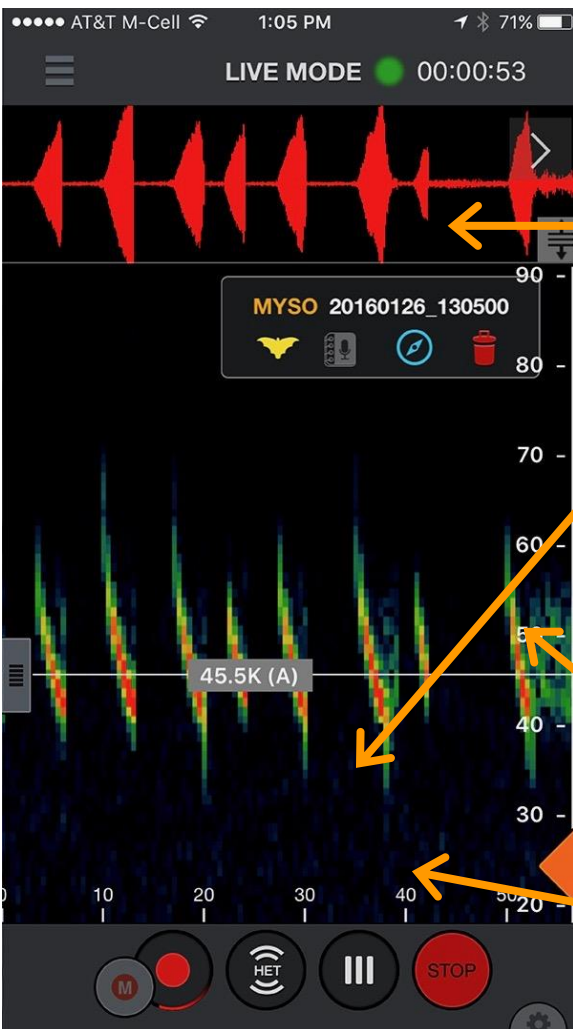
Waveform

Spectrogram

Frequency scale in kHz

Time scale in milliseconds

In LIVE MODE you can scroll back and zoom into portions of the scrolling spectrogram. After scrolling back in time, a "Return to real-time" button appears at the top right of the screen; press to jump forward to real-time. You can scroll back in time through up to 10 minutes of history. The app will intelligently reduce the history if the iOS device is nearly full. A frequency reference line allows viewing a specific frequency.

Slide to change waveform display size

Pinch and zoom in time or frequency on the spectrogram or waveform

Tap to activate frequency reference line (drag to move)

RTE/HET/OFF toggle

Spectrogram Settings
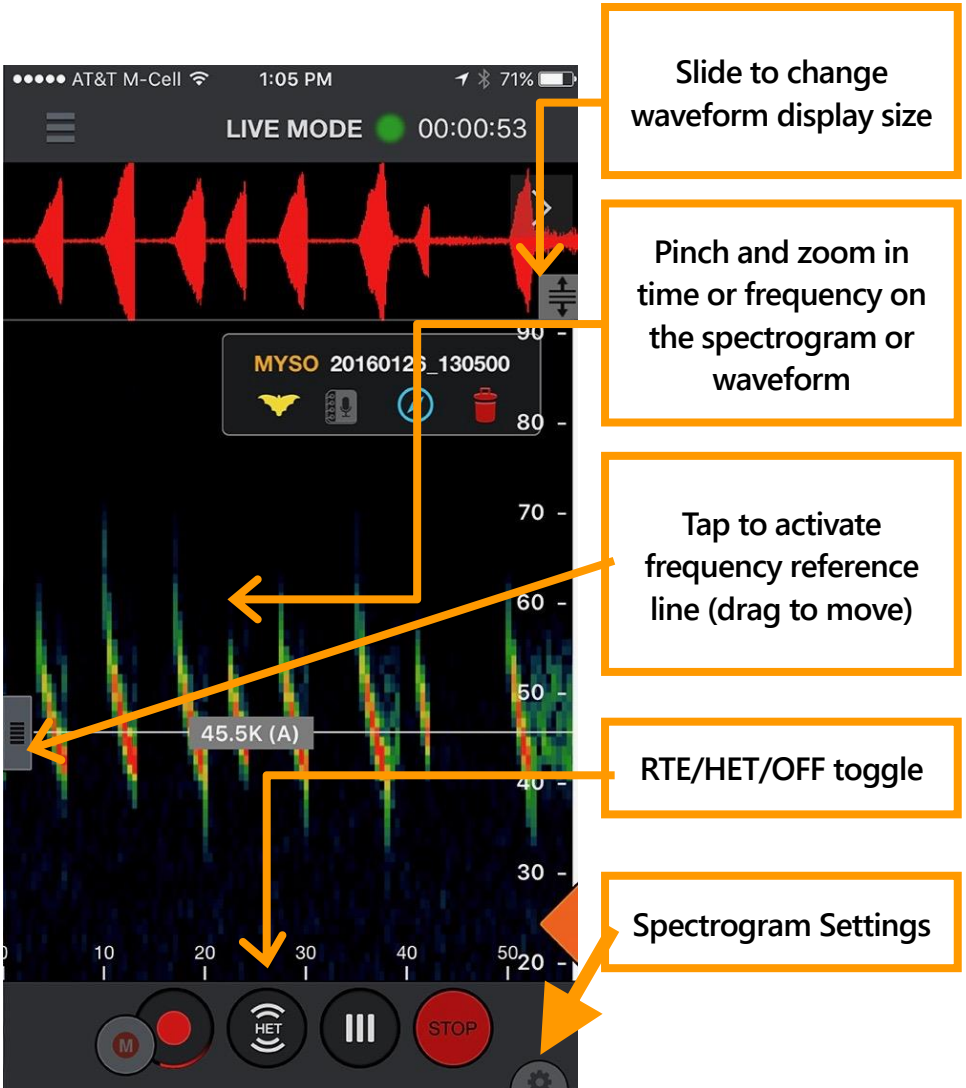
You can listen to bats using Wildlife Acoustics patented Real Time Expansion (RTE) or Heterodyne (HET). RTE translates the ultrasonic sounds to a range that is audible to humans by taking tiny snippets of the sound and slowing it down. Since there is quite a bit of space in between bat echolocation calls relative to the length of the call, the space in between is used to play back the slowed down call. When in HET mode, double tap the grey frequency reference control to go into auto-het mode. This will constantly tune to the frequency with the most energy above the

Trigger Minimum Frequency setting (see below) or a minimum of 10 kHz for EMT1 and EMT2 Pro or 16 kHz for EMT2. Just drag the grey slider on the left side to manually tune.

A bandpass filter is implemented based on the zoom level of the frequency axis in all listening modes. If you zoom in frequency, you will only hear the frequencies visible on the screen. If there is a quite a bit of low frequency noise, or the recorder is picking up its own output, you can zoom such that the noise is not seen on the screen and filter for a cleaner sound. You can also filter out the higher frequency noise of the EMT2 if you do not have very high frequency bats. Auto-HET will only tune to frequencies visible on the spectrogram based on zoom level.

Tap the Settings icon to open the spectrogram settings panel. Here you can adjust the brightness and contrast of the spectrogram as well as adjust the minimum frequency to trigger a recording. In portrait orientation, it appears as shown; in landscape orientation it appears at the top right of the screen.

