

## SECTION 1 – PRODUCT FEATURES

### 1.1 Getting To Know Your Beacon



Figure 1

**NOTE:** The appearance of your beacon may vary slightly from this picture.

## SECTION 2 – RESPONSIBLE USE

The personal locator beacon is a distress signaling device of last resort, for use when all other means of self-rescue have been exhausted; where the situation is grave and imminent, and the loss of life, limb, eyesight or valuable property will occur without assistance. *Deliberate misuse may incur a severe penalty.*

### 2.1 Prevention of False Alerts

A false alert is any activation of the beacon, intentional or otherwise, that does not result from a situation of grave and imminent danger. Be sure to do the following:

- **Register your beacon.** This does not reduce false alert rates; however, it does have a dramatic effect on the impact of a false alert. When the beacon is properly registered, the situation can be resolved with a phone call. **This beacon has been registered.**
- Be careful who you leave your beacon with. Make sure that they know how to use it, and that they understand the ramifications of causing a false alert. A lot of false alerts are generated by curious individuals. If you notice the beacon is flashing the red or green LED and BEEPING periodically on its own, this likely means it has accidentally been activated and needs to be shut off and reported.

The COSPAS - SARSAT satellites detect distress beacon transmissions immediately. These satellites will locate the transmission within a few minutes of the beacon activation. If you're not in distress, you just generated a false alert.

Should there be an inadvertent activation or false alert, it must be reported to the United States Air Force Rescue Coordination Center (AFRCC) immediately (see below).

**NOTE:** If you report a false alert and the authorities have not received the signal, don't worry. This may mean the beacon was deactivated before transmitting the signal.

### 2.2 Reporting False Alerts

To report false alerts in the United States, contact:

**United States Air Force Rescue Coordination Center (AFRCC)**

**Tel: 1-800-851-3051**

The information reported must include the beacon Unique Identifier Number (UIN), date, time, duration and cause of activation, as well as location of beacon at the time of activation.

False alerts that are rectified must be reported to the AFRCC to let them know that the situation has been corrected and everything is fine. Responsibly reporting these events to the AFRCC or your proper authority will not incur a penalty, ***but deliberate misuse or not notifying the proper authority may incur a severe penalty.***

### SECTION 3 – OPERATION

The MicrOFix™ 406 GPS beacon is designed to be manually deployed and activated. **It is only to be activated when all other means of self-rescue have been exhausted.** When properly registered as required, the activation of the beacon tells Search and Rescue who you are, where you are, and that you are facing a life threatening situation.

