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LB Altimeters operates a policy of continuous development
Therefore, we reserve the right to make changes and improvements to any of the
products described in this guide without prior notice



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WARNING

The **ECHO** is intended to be a backup device and must not be relied upon as your primary means of maintaining altitude awareness. Use the **ECHO** at your own risk

Altimeters may give erroneous readings if you are tumbling or the altimeter is in a burble (wake). Chest mount altimeters are more vulnerable to this problem compared to hand/wrist mounted altimeters. If you are in doubt about how this limitation affects your skydiving, consult a licensed instructor

DO NOT use this equipment unless you are currently participating in, or have successfully passed, an approved skydiving course

Please read ALL instructions carefully prior to use

The **ECHO** must be switched **ON** prior to entering the airplane

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INTRODUCTION

The **ECHO** is the most high-end, accurate, and reliable audible altimeter to be developed by LB Altimeters to date. The **ECHO** software includes second-to-none error correction to ensure correct live altitude readings in any application

Features

- Audible altimeter
- 4 climb to altitude warnings
- 4 high speed warnings
- 4 low speed warnings
- 3 preset memory banks for quick User change
- Large high contrast, non-flicker, LCD display
- Waterproof and shock resistant aluminum casing with reinforced glass
- Quick buttons for access to primary functions
- IR access functionality, to use with optional AltiSet2 Remote Control

Functions

- Calibration to the local elevation
- User selection of feet / meter
- User selection of pre-set Modes:
 - o Tandem
 - o Student
 - o Expert
- User setting of warnings
- Optional: Super User setting to ACCESS warnings

DESCRIPTION

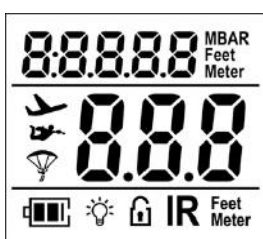
- 1 Altitude Offset / Up
- 2 Main
- 3 Backlight / Down
- 4 Display
- 5 Battery cover
- 6 Reset button
- 7 IR port
- 8 LEDs



DISPLAY

Startup

When turning ON ECHO, the unit will display the following during the startup self-test



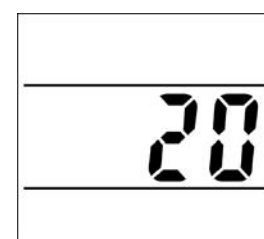
Full display



Air pressure reading (mbar)
Firmware version



Temperature (Celsius)
Battery voltage (V)



Self-test control number

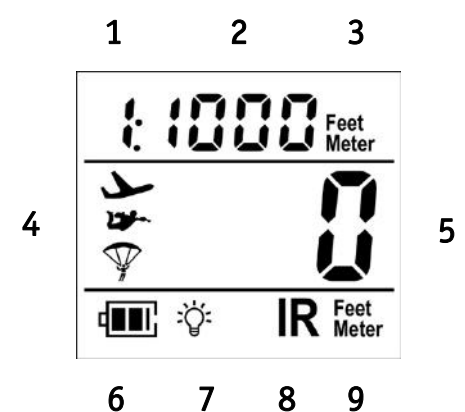


LED lights ON test

Main window

The main window is the default window after the unit is turned ON, and starting point for any further actions

- 1 Warning number (flashing)
- 2 Warning altitude
- 3 Feet / meter indicator – Warning altitude
- 4 Warning type
- 5 Altitude display (flashing when negative)
- 6 Battery indicator
- 7 Backlight indicator
- 8 IR Mode indicator
- 9 Feet / meter indicator – Altitude display






Jump Mode LED

1 of 3 colored LEDs will flash below the main window to display the current Jump Mode (while LED setting is ON):

Warning Type

The icon will show the selected warning type for display and settings:

-  Climb to Altitude warning
-  High Speed warning
-  Low Speed warning

Warning Display

All warnings can be displayed in the top 3rd of the main window by using Quick Buttons to scroll

Settings / Warning Settings

Display examples, after performing ACCESS, are shown in the separate sections

Altitude Window

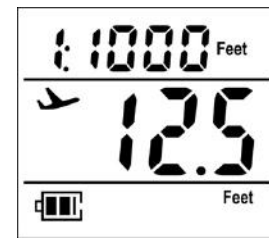
Shortly after take-off, the main window will automatically display altitude readings
The displayed altitude increments (feet / meter) depend on the current altitude



