## StratoLoggerCF Field Guide

## Numerical Reporting

Numbers are reported as a long beep (separator), followed by a pattern of shorter beeps for the individual digits, with a pause before the next digit.

As an example, 12,560’ would be reported as:

***Long-beep****-pause-****beep****-pause-****beep****-****beep****-pause-****beep****-****beep****-****beep-beep****-****beep****-pause-****beep****-****beep****-****beep****-****beep****-****beep****-****beep****-pause-****beep-beep****-****beep****-****beep****-****beep-beep****-****beep****-****beep****-****beep****-****beep****-long pause*

***Digit Reported as:***

1. beep-beep-beep-beep-beep-beep-beep-beep-beep-beep
2. beep
3. beep-beep
4. beep-beep-beep
5. beep-beep-beep-beep
6. beep-beep-beep-beep-beep
7. beep-beep-beep-beep-beep-beep
8. beep-beep-beep-beep-beep-beep-beep
9. beep-beep-beep-beep-beep-beep-beep-beep
10. beep-beep-beep-beep-beep-beep-beep-beep-beep

***Powerup***

When the altimeter is turned on, it will report its current settings and other information *before* readying itself for flight. This is what you will hear:

* One digit number corresponding to the currently-selected program preset.
* Two second pause
* Four digit number corresponding to the main deploy altitude setting
* Two second pause
* Continuous five second tone to warn that apogee firing is set to be delayed
* Two second pause
* Three to six digit number (range of 160 feet to 103,500 feet) representing the apogee altitude of the last flight.
* Two second pause
* Two or three digit number representing the battery voltage in tenths of a volt (e.g. 9.2 volts would report as 92).
* Two second pause followed by powerup delay pause
* Followed by continuity beeps repeated every 0.8 seconds:
  + A single beep means drogue e-match continuity is OK.
  + Two beeps means main e-match continuity is OK.
  + Three beeps means both drogue & main have good continuity.
  + If the altimeter remains silent at this point, it means that there is no continuity on either e-match terminal block.

While reporting continuity, the altimeter will begin tracking ground level pressure, and will continuously update its internal ground reading to follow fluctuations in ground level pressure until time of launch.

***The altimeter is ready to launch at this point.***

If the altimeter detected an abnormal condition on the previous flight, a short siren tone will sound, followed by one or more digits representing the error code(s), and a second siren tone. The error codes are listed below:

1. **Total power loss during last flight.**

Downloading the data with the DT4U USB interface can help you to determine the exact time of the power loss, which will aid in diagnosing the underlying cause.

1. **Momentary power loss during last flight.**

The battery voltage to the altimeter dropped briefly to less than 50% of its initial voltage at some point during the flight. The altimeter’s brownout protection allowed the altimeter to continue normal operation, but a loose connection or other issue is likely. Inspecting the downloaded voltage data will aid in diagnosing the underlying cause.

1. **Drogue current exceeded 6 amps.**

When the drogue output was activated, the ematch current was greater than 6 amps. The ematch may have been shorted, or an inappropriate ematch/battery combination is in use. Repeated operation with this condition can lead to damage of the altimeter.

1. **Main current exceeded 6 amps.**

When the main output was activated, the ematch current was greater than 6 amps. The ematch may have been shorted, or an inappropriate ematch/battery combination is in use. Repeated operation with this condition can lead to damage of the altimeter.

1. **Problem detected with FLASH memory.**

The selftest detected a read/write error with the flight data memory. Contact PerfectFlite for assistance.

1. **Problem detected with pressure sensor.**

The selftest detected an error with the pressure sensor. The altimeter will not continue with the powerup sequence if this error is present. DO NOT FLY. Contact PerfectFlite for assistance.

*The error will clear automatically after the next flight if new errors are not encountered.*

***Post-flight***

After flight the altimeter will report in this sequence:

* An extra-long tone to indicate the start of the reporting sequence.
* A three to six digit number representing the peak altitude in feet.
* A long separator tone followed by a two to five digit number representing the maximum velocity during the flight in miles per hour.
* A 5 second pause or longer
* A 10 second warbling siren tone. If you do not want to use this feature, set the Siren Delay setting to “0” and it will be disabled.
* After a 10 second period of silence, the sequence repeats until power is disconnected. Flight data and peak altitude are preserved when power is turned off.

## Parts Identification

1. **Battery Terminal Block:** Connect a 4 volt to 16 volt power source here. Ensure that the negative battery terminal is connected to the terminal labeled “NEG”. *Polarity (POS/NEG) must be correct or altimeter won’t power up. Reverse polarity will not cause damage.*
2. **Power Switch Terminal Block:** Remove factory supplied jumper and connect a power switch here. *Must be connected to an external switch or shorted with a jumper or the altimeter will not power up.*
3. **Main Ejection Output Terminal Block:** Connect to the electric match for the main deployment charge (if used), or leave unconnected otherwise. ***DO NOT SHORT CIRCUIT!***
4. **Drogue Ejection Output Terminal Block:** Connect to the electric match for the drogue/apogee deployment charge (if used), or leave unconnected otherwise. ***DO NOT SHORT CIRCUIT!***
5. **Data I/O Connector:** For connection of the optional data transfer kit or user-supplied in-flight telemetry equipment.
6. **Beeper:** Audibly reports settings, status, etc. via a sequence of beeps.
7. **Preset Program Button:** For selecting and modifying the 9 user settings presets