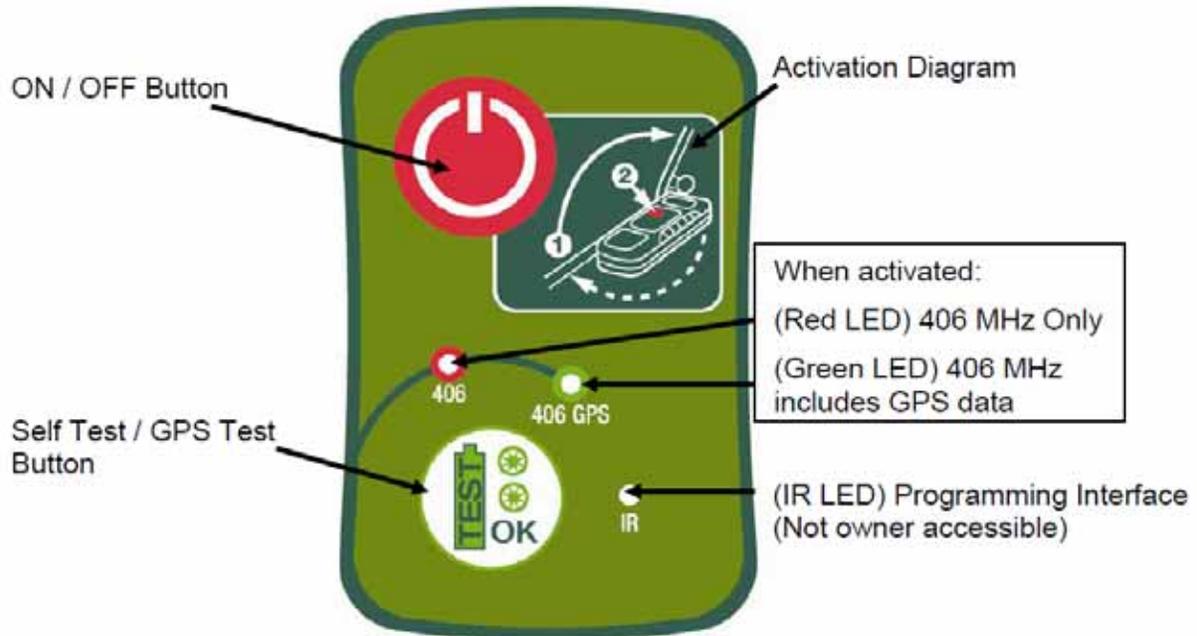


Figure 2 - Key Pad Functions

**NOTE:** If you notice the PLB is flashing the red or green LED and BEEPING periodically on its own, this likely means it has accidentally been activated and needs to be shut off and reported.

**3.1 Activation (406 MHz and 121.5 MHz)** To activate your beacon in a distress situation, follow these steps:

- 1) Unfasten the antenna from the case.
- 2) Move it into the upright position (see figure 3 below).
- 3) Depress the ON/OFF  button for 1 full second.

You will hear a BEEP and your beacon is now activated. While transmitting your distress signal, the red LED will flash once every 2 seconds alerting you that your beacon is active. An additional BEEP will sound every time your beacon transmits data to the satellites (roughly every 50 seconds).

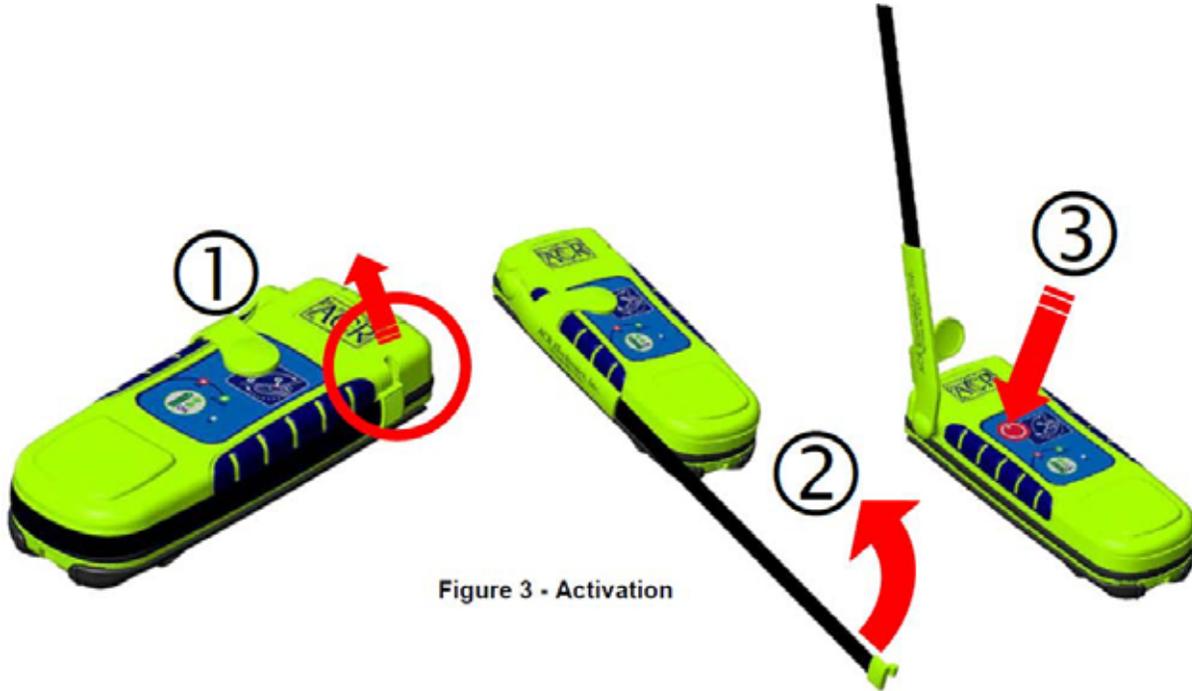


Figure 3 - Activation

### 3.2 406/121.5 Antenna Position

For maximum performance you must deploy the beacon antenna into the proper position (see figure 3). If at all possible, be sure the antenna is positioned facing the sky and avoid submerging in water. This device is intended to operate on or above the ground or while attached to your person **above the water line**.

