

Distress beacons: a buyer's guide

What's the difference between EPIRBs, PLBs and AIS MOB devices? It's certainly no joke: David Parker unpicks the jargon and explains what type might best suit you on board

The impact on the boat was enough to throw it sideways, hurling the skipper on watch across the saloon and throwing the two crew members out of their berths.

This was no light displacement cruiser but a solidly-built Hallberg-Rassy 48 with a seven ton keel. The force of that blow from a flesh-and-blood creature would eventually sink the blue water yacht, which had been doing about five knots at the time. It happened at 0930 when David Bowes and his crew were on the return leg of an Atlantic circuit. Three days out of the Azores and heading towards the UK they were T-boned by a whale. It was a pretty big whale.

'I picked myself up, went up the companionway and saw the tail fluke of the whale vertical by the starboard quarter and actually touching the boat. I carry a 3.1m RIB on davits and the tail fluke against the guardwire was as big as that,' said David.

'It was a very violent impact. I have never known anything as violent as that.'

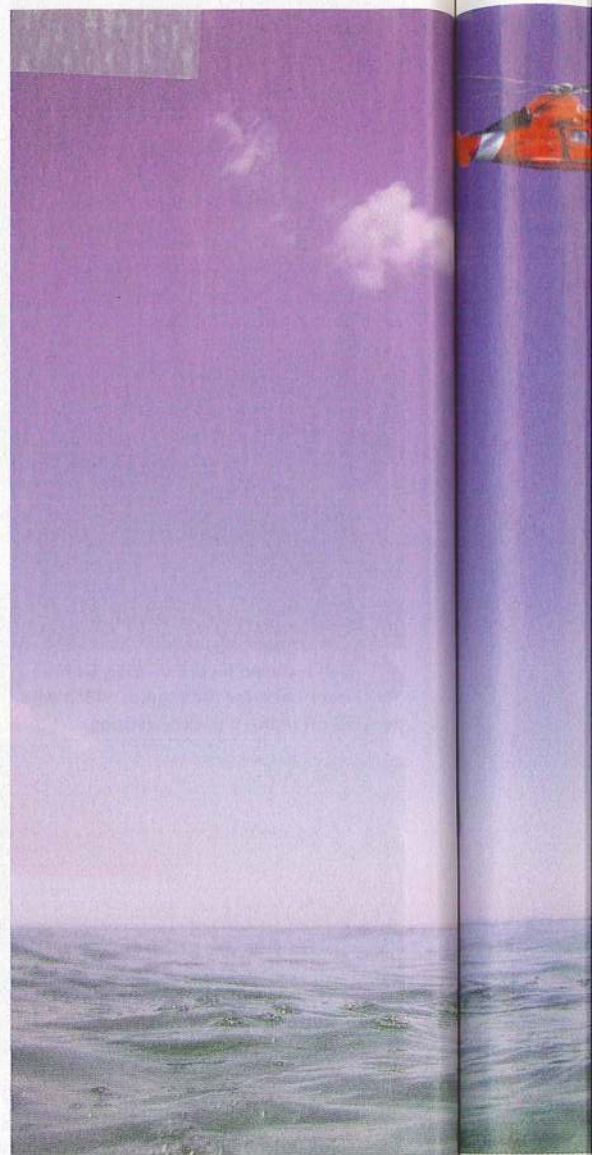
After an initial damage inspection they thought they'd got away with it, but the mighty whale had dealt the boat a fatal blow. The keel and keel bolts were intact but over the next 15 hours the relentless Atlantic rollers heaving the boat from port to starboard worked on the hull fractures. The crew watched as the cracks appeared and the pumps became overwhelmed by the volume of water they were taking on.

David told me this story at this year's Southampton Boat Show when, coincidentally, I was researching this article on distress beacons.

It was in fact an ACR Global Fix EPIRB which saved David and his crew. After he activated the beacon the Portuguese Coastguard contacted them by Satellite Messenger Service, aircraft were sent out to watch over the boat and eventually they were picked up by a Ukrainian-registered bulk carrier.

Fortunately they were able to transfer directly from their sinking yacht to the ship and never had to transfer to the life raft.

But having to abandon any vessel is



When a whale hit David Bowes's yacht in the Atlantic it was an EPIRB like this which saved his and the crew's lives

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Having the right distress beacon will alert rescue authorities to your situation



naturally something most sailors hope and pray they will never experience.

But as David's account shows, extraordinary and unforeseen things can occur on the water. Having a boat sink from under you or falling overboard does happen, as we all know, and is a fact of life at sea. But nowadays boat owners can benefit from sophisticated search and rescue technology which was unknown to previous generations.

David was able to show me the type of EPIRB which saved them, but my walk around the boat show also showed me there were many emergency devices of varying shapes and sizes on display. As the market in rescue devices expands, so confusion can grow as to which device does what. And how much do you need to spend anyway?