0 - 990
Altitude display: Normal
Increments of 10 feet / 5 meters







1.000 – 9.990
Altitude display: 10s
Increments of 10 feet / 10 meters



10.000 and above
Altitude display: 100s
Increments of 100 feet / 100 meters

Battery Indicator

The battery indicator shows the current battery status

-  Full capacity: Two black bars are shown inside the battery symbol
-  Half capacity: One black bar is shown inside the battery symbol
-  Low capacity: The battery symbol is empty. The batteries must be replaced as soon as possible
-  Empty: The battery symbol is flashing. Do not continue jumping. Replace batteries immediately

Warning: Do not perform night jumps, or jumps in sub-zero temperatures (Celsius) when the battery symbol shows low capacity

WARNINGS

The ECHO has 3 different types of audible warnings:

Climb to Altitude Warning:

While climbing in the aircraft, each preset warning will sound a series of beeps starting at the lowest preset altitude

Up to 4 different warnings can be preset (factory setting being 1 warning at 1000 ft. / 300 m);

- 1st warning:
- 2nd warning: One 0.2 second beep
- 3rd warning: Two 0.2 second beeps
- 4th warning: One 1.3 second beep

The 1st warning will also:

- Verify functionality of the ECHO
- Indicate the altitude at which the highest preset High Speed warning sounds (one beep per 1000 ft., followed by a pause and another beep if preset an additional 500 ft.)

High Speed Warning:

During a vertical descent with speed over of 13 m/sec, each preset warning will sound a series of beeps as follows

Up to 4 different warnings can be preset;

1 st warning:	One 1.5 second alarm.	(Pulsating, low repetition)
2 nd warning:	One 3 second alarm.	(Pulsating, low repetition)
3 rd warning:	One 4 second alarm.	(Pulsating, high repetition)
4 th warning:	One continuous siren.	(High pitch siren, continuous while vertical speed is over 13 m/sec)

Note: After ECHO registers deployment, a vertical descent with speed over of 35 m/sec must be reached before High Speed Alarms activate.

Low Speed Warning:

During descent, each preset warning will sound a series of beeps starting at the highest set altitude

Up to 4 different warnings can be preset;

1 st warning:	One 0.2 second beep
2 nd warning:	One 0.2 second beep
3 rd warning:	Two 0.2 second beeps
4 th warning:	One 1.3 second beep

Note: When selecting Guide ON, a series of 5 beeps will 'count down' from the 3rd to the 4th warning. The time between the beeps will shorten as the 4th warning is approached

Disable Warning(s):

Less than 4 warnings can be selected for each type, by setting 2 or more alarms to the same altitude or zero '----':

Climb to Altitude Warning:

1 warning set to '----':	1 st , 2 nd , and 3 rd warnings will be used
2 warnings set to '----':	1 st and 2 nd warnings will be used
3 warnings set to '----':	1 st warning only will be used

High Speed Warning and Low Speed Warning:

1 warning set to '----':	2 nd , 3 rd , and 4 th warnings will be used
2 warnings set to '----':	3 rd , and 4 th warnings will be used
3 warnings set to '----':	4 th warning only will be used

Note: To re-enable any warning, select an altitude above zero

JUMP MODE and MEMORY BANK

ECHO has 3 color coded Jump Modes, each with a Memory Bank:

Yellow / Student
Blue / Tandem
Red / Expert

The Memory Bank contains 4 Climb to Altitude warnings, 4 High Speed warnings, and 4 Low Speed warnings. All Memory Banks are stored on ECHO while switching Jump Mode.

MENU OVERVIEW

The ECHO menu system consists of 3 separate areas, which include the following (use road map for reference)

Quick Buttons	Settings	Warning Settings
<ul style="list-style-type: none"> Turn ON unit Warning Display Altitude Offset IR Mode Backlight 	<ul style="list-style-type: none"> Mode LED ON / OFF Scroll ON / OFF Units - Altitude Sound Pitch Sound Test Guide ON / OFF Guide Test OFF <p style="text-align: center;">ACCESS to Warning Settings</p>	<ul style="list-style-type: none"> Climb Warnings High Speed Warnings Low Speed Warnings Super User Lock