### 3.3 Activation with GPS

Your beacon is equipped with an internal GPS receiver. Once activated, the GPS engine will start up and search to find your LAT/LON and incorporate it into your 406 MHz signal. As soon as the GPS receiver acquires good positioning data the red LED will stop blinking and the green LED will begin flashing once every 2 seconds.

The same GPS data will be sent with each 406 MHz signal for the next twenty minutes. At that time the internal GPS will start up again, search to find your LAT/LON and incorporate it into your next 406 MHz signal. If for any reason the internal GPS cannot update your LAT/LON, your last position will be used for the next four hours. At that time the green LED will stop blinking and the red LED will flash once every 2 seconds until new GPS data is obtained.

### 3.4 GPS Receiver Orientation

When activated it is critical that you do not cover the beacon with any body part, water, clothing, etc. The GPS receiver is located under the bottom portion of the case behind the MicrOFix™ logo (see figure 4). To ensure optimum performance of the GPS receiver, the beacon needs to have an unobstructed view of the sky. Avoid submerging the GPS receiver in water if possible. Water will shield and inhibit the GPS receiver and may cause difficulties obtaining your GPS coordinates. Avoid leaning over the beacon to view blinking LED as you may shield the GPS reception.



Figure 4 – GPS Receiver Location

### 3.5 Deactivation

To deactivate your beacon, depress the ON/OFF  button for 1 second. Once the beacon is deactivated, all blinking LED's will stop signifying that the beacon is no longer sending your distress message.

### 3.6 Self Test

ACR strongly recommends performing the self test once per month, or at least two weeks prior to a trip allowing enough time for service should your beacon require it.

A self test is initiated by holding the self test button  for at least ½ second and **less than 5 seconds**. Your beacon will sound an initial beep and flash the green LED to signify the test has begun. The green LED will flash a second time to indicate that the self test was successful.

**NOTE:** The beep is a very high pitch that many people are unable to hear.

**Components Tested:** Data Integrity and Memory; 406 MHz Synthesizer; RF Power/Battery; GPS header. If a RED LED flashes at the completion of the self test, your beacon has failed. Repeat the self test. If the failure persists, contact ACR Electronics or an authorized Battery Replacement Center for servicing of your beacon.

**NOTE:** During a self test your beacon will send a 406 MHz signal coded as self-test to the satellite system. The 121.5 MHz homing signal is inhibited during self test; this allows you to test your beacon any time during the day without causing false alerts.

Self Test Sequences	Self Test Guide (  Green LED  Red LED)
 Green LED, 4 BEEPS,  Green LED	Successful Self Test
 Green LED, Less than 4 BEEPS,  Red LED	Failed Self Test – Return beacon to ACR
 Red LED, 4 BEEPS,  Green LED	Successful Self Test – At least 1 hour of battery power has been depleted, have battery replaced.
 Red LED, Less than 4 BEEPS,  Red LED	Failed self test – Return unit to ACR for service.

### 3.7 Battery Witness Seal Life

If your beacon flashes an initial Red LED at the beginning of the Self Test, this indicates that your electronic witness has been broken and you have used more than 1 hour of battery life. While the beacon will still operate normally in a distress situation, ACR strongly recommends you have your battery replaced and the electronic witness reset to ensure that you will have 24 hours of battery power.

## SECTION 4 – ACCESSORIES



Figure 5 - Belt Clip

### 4.1 Multi-Function Belt Clip

The MicroFix™ comes standard with a multi-function belt clip. To install the clip, simply align the bottom tabs on the clip with the insert holes located on the bottom of the beacon. Snap the clip in place by pressing the top of the clip so that the two top tabs engage in the two insert holes on the top of the beacon (see figure 5). To remove the clip, push up and back on the top tabs one at a time to disengage the clip from the beacon.

