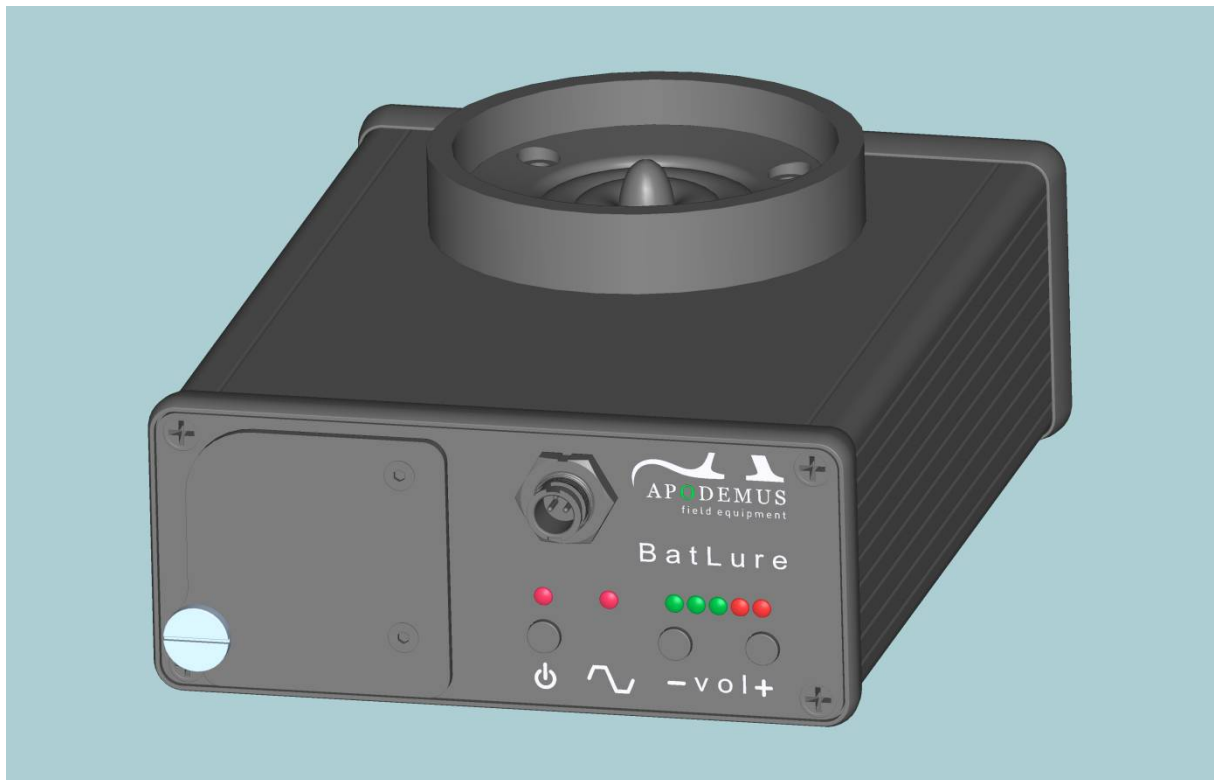# BatLure

General Description

This stand-alone wave player is used to attract bats for field and research purposes. It will be used to play all files present on the inserted SD card with a small amount of pause between these files.

The device is able to work for about one long night on fresh batteries. The power amplifier and speaker are loud enough to attract bats in the neighborhood.

The BatLure is a rugged aluminum device with protection features for its speaker. All parts are secured to this housing so it is not possible to lose small parts.

The auto-play feature will start playing as soon as electricity comes available on the external power connector, making it possible to operate the BatLure on a timer. When the BatLure is battery powered on 8x AA batteries, it will be able to display the status of the batteries.

Its simple user interface makes it very easy to operate, even without reading this manual you will be able to use the BatLure within a few minutes. All operations like changing the batteries or SD card do not need tools.

