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Client: Blackbird Technologies, Inc.
Model: Blackbird Asset Tracker
FCC ID: X6K-BAT-001
Standards: FCC Part 25
Report #: 2010008

Appendix J: Manual

Please refer to the following pages.



BAT™

(Blackbird Asset Tracker)

User Guide

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Firmware Version 6

This product uses satellite and terrestrial technologies that are inherently subject to transmission and reception limitations, and will operate intermittently under certain environmental conditions. Extreme weather or objects that prevent an unobstructed view of the sky may restrict reception or transmission of messages as well as acquisition of your global positioning system (GPS) coordinates. In addition, service may become limited or temporarily unavailable due to equipment failures or outages by the service providers. Accordingly, Blackbird cannot guarantee that the product will operate without interruption.

The BAT device integrates with Blackbird Technologies' Gotham system. The Gotham system is a comprehensive back-end solution for monitoring, operating, and managing tagging, tracking, and locating (TTL) devices and viewing associated geospatial data.

For information about Blackbird's other TTL products and services, and for technical support, contact the Blackbird Help Desk through the following email address:

tfl-help@blackbirdtech.com

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Rev B

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna*
- Increase the separation between the equipment and receiver*
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected*
- Consult the dealer or an experienced radio/TV technician for help*

This device has been shown to be compliant for localized specific absorption rate (SAR) for uncontrolled environment/general exposure limits specified in ANSI/IEEE Std. C95.1-1999 and has been tested in accordance with the measurement procedures specified in IEEE 1528-2003, OET Bulletin 65 Supp. C and Safety Code 6.

Changes or modifications not expressly approved by Blackbird could void the user's authority to operate the equipment.

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BAT DIAGRAM



BASIC USAGE

Device Description—BAT is a small, global positioning system (GPS)-enabled, satellite transmitter capable of sending its position as well as emergency beacons and brevity messages.

Batteries—BAT requires two AA lithium batteries (1.5V only).

To replace the batteries, follow the steps below.

1. Rotate the ¼-turn screw counterclockwise.
2. Remove the battery door.
3. Insert batteries in direction of diagram located in battery casing.
4. Replace door.
5. Rotate the ¼-turn screw clockwise until it clicks.

Power On—To power on BAT, press and hold Power until a short vibration occurs.

Power Off—To power off BAT, press and hold Power until the GPS LED extinguishes and two short vibrations occur.

NOTE: When Emergency Mode is activated, the BAT must be unlocked before Power Off is functional.

LED Indicators—BAT is equipped with two LED indicators. The left LED indicates GPS status (RED or GREEN), and the right LED indicates transmission (TX) status (BLUE).

LED	Action	LED Status
GPS	Acquiring GPS	Rapid triple RED flash every 2 seconds
GPS	GPS acquired with Error \geq 50M	Double GREEN flash every 2 seconds
GPS	GPS acquired with Error $<$ 50M	Single GREEN flash every 2 seconds
TX	Preparing to transmit	Flashing BLUE
TX	Transmission in progress	Solid BLUE
TX	Satellite transmit failure detected	Constant rapid BLUE flashing
BOTH	Emergency Mode started via A&D or Emergency button	Flash in unison for 4 seconds
BOTH	Emergency beacon in progress	Solid on
BOTH	Hardware failure	Continuously flash in unison immediately following power on

Transmission Status

Vibration Indicators—BAT is equipped with a vibration motor, which indicates power on, power off, and transmission sent. A single vibration indicates power on and transmission sent, while a double vibration indicates power off.

LED Settings—BAT is equipped with three LED settings: Visible, Infrared, and Off. The default mode is Visible. The user can toggle through the modes by pressing the LED button located above the GPS and TX LEDs. When BAT is in Infrared LED setting, the LED flashes are displayed in white and can only be viewed using infrared goggles or through some digital camera lenses.

NOTE: The Infrared and Off LED settings are only available in Normal Mode.

NOTE: The selected LED setting persists through power cycles.

Brevity Messages—A brevity message is activated by pressing and releasing buttons A through D or any 2-, 3-, or 4-button combinations. Each brevity message can be assigned a specific meaning or code via Gotham, with the exception of the A&D button combination.

The A&D button combination is reserved for Emergency Mode. Button combinations should be entered by pressing all buttons simultaneously. This ensures that the combination will be reliably registered. After releasing the buttons, four options are available to the user:

Option	Description
Wait	If BAT already has a GPS fix at the time of the button press, transmissions typically occur within 4 seconds; otherwise, BAT waits for a GPS fix prior to sending—up to 120 seconds in Normal Mode.
Abort	Press and release Power. The transmission may be cancelled at any time while the TX LED is still flashing.
Force	Press the button again. This forces BAT to transmit regardless of GPS fix status.
Power Off	Press and hold Power until a short vibration occurs and all LEDs extinguish.

Button Options

The optimum orientation of BAT during transmission is face up (the side with the LED indicators) toward the sky, held at arm's length away from the body. Completion of brevity message transmission is indicated by a single vibration.

NOTE: To transmit a brevity message and position with Normal settings, BAT should remain outdoors in a location with a clear view of the sky. This typically takes 15 seconds to complete.

