

Fastfind & Fastfind Plus Personal Locator Beacon



Owner's manual

WARNING

Use only in situations of grave and imminent danger

Register PLB with NOAA SARTSAT (refer to details on Page 2 following) before use

McMurdo Limited reserves the right to change this specification at any time without notice, and hereby specifically disclaims liability for any consequences of such action.

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IMPORTANT

Please take time to read this manual carefully and to understand its contents fully, so that you can maintain your PLB and operate it correctly in case of an emergency



Recommendations and Safety Notices

This Fastfind or Fastfind Plus Personal Locator Beacon (PLB) is an emergency radio beacon for use only in situations of grave and imminent danger.

False alarms cause expensive disruption to search and rescue services, and may endanger lives. Deliberate misuse of the PLB can result in a severe penalty.

Make sure you read this manual and understand how to activate/de-activate your PLB, and how to change the battery packs. Ensure that the PEPiRB is registered with NOAA Sarsat office in Suitland, MD. Failure to register may lead to prosecution.

The PLB and battery pack contain no user-serviceable parts. Do not dismantle the PLB or the battery pack. Battery packs contain lithium batteries. Do not incinerate, puncture, deform, or short-circuit. Dispose of spent battery packs safely and in accordance with local waste disposal regulations.

The PLB is a radio transmitter, and as such emits radio frequency radiation when activated. This radiation is classified as harmless because of the levels and duty cycles; however it is advisable not to handle the antenna while the unit is transmitting.

Registration and licensing

Each PLB is programmed with a unique digital identity before reaching the customer. This 15 digit hexadecimal number appears on the programming information label located on the back of the PLB (visible when the battery pack is removed), and is pre-printed on the registration card included in the PLB pack. This is the identity which is transmitted to the satellite system when the PLB is activated.

The registration form must be completed, signed, and forwarded to the NOAA SARSAT office in Suitland MD by fax or mail as soon as possible. The registration forms are pre-printed with the correct mailing address and fax number. Registration will also be available on-line (anticipated date: August 1 2003) at <http://www.sarsat.noaa.gov>, or forms may be downloaded now for completion off-line. **Use the PLB form in both cases.**

Emergency Contact

It is VITAL that the Emergency Contact information is accurate, particularly regarding the telephone number, as this will be used to validate an alert. Only if the beacon registration and approximate location details can be confirmed will AFRCC (the Air Force Rescue Coordination Center) launch an immediate rescue, otherwise there will be a delay whilst further alerts from the same source are received and verified.

You will be sent a sticker which must be attached to the PLB. The most convenient place for this is on the front of the unit clear of the recess for opening the cover.

Registration address:

NOAA SARSAT Beacon Registration
E/SP3, RM 3320, FB-4
5200 Auth Road
Suitland MD 20746-4304

FAX: 301-568-8649

Helpline: 301-457-5678 or toll-free: 1-888-212-SAVE (7283).

Quick Checklist

Do:

- **Test the PLB before taking it on a trip**
- **Ensure that the PLB is registered with NOAA SARTSAT**
- **Make sure that you know how to activate and position the PLB in an emergency**
- **Check the battery expiry date**

Don't:

- **Activate the PLB unless there is a genuine emergency**
- **Tamper with the red cover or antenna**
- **Test the PLB more than once per month (on average)**

Introduction

Congratulations on your discerning purchase of this Fastfind 406MHz PLB. This beacon has been designed to ensure your peace of mind by providing you with many years trouble-free service. If you have any problems or require further help and advice, please do not hesitate to contact your retailer, distributor or McMurdo directly.

The Fastfind and Fastfind Plus PLBs are Personal Locator Beacons. In an emergency, activating the beacon causes an alarm to be transmitted to the rescue services through the COSPAS-SARSAT satellite array. This alarm enables the user's location to be established; the PLB also transmits a local homing signal to direct the rescue mission.

The Fastfind PLB uses the satellite system to establish the position of the emergency; the Fastfind Plus incorporates a GPS (Global Positioning System) module which pinpoints the user's position directly and sends this information to the satellite for onward transmission.

Preparation for Use

List of contents

- PLB
- Belt bag
- Lanyard
- User manual (this document)

Open the box and check the contents. Test the PLB in accordance with the instructions in the next section of this manual.