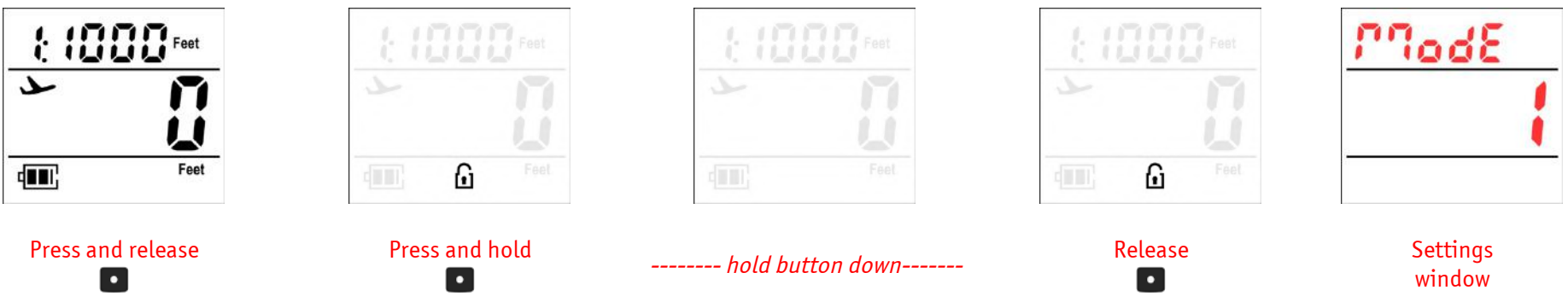
PERFORMING ACCESS

In order to access each of the individual areas, the following steps must be performed from the main window (use road map for reference)

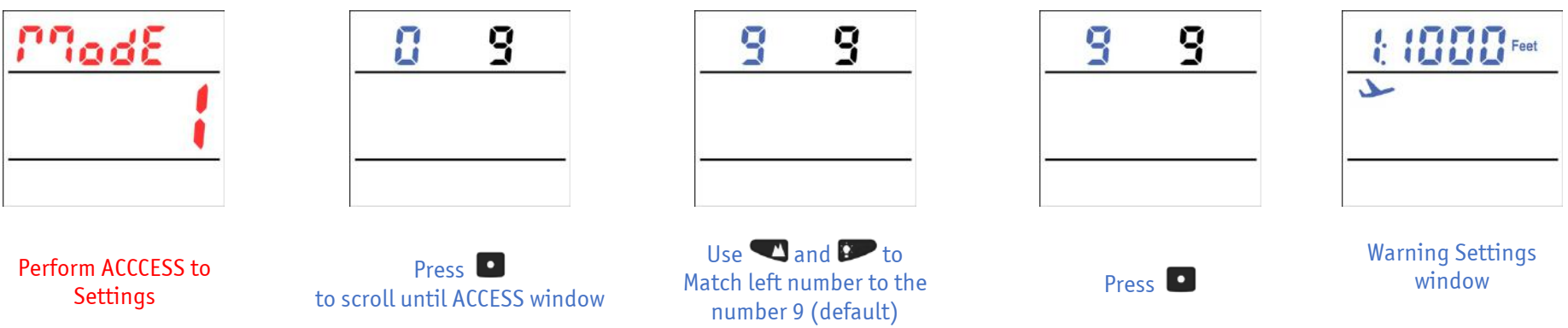
Quick Buttons

Press and hold the designated button for 5 seconds

Settings



Warning Settings



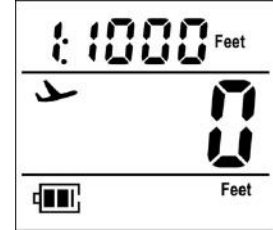
QUICK BUTTONS

Quick Buttons are accessible from the Main Window and do not require ACCESS

Turn ON unit

Turn ON **ECHO** on the ground before use. The unit runs a self-test and calibrates to the current ground level
The **ECHO** will stay turned ON for 14 hours after the last jump or after last ACCESS performed

With the unit OFF, press and hold any button for 5 seconds



If **ECHO** is turned on during flight, the present altitude must be adjusted manually

Altitude Offset

Use Altitude Offset to adjust for altitude difference between landing zone and take-off elevation



To ensure proper ground reference on landing zone:

Select a **positive altitude** offset, if take-off elevation is **HIGHER** than the landing zone
Select a **negative altitude** offset, if take-off elevation is **LOWER** than the landing zone

Alternatively enter the absolute air pressure for the landing zone:

Select the **mbar value** registered/calculated for the landing zone

Press and hold  for 5 seconds

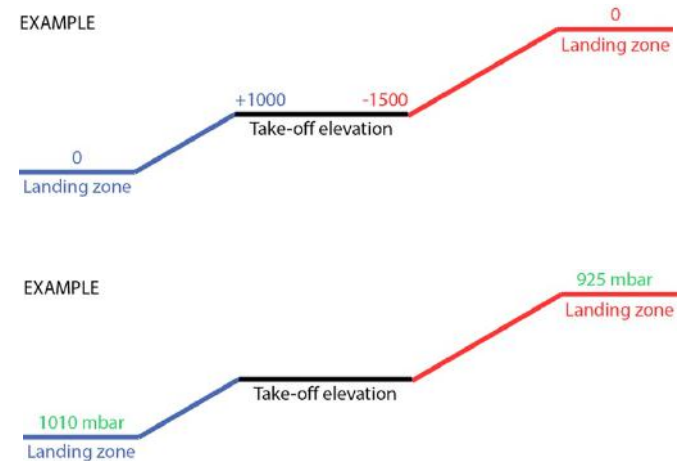
Press  to increase altitude/mbar
Press  to reduce altitude/mbar