Brightness and Contrast of the spectrogram

Recording Frequency Threshold
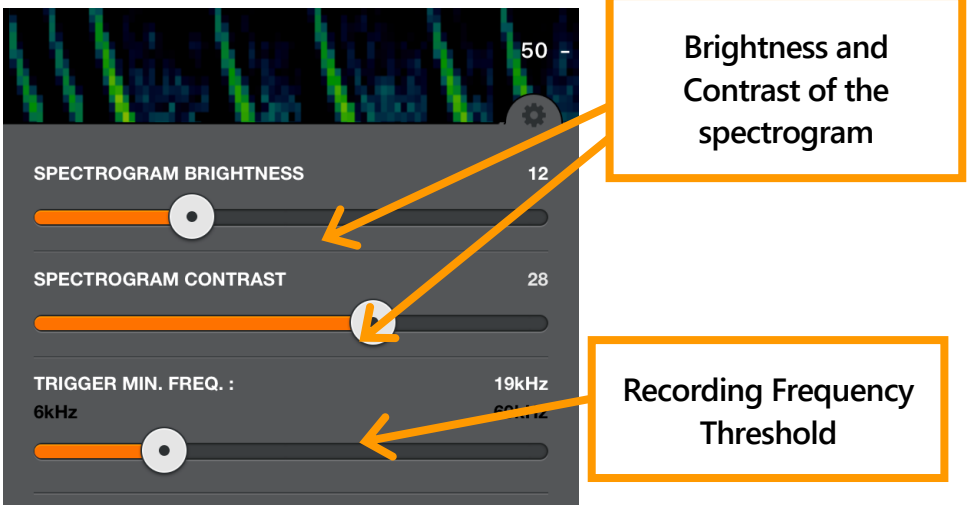
In Compressed mode, the Echo Meter Touch only shows spectrograms containing ultrasonic signals. The spectrogram does not scroll unless there is a signal such as bat echolocations. In Expanded mode, the spectrogram scrolls in real time. Use this mode to examine the timing between previous bat

echolocations. Because the signals scroll too quickly, this mode is not recommended for monitoring.

Tap the STOP button to stop streaming data and put the Ultrasonic Module into a low-power state. Press START to resume.
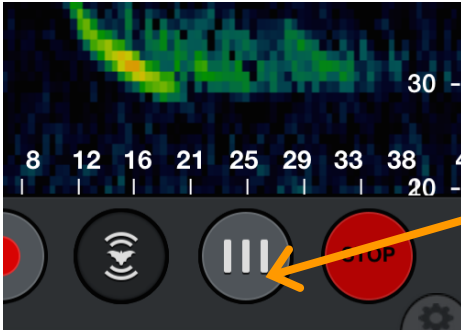
Toggle between Compressed and Expanded Mode (Expanded shown)

2.4 Configuring Auto-ID

Enter Auto ID mode to view a list of available regions. Current regions are North America, Europe and United Kingdom, and Neotropics. There is also a South African region that is in beta. Check a region to select all bats in that region. Tap a region to learn more about the species and to select only bats in your area.
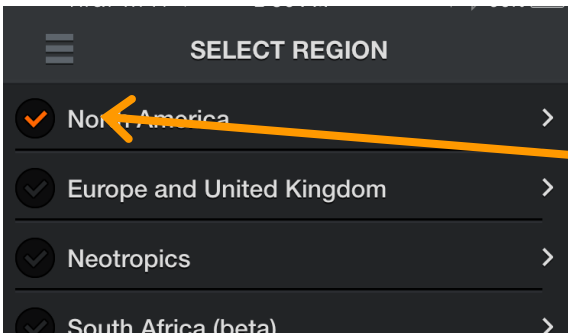
Select region

A dropdown menu allows you to easily select only bats in your North American state or Canadian province.

Back

Arizona

Antrozous pallidus
ANTPAL (Pallid bat)

Corynorhinus rafinesquii
CORRAF (Rafinesque's big-eared bat)

Corynorhinus townsendii
CORTOW (Townsend's big-eared bat)

Eptesicus fuscus
EPTFUS (Big brown bat)

Euderma maculatum
EUDMAC (Spotted bat)

Eumops floridanus
EUMFLO (Florida bonneted bat)

Eumops perotis
EUMPER (Greater bonneted bat)

Eumops underwoodi
EUMUND (Underwood's bonneted)

Idionycteris phyllotis
IDIPHY (Allen's big-eared bat)

Lasionycteris noctivagans
LASNOC (Silver-haired bat)

Lasiurus blossevillii
LASBLO (Western red bat)

Use dropdown to select only bats in your area for most accurate results

Tap a species to learn more about the species or view the Merlin Tuttle portrait.

Grey checks indicate the species is in your area but the app can't yet identify it.

After you select the bats to identify, you can automatically identify them in LIVE MODE.

2.5 Recording in Live Mode

There are two methods of initiating a recording; using triggers and manually. Using triggered recording, a recording is triggered only when bat activity is detected and is ended when there is no activity or 15 seconds have elapsed, whichever comes first. As long as recording is turned on, the device records automatically when bats are present, even when the app is running in the background. There is also a small manual record button which you can use to initiate a recording. This can be used on its own or while triggered recording is activated if the trigger misses something. When you press the manual button, a recording starts 5 seconds back in time and continues until you hit the button again or 15 total minutes is reached. The NOISE filter will

not act on manual recordings and Auto-ID will only run in real time if the length is under 60 seconds.

During triggered recording, the Trigger Minimum Frequency, in the Spectrogram Settings panel, should be set as high as possible but lower than any expected bat echolocation. For North America and the UK, 12 kHz works well. Lower frequency signals will not initiate a recording. The Threshold can be set between 6 kHz and 60 kHz.

During recording, animation appears around the Record button. A white outline forms around the recording on the spectrogram when a recording is in process. In addition, a glowing red orb appears on all title bars in the app when recording is activated and glows green when a recording is triggered. The duration of the current recording is shown to the right of the orb. Using triggered recording, the duration of the current session is shown and using manual recording, the duration of the current recording is shown. At the conclusion of the recording, a label shows the filename. Tap appropriate icon in the label to:

- Identify the species of bat automatically, or override the species tag.
- Append voice or text notes to that recording.
- Navigate to the recording location in GPS view.
- Delete the recording.

Recordings with no bat detected are automatically tagged as "NOISE" and automatically deleted. You can choose to not auto-delete NOISE files in the Advanced Settings screen.

Using triggered recording, each time you press the Record button a session is started. The session is concluded when you toggle recording off. Each session is given a distinctive color bar in the recording List and as a path in GPS View. An option in the Advanced Settings screen organizes sessions into nightly sessions (noon to noon) regardless of the number of times recording is

stopped and started. Each nightly session exports in its own folder with its own KML file.

Using manual recording, the app automatically uses nightly session mode for those recordings so as to avoid making a folder for every recording.

The recording timer at the top of the screen starts at the beginning of triggered recording session. Or at the beginning of a manual recording. If a manual recording is made during a triggered recording session, then after the manual recording is over, the timer returns to the elapsed time for the triggered session rather than restarting.