Belt bag

The belt bag is for carrying the PLB hands-free. Fit the bag to the belt. Attach the lanyard to the PLB by removing the battery securing screw, as described on Page 15. Clip the lanyard to the D-ring inside the bag, then place the PLB in the bag and close the self-sealing cover. To remove the PLB, pull open the cover and extract the PLB.

Operation

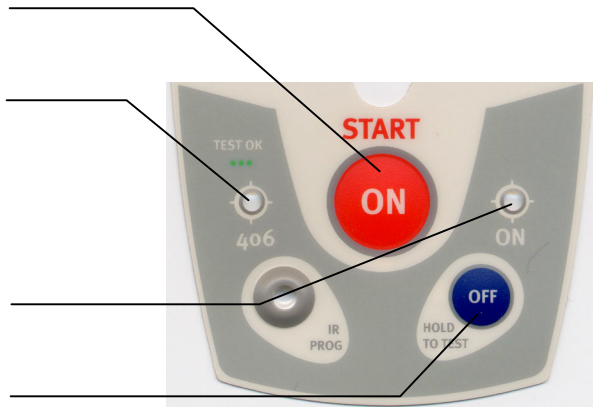
Self-test

Emergency ON
button

Green lamp

Red lamp

Self-test/OFF
button



***PLB control panel
(Fastfind shown)***

The PLB should be tested before setting out, but testing should be limited to about 12 times per year to minimise the total power taken from the battery.

Self-test should only be carried out in the first five minutes of any hour.

Open the flip-top lid. Do NOT pull off the red anti-tamper cover.

Self-test uses the OFF/Test button, located under the flexible handle of the red anti-tamper cover on the right side as shown above.

Slide a finger under the flexible handle of the anti-tamper cover to operate the switch. Press the switch and **HOLD IT DOWN** until the self-test sequence is completed. This will take about 8 seconds. While the button is held down and the self-test sequence is in progress the red indicator light marked "ON" (above the switch) will illuminate.



Self-test

On successful completion of the self-test sequence, the green light on the left will flash 3 times and the buzzer will sound 3 times. The PLB will switch itself off after completing a self-test, even if the OFF button is still held down. Release the button and close the flip-top lid.

If the self-test fails, repeat it. If the problem persists, check the battery expiry date. Do not use the PLB; return it to a dealer.

Emergency operation

Important: DO NOT pull off the red anti-tamper cover unless you are activating the PLB in an emergency. Make sure the PLB is firmly anchored to lifejacket, clothing, or person (eg with a strap) before activating.

Raise the flip-up lid to expose the red anti-tamper cover. Once opened, the flip-up lid can be pulled off the PLB and discarded if necessary. Grasp the handle part of the red anti-tamper cover, and pull sharply away from the PLB body. This uncovers the START/ON button. The antenna will spring into an upright position as soon as the anti-tamper cover is removed.

Locate and press the large START/ON button located in the centre of the PLB switch panel. THE START/ON BUTTON MUST BE HELD DOWN FOR ABOUT 1 SECOND.

The indicator lights will show the status of the PLB. When the indicator lights are flashing, the PLB is transmitting. A full table of the status indications is given in the section "Indicators". The PLB will continue to transmit for a minimum of 24 hours.

Important: Transmissions do not start until the PLB has been active for 2 minutes. This is to allow time to switch the unit off in the event of accidental activation, preventing a false alert being sent to the search and rescue services. During this period the red indicator light comes on continuously on both the Fastfind and Fastfind Plus models.



Pulling anti-tamper cover from PLB



Antenna erected

Switching off

To switch off the PLB after it has been activated in an emergency (eg when rescue has been effected), press the OFF button and hold it down until the indicator lights go off and the buzzer stops sounding.

A five second delay is built in to the operation of the OFF switch to prevent inadvertent de-activation during an emergency situation. After operating the OFF button, confirm that both indicator lights are extinguished and that the buzzer has stopped.

PLB antenna erected



Using the PLB in an emergency

Do:

- Keep PLB flat with antenna vertical
- Try to place PLB where it has a clear view of the sky

Don't:

- Obscure or hold the antenna
- Place PLB next to large metal objects
- Submerge antenna



Ideal position for PEPIRB in open area

How does it work?