The MicroFix™ clip has been designed to accommodate your extreme adventures. You can secure your beacon directly to backpack webbing straps, life jackets or belts to ensure the beacon is close at hand. ACR recommends that you secure your beacon someplace on your person that is easily accessible in case of an emergency for rapid activation. Ensure the beacon is secured firmly and is protected before heading out to avoid damage or loss.

**NOTE:** ACR recommends that once you have clipped your beacon in place that you also anchor the beacon with the lanyard to your life jacket, backpack, etc. to ensure the unit will not be lost if it should break out of the clip.

## SECTION 5 – CARE AND MAINTENANCE

**WARNING: Contains Lithium Battery** To avoid possible fire, explosion, leakage or burn hazard, do not open, recharge, disassemble or heat beacon above +70°C (+158°F) or incinerate

These products may contain lithium in the form of a battery. Shipping of hazardous materials requires special handling and documentation. MSDS sheets, along with shipping information, can be found on our website at <http://www.acrelectronics.com/hazmat/default.htm>.

### 5.1 Routine Maintenance

Carefully inspect the beacon case for any visible cracks. Cracks may admit moisture, which could falsely activate the beacon or otherwise cause a malfunction. Any cracking observed should be immediately referred to ACR for evaluation by calling 1-800-432-0227 in the US, or +1-954-981-3333 elsewhere. ACR technical support can also be reached by sending an email to [service@acrelectronics.com](mailto:service@acrelectronics.com).

After checking the beacon case for cracks, it may be wiped down with a clean, damp cloth. Do not use any type of cleaner on your beacon.

**5.2 Battery Replacement** The battery must be replaced by the date indicated on the beacon or every five (5) years. At each inspection, check the time remaining until replacement is required. The battery should be replaced if the beacon has been activated for any use other than the self test. Always refer all long life battery replacement and other beacon service to a factory authorized service center. Battery replacement includes servicing the beacon by replacing all o-rings, testing the water seal and the electrical properties.

**NOTE:** There are no user serviceable items inside the beacon. DO NOT OPEN THE BEACON.

For the nearest location of a Battery Replacement Center, visit our website at [www.acrelectronics.com](http://www.acrelectronics.com)

The beacon may or may not require special shipping instructions due to the lithium batteries and changes in shipping regulations. Call ACR's customer service department at +1 (954) 981-3333 ext. 2110 for proper shipping instructions.

## SECTION 6 – THE SEARCH AND RESCUE SYSTEM

**6.1 General Overview** Beacons provide distress alerts via radio transmission on 406 MHz to the LEOSAR satellites of the COSPAS - SARSAT network. The MicroFix™ can also transmit a distress alert (acquired by the internal GPS) to the GEOSAR network that includes GPS latitude and longitude coordinates.

The message transmitted is unique for each beacon, which provides identification of the transmitter through computer access of registration files maintained by the National Oceanic and Atmospheric Administration or other national authority\*. Remember, SAR forces will know who you are and who to contact that might know of your current situation only if your beacon has been properly registered. This will help expedite the launch of a rescue operation.

**NOTE:** 406 MHz beacons are required to have their registration updated every two years.

\*The national authority is the governmental body responsible for beacon registration database administration for the country for which the beacon is programmed.

Once the 406 MHz signal is relayed through the LEOSAR and/or GEOSAR network, SAR forces determine which SAR group is closest. This group proceeds to the beacon using the 121.5 MHz homing frequency.

### 6.2 Satellite Detection

Beacons transmit to the satellite portion of the COSPAS - SARSAT system. COSPAS - SARSAT is an international system that utilizes Russian Federation and United States' low altitude, near-polar orbiting satellites (LEOSAR). These satellites assist in detecting and locating activated 406 MHz satellite beacons.