The top two bat's scientific and common names appear in the Auto-ID pop-up, which is shown for 10 seconds after identification. This is not intended to ID two species of bats that might appear simultaneously in a recording, though it might in some circumstances. It is intended to give more information in order to help you make the best ID possible and also to allow you to see common confusions so you can learn the ID's limitations. You can also get a sense of the accuracy ID from the pulse count. This shows the number of echolocation pulses that match the top bat and the number of total pulses. More matching pulses can indicate a stronger match. You can select the runner-up species on the Auto-ID pop-up to immediately tag the recording with that bat instead of the front-runner. Click on the "i" icon to learn more about that species. If you know that both species are incorrect, select "CHOOSE ID FROM LIST" to label the recording with any other selected species of bat or enter your own six letter species code. The Auto-ID pop-up also shows the ratio of echolocation calls of the top bat to the total detected calls. This helps give a sense of confidence in the identification.

You can also run ID on one or all recordings from the recording list or while viewing spectrograms from the icon in the recording label. Each recording takes a second or two to identify. If Real

Time ID is set on, the app will not be able to trigger for a couple seconds following a recording while ID takes place. The species code or NoID is assigned as a prefix to the recording name. You can rerun Auto-ID if you should choose to select different bat species to ID. In addition, from the recording you can choose another label from your selected bat species by pressing the yellow bat in the recording label.
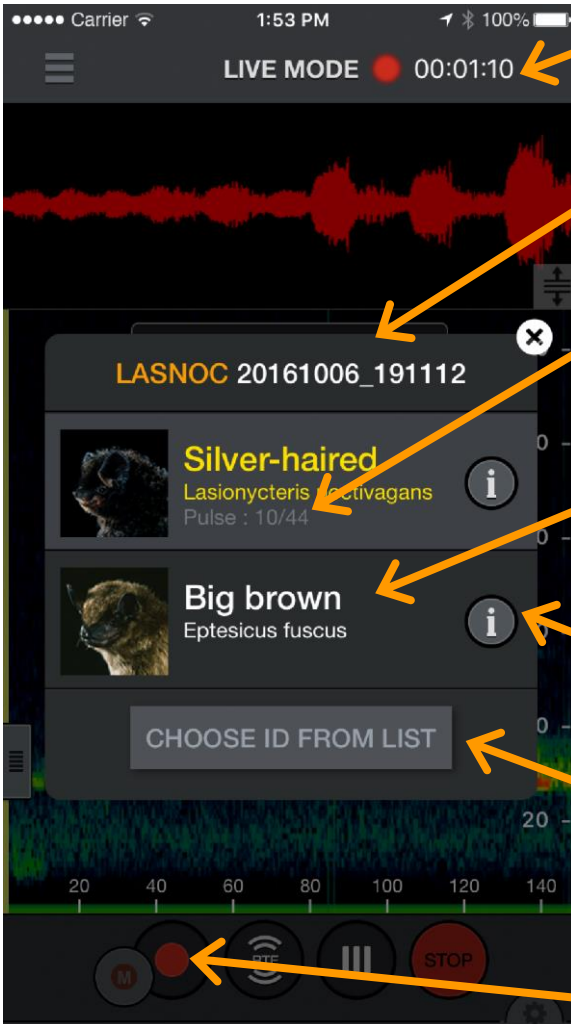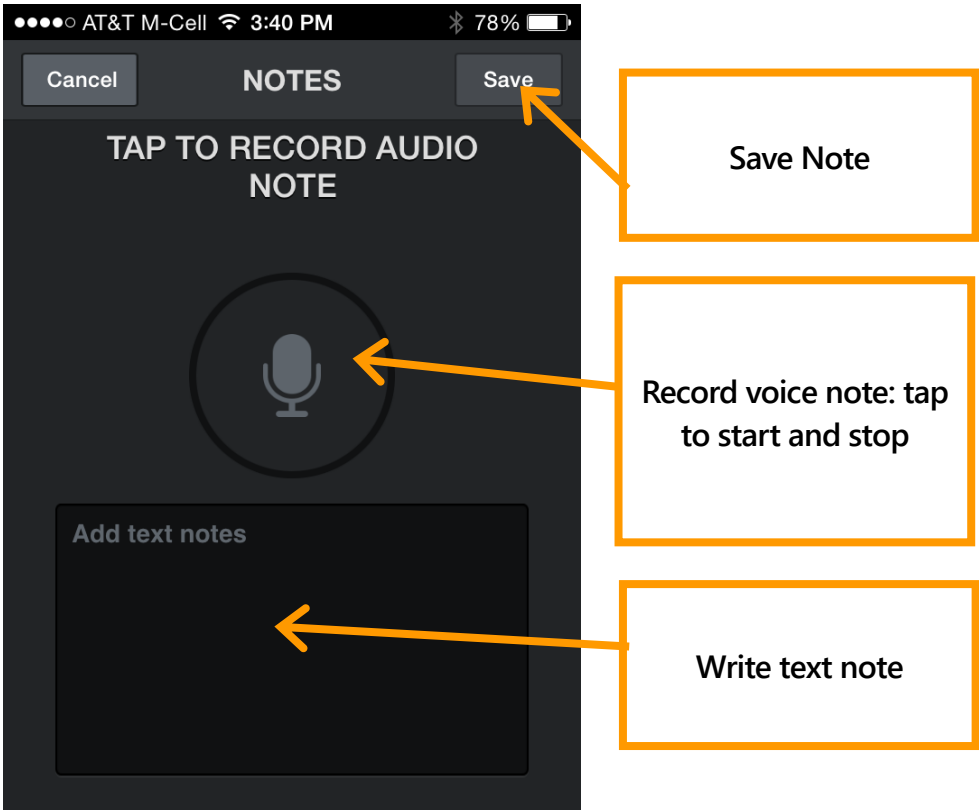

Recording timer

Auto-ID pop-up

Pulse count

Click to label recording with alternate bat

Learn more about bat species

Label recording with another species of bat

Triggered recording and/or manual recording

Tap the recording label icon to open the NOTES page. Voice and text notes are saved as metadata in the recording so they can be transferred with the recording to a computer.

●●●●○ AT&T M-Cell 🛜 3:40 PM ⚹ 78% ▭	
Cancel **NOTES** Save	**Save Note**
TAP TO RECORD AUDIO NOTE	
🎤	**Record voice note: tap to start and stop**
Add text notes	**Write text note**

2.6 The Recording List

Here you can see a list of all of your recordings. The list can be sorted by Time or Species. The latter is useful to sort by species for identified recordings or to sort out noise or NoID recordings. Tapping again will reverse the sort order. Tap on a recording in the list to view the spectrogram or leave notes. If you are monitoring and recording in the background you will be advised that you are leaving Live Mode.