Once you activate the PLB, the PLB transmits a continuous series of radio signals on 406 MHz. Providing the PLB's batteries are in good condition, the signal should continue for a minimum of 24 hours. These signals can be detected by aircraft within range and by orbiting and geostationary satellites. The Commerce Department's National Oceanic and Atmospheric Administration (NOAA) operates a series of satellites in low-earth and geostationary orbits to detect and locate aviators, mariners and land-based users in distress. The satellites, along with a network of ground stations and the U.S. Mission Control Center (MCC) in Suitland, MD, are part of the International Cospas-Sarsat Program whose mission is to relay distress signals to the international search and rescue community.

The PLB transmits radio signals to a constellation of Cospas-Sarsat satellites. Ground stations track these satellites and process the distress signals to obtain a location (by using Doppler location techniques) of the distress. The processed information is then forwarded to an MCC where it is combined with other location and registration information and passed to the Air Force Rescue Coordination Center (AFRCC) who alert the appropriate SAR authorities. Successive satellite passes refine and confirm this information. Alternatively, some beacons operating at the 406 MHz frequency can use the GPS system to obtain a very accurate position to within 200 feet. This position is then transmitted as part of the distress signal.

GPS systems do require a clear view of the sky in order to work effectively. Positions where the sky area is obscured significantly, such as under a tree canopy or in a steep-sided canyon, may result in the GPS system failing to acquire its position correctly. Under such conditions the GPS system "fails safe"; it does not transmit an inaccurate position, but instead sends information to indicate that no position is available. Position information is then dependent on the orbiting satellite system, with its 3 miles accuracy. However, the homing signal from the 121.5 MHz transmitter is detectable from the air and in some cases from the ground and may be of great value in refining the position of the beacon.

The Cospas-Sarsat program is operated in the United States by NOAA, the U.S. Coast Guard, U.S. Air Force and NASA. Since the inception of the system in 1982, over 14,000 lives have been saved world-wide and nearly 4,500 persons have been rescued just in the United States.

The network of orbiting satellites can detect signals over the entire surface of the earth; in addition, there are four geostationary satellites that appear fixed in position and which detect signals over enormous areas (approximately one-third of the surface of the earth, but excluding Polar regions).

If an aircraft hears an activated beacon, it will immediately make a report to the Federal Aviation Administration who will pass this information to the Air Force Rescue Coordination Center (AFRCC). Detection of the beacon by aircraft or satellites is highly dependent on the beacon placement and antenna position. Once activated, the beacon should be placed in a clear area with as clear a view of the sky as possible, and with the antenna fully extended and as vertical as possible.

A beacon should not be switched off once activated for a distress situation until the SAR agency directs this.

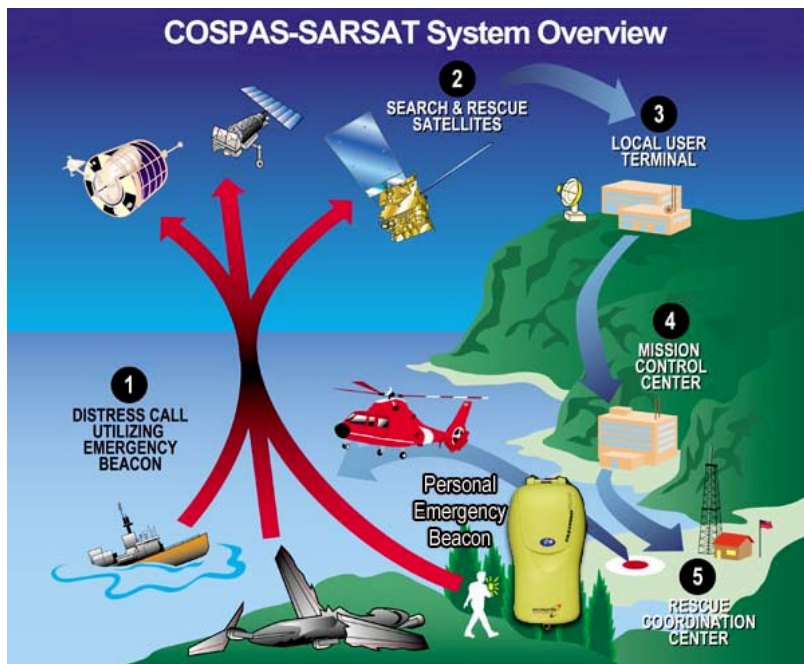
PLB Registration

It is ESSENTIAL that you register your PLB with NOAA SARSAT at Suitland, MD, as described on Page 2.