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Layout

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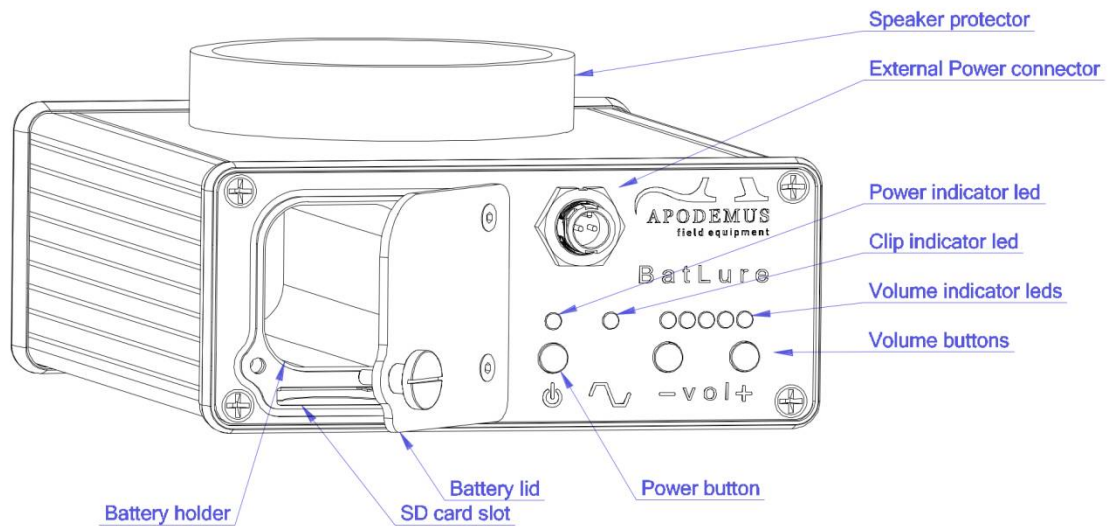
Using your BatLure

The first time you use your BatLure you will need to prepare it for use:

- Place batteries

- Place an SD card

- Power-on the device

Placing the batteries

1. Open the battery lid by loosening the thumbscrew;

2. Pull-out the battery holder;

3. Place eight fresh AA (penlight) batteries of the same type and charge in the holder;

4. Put the battery holder back in the BatLure. Make sure the contact pins are put in first with the pins on the right-hand side;

5. Close the battery lid with the thumbscrew.

(Re)Placing an SD memory card

1. Open the battery lid by loosening the thumbscrew;

2. Remove old SD card (if present): push it in further and it will come back out when released;

3. Place a new SD card with playable wave files. Make sure the contacts are facing up (SD card is upside down);

4. Close the battery lid with the thumbscrew.

    * To create a new SD card please see the regarding chapter.

Turning on the BatLure / Starting the BatLure

1. Push the power button once, the device will power up.

2. Your BatLure is now on and it will play all available files as instructed in the configuration file.

    * The BatLure will show the battery status for five seconds on its volume led's.

Turning off the BatLure

1. Push and hold the power button for approximately one second.

2. Release the power button when the lights turn off.

3. Your BatLure is now off.

Setting the volume

1. Power the BatLure.

2. Push the volume buttons to increase or decrease the volume level.

3. The volume led's will light up according to the volume setting for 2 seconds.

   * Digital amplification and Clipping:
   In normal operating mode the volume led`s are green. When using digital amplification the led`s are red. Digital amplification is a useful feature to play files that are recorded on a low amplitude level; however the possibility of clipping appears when enabling this feature.

   Clipping of the audio signal will be signaled by the "clipping led" lighting up red. Whenever this happens it is suggested to decrease the volume level to preserve audio quality.

Reading the battery status

1. Power the BatLure.

2. Push the power button briefly.

3. The volume led's will light up according to the current battery status.

   There is a small difference in the reported battery status of rechargeable and non-rechargeable batteries. Rechargeable batteries tend to report a little less capacity than they really have. This does not shorten the operating time of the BatLure.

Preparing an SD card for your BatLure (a computer is needed)

1. Place the SD card in your computer and navigate to its location.

2. Copy-paste or drag-drop the files you want to play to the top-directory of the SD card.

3. You might want to edit the configuration file, otherwise remove the SD card (safe remove) and place it back in the BatLure.