Tap the Edit button at the top right to delete recordings, transfer recordings to your computer via Wi-Fi, share recordings or identify the bat species in the recordings. Press a box to

individually 'check it' in the list. You can select multiple recordings from the list by checking the box of any recording, then pressing and holding the checkbox of any recording above or below. This will check all boxes in between.
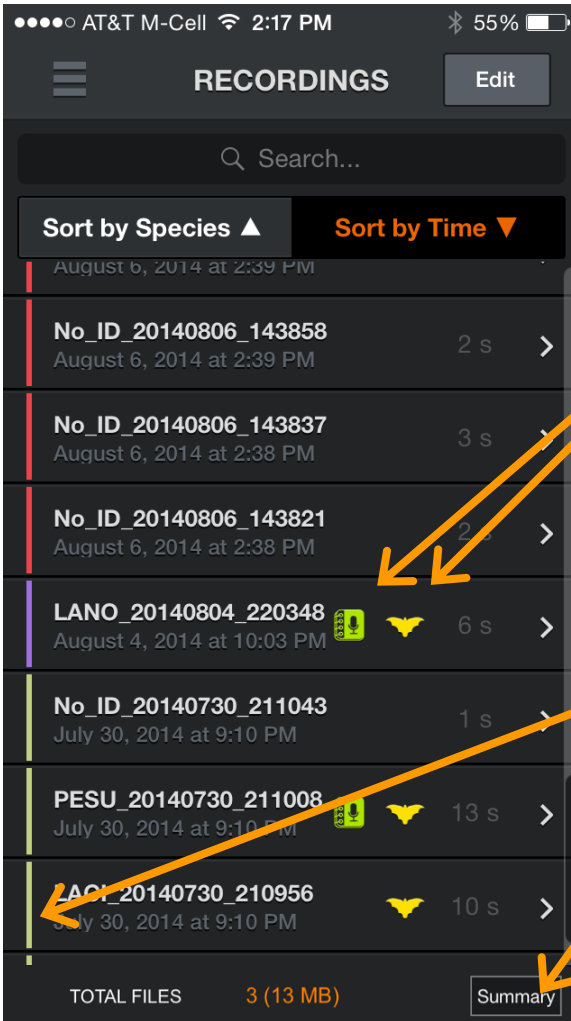
Icons indicate recordings with voice or text notes and recordings with an identified species

Colored recording session identifier
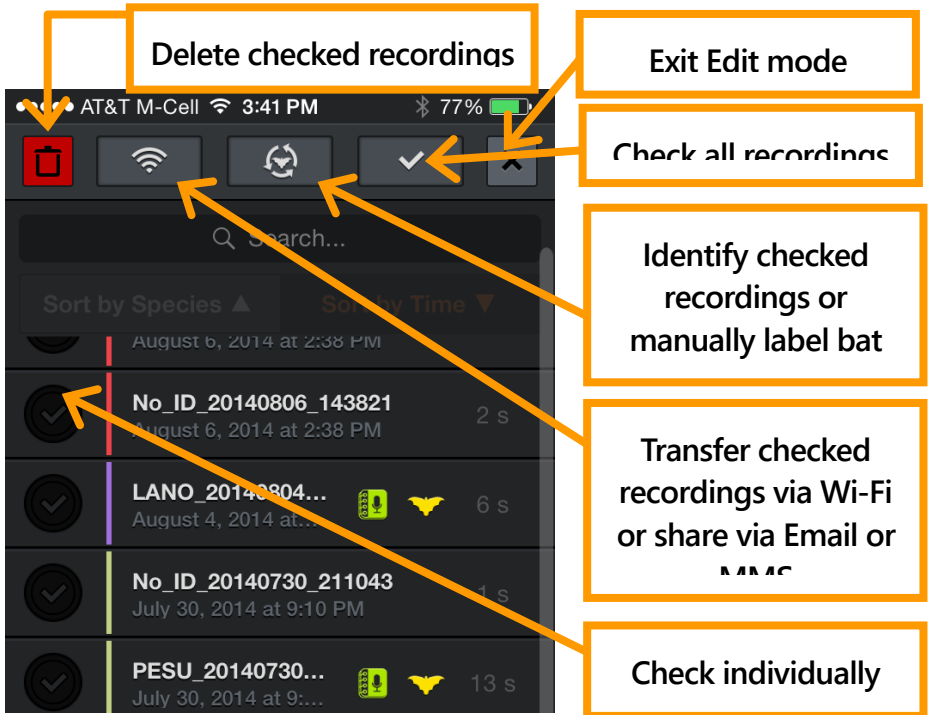
Show summary pop-up

Press the Summary button to show a pop up screen with the number of recordings with each identified species, NoIDs, and the NOISE files. This will summarize all recordings if none are checked, or a subset if only some have been selected with the checkboxes.

Use the search bar to search for species IDs or to search the text of any text notes you have added.

In addition to running ID or manually labeling recordings, the Auto-ID button will also give the option to remove all IDs from the checked recording. This will remove the ID meta data as well as the filename prefix.

Delete checked recordings

Exit Edit mode

Check all recordings

Identify checked recordings or manually label bat

Transfer checked recordings via Wi-Fi or share via Email or MMS

Check individually

AT&T M-Cell 3:41 PM 77%

Search...

Sort by Species ▲ Sort by Time ▼

August 6, 2014 at 2:38 PM

No_ID_20140806_143821
August 6, 2014 at 2:38 PM   2 s

LANO_20140804...
August 4, 2014 at...   6 s

No_ID_20140730_211043
July 30, 2014 at 9:10 PM   1 s

PESU_20140730...
July 30, 2014 at 9:...   13 s

The app has a limit of 10,000 recordings and recordings will need to be transferred or deleted to activate recordings once that limit has been reached.

2.7 Viewing Spectrograms of Recordings

Tap a recording from the Recordings list or from GPS view to view the spectrogram of the recording, leave a voice or text note, identify the bat, and listen to the recording. You can listen using RTE, (HET), or Time Expansion (TE) playback. Use TE to play the recording at a slow speed that renders ultrasound into audible sound. In compressed view, you will only hear visible signals

during playback, not the space in between echolocations. For HET and RTE, the playback occurs on all samples as though expanded view is selected, whether in compressed or expanded view. This lets you hear exactly how the bat would have sounded in live mode. As in Live Mode, heterodyne can be tuned automatically or manually.

Press the up or down buttons to go to the next or previous recording in the recording list. The order of the recordings will match the sorting chosen in the list. Colored vertical bars at the beginning of each recording show the corresponding recording session and match the color shown in the recording list as well as the path in GPS view.

You can filter the audio for better fidelity as in Live Mode by zooming to only the frequencies of interest.

Spectrograph settings are available as in LIVE MODE.

2.8 GPS View

In GPS VIEW, you can see the locations of recordings and species ID and the track of your recording session on a map. Each recording session is shown with a different path color. NOISE files and path lines can be shown or hidden..

A KML file is generated and stored with the session recordings in the session folder. If any recording from a recording session is transferred via Wi-Fi, a KML file will be included in the session folder with all recording's waypoints shown. You can also download the files as described in this User Guide. KML files can

be opened directly in Google Earth to show the recording locations, species IDs and recording path