Registration helps reduce the number of false alarms and hoax calls, and so makes the rescue service more efficient.

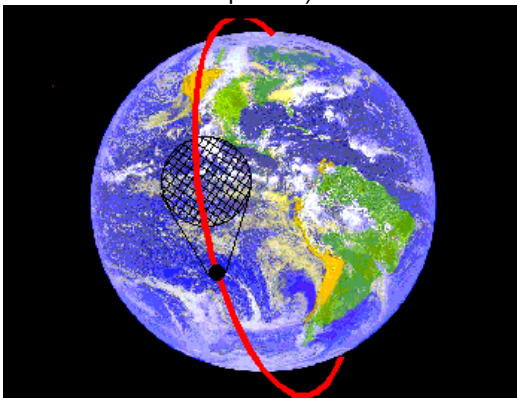
On receipt of a PLB alert, the SAR organization (ie AFRCC) will firstly try to check that the registered owner of the PLB has not accidentally activated the beacon. They will then try to confirm the approximate location before launching a rescue mission. This is another good reason for ensuring that somebody at your home knows where you are going. For the same reason, you should not lend your PLB to anybody unless you know what they are planning to do with it - you (or your named contact) will be the person contacted if an alert is generated.

COSPAS-SARSAT Satellite System



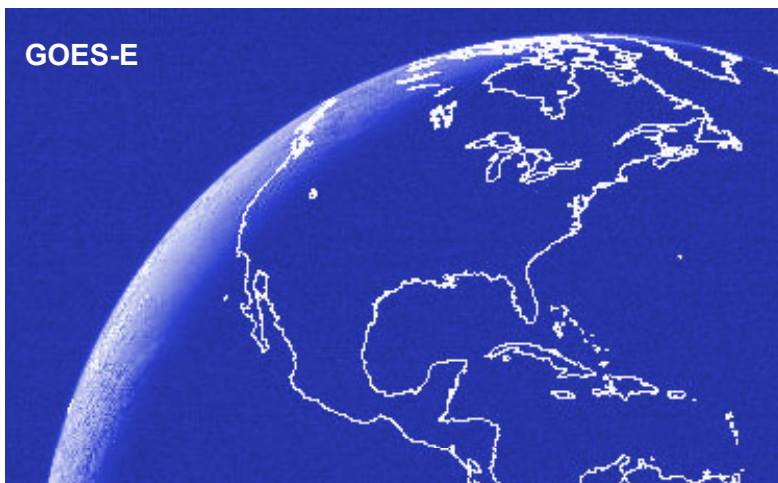
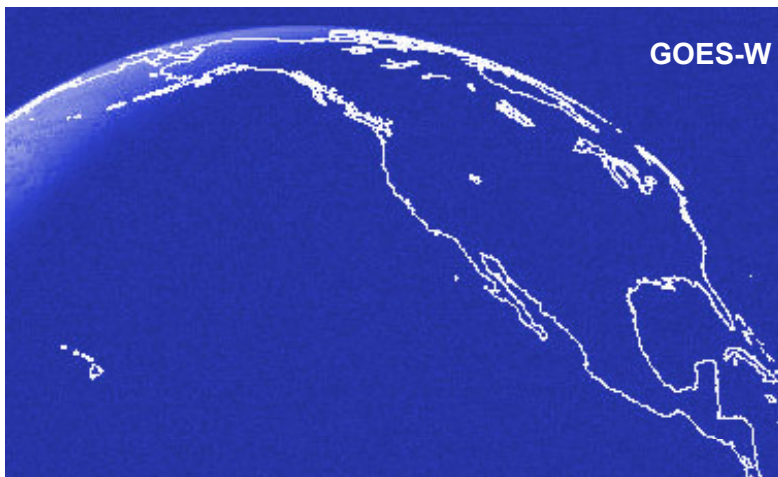
This diagram shows the path the distress signal takes from the PLB through the satellite and ground station to the Search and Rescue organization, as was described on Page 10.

The orbiting satellites circle the entire Earth; the illustration shows the satellite "footprint" (the area each satellite sees as it passes).