Press  to confirm Altitude Offset setting

The Altitude Offset will now be displayed in the main window
(flashing when negative)

Altitude Offset must be confirmed within 15 seconds following an altitude change
Altitude Offset is cancelled if no button is pressed within 15 seconds

Note: If using Altitude Offset during flight either use the aircraft altimeter for reference, or enter the absolute air pressure for the landing zone




IR Mode

Activate/Deactivate IR Mode for communication with AltiSet2 remote control

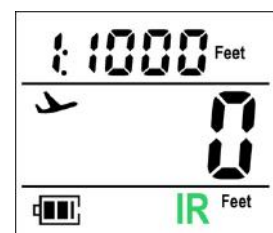
Press and hold  for 5 seconds

IR Indicator will flash and IR mode is active for 2 minutes


Activate IR Mode on AltiSet2
Point the AltiSet2 at the IR port
ECHO adjusts to the AltiSet2 preset altitude, warnings, and/or backlight

Press  to exit IR mode

Note: Refer to the AltiSet2 manual for more information on using the AltiSet2 remote controls



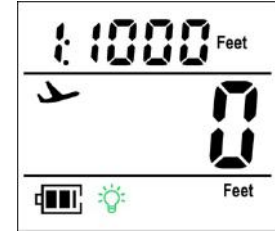
Backlight

 Indicates if backlight is ON or OFF

Enable/disable backlight:

Press and hold  for 5 seconds



Backlight will turn OFF automatically after 30 seconds, if ECHO is not in Flight Mode
Backlight will remain ON while ECHO is in Flight Mode

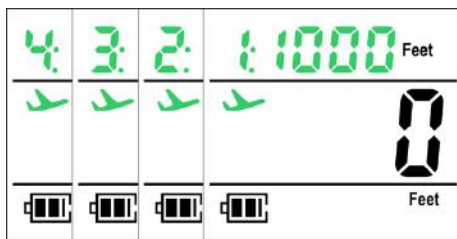


Warnings Display

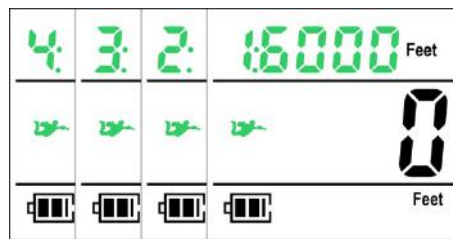
In the Main Window the Warnings can be scrolled through manually, or automatically.
The Warning number and set altitude will be displayed in the top section of the LCD screen, separated by a colon

Note: The flashing LED will show the current Jump Mode selected.

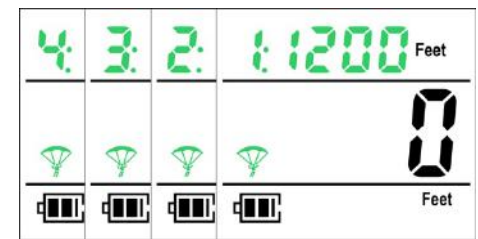
Press  to select previous Warning
Press  to select next Warning



Climb to Altitude Warnings



High Speed Warnings




Low Speed Warnings

Note: If Scroll is ON in Settings, Warnings will automatically scroll in the Main Window without pressing any buttons

SETTINGS

Settings are used to customize the ECHO

Perform **ACCESS** to enter the first entry of **Settings**



Press  to scroll through all settings

ECHO will exit **Settings** if no button is pressed within 15 seconds

Jump Mode

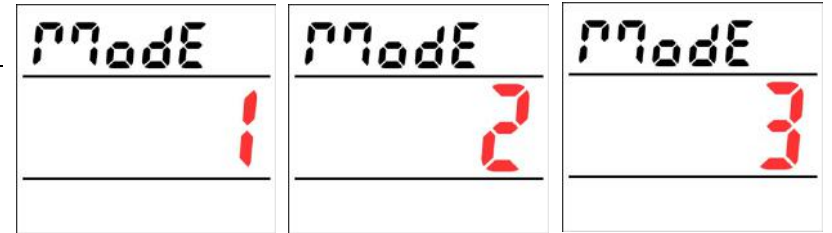
Sets the current Jump Mode.