Show or Hide NOISE files

Turn Paths On and Off

Toggle between map and satellite views

Tap to go to recordings

Zoom or scroll map view

Center and follow mode
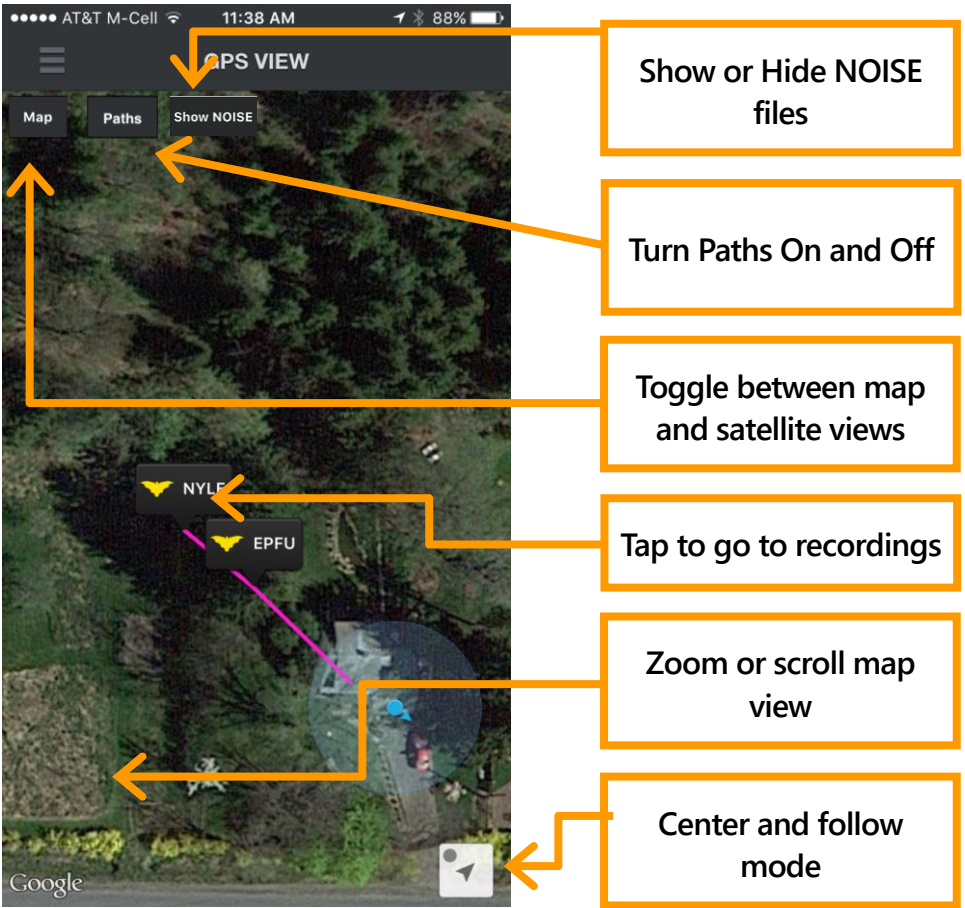
The **zoom to current location** triangle in the lower right of the GPS view zooms to your current location and scrolls the map as you move. The blue dot indicates it is in auto-scroll mode. If you scroll away from your location, the dot turns gray and auto-scroll turns off.

2.9 Settings Screen

The Settings screen is accessible from the main menu.

Audio Division Ratio

Adjusts how the RTE sounds in **Live Mode** and how RTE and TE sound on a previously made recording. 1/10 is higher pitch and 1/20 is lower.

Values: 1/10, 1/20

Default: 1/20

Nightly Sessions Mode

Set to **ON** to organize sessions into nightly sessions (noon to noon) regardless of the number of times recording is stopped and started. Each nightly session exports in its own folder with its own KML file.

Using manual recording, the app automatically uses nightly session mode for those recordings so as to avoid making a folder for every recording.

Values: ON, OFF

Default: OFF

Save Noise Files?

Recordings with no bats detected are automatically tagged as "NOISE". You can choose whether to save these files or automatically delete them.

Values: ON, OFF

Default: OFF

Real-Time Auto ID

If **ON**, Auto-ID will run immediately after concluding a recording and the Auto-ID pop-up will be displayed.

Values: ON, OFF

Default: ON

Real-Time Auto ID Sensitivity

Adjusts how conservative the ID results will be. On **SENSITIVE**, more bats will be identified even if the algorithm is less confident of the result. On **ACCURATE**, only bats in which the algorithm is very confident will be shown. **BALANCED** is in between.

Values: SENSITIVE, BALANCED, ACCURATE

Default: SENSITIVE

Trigger Sensitivity

Adjusts the recording trigger sensitivity level. High is extremely sensitive and maximizes detection, but will also trigger from other noises resulting in NOISE files. Low will only trigger on stronger signals that are likely to be able to be identified. Medium is somewhere in between the two extremes. The trigger only applies to signals that are higher in frequency that the **Trigger Minimum Frequency** setting in the **Spectrogram Settings** panel.

Values: LOW, MEDIUM, HIGH

Default: MEDIUM

Trigger Window

The recording continues for this amount of time after the last signal that satisfies the trigger. (The recording is also truncated when it reaches the maximum recording duration set by **Max Trigger Length**.) Set the trigger window setting long enough to avoid a recording that ends after one echolocation call. For example, if bat echolocation calls occur every 0.5 seconds and trigger window is 0.1 seconds, you would get a new trigger with every single echolocation call.

> NOTE: Some standards describe a specific recording trigger window as a bat pass.

Values: 1 to 15 seconds in 1-second increments

Default: 3 seconds

Max Trigger Length

You can specify the maximum length (time duration) of recordings to comply with file size restrictions of your analysis software or to fulfill a specific recording protocol or definition of a bat pass.

Values: 1 second to 60 seconds in 1-second increments

Default: 15 seconds

Gain (EMT 2 Pro only)

The Echo Meter Touch 2 Pro has configurable gain. The HIGH setting roughly corresponds to the gain on the Echo Meter Touch 1 and the SM4BAT FS set to the default 12dB level. This can be useful for recording very distant or quiet bats. MEDIUM corresponds to the gain on the Echo Meter Touch or the 0dB gain setting on the SM4BAT FS and is a good setting for general recording. The LOW setting is 12 dB lower than MEDIUM and is useful for recording hand released bats or any other situation where the bats are close or loud.

Values: LOW, MEDIUM, HIGH

Default: MEDIUM

Sample Rate (EMT 2 Pro only)

The sample rate on the Echo Meter Touch 2 Pro can be set to 256k or 384k. 256k will record up to 128kHz which is sufficient for all North American and European bats. 384k will record up to 192kHz but will use proportionately more storage for recordings.

Values: 256k, 384k

Default: 256k

Advanced Settings

Clean Recording Database

This button will make sure that each recording in the list still points to a recording file on your device. Sometimes recordings can end up in this list with no associated file if the user deletes files in the file system of the device. Cleaning this up when the app is "initializing" on start up just takes too long so this is a way to clean house when needed without start-up delays.

Restore Defaults

Press the **Restore Defaults** button to restore the following to defaults: zoom level, spectrogram settings and advanced settings. It also unselects all bats on the AUTO-ID SELECTION screen.

3 Recordings

This section describes the format of the recordings, how to transfer them to or from a computer, and how to share them with others.

3.1 Filenames for Recordings

Recordings use the following naming convention:

    ID_YYYYMMDD_HHMMSSWAV

ID

The first three letters of the species and the first three letters of the genus for recordings that have been identified, NoID if Echo Meter Touch was unable to identify the recording or NOISE if the no bats are detected in the recording.

YYYYMMDD_HHMMSS

The full timestamp including the year, month, day, hour, minute, and second when the recording started.

3.2   Metadata Included in Recordings

Metadata is stored in the recording file in the standard GUANO format as well as Wildlife Acoustics' proprietary format. For more information om the format, visit www.wildlifeacoustics.com/SCHEMA/GUANO.html. Metadata is visible in Wildlife Acoustics Kaleidoscope free spectrogram viewer software and can be tabulated in spreadsheet form using Kaleidoscope's converter function. Kaleidoscope software has the ability to add further metadata relating to analysis of the recording. The following are some of the metadata stored in each recording:

Device Model: Displays the type of Echo Meter Touch.

Module Serial Number

App Version

Timestamp

GPS Coordinates: The location and elevation of the Echo Meter Touch when the recording started.

Voice and Text Notes

Species ID: Stores the Auto-ID species, if run, as well as any manual ID added by the user.