If you feel a bit befuddled by acronyms this feature sets out to give an overview of what's out there. Hopefully you'll never experience a head butt from a whale, but you will be armed with a bit more information when it comes to making life safer for you and your crew.

The EPIRB

The EPIRB (Emergency Position Indicating Radio Beacon) is predominantly of interest to blue-water sailors undertaking long distance ocean cruising. It's a rescue beacon intended for the boat rather than for personal use and is therefore registered to a vessel.

It is designed to be automatically activated on contact with the water so if the boat sinks and the crew have to abandon to a liferaft the EPIRB will automatically alert the rescue authorities.

The alert is triggered by the beacon repeatedly transmitting a distress signal on 406MHz to the Cospas-Sarsat satellite system. This activates a response from the designated worldwide rescue authorities – in the UK it is MRCC Falmouth that would coordinate a rescue. An EPIRB must be able to transmit signals for a minimum of 48 hours.

It should be noted that all EPIRBs and PLBs (Personal Locator Beacons) in



KM's SafeLink SportPro+ GPS EPIRB meets the demands of both the commercial and recreational marine sectors and can be deployed automatically or manually



today's market are designed to meet the same approved specifications. Every EPIRB and PLB will be transmitting both on the 406MHz frequency to send an alert via the satellite system, and also on 121.5MHz, which is the frequency that search and rescue vessels and aircraft use to home in on your position. Every EPIRB and PLB will also have a visual reference with a strobe light.

You can buy an EPIRB without a GPS but most of this type are sold to meet statutory commercial requirements. The leisure sailor should never choose to have an EPIRB without a GPS because ensuring your position is pinpointed is of paramount importance.

Mounting an EPIRB

When mounting an automatic EPIRB it must have clear access all around it to allow the lid to open cleanly and the EPIRB to float free – clear of overhangs, vessel rigging, antennas etc. Also avoid locating it close to engine exhaust fumes where it might be vulnerable to damage.

An automatic EPIRB has to sink to a

be released from its bracket, so remember to take this into account when checking its mounting position. Automatic versions have a hydrostatic release mechanism (HRU) that will release it from the bracket so it can float to the surface and start transmitting.

Testing an EPIRB

The EPIRB should only be activated in an emergency situation, but it will have in-built self-test features outlined in the user guide. Operating the self-test allows the entire unit, including electronics, battery and antenna, to be tested without generating a false alarm.

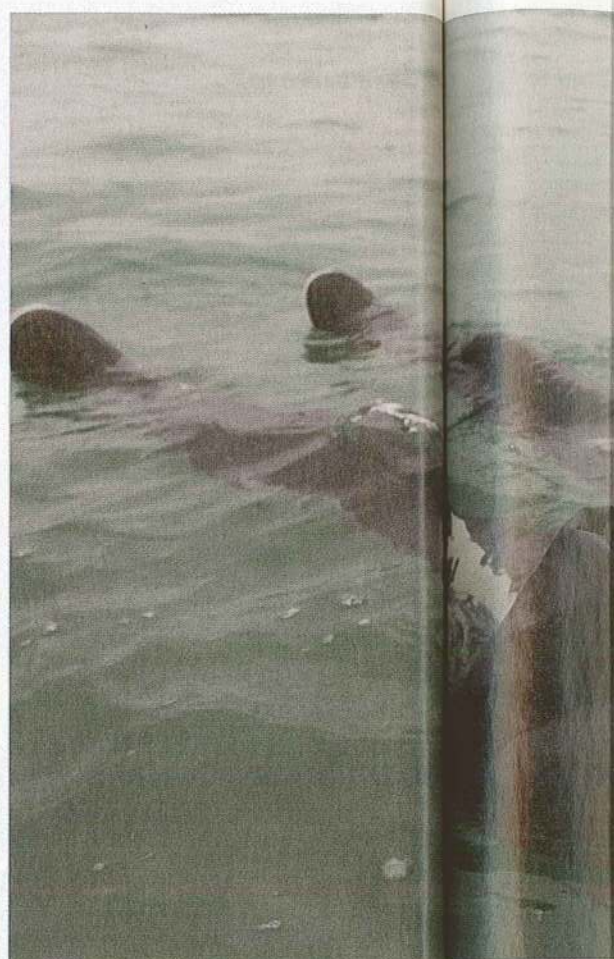
Take care to check the unit regularly to see there are no signs of rust on metal parts and that plastic shells are not cracked. No water droplets should be visible inside when looking into the clear plastic dome. Check that the battery and hydrostatic release expiry dates are valid. Verify that the lanyard cord is securely attached to the EPIRB body and not tied off to the vessel or the mounting bracket.