- 1: Yellow / Student
- 2: Blue / Tandem
- 3: Red / Expert

Press  to select previous Jump Mode
Press  to select next Jump Mode

The LED will light up to display the selection made

Press  to continue

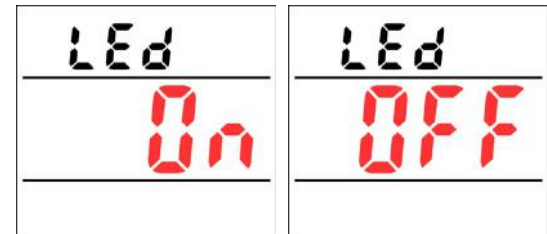


LED ON / OFF

Will activate or de-activate the LED for displaying Jump Mode

Press  or  to switch ON / OFF

Press  to continue



Scroll ON / OFF

Will activate or de-activate the Scroll setting for Warnings in the Main Window

Press  or  to switch ON / OFF


Press  to continue

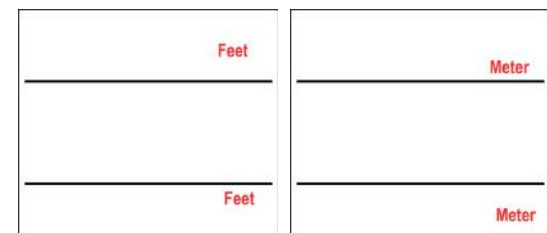


Altitude Units

Sets altitude display in either feet or meters

Press  or  to switch units



Press  to continue




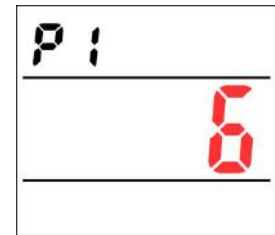
Pitch

Change the pitch of the Warning audible sounds

The pitch can be selected in the range of 1 (lowest pitch) to 9 (highest pitch)

Press  to increase the pitch
Press  to decrease the pitch


Press  to continue

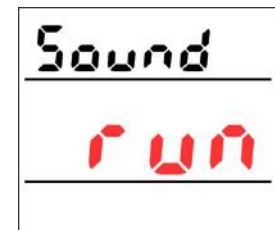


Sound Test

Will test the High Speed Warnings by sounding each one in succession

Press  or  to start sound test

Press  to continue




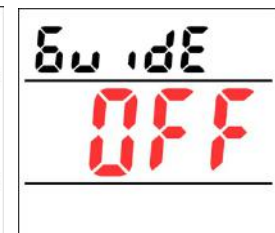
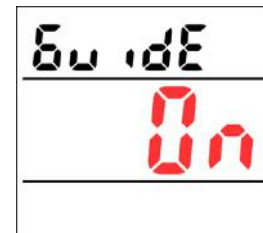
Note: The Warning Altitude will display at the top of the window during the test

Guide ON / OFF

Will activate or de-activate the Guide for Low Speed Warnings

Press  or  to switch ON / OFF

Press  to continue

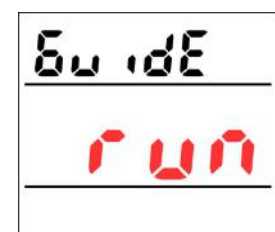


Guide Test

Will test the Guide for Low Speed Warnings

Press  or  to start sound test

Press  to continue






Note: The Warning Altitude will display at the top of the window during the test


Turn OFF

Turns ECHO OFF

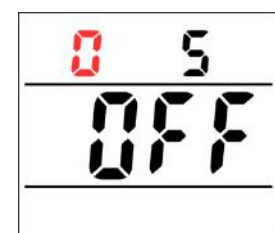
To avoid unintentionally turning the ECHO OFF, the counter at the top of the screen must be set to '5'

Press  and  to match counter to '5'
Press  to accept

Warning:




If the counter is set at '5',  cannot be used to scroll through settings and will turn ECHO off

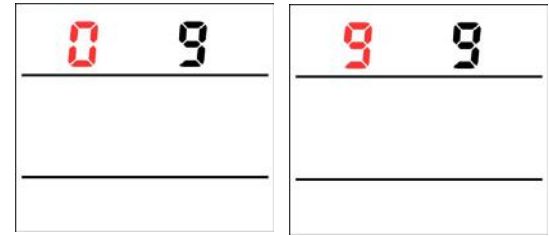
Press  to continue




ACCESS to Warning Settings

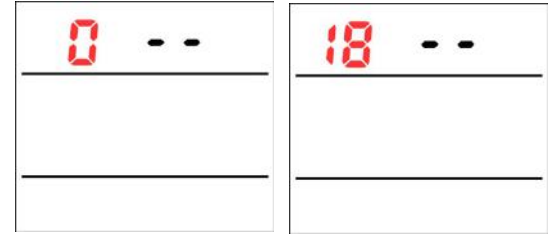
Performs ACCESS to Warning Settings

Press  and  to match left number to the number '9' (Default)
Press  to accept




Warning:
If '--' is displayed on the right side, the default number has been changed and the unit is locked for Super User only. ACCESS can only be performed matching the left number to the correct hidden number.