COSPAS and SARSAT satellites receive distress signals from beacons transmitting on the frequency of

406 MHz. The COSPAS - SARSAT 406 MHz beacon signal consists of a transmission of non-modulated carriers followed by a digital message format that provides identification data. The 406 MHz system uses Satellite-borne equipment to measure and store the Doppler-shifted frequency along with the beacon's digital data message and time of measurement. This information is transmitted in real time to an earth station called the Local User Terminal (LUT), which may be within the view of the satellite, as well as being stored for later transmission to other LUTs.

The LUT processes the Doppler-shifted signal from the LEOSAR and determines the location of the beacon, then the LUT relays the position of the distress to a Mission Control Center (MCC) where the distress alert and location information is immediately forwarded to an appropriate Rescue Coordination Center (RCC). The RCC dispatches Search and Rescue (SAR) forces.

The addition of the GEOSAR satellite system greatly improves the reaction time for a SAR event. This satellite system has no Doppler capabilities at 406 MHz, but will relay the distress alert to any of the LUT stations. When there is GPS data included in the distress message, SAR authorities instantly know your location to within 110 yards (100 m). This speeds up the reaction time by not having to wait for one of the LEOSAR satellite to pass overhead. Because most of the search and rescue forces presently are not equipped to home in on the 406 MHz Satellite beacon signal, homing must be accomplished at 121.5 MHz.

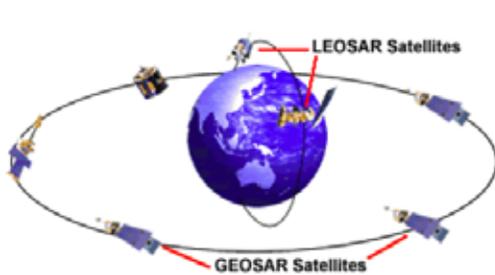


Figure 7- Satellite Coverage

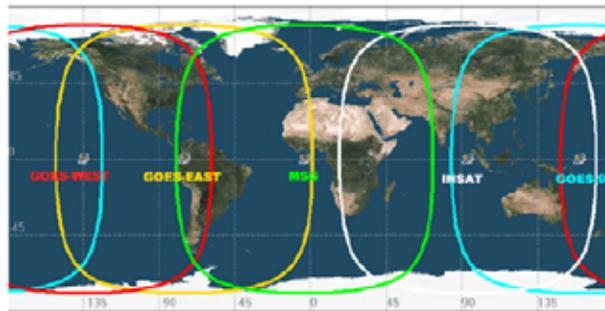


Figure 8- GEOSAR Satellite Orbits

### 6.3 Global Positioning System (GPS)

The GPS system is a satellite group that enables a GPS receiver to determine its exact position to within 30 m (100 ft.) anywhere on earth. With a minimum of 24 GPS satellites orbiting the earth at an altitude of approximately 11,000 miles they provide users with accurate information on position, velocity, and time anywhere in the world and in all weather conditions. The MicroFix™ stores this data into its distress transmission allowing search and rescue forces to narrow the search into a very small area and thus minimize the resources required, dramatically increasing the effectiveness of the overall operation.

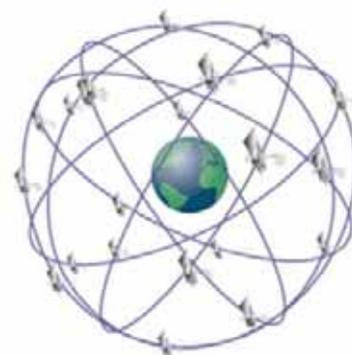


Figure 9 – GPS Satellite Orbits

## **SECTION 7 – TECHNICAL INFORMATION**

### **7.1 Characteristics**

The MicrOFix™ is a battery operated Personal Locator Beacons. The beacon case, with its antenna, is waterproof, while semiconductor circuits are mounted within the case assembly which also contains the battery power supply. Keypads with “self test” and “ON” buttons are installed on the case, along with an internal beeper and three LEDs. The beacon contains a GPS receiver that will acquire your LAT/LON located under the bottom of the front case.

The MicrOFix™ meets the requirements of Federal Communications Commission (FCC) Part 95 Subpart K; and European R&TTE Directive.