Settings: Including Gain, Sample Rate, Max Trigger Length, Trigger Window, Trigger Sensitivity, and Trigger Minimum Frequency.

3.3   Sharing Recordings via Email or Text Message

Recordings can be shared via Email or MMS text messaging via iMessage.

1. Tap the Edit button at the top right to make the edit bat appear.

2. Select one or more recordings (up to 20MB total).
3. Tap the Share button and select Email or MM**S**. A message composition window opens.

Shared recordings can be imported into the app.

1. Press and hold the recording attachment in the email or text message.
2. Select the Echo Meter Touch app. The recording is imported into the app.

> NOTE: iMessage is not compatible with high sample rate WAV files natively so the file is actually sent as an EMTOUCH file and then converted back to a WAV file upon import.

All imported files must have been recorded using Echo Meter Touch app (as opposed to another bat recorder) and will be stored in a session folder called Imported Files. Imported files have a white session color in the recording list.

3.4   Backing Up Recordings

If you have iCloud backup activated on your iOS device, the recordings will be backed up to that service. If you have many recordings this will use up a lot of your storage. If it exceeds your plan, you will get a pop-up warning that says "Not Enough Storage". If this is a problem, go to the Settings app then iCloud-->Storage-->Manage Storage and click on appropriate back up in the BACKUPS section. From there you can turn off Echo Meter Touch backups. Press "Show All Apps" if you don't see it listed. If you are not sure if you use iCloud backup, go to Settings-->iCloud and see if Backup shows "On" or "Off".

In addition, recordings can be transferred to any online storage service that is installed on the iOS device. They can be accessed with the **Share** button on the Recording List screen.
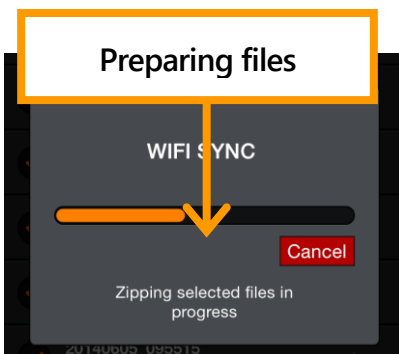
Using one of these strategies is advised since all your recordings can be lost if the app is accidently deleted or if your iOS device breaks.

3.5 Export Recordings to a Computer

Recordings can be exported to a computer via Wi-Fi or via direct connection through a Lightning/USB-C cable.

Export Via Wi-Fi

1. Tap the Edit button at the top right to make the edit bat appear.
2. Select one or more recordings.
3. Tap the Share button and select Wi-Fi to compress all the recordings into one or more transfer files (not to exceed 1GB).
4. A short URL with an IP address and port appears.
5. Type the address exactly as shown into any web browser on any computer on the same wireless network.
6. A page appears where you can download the recordings.

Preparing files

WIFI SYNC

Cancel

Zipping selected files in progress

20140605_095515

Ready to download

WIFI SYNC

http://10.0.1.12:8080

Enter this URL into the browser on your computer to download the files, and Please don't close the popup un...

Close

January 8, 2014 at 3:29

Direct Transfer to Mac

Recordings can be directly transferred to a Mac OS computer via a Lightning-to-USB or USB-C to USB cable (this is the charging cable that comes with the iOS device).

1. Plug the iOS device into the computer using the charging cable
2. Unlock the iOS device
3. Open a Finder window on the Mac desktop
4. Select the iOS device which is now listed on the left of the Finder window
5. Select and open the Echo Meter Touch 2 app
6. Select individual files or entire session folders and drag to the desktop to import to the computer.

Direct Transfer to Windows

iOS devices use iTunes software for direct file transfer under Windows OS.

1. Download and install Apple iTunes software from the Microsoft App store onto your PC.
2. Plug the iOS device into the computer using the charging cable.
3. Launch iTunes
4. Select the attached device by clicking on the small iOS icon that will appear in the menu bar.
5. Select File Sharing in the side tab.
6. Select Echo Meter Touch app.
7. Select the recording sessions you want to transfer and press the Save to button to select a destination.

3.6 Import Recordings From a Computer

You can import recordings and/or session folders into the Echo Meter Touch 2 app directly from a computer desktop.

Import From Mac

1. On your computer desktop, create a folder named "import".

NOTE: import must be all lower case.

2. Copy all session folders and/or independent recordings that you wish to import into your EMT device into this folder.

NOTE: If the files were exported from an EMT device as a .zip file, you can drag the .zip file into the import folder.

3. Close the EMT app and connect your iPhone or iPad to the computer using a Lightning or USB-C cable (depending on the connection type of the iOS device).
4. Open a Finder window on the Mac desktop. The iOS device will appear in the Sidebar on the left
5. Select the iOS device. The Echo Meter Touch 2 app will be listed in the window.
6. Select and open the Echo Meter Touch 2 app.
7. Drag and drop the "import" folder that you created above into the Echo Meter Touch 2 app.

NOTE: If there is already an import folder inside the app, replace this old folder with the new import folder

8. On the iOS device, launch the Echo Meter Touch app. This will automatically import all of the session folders and recordings into the app on your device and they can then be found in the recordings list. Sessions will be shown with a unique color bar and the path will be imported into GPS view as well.

Import From Windows

iOS devices use iTunes software for direct file transfer under Windows OS.

1. Download and install Apple iTunes software from the Microsoft App store onto your PC

2. Plug the iOS device into the computer using the charging cable
3. Launch iTunes
4. Select the attached device by clicking on the small iOS icon that will appear in the menu bar
5. Select File Sharing in the side tab
6. Select and open the Echo Meter Touch 2 app
7. Drag and drop the "import" folder that you created above into the Echo Meter Touch 2 app

> **NOTE:** If there is already an import folder inside the app, replace this old folder with the new import folder

8. On the iOS device, launch the Echo Meter Touch 2 app. This will automatically import all of the session folders and recordings into the app on your device and they can then be found in the recordings list. Sessions will be shown with a unique color bar and the path will be imported into GPS view as well.

3.7   Analysis Software

Use the free Kaleidoscope Viewer to create a spreadsheet file showing your recording's metadata and notes and view spectrograms of your bat recordings on a computer. Upgrade to Kaleidoscope Pro to add automatic classification of bats. You can also use third party bat analysis software for your Echo Meter Touch recordings.

4   Testing the Microphone Element

Use the available Ultrasonic Calibrator to test the microphone element on the Echo Meter Touch. Since ultrasound is beyond the range of human hearing, verifying performance requires

special equipment. The Ultrasonic Calibrator helps you test both the microphone and the full recording system.

The calibrator uses a 9V alkaline battery (included with the calibrator). When the battery is depleted, the calibrator can no longer provide a tone and its LED no longer illuminates. While the recorder may still emit sound at this point, it cannot be used as an accurate calibrator until the battery is replaced.

The calibrator offers two modes of operation. Calibration mode is used to test the microphone at close range and Chirp mode is used to test the entire system at a greater distance.