System graphic and GOES images ©NOAA, LEOSAR satellite courtesy of COSPAS-SARSAT

The images below show the coverage areas of the geostationary NOAA satellites over North America. GOES-W can see the entire continent, although the East coast is marginal; only Alaska and Hawaii are invisible to GOES-E. Consequently, coverage overlaps over virtually all the continental US and there is always one satellite which can see any place. This means that a GPS-fitted PLB will have its distress position known almost instantaneously - provided that the GPS system can determine the position, as described on Page 10.



Indicators

Fastfind (non-GPS version)

PLB SELF-TEST		
Event	Self-test button pressed and held	Self-test completed and passed
Red Light	On while self-test sequence in progress (approx 8 seconds)	Off
Green Light	Off	Flashes 3 times
Buzzer	Off	Sounds 3 times

EMERGENCY OPERATION			
First 2 minutes		After 2 minutes	
Event	Start/On button pressed	121.5MHz homing transmitter on.	406 MHz burst transmission
Red Light	On continuously for first 2 minutes	Flashes every 2.5 seconds except during a 406 MHz burst transmission	Off
Green Light	Off	Off	Long flash for 2 seconds every 50 seconds, then off.
Buzzer	Sounds approx every 2.5 seconds		

DIAGNOSTIC INDICATIONS					SPECIAL MODES
Event	Self-test button pressed and held	Self-test completed	During operation		Protocol Programming
Red Light	Off	Flashes 3 times	Does not flash	Flashes every 2.5 seconds	Flashes continually.
Green Light	Off	Off	Long flash for 2 seconds every 50 seconds, then off.	Does not flash	-
Buzzer	Off	Off	-	-	-
Meaning	No power to PLB	Self-test failure	No 121.5MHz signal	No 406 MHz signal	Programming mode.
Action to be taken	Check battery pack is secure. Replace battery pack. Return unit to dealer if problem persists.	Do not use. Return unit to dealer.	None. Unit is still broadcasting 406MHz signal.	None. Unit is still broadcasting 121.5MHz signal.	Programming can only be carried out by an authorised dealer using special equipment.

Fastfind Plus (integral GPS version)

PLB SELF-TEST		
Event	Self-test button pressed and held	Self-test completed and passed
Red Light	On while self-test sequence in progress (approx 8 seconds)	Off
Green Light	Off	Flashes 3 times
Buzzer	Off	Sounds 3 times

EMERGENCY OPERATION					
Event	First 2 minutes	After 2 minutes			
	Start/On button pressed	121.5MHz homing transmitter on.	406 MHz burst transmission	406 MHz burst transmission with GPS data less than 20 minutes old	406 MHz burst transmission with GPS data more than 20 minutes old
Red Light	On continuously for first 2 minutes	Flashes every 2.5 seconds	Long flash for 2 seconds every 50 seconds. Then flashes every 2.5 seconds.	Long flash for 2 seconds every 50 seconds. Then flashes every 2.5 seconds.	Long flash for 2 seconds every 50 seconds. Then flashes every 2.5 seconds.
Green Light	Off	Off	Off	On for 2 seconds every 50 seconds. Then flashes every 2.5 seconds. Comes on in time with red light.	On for 2 seconds every 50 seconds (approx), then off.
Buzzer	Sounds approx every 2.5 seconds				

DIAGNOSTIC INDICATIONS						SPECIAL MODES
Event	Self-test button pressed and held	Self-test completed	During operation			Protocol Programming
Red Light	Off	Flashes 3 times	Only flashes for 2 seconds every 50 seconds	Flashes every 2.5 seconds, but no long (2 second) flash	-	Flashes continually.
Green Light	Off	Off	-	-	Does not flash	-
Buzzer	Off	Off	-	-	-	-
Meaning	No power to PLB	Self-test failure	No 121.5MHz signal	No 406 MHz signal	GPS has not been able to acquire a fix since switch-on	Programming mode.
Action to be taken	Check battery pack is secure. Replace battery pack. Return unit to dealer if problem persists.	Do not use. Return unit to dealer.	None. Unit is still broadcasting 406MHz signal.	None. Unit is still broadcasting 121.5MHz signal.	If possible, make sure GPS view of the sky is not impaired. Flashing red light shows status of 121.5 & 406 MHz transmissions.	Programming can only be carried out by an authorised dealer using special equipment.