**Specifications:**

Power: 4V – 16V, nominal 9V battery

Current consumption: 1.5 ma

Output current: Do not exceed 5 amperes

*(Actual current is battery dependent)*

Output “on” time: 1.0 second

Launch detect: 160’ to 300’ AGL, default 160’

Main deploy altitude: 100’ AGL to 9,999’ AGL

Maximum altitude: 100,000’ MSL

Altitude resolution: 1’ up to 38,000’MSL

< 2’ to 52,000’MSL

< 5’ to 72,000’MSL

Analog to Digital Converter: 24 bit Sigma Delta

Calibration accuracy: +/- 0.05% typical

Measurement precision: +/- (0.1% reading + 1 foot) typical

Flight data logged: Altitude, temperature, battery voltage

Number of flights stored: 16

Recording time per flight: Over 18 minutes

Sample rate: 20 samples per second

Operational temperature: -40C to +85C (-40F to +185F)

Dimensions: 2.0”L x 0.84”W x 0.5”H

Weight: 0.38 oz.

## Changing Settings in the Field (no Computer)

1. Hold down the PROG button, then turn on power while continuing to hold the button down (a constant tone will sound while the button is down).
2. Release the button. As soon as the tone stops, tap the button the number of times that corresponds to the preset that you want to select (e.g. tap 4 times to select preset #4). The altimeter will beep to confirm each time you press the button. *If you wait too long before entering your number, the altimeter will exit program mode and continue with normal operation.*
3. Shortly after you have finished tapping in your preset number the altimeter will emit another continuous tone. *You can now modify the main deployment altitude (MDA) of the preset by proceeding to step 4.* If you don’t want to modify the preset (i.e. you are just selecting the preset for use with the flight, but not modifying the Main Deploy Altitude for the preset) just wait for the continuous tone to stop. When the tone stops, the altimeter will proceed to the normal powerup state and report the new settings, last flight altitude, and battery voltage as described in the *“Powerup”* section.
4. *(optional)* If you want to *change* the preset’s Main Deploy Altitude in addition to selecting the preset, do not wait for the continuous tone to stop in the preceding step. While the tone is still sounding, press and hold the button again. The tone will change pitch to confirm that you are about to change the preset’s setting. When the tone changes, release the button and the tone will stop. You can then tap in a number for the new Main Deploy setting in hundreds of feet (e.g. 9 taps will set to 900 feet, 4 taps would set to 400 feet).

*If you wait too long before entering your number, the altimeter will exit program mode and continue with normal operation.*

Shortly after you have finished adjusting your preset’s MDA, the altimeter will proceed to the normal powerup state and report the new settings, last flight altitude, and battery voltage as described in the “*Powerup*” section.

## Preset settings

### Preset Main Deploy (feet) Delay Apogee Firing By (seconds)

1. 1000 2
2. 1050 2
3. **1100 2**
4. 1150 2
5. 1200 2
6. 1250 2
7. 1300 2
8. 900 2
9. 950 2

*\* Altimeter uses preset #3 by default*

## Changing Settings with a Computer

Connect the altimeter to a computer and power it on. Select the “Settings” menu item from the “Altimeter” menu. A screen will appear with the current settings, altimeter model, altimeter serial number, firmware revision level, and total number of flights listed.

## Preset Number

To change the currently active preset, simply select the radio button adjacent to the desired preset and click “update”.

## Main Deploy Altitude

To change any of the presets’ Main Deployment Altitude settings, just select the text for the MDA in the preset that you want to change, enter a new number, and click “update”. The new setting must be in the range of 100 to 9,999 feet; increments of 1 foot.

## Apogee Delay

The apogee delay is set the same way the Main Deploy Altitude is; simply select the old number, enter a new one, and hit “update”. The number will be constrained to the range of 0 to 5 seconds.

## Launch Detect

You can change the Launch Detect Altitude by selecting the text, entering a new number, and hitting “update”. The Launch Detect Altitude controls the point that the altimeter “arms” itself and begins the flight sequence. If a flight doesn’t make it to this altitude, the ejection events will never fire and data will not be recorded.

Valid settings range from 160 feet to 300 feet above ground level. The factory default of 160 feet allows for maximum prelaunch data collection combined with reasonable resistance to wind gust induced false triggering. If you must launch in abnormally high wind conditions, the Launch Detect Altitude can be increased for additional resistance.

## Power-up Delay

An additional delay can be inserted between the times that the altimeter finishes reporting its settings on power-up and when the continuity beeps start as the altimeter looks for a pressure drop signifying launch. This is typically used when a power switch is not accessible from the outside of the rocket and additional time is needed after power is applied to provide time to close up the altimeter compartment and allow pressure to stabilize before the altimeter begins to look for a valid launch condition.

*Warning: If you will be using the drogue or main outputs to activate ejection charges, you MUST make a provision for turning the altimeter on and off from outside the rocket. If you ever have to abort a flight, you need to turn off (disarm) the altimeter before opening the rocket or altimeter compartment. If you open a rocket that has an active altimeter operating, the pressure drop when you pull the rocket sections apart will trigger the altimeter, firing the ejection charges.*

Acceptable settings are 0 (no additional delay) to 60 seconds. Factory default setting is 0 seconds.

## Siren Delay

Shortly after landing, the altimeter begins its beeping sequence with a pause of about 10 seconds before the sequence repeats. If the Siren Delay is set to a number other than 0 (disabled), the 10 second pause will be preceded by a delay as specified by the Siren Delay value, followed by a 10 second warbling siren from the beeper.

Valid settings are 0 (siren disabled) to 120 seconds. Factory default setting is 5 seconds.