This automatic release housing allows the EPIRB to float free in the event of a vessel sinking. Primarily for commercial use, it is mandatory for SOLAS-approved vessels



REGISTERING A 406MHZ BEACON

Alarmingly there's a big gap between the number of beacons bought and those registered – some manufacturers reckon between 20% and 30%. While it is not a legal requirement, you should always register your 406MHz beacon with the Maritime and Coastguard Agency and keep your registration up to date if it's to help locate you in an emergency. You must also notify the coastguard of changes to your beacon or your vessel. You must also, of course, inform the authorities immediately if the beacon is triggered accidentally. If your beacon is activated and a distress signal received, the search and rescue authorities will first contact you using the information on the register. You'll also be asked to provide an emergency contact in case you are unreachable. Paperwork to submit these details is included with the product on purchase so you can complete the registration process. Registrations and updates can be done online in the MCA section at www.gov.uk



The PLB

Personal Locator Beacons work in exactly the same way as EPIRBs by initially sending a coded message on the 406MHz distress frequency, which is relayed via the Cospas-Sarsat GSS. When activated it sends out a distress signal to the rescue authorities via the nearest satellite. It also transmits on the 121.5MHz frequency to act as a homing device.

As its name suggests the Personal Locator Beacon is designed for use by an individual and is registered to that individual, not a vessel.

PLBs are designed to be light and compact so they can be fitted to a lifejacket, put in a pocket or stowed in a grab bag. They will transmit for a minimum of 24 hours and can also be used on land. Costing less than EPIRBs they are often used by coastal cruisers and consequently there are more of them in circulation.

So they're not set off accidentally they do not activate automatically, but must be triggered manually. The triggering process involves a series of deliberate steps such as deploying an antenna, lifting a cover and depressing a button.

With both PLBs and EPIRBs, batteries must be replaced by approved service



Kannad Ma comes with your wrist attached to

PLBs require manual activation and this also includes deploying the antenna as in the sprung whip design shown here



Kannad Marine's SafeLink SOLO PLB comes with a lanyard to keep it around your wrist and a pouch allowing it to be attached to a belt or webbing strap



Ocean Signal claims its rescueME PLB1 is the world's smallest PLB when compared to other products approved to standards available in January 2015

stations. This is because when sealing gaskets are replaced, units must be pressure tested to ensure they are still watertight. Battery size is what determines the duration of transmission, which explains why PLBs are smaller than EPIRBs.

Distress beacon accuracy

There can be an alert delay of up to 45 minutes depending on when the satellites come into view on the horizon, but the satellite can determine the position of your EPIRB/PLB to within 5km (3 miles). GPS-enabled beacons will transmit the activated beacon's position to within +/- 50 metres, and update this position information every 20 minutes.

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PLB	Personal Locator Beacon
EPIRB	Emergency Position Indicating Radio Beacon
AIS	Automatic Identification System
SART	Search And Rescue Transponder
MOB	Man Over Board
MMSI	Maritime Mobile Service Identity
PFD	Personal Flotation Device
GMDSS	Global Maritime Distress and Safety System
COSPAS	Cosmicheskaya Sistyema Poiska Avariynch Sudov (Russian for: Space System for Search Vessels in Distress)
SARSAT	Search And Rescue Satellite-Aided Tracking
GSS	Global Satellite System
MRCC	Maritime Rescue Coordination Centre
HRU	Hydrostatic Release Unit
DSC	Digital Selective Calling



AIS beacons

Most leisure boaters will know about AIS as a collision avoidance system which, with a click of a cursor, can tell you what ships are out there and if they are heading your way. Basically this is a system of electronic tagging allowing shipping movements and other data to be displayed on another vessel's radar, chart plotter or PC display using suitable software.

AIS is not like RADAR because it relies on something actively transmitting its position. Some special navigation marks can also broadcast on the AIS frequency.

However, AIS beacons (also known as AIS SARTs) have also grown in popularity as MOB devices. Unlike PLBs they are mostly automatically activated on contact with the water – which makes them useful to detect an injured or unconscious casualty. They don't use a satellite system, but instead transmit a VHF radio signal that shows up as an icon and alarm on an AIS receiver display. AIS beacons transmit your location to anyone in the near vicinity, but range is restricted by the antenna, which of course will be at sea level. Typically this is about four nautical miles, but this also depends on the sea state.

Comparing AIS with EPIRBs and PLBs

The biggest difference therefore between EPIRBs/PLBs and AIS MOB devices is that the former are alerting the rescue authorities that you are in distress, while the AIS MOB device is communicating back to the vessel you came off and other AIS-equipped vessels in the vicinity. It's worth bearing in mind that in an offshore MOB situation your best chance of rescue comes from the boat you came off.