Press  to continue




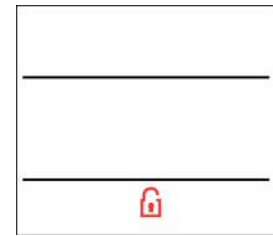
Exit Settings

 is flashing

Allows manual exit from Settings

Press  or  to exit from Settings

Press  to start from the beginning



WARNING SETTINGS

Warning Settings are used to customize the ECHO audible Warnings

Perform **ACCESS** to enter the first entry of **Settings**

Perform **ACCESS** to enter the first entry of **Warning Settings**

Press **▲** to scroll through all Warnings for the selected Jump Mode

ECHO will exit **Warning Settings** if no button is pressed within 15 seconds

Select Warning

Press **▲** to scroll through all Warnings for the selected Jump Mode, starting with 1st Climb to Altitude Warning
The Warning number and altitude will be displayed in the top section of the LCD screen, separated by a colon



Climb to Altitude Warnings



High Speed Warnings



Low Speed Warnings

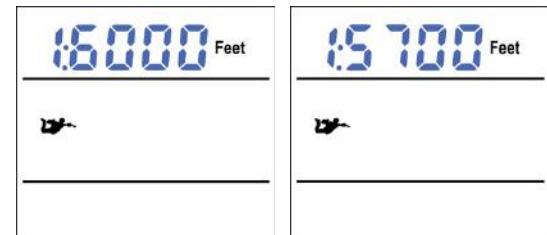
Note: The LED will show the current Jump Mode selected.

Change Altitude

Change the altitude of the selected Warning

Press **▲** to increase altitude
Press **▼** to decrease altitude

Press **■** to confirm altitude and continue



ECHO automatically sort the entered altitudes in order:

Climb to Altitude: 1st Warning will be lowest altitude, 4th Warning will be highest altitude

High Speed Warning: 1st Warning will be highest altitude, 4th Warning will be lowest altitude

Low Speed Warning: 1st Warning will be highest altitude, 4th Warning will be lowest altitude

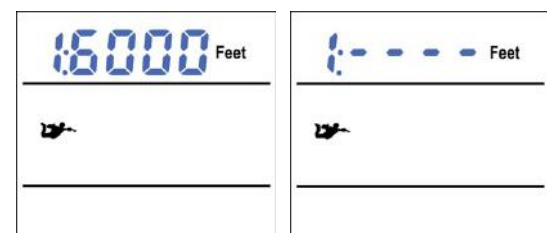
Note: If same altitude is selected as an existing Warning of same type, the Warning will be disabled.

Disable Warning

Will disable the Warning

Press **▼** to decrease altitude to zero '----'


Press **■** to confirm altitude and continue





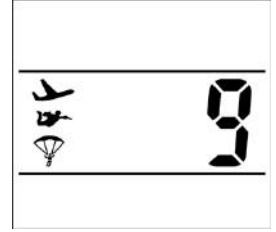
Note: To re-enable any Warning, select an altitude above zero


ACCESS Code

Sets hidden ACCESS code for Warnings Settings menu

Press  to cycle through all Warnings until the ACCESS code window

Press  or  to switch ACCESS code

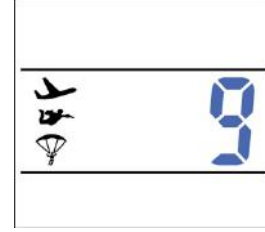


Press  to confirm and continue

Warning:


If any other number is selected other than '9' (default), the unit is locked for Super User only and '--' will be displayed in the Settings window when performing ACCESS

ACCESS can only be performed matching the left number to the correct hidden number






Note: To reset ACCESS code to '9' (default), a factory reset must be performed

Exit Settings

 is flashing

Allows manual exit from Warning Settings

Press  or  to exit from Warning Settings

Press  to start from 1st Climb to Altitude Warning



FUNCTIONALITY

Automatic Calibration / Flight Mode

After the **ECHO** is turned ON, it will continue to automatically calibrate itself to the field elevation where it is currently located. This will continue after each jump / landing, to ensure the unit is always zeroed before jumps are made and will take into account weather related pressure changes.