False Alarms and Complete Deactivation

If the PLB has been accidentally activated, or if rescue has been effected before arrival of the rescue services:

Attempt to contact the rescue services, coastguard, or police by radio or telephone to advise them of the situation.

Only switch off the PLB if you cannot make contact with the authorities, otherwise leave it on until instructed by the rescue services or authorities to turn it off.

The PLB may be completely deactivated by removing the battery pack, as described in the **Service and Maintenance** section.

Because the PLB is completely sealed against the environment only when the battery pack is fitted, deactivating the unit by removing the pack is not advisable unless:

the PLB cannot be switched off because of damage sustained during the emergency

or

on instruction from the authorities or rescue services.

Service and Maintenance

WARNING: If the PLB has been used in an emergency, the battery pack must be replaced. It is advisable to return the PLB to a dealer for a complete service.

Before use

If the PLB has not been examined for more than 1 month, check the battery expiry date. Run the self-test. Examine the PLB for any signs of cracks or other damage.

After use

If the PLB has not been activated, clean it using fresh water, wipe dry and examine for any damage. Store in a cool dry place until next needed.

Inadvertent Activation

If you accidentally damage the tear-off cover or the tamper seal or if you deploy the antenna, the PLB should be returned to a dealer for repair and examination.

Battery Packs

The PLB may be fitted with either of 2 battery packs, which can be changed by the user. Both types of pack will operate in temperatures up to +55°C (+131°F), and may safely be stored in temperatures up to +70°C (+158°F).

**-20°C Class 2
Battery Pack
Part No. 85-720-004**



**-40°C Class 1
Battery Pack
Part No. 85-740-004**

The larger battery pack will provide 24 hours continuous operation at a minimum temperature of -40°C (-40°F), making the PLB compliant with COSPAS-SARSAT Class 1 beacon requirements. With the larger Class 1 battery pack fitted, the PLB does not float and should not be used around water. The smaller battery pack provides 24 hours continuous operation at a minimum temperature of -20°C (-4°F). With this pack fitted, the PLB complies with COSPAS-SARSAT Class 2 beacon requirements, and is buoyant. Make sure that the battery fitted to the PLB is suitable for the environment in which it may be used.

A new battery pack must be fitted when the expiry date has been reached. Only use branded battery packs designed specifically for the Fastfind and Fastfind Plus products. Do not remove and replace the battery pack unnecessarily: this may jeopardise the integrity of the O-ring seals which prevent water ingress around the battery connections between the battery pack and the PLB. To change the battery pack, refer to the instructions supplied with each battery pack.

Spare Parts

Battery pack, Class 1, -40°C	85-763-040
Battery pack, Class 2, -20°C	85-763-020
Replacement pouch	85-736-004
Replacement cover FastFind	85-764-004
Replacement cover FastFind Plus	85-764-504

Service

The PLB contains no user-serviceable parts. It must be returned to a dealer or Service Agent if it requires service.

A list of dealers and service Agents is on the McMurdo web site, www.mcmurdo.co.uk, and on the McMurdo Pains Wessex site, www.mcmpw.com

When the PLB is returned by post, if possible the original packing should be used. Postage must be paid. Ensure that the name and address of the owner is enclosed with the PLB.

Verification

After a battery change, or alternatively at intervals of approximately 5 years, it is recommended that the PLB is taken to an Approved Service Agent for calibration checking. The Service Agent possesses test equipment which verifies the performance and programming of the PLB; this testing is rapid and involves no disassembly of the PLB.

Specification

General

Approved to	COSPAS-SARSAT T.007 Class 1
Complies with	EN 60945 RTCM 76-2002/SC110-STD V1.1
Operating temperature range	-40°C to +55°C with Class 1 battery fitted, -20°C to +55°C with Class 2 battery fitted
Storage temperature range	-50°C to +70°C
Operational life, Class 1	24 hours minimum at -40°C
Operational life, Class 2	24 hours minimum at -20°C
Battery type, Class 1	12V lithium sulphur dioxide
Battery type, Class 2	11V lithium iron disulphide
Battery expiry	5 years from date of manufacture

Electrical

406.028MHz transmitter

Frequency	406.028MHz $\pm$ 1kHz
Output power	5W $\pm$ 2dB
Data encoding	Bi-phase L
Modulation	Phase modulation; 1.1rads $\pm$ 0.1rads
Transmission time	520ms $\pm$ 1% GPS, 440ms $\pm$ 1% non-GPS
Repetition period	50secs $\pm$ 2.5secs