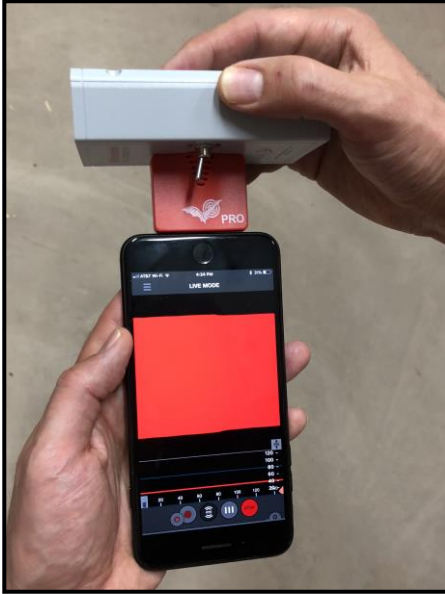## 4.1   Calibration Mode Microphone Testing

1. Remove the clear calibrator microphone adapter by sliding it off the calibrator from the bottom.
2. Turn the calibrator ON and set the toggle switch to CAL (calibration). The calibrator generates a 40 kHz inaudible tone.
3. If you are using the Pro version of the EMT 2, set the gain to Medium in the Advanced Settings of the app.

4. Enter Live Mode on the Echo Meter Touch. Make sure you are in expanded view or the spectrogram will adapt to the calibration tone and stop scrolling. Also turn the volume on your phone or tablet down so as to avoid acoustic feedback affecting the test.
5. Drag the slider to maximize the size of the red waveform at the top of the screen.

6. Point the acoustic horn of the Echo Meter Touch directly at the calibrator speaker.

7. Observe the waveform level on the

screen. Move the Echo Meter Touch around until the waveform is maximized. There is variation in microphone sensitivity between units an calibrators so you may see a larger waveform, but a microphone is good if the waveform takes up more than ¼ of the waveform panel.

4.2 Chirp Mode System Testing

To test the entire system, use the Ultrasonic Calibrator in Chirp mode to emit loud ultrasonic signals that can be picked up by the Echo Meter Touch from some distance. This can be used to verify all triggering and recording functions.

1. Turn the calibrator ON and set the toggle switch to CHIRP. The calibrator emits a 100ms long tone at 40kHz (+/- 10Hz) every 500ms. The amplitude of the tone is 104dB SPL (+/- 3dB) at 10cm.

2. Enter Live Mode on the Echo Meter Touch and place the calibrator within 20 meters to assure the signal can be received.
3. With the calibrator chirping, you can test trigger settings and monitoring modes.

> WARNING! Do not place the Ultrasonic Calibrator near your ears. In CHIRP mode, the calibrator emits a 40 kHz signal at over 100 dB SPL. Prolonged exposure to high intensity ultrasonic signals may cause permanent hearing loss at audible frequencies.

5 Compatibility and Firmware Updates

5.1 Compatibility Table

As of April 2024, there is now limited cross-compatibility between Echo Meter Touch modules with Micro-USB or USB-C plugs, previously sold as Echo Meter Touch 2 for Android, with iOS devices. This table summarizes which Echo Meter Touch modules are compatible with categories of mobile devices based on their operating system (Android or iOS) and the type of data port they have (Lightning, USB-C, or Micro-USB). The table's footnotes indicate whether a firmware update and/or an adapter is required.

EMT Module Plug	iOS Devices		Android Devices	
	Lightning Port	USB-C Port	Micro-USB Port	USB-C Port
USB-C Plug	No	Yes (1)	Yes (2)	Yes
Micro-USB Plug	No	Yes (3,4)	Yes	Yes (3)
Lightning Plug	Yes	Yes (5)	No	No

1. Older units require a firmware update through the Android app.
2. Requires an OTG USB-C to Micro-USB adapter.
3. Requires an OTG Micro-USB to USB-C adapter.
4. Requires a firmware update through the Android app.
5. Requires Apple's official USB-C to Lightning Adapter.

5.2 Update the Firmware on USB Modules to Add iOS Compatibility

In April 2024, we released a firmware update allowing Echo Meter Touch modules with Micro-USB and Lightning plugs to connect to iOS devices that have a USB-C port.

If you have an Echo Meter Touch module that has a Micro-USB or USB-C plug and was purchased prior to April 2024, you can use an Android device to update the module's firmware and enable this new compatibility.

1. Update the Echo Meter app on your Android device to the latest version available from the Google Play store.
2. Connect your Ultrasonic Module to a compatible Android device.

3. Navigate to Settings > Advanced Settings.
4. Select Update Module Firmware.
   A progress bar will appear, then the Echo Meter Touch module will disconnect from the app.
5. Remove and re-insert the Ultrasonic Module.

After the firmware has been updated, the Advanced Settings screen will display a message to indicate the module is up-to-date. Your module is now ready to use with USB-C-equipped iOS devices.

5.3   Required Adapters

iOS devices must have a Lightning or USB-C port to be compatible with any Echo Meter Touch module.

iOS devices with Lightning ports are only compatible with Echo Meter Touch modules that have Lightning plugs. **An Echo Meter Touch module with a USB-C or Micro-USB plug will not work with a Lightning-equipped iOS device, even with the use of an adapter.**

iOS devices with USB-C ports are compatible with all released versions of the Echo Meter Touch module. In order to connect to modules that have Micro-USB or Lightning plugs, an appropriate adapter is required.

Micro-USB Module, USB-C iOS Device

If you need to connect a Micro-USB-equipped Echo Meter Touch module with a USB-C-equipped, Android or iOS phone or tablet, you will need a USB OTG adapter with a Micro-USB socket and a USB-C plug, also referred to as "Micro-USB female, USB-C male."

Lightning Module, USB-C iOS Device

If you need to connect a Lightning-equipped Echo Meter Touch module with a USB-C-equipped iOS device, you must use

Apple's official USB-C to Lightning Adapter, available through Apple's website and at Apple stores.

We have tested adapters with the same physical connections from multiple manufacturers, but Apple's official adapter is the only option we have found to work.

6   Specifications

6.1   Physical

	Echo Meter Touch (original)	Echo Meter Touch 2 and 2 Pro
Length w/o Lightning:	1.8 inches (46 mm)	1.4 inches (35mm)
Width:	1.9 inches (48 mm)	1.9 inches (48 mm)
Thickness:	0.47 inches (12 mm)	.3-.6 inches(7-16mm)
Weight:	1.1 ounces (31 g)	0.7 ounces (20g)
Material:	Anodized Aluminum	Polycarbonate/ABS
Environmental:	Weather resistant but avoid rain	

6.2   Audio

	EMT 1	EMT 2	EMT 2 Pro
Recording Format:	12-bit WAV	16-bit WAV	16-bit WAV
Gain:	Fixed	Fixed	3 settings
Sample Rate:	256kHz	256kHz	256kHz/384kHz
Directionality:	Omnidirectional	Slightly Directional	Slightly Directional
Hi Pass Filter:	2-pole at 8kHz	None	2-pole at 8kHz