After take-off, the **ECHO** will enter Flight Mode.

Altitude Offset

When performing Altitude Offset, the **ECHO** enters Flight Mode and will retain any offset for 14 hours if no jump is made. After 14 hours the unit calibrates itself to the field elevation where it is located.

To exit Flight Mode, turn the unit OFF, then ON.

Manual Zeroing

If the unit does not display the correct altitude when arriving at the drop zone, it must be manually zeroed

Turning the unit OFF, then ON, will clear any Altitude Offset and re-enter automatic calibration

Automatic OFF

The **ECHO** automatically switches OFF if no jump has been made within 14 hours, no button has been pressed within 14 hours, or the unit has not been in Flight Mode within 14 hours

Factory Default Warnings

Yellow / Student Jump Mode:

	1 st Warning	2 nd Warning	3 rd Warning	4 th Warning
Climb to Altitude Warning:	1000 feet	'----'	'----'	'----'
High Speed Warning:	'----' feet	6000 feet	4500 feet	3000 feet
Low Speed Warning	1200 feet	900 feet	600 feet	300 feet

Blue / Tandem Jump Mode:

	1 st Warning	2 nd Warning	3 rd Warning	4 th Warning
Climb to Altitude Warning:	1100 feet	1200 feet	'----'	'----'
High Speed Warning:	7000 feet	5500 feet	4000 feet	3000 feet
Low Speed Warning	2200 feet	1900 feet	1600 feet	1300 feet

Red / Expert Jump Mode:

	1 st Warning	2 nd Warning	3 rd Warning	4 th Warning
Climb to Altitude Warning:	1200 feet	1300 feet	1400 feet	'----'
High Speed Warning:	8000 feet	6500 feet	5000 feet	4000 feet
Low Speed Warning	3200 feet	2900 feet	2600 feet	2300 feet

MAINTENANCE

Reset ECHO

A reset may be necessary for troubleshooting and firmware verification

*Locate the small hole on the side of the battery cover
Insert a paper clip or similar into hole, press and release
Battery system calibrates*

The firmware version will be displayed after reset



Battery Change

Only use Renata CR-2325 batteries (2 ea.)

Battery cover screw specs: M3/T6 head (4.5mm length)

*Remove the screws and battery cover
Remove both batteries and note the polarity
Install 2 new batteries
Install battery cover, and ensure rubber seal is in correct placement
Place and tighten screws, using a torque screwdriver set at **0.8 Nm***

*Restart **ECHO** after battery change
to calibrate battery system*

All settings and logbook is kept in a non-volatile memory and will not be lost, however time may need to be set again after battery change

WARNING: The battery cover and seal must be installed correctly, using correct screws and torque, before any water jumps are made



Air Filter Change

The **ECHO** is waterproof to a depth of 5 feet, for 24 hours

If the **ECHO** is submerged into water, allow the unit and air filter to dry in a warm place for 48 hours
The air filter must be replaced if jumping is to be resumed immediately, or if the air filter is suspected to be contaminated

*Remove the screws and battery cover
Remove air filter from battery cover
Install new air filter into battery cover
Install battery cover, and ensure rubber seal is in correct placement
Place and tighten screws, using a torque screwdriver set at **0.8 Nm***

*Restart **ECHO** after air filter change
to calibrate battery system*

Air filter, and filter removal tool, are accessories that can be purchased separately



Trouble Shooting

If the **ECHO** detects an issue, an error symbol is shown (ERR) with a number at the top of the screen


Error codes:

- 1: Transducer defective
- 2: Transducer out of range
- 3: Transducer Time Out too long
- 4: Crystal defective
- 5: Communications error to flash
- 100: Flash defective

*Always restart **ECHO** to attempt to remedy a single ERR code*

If the ERR code persists, then also perform battery change

After unsuccessful restart of the **ECHO**, a Factory Reset is necessary:

Press and hold  during reset, to perform Factory Reset

WARNING: All logbook data will be lost with Factory Reset

If the **ECHO** is still faulty after Factory Reset, it must be serviced by an LB Altimeters Service Center

SPECIFICATIONS

Mechanical:

Casing: Rugged, precision machined aircraft aluminum
Screen glass: Scratch proof lens made of high impact etched glass
Dimensions: 64mm x 44mm x 15mm
Weight: 68g
LCD viewing area: 34mm x 29.5mm