Beacon Mode—BAT can be configured to beacon at a set interval.

1. Power off BAT.
2. Power BAT on while holding A. Release Power button after a single vibration occurs, then release the A.
3. Upon releasing the buttons, both GPS and TX LEDs illuminate and a short vibration occurs.

4. Select the Beacon Interval by entering the button combination listed in the table below:

Button Entry	Interval
A	1 Minute
B	5 Minutes
A&B	10 Minutes
C	15 Minutes
B&C	30 Minutes
C&D	45 Minutes
D	60 Minutes
Power	Disable

Beacon Interval

5. The beacon interval is indicated by a quick flash of the TX LED every 2 seconds when not transmitting. When BAT is configured for beacon intervals greater than 1 minute, GPS periodically shuts down between transmissions to conserve power (LEDs are inactive during this time). User-initiated transmissions can be made at any time BAT is not actively transmitting. Transmission (in progress) is indicated by a solidly illuminated TX LED.

NOTE: The selected Beacon Mode persists through power cycles.

Emergency Mode—To activate Emergency Mode, perform one of the following:

- Hold the Emergency button for 4 seconds (from power on or off position).
- Press and hold A&D simultaneously when BAT is powered on.

Entry	Indication of Emergency Mode Entry
A&D	Both LEDs flash for 4 seconds, followed by 16 seconds of solid illumination and then SOS distinctive vibrations (3 short / 3 long / 3 short) occur.
Emergency (for 4 seconds)	SOS distinctive vibrations (3 short / 3 long / 3 short) occur.

Emergency Mode

Emergency Beacon Rate—Once Emergency Mode is initiated, the LEDs extinguish, the vibration motor shuts down, and all buttons are nonfunctional. The Emergency beacons are transmitted as follows (assuming the batteries are fully charged):

- For first 4 hours—every 30 seconds
- 20 hours—every 5 minutes
- 40 hours (or until the batteries extinguish)—every 30 minutes

NOTE: The Emergency Mode may be exited by entering the unlock sequence A, D, B&C, Power or by battery removal.

TROUBLESHOOTING

SYMPTOM	CORRECTIVE ACTION
GPS and TX LEDs constantly flash after Power On	<p>The BAT has detected an internal hardware failure. Power down BAT and perform the following steps:</p> <ul style="list-style-type: none"> • Reset GPS to factory defaults by powering on the BAT while holding A&D until a vibration is felt.
TX LED rapidly flashes following a shot	<p>The BAT detected a hardware failure during the previous transmission attempt. If problem persists, return device for repair.</p>
GPS takes longer than 2 minutes to obtain fix indication	<p>GPS fix will take longer in a more challenging environment such as the inside of a moving vehicle, under heavy tree coverage, or held close to the body.</p> <p><u>Possible Solutions:</u></p> <ul style="list-style-type: none"> • Move to a more open location where the GPS signal can be received. • Reset GPS to factory defaults by powering on the BAT while holding A&D until a vibration is felt. • Replace batteries.
Transmissions not being reported	<p>Many factors can cause transmissions to not be reliably received at the monitoring station.</p> <p><u>Possible Solutions:</u></p> <ul style="list-style-type: none"> • Move to a more open location where the BAT has a clear view of the sky. • Replace batteries.

BAT QUICK SHEET—ACTIONS

FUNCTION	ACTIONS
Power On / Off	Power for 2 seconds (or until vibration).
LED Setting Switch	Press LED button to toggle between Visible, Infrared, Off (visible mode is default upon Power On).
Enter Emergency Mode	<u>Option 1</u> – Emergency button for 4 seconds (or until SOS distinctive vibration) from Power On or Off position. <u>Option 2</u> – A&D for 2 seconds in the Power On position.
Exit Emergency Mode	A, D, B&C, Power (or remove batteries).
Enter Beacon Mode	Power and A for 2 seconds A = 1 minute B = 5 minutes A&B = 10 minutes C = 15 minutes B&C = 30 minutes C&D = 45 minutes D = 60 minutes
Exit Beacon Mode	Power and A for 2 seconds, then Power.
Altitude Setting	Power and A&C, C, Power, Power, C, A&B A = MSL B = WGS-84

BAT QUICK SHEET—RESULTS

FUNCTION	RESULT
Power On	Single vibration, LEDs flash once, GPS LED extinguished.
Power Off	Double vibration, LEDs flash twice, powered down.
LED Setting Switch	<u>Visible</u> Mode displays LEDs. <u>Infrared</u> Mode can only be viewed using infrared goggles or through a camera lens. <u>Off</u> Mode turns off LEDs.
Enter Emergency Mode	<u>In Power Off</u> —short vibration, SOS distinctive vibration. <u>In Power On</u> —LEDs flash 4 seconds, LEDs stay solid 16 seconds, SOS distinctive vibration, LEDs extinguish, all vibrations stop, buttons locked out.
Exit Emergency Mode	Short vibration, LEDs stay solid 16 seconds.
Enter Beacon Mode	Short vibration, LEDs stay solid until beacon interval is selected, short vibration.
Exit Beacon Mode	LEDs extinguish, short vibration.