Maximum Recording Frequency: Half of the sample rate (up to 128 kHz for 256 kHz sample rate and up to 192 kHz for 384 kHz sample rate)
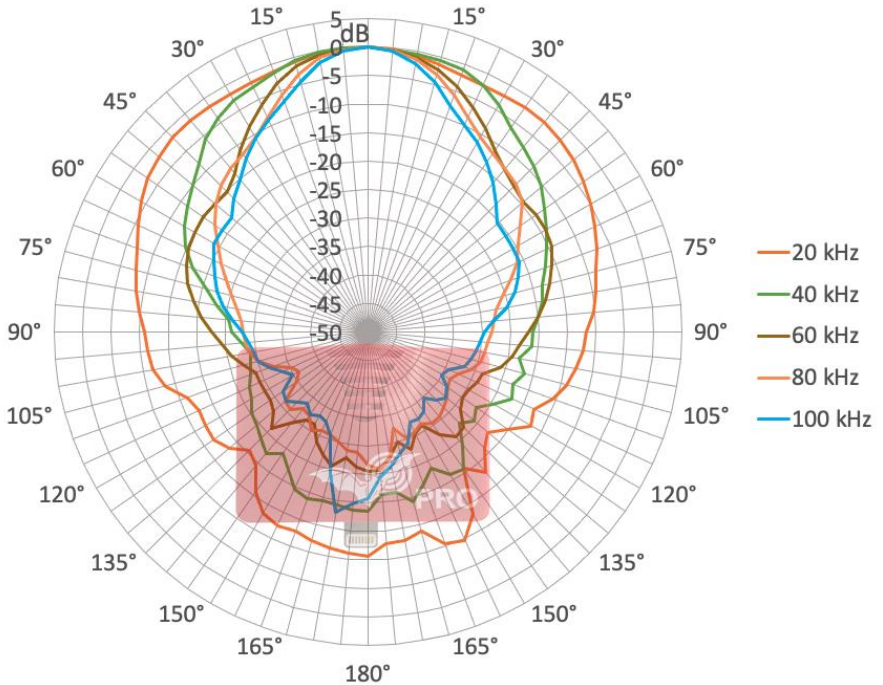
Signal to Noise Ratio (chart below): This is a measure of quality within the recording bandwidth. A higher value is better.
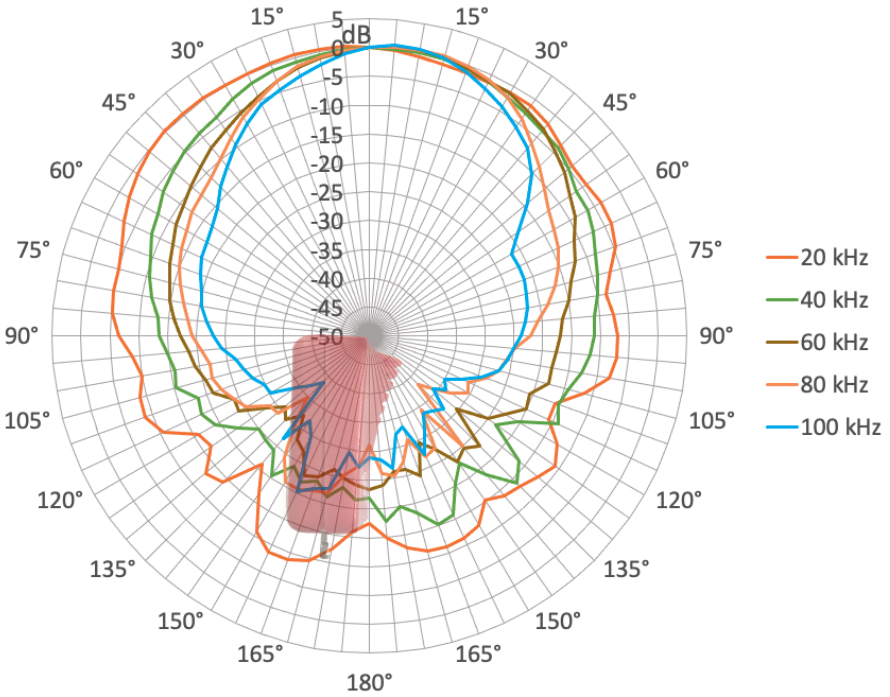

Echo Meter Touch Signal to Noise Ratio
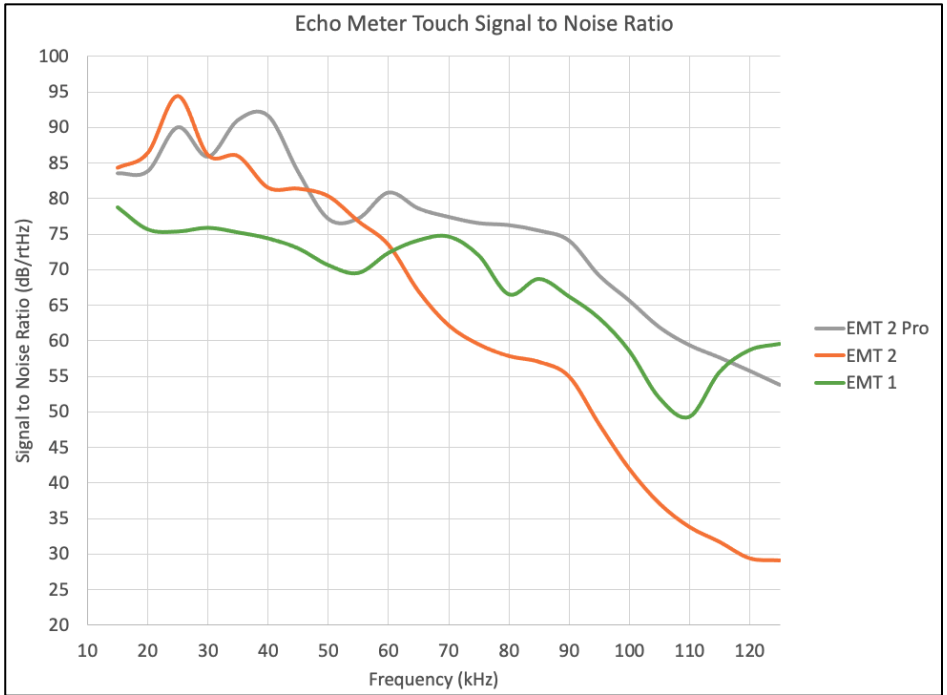
Directionality (charts below): The waveguide on the EMT 2 provides some directionality to reduce extraneous noise and echoes. See the chart below.

Echo Meter Touch 2 and Pro Directionality (Horizontal)

Echo Meter Touch 2 and Pro Directionality (Vertical)

6.3 Storage Requirements

How many recordings you can store on your iOS device depends on the capacity of your iPad or iPhone and how much memory is available. A 5.0-second recording uses 2.5 MB of storage. A 32 GB iPad with 28 GB of storage available, for example, would be able to save over 10,000 recordings.

The app also needs at least 600mb of storage for sufficient buffering of Live Mode. The app will warn you if you have insufficient storage.

6.4 Module Firmware Updates

The firmware on the Echo Meter Touch module can be updated through the app to improve compatibility with future iOS devices or operating systems. If new firmware is available, a pop-up alert will be shown giving the option of updating or waiting. The

update process takes under a minute. Do not remove the module during the process.

6.5   Battery Life

iPad: Up to 9 hours

iPad mini: Up to 7 hours

iPhone: Up to 3.5 hours

> NOTE: The above run times are with the following realistic settings: screen brightness minimized, audio at maximum, recording and Auto-ID on, and GPS off. Turning GPS on will significantly reduce battery life.

6.6   iOS Hardware Compatibility

For up to date compatibility information regarding the Echo Meter Touch 2 for iOS, please check here:

https://www.wildlifeacoustics.com/products/ios-device-compatibility

Wildlife Acoustics, Echo Meter, and Kaleidoscope are registered with the U.S. Patent and Trademark Office. All other trademarks are the property of their respective owners.

The Echo Meter Touch is covered under the following patents:

US 8,599,647

US 10,612,967

GB 2480358

US D813,835

GB2559838 Ultrasonic microphone enclosure

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