Certain AIS devices also offer the ability to program in a boat's Maritime Mobile Service Identity (MMSI) number, so it can

The McMurdo SmartFind S10 is an AIS MOB device with manual, two-stage activation. It floats and is waterproof down to 60m



The Kannad SAFELINK R10 SRS AIS MOB can be mounted on a lifejacket and is manually activated by sliding a catch to deploying the antenna

MAKE	MODEL	TYPE	WEIGHT	SIZE (MM)	BATTERY LIFE
McMurdo	FastFind 220	PLB	152g	34 x 47 x 106	6 years
Ocean Signal	rescueME	PLB	116g	75 x 51 x 32.5	7 years
Kannad	SafeLink SOLO	PLB	165g	36 x 50 x 112	6 years
Kannad	SafeLink PRO	PLB	300g	146 x 78.4 x 54	5 years
ACR	ResQLink	PLB	153g	114 x 41 x 48	6 years
McMurdo	SmartFind G8	EPIRB with AIS	710g	217x 104 x 103	10 years
Ocean Signal	rescueME EPIRB1	EPIRB	422g	178 x 89 x 100	10 years
Kannad	SPORTPRO+ GPS	EPIRB	770g	225 x 130 diameter	6 years
ACR	GlobalFIX V4	EPIRB	764g	207 x 109 diameter	10 years
McMurdo	SmartFind S10	AIS MOB	186g	199 x 51 diameter	5 years
McMurdo	SmartFind S20	AIS MOB	120g	27 x 47 x 124	7 years
Ocean Signal	rescueME MOB1	AIS MOB	92g	134 x 38 x 27	7 years
Kannad	SAFELINK R10 SRS	AIS MOB	120g	27 x 47 x 124	7 years
ACR	AISLink	AIS MOB	92g	115 x 46 x 27	7 years

MOB alarm systems

Other types of electronic MOB alerts are 'tags' such as bracelets or wrist bands worn by crew. They emit a signal which is detected by smartphones or a tablet with the relevant app installed. When the wrist band is submerged or travels too far from the boat, the signal is interrupted, triggering an audio-visual alarm on the device with the app, which then records the position of the boat (using the smart device's inbuilt GPS/location receiver) when the alarm was activated. The app also indicates the bearing and distance from the casualty so you can track back to the point of lost contact. Currently, the tags do not have integral GPS, so they are therefore more of an alerting, rather than a precise locating device as no account of subsequent drift on the part of the casualty can be measured.



MOB alerts let fellow crew know you've gone overboard, but won't pinpoint your current position in the water

Lester McCarthy



McMurdo's SmartFind G8 is the world's first AIS EPIRB. Designed to fit into a housing, it can be activated manually, or automatically when submerged between 1-4m

send an initial distress alert directly to the mother vessel's own VHF radio via Digital Selective Calling (DSC), before going on to broadcast it on the usual AIS channel.

The MMSI uniquely identifies a vessel's radio (or a shore station): think of it as a phone number used to make a call to a specific vessel, or group of vessels.

At this year's TYM Southampton Boat Show, McMurdo launched the world's first EPIRB with AIS, the SmartFind G8 AIS, which has the 406MHz and 121.5MHz frequencies for satellite transmission, GPS for position location and AIS for localised distress alerting.

SIZE (MM)	BATTERY LIFE	POWER: ALERT/HOMING/AIS	MINIMUM TRANSMIT TIME	LIGHT	PRICES*
x 47 x 106	6 years	5W/50mW/Na	24h	SOS LED	£169.95
x 51 x 32.5	7 years	5W/50mW/Na	24h	Strobe	£179.45
x 50 x 112	6 years	5W/62mW/Na	24h	SOS LED	£245.00
6 x 78.4 x 54	5 years	5W/62mW/Na	48h	LED	£306.00
4 x 41 x 48	6 years	5W/>25mW/Na	24h	LED/strobe	£219.95
7 x 104 x 103	10 years	5W/100mW/2W	48h	LED x 3	£644.60
8 x 89 x 100	10 years	12W/50mW/Na	48h	Strobes x 2	£258.55
5 x 130 diameter	6 years	5W/10mW/Na	48h	LED	£599.00
7 x 109 diameter	10 years	5W/50mW/Na	48h	LED/strobe	£314.95
9 x 51 diameter	5 years	Na/Na/2W	24h	LED	£258.55
x 47 x 124	7 years	Na/Na/2W	24h	LED	£149.95
4 x 38 x 27	7 years	Na/Na/1W (0.5W DSC)	24h	Strobe	£189.95
x 47 x 124	7 years	Na/Na/2W	24h	LED	£199.00
5 x 46 x 27	7 years	Na/Na/1W (0.5W DSC)	24h	Strobe	£199.95

* These are guide prices only and prices will vary from the RRP given by manufacturers. Check for online deals and note that as new models are introduced special offers may be available in the chandler's for existing stock of previous designs