AltiSet2 IrDa compatible: Yes

Altitude Adjustment:

Altitude in mbar offset: Yes
Altitude mbar offset range: 200 to 1075 mbar (20,67 to 31,74 In Hg)
Present mbar steps: 0.5 mbar
Altitude in feet /meter offset: Yes
Altitude feet /meter offset range: -19900 ft. to +19900 ft. (-6000 m to +6000 m)
Present altitude steps: +/- 10 ft. (5 meters)

Tolerances:

Altitude display: +/- 1%
mbar: +/- 1 mbar

Factory default settings:

Feet / meter: Feet

Other:

Operating altitude: 0 to 40,000 ft. (0 to 12,200 m)
Storing Temperature: -20C to +70C
Operating Temperature Range: -30C to +60C continuous operation
Will operate at -50C for: 10 minutes
Storing Pressure: 200 to 1075 mbar
Maximum allowable humidity: Up to 99,9% relative humidity
Waterproof: 5 feet for 24 hours

Function Period: 14 hours
Maintenance: 4, 8 and 12 years, from date of manufacture
Battery type: 2 x Renata CR 2325

L&B part no.: 275727
NATO Stock no. 6675-22-630-2339

WARRANTY

The following conditions apply to the **ECHO** warranty:

If within 12 months of the purchase of **ECHO** a defect or damage is identified by faulty manufacture, LB ALTIMETERS will repair the unit at no cost to the end user

To make a claim under this warranty, send the unit to an authorized dealer or directly to LB ALTIMETERS together with the dated purchase invoice or receipt. The warranty becomes void if damage is caused by external circumstances or if the unit has been serviced or repaired by third parties unauthorized by our national agents or LB ALTIMETERS. All further claims, especially for defects after skydiving accidents, are excluded. LB ALTIMETERS has no obligation to honor any extension of warranty granted by any national agent

WAIVER OF LIABILITY

The buyer and user of the **ECHO** indemnify the manufacturer and vendor from any liability for damage incurred before, during and after skydiving with the instrument



For download and support visit
www.LBAltimeters.com

ECHO - QUICK START & ROAD MAP

Quick Buttons

Press and hold button for 5 seconds

ECHO is ON

IR Mode

Altitude Offset Backlight ON / OFF



Turn ECHO ON

ECHO is OFF

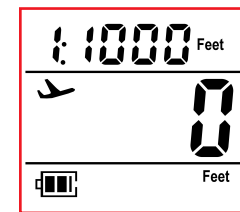
Warning Display



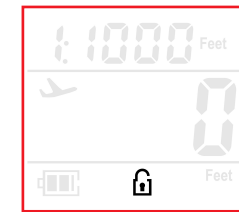
Select previous Warning

Select next Warning

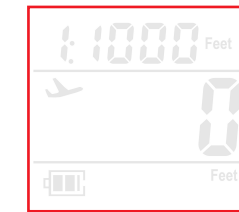
Performing ACCESS to Settings



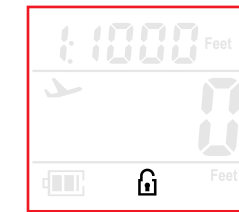
Press and release



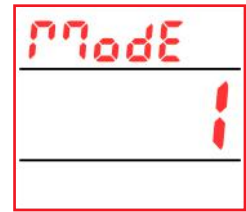
Press



--- hold button ---
--- down ---

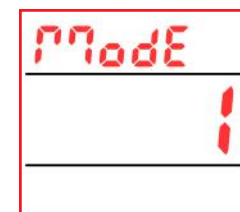


Release

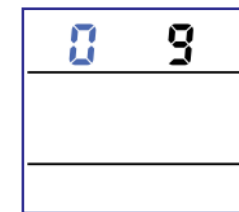


Settings Window

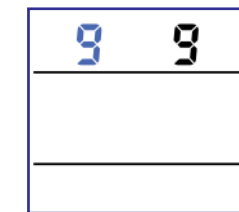
Performing ACCESS to Warning Settings





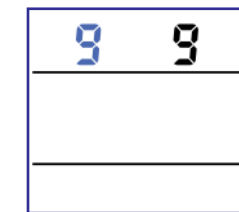
Perform ACCESS to Settings



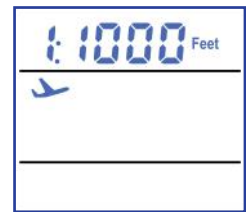
Press  to scroll until ACCESS window



Use  and  to match left number to the number 9 (default)



Press



Warning Settings Window



ECHO - QUICK START & ROAD MAP