121.5MHz transmitter

Frequency	121.5MHz +3kHz
Output power	50mW $\pm$ 3dB PERP
Transmit duty cycle	100%
Modulation format	3K20A3X (2K00A2A during Morse "P" Tx)
Modulation frequency sweep	1300Hz to 350Hz (fixed 1kHz tone during Morse "P" Tx)
Modulation duty cycle	41% $\pm$ 5%
Sweep repetition rate	3Hz $\pm$ 1Hz
Sweep direction	UP

GPS receiver/engine

Centre frequency
Received signal sensitivity
Maximum number of satellites tracked

(Fastfind Plus only)
Band L1 1.57542GHz
-175dBW minimum
12

Transmit antenna

Type
Characteristics

Flexible vertical tape monopole
Vertically polarised, omni-directional

Receive antenna

Type
Characteristics

(Fastfind Plus only)
Ceramic dielectric patch
RH circular polarised, gain +3dBi nominal

External interfaces

Programming interface
Manual activation
Self test/Manual deactivation

IR link to PC serial port
Sealed membrane switch with tamper cover
Sealed membrane switch

Physical characteristics

Weight, Class 1
Weight, Class 2
Length
Width

411g
300g
146mm
78mm

Buoyancy
Sealing

Buoyant with Class 2 battery
Waterproof to 5m immersion

Communications

Time to first transmission
Typical time to alert

2 minutes
LEOSAR: 90 minutes*
GEOSAR: 05 minutes*
Fastfind Plus: 30m
Fastfind: 5km*

Position accuracy

** COSPAS-SARSAT published figures*

McMurdo Limited Product Warranty

Subject to the provisions set out below McMurdo Limited warrants that this product will be free of defects in materials and workmanship for a period of 12 months from the date of purchase.

McMurdo Limited will not be liable to the buyer under the above warranty:-

- for any defect arising from fair wear and tear, wilful damage, negligence, abnormal working conditions, failure to follow McMurdo Limited's instructions (whether oral or in writing) including a failure to install properly and/or to use batteries recommended and/or supplied by McMurdo Limited, misuse or alterations or repair of the product by persons other than McMurdo Limited or an Approved Service Agent;
- for parts, materials or equipment not manufactured by McMurdo Limited in respect of which the buyer shall only be entitled to the benefit of any warranty or guarantee given by the manufacturer to McMurdo Limited;
- for the battery storage life which is specifically excluded from this warranty;
- if the total price for the product has not been paid.

McMurdo Limited does not make any other promises or warranties (express, implied or statutory) about the product except where the product is sold to a consumer in which case the statutory rights of a consumer are not to be affected.

In order to be valid, claims must be made under the above warranty in writing as soon as practicable after discovery of the defect or failure and within the warranty period referred to above. Proof of purchase will be required. The claim should be sent together with the product in question to the address set out below or to an Approved Service Agent.

Following a valid warranty claim McMurdo Limited shall be entitled to repair or replace the product (or part) in question free of charge, or at McMurdo Limited's sole discretion to refund to the buyer the price of the product (or a proportional part of the price). McMurdo Limited shall not be liable to a buyer who is not a consumer for any other loss or damage (whether indirect, special or consequential loss of profit or otherwise) costs, expenses or other claims for compensation which arise out of or in connection with this product. In the case of a consumer McMurdo Limited shall only be liable where other loss or damage is foreseeable.

Nothing shall limit McMurdo Limited's liability for death or personal injury caused by its negligence.

This warranty is to be interpreted under English law.

All enquiries relating to this warranty or Approved Service Agents should be sent to:

McMurdo Limited

**Silver Point, Airport Service Road,
Portsmouth, Hampshire, PO3 5PB, United Kingdom**

Telephone: Int + 44 (0) 23 9262 3900

Web: www.mcmurdo.co.uk

Fax: Int + 44 (0) 23 9262 3999

Email: sales@mcmurdo.co.uk

User Notes

Contact:

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Delray Beach, Florida 33445

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Fax 561 819 2650
Toll free: 1 800 576 2605
www.mcmpw.com

Website: *www.mcmurdo.co.uk*

Email: *customerservice@mcmurdo.co.uk*

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