   *Formatting your SD card
   It is preferred to format your SD card before using it: this will make sure you will not experience any playback difficulties. Use a FAT, FAT16 or FAT32 file system.

   o *On Mac: Open the "Disk Utility" application and select your SD card. Select "Erase" from the menu, then choose "FAT".*

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    ○   *On Windows: Open "My Computer", right-click on your SD card. Select "Format" from the menu, then choose "FAT" and press start.*

Editing the BatLure configuration file (a computer is needed)

1. Place the SD card in your computer and navigate to its location.

2. Open the file "batlureconfig.txt" in the top directory of the SD card, use a plain text editor like notepad.

   To get a fresh copy of "batlureconfig.txt":
   a. *Delete or rename the file "batlureconfig.txt" from you SD card (if there is one);*

   b. *Place the SD card in the BatLure and turn it on;*

   c. *After 5 seconds you can turn it off;*

   d. *A fresh copy of "batlureconfig.txt" is placed on the SD card.*

3. You can modify the file by changing the numerical values. If you use unrecognized values, a factory set of values will be used instead.

4. When you have set the "batlureconfig.txt" according to your wanted setting, save it to the SD card and safely remove the SD card. It is now ready to use.

Field:	Values:	Units:	Explanation:
time_expansion	0 or 1	off/on	Enables or disables the time expansion feature. With this feature enabled, all files with a sample rate below 20KHz will be played 10x faster.
track_pause	1 to 600	seconds	Determines the pause between two files.
startup_volume	0 to 31	steps	Determines the volume level at power on.
repeat	1 to 100	times	Number of times to repeat a wave file (only when the file is shorter than repeat_time)
repeat_time	0 to 600	seconds	Threshold time to decide when to repeat a wave file.
list_pause			Pause at the end of playlist, before repeating
sine_mod_time			Sine modulation period (seconds), set to 0 to disable this feature
sine_mod_volmin			Sine modulation lower volume level

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Batlure advanced features

Since the first BatLures were produced, there have been a number of upgrades in the BatLure design. The serial number of the BatLure is used to check whether a BatLure has certain features out of the factory, and also to check which serial number is required to update to a newer version, and with that gaining new and advanced features.

Feature:	Description:	Standard from:	Possible from:
FW Update	Enables in the field firmware updates. An update file is required, and can be requested.	BL1303001+	BL1302001+ (Carry in)
External Speaker Connection	Adds the possibility to connect an external speaker to your BatLure.	BL1307001+	**BL1307001+ (Hardware)**
Filler chunk support	Supports Filler chunks in wave files.	BL1307001+	BL1303001+ (FW update) BL1302001+ (Carry in)
Sine modulation	Sine Modulation: this feature simulates a moving sound source by modulating its volume. Disable it by setting sine_mod_time to 0. The modulator will vary the volume between the normal volume (upper level) and sine_mod_volmin	BL1307001+	BL1303001+ (FW update) BL1302001+ (Carry in)
Playlist pause	Pause at end of playlist	BL1307001+	BL1303001+ (FW update) BL1302001+ (Carry in)

BatLure error reports

The BatLure is equipped with an error reporting function: this function enables the developers to get feedback from you, the professional user, with enough technical detail to further investigate the error you came across. Whenever an error occurs, the BatLure will generate a report and save it on your SD card. Off course no personal data is included in these files.

If you find a file called "ERRORREPORT.TXT" on your SD card, you are encouraged to send this file to info@apodemus.eu together with the wave files that created the error.

By sending these reports you will help Apodemus further developing the BatLure hardware.

External power

The BatLure is equipped with a connector to connect an external DC power source. This power source must be between 6…16V and must be able to supply at least 3A of peak current in order to operate. One external power lead is supplied with your BatLure.

Technical specifications

Memory card:	SD Card, formatted either in FAT16 or FAT32, up to 32GB supported.
Supported files:	Wave files (.wav), Mono/ Stereo, 8/16bit
Output frequency:	5KHz…100KHz
DAC Sampling frequency:	up to 600KHz
Time expansion:	Standard supported (switchable)
Output power:	~6W
DAC resolution:	12 bit
Battery operating time:	>10hours (30% output power)
Batteries:	8x AA battery
External DC power:	6…16V, <3A peak, low impedance
Speaker:	Vifa XT25SC90-04
User controls:	On/Off, Volume up, Volume down.
User feedback:	Power led, clip indicator, volume leds (5x).
Size:	~170x120x65mm including battery and speaker.
Housing:	Black anodized aluminum.
Weight:	1000g including batteries.
Tripod mount:	Female thread for mounting on a standard photographing tripod (1/4UNC, 20tpi).
Ingress protection:	IP20
External power connector:	Standard
Suspending eye:	Standard