Personal Emergency Radio Devices

If you fall into the sea, it may be difficult to find you, even in moderate swell. It will be worse if no-one sees you go into the water. So, if you fall overboard, or your boat is suddenly lost, you'll need to raise an alarm and ensure that you can be located. A device such as a personal locator beacon (PLB) or a man overboard (MOB) device can assist in your rescue. These radio devices can perform two functions

• alerting someone that you need rescuing using **Alerting Technology**

• help them locate you using **Locating Technology**

Depending on your marine activity, you will also need to choose between

• a local device which uses VHF (limited by line of sight which, for a person in the water, usually means a distance of a few miles); or

• a long range device which uses satellites (unlimited range to shore but not to local vessels); or

• a device which uses a combination of VHF and satellites

Some of these technologies rely on receivers that are commonly found on other vessels, others require a special receiver which is carried by UK rescue helicopters and lifeboats. So you will need to decide what combination of technology is the best for your activity.

These personal emergency devices only work when the aerial is above the water. Make sure that you attach your device to your lifejacket and that you wear it at all times whilst on deck. Devices and beacons which rely on GMDSS communications (VHF DSC, 406MHz Cospas-Sarsat, AIS) may only be used for emergencies.

Alerting Technology

This will alert others to your distress but will not necessarily provide updated and ongoing information regarding your location.

Local devices which use VHF DSC

This is likely to be a DSC distress beacon which can send a distress message to your own boat and if no response, to nearby boats. The distress message contains an accurate position from an inbuilt GNSS (Global Navigation Satellite System such as GPS) receiver. It will cause an audible alarm in the receiving DSC radio. The message is repeated at intervals and stops once acknowledged. After this you may need to rely on a locating technology to help rescuers find you.

VHF range limitations – a transmission from water level **might** have a five mile range but could be partially blocked by waves.

VHF DSC is monitored by the UK Coastguard and all SOLAS vessels, and the radios are popular with small boat users. These DSC signals are only used for alerting and will be acknowledged.

Worldwide devices which use 406 MHz Cospas-Sarsat

This might for example be a personal locator beacon. The beacon will send a distress signal through the Cospas-Sarsat satellite system to a rescue coordination centre (RCC). Some devices have an integral GNSS which significantly improves how quickly and accurately the casualty location is available. Without a built-in GNSS it can take up to 2 hours to achieve a position with an accuracy of 5 km.

You need to ensure that your device is registered with the UK Coastguard so that your information is automatically available to rescue services.

Other technology

Other technologies include a tag system which uses a base unit on the vessel and tags worn by all crew members. The alarm sounds on board your vessel only, when the base loses contact with a tag, when the tag is either immersed in water or when the distance between the tag and the base is too great. Other systems can alarm when they receive the AIS MOB message however this is not common or a recognised GMDSS method of raising the alarm and cannot be relied upon beyond your own vessel.

Locating Technology

This will help rescuers to find you but it will not necessarily alert them to your distress.

Local devices which use AIS

All devices using AIS have an inbuilt GNSS receiver which provides an accurate position so that rescuers can locate you more easily. The beacon will broadcast your position via AIS to any vessel that has an AIS receiver and is within VHF range.

AIS receivers are carried on all SOLAS vessels and are popular with small boat users. UK rescue helicopters and lifeboats also carry this equipment to assist with locating casualties.

Local devices which use 121.5 MHz Homing Signal

Your MOB device or PLB may also be able to transmit a 121.5 MHz homing signal. UK rescue helicopters and lifeboats are equipped with direction finding (DF) equipment so that they can track this signal. However, most other vessels do not carry equipment capable of receiving or locating the 121.5 MHz homing signal.

Worldwide devices which use 406 MHz Cospas-Sarsat

Having transmitted an alert, these devices will continue to transmit and provide the rescue coordination centre (RCC) with updated position information. If the device has a built-in GNSS this position information will be far more accurate. However, vessels / aircraft on scene will not receive this directly, relying on the RCC to forward this information. UK rescue helicopters can use Direction Finding (DF) on the 406 MHz frequency.
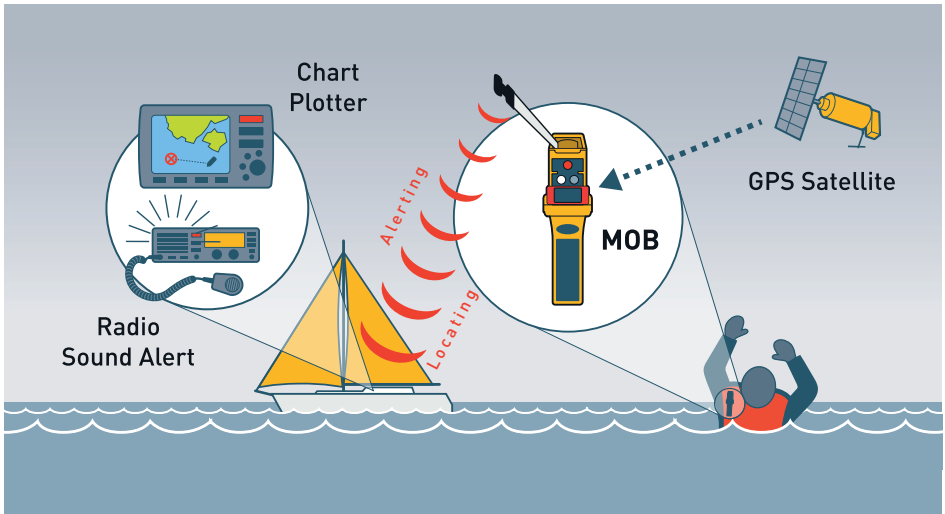
Other technology

Although there are other technologies which may transmit a homing signal or the position from an inbuilt GNSS receiver to a specialist receiver, you need to consider who will have a specialist receiver with the capability to rescue you.

Which technology is suitable for my activity?

|	406 MHz Cospas-Sarsat	DSC	AIS	121.5 MHz Homing Signal
Does it raise an audible alarm?	Yes – with RCC (Coastguard)	Yes on DSC receivers in range, inc Coastguard	Sometimes	Rarely
Does it help rescuers find me once they are within the last mile?	Yes – UK rescue helicopters can use DF to find casualty	No – Initial GNSS position only	Yes – Regularly updates GNSS position.	Yes – direction finding on a continuous signal
What range does it have?	Worldwide	Line of sight	Line of sight	Line of sight
Can other vessels use it?	No capability	Most but not all carry DSC receivers	May carry AIS receivers	Rarely

Most people who fall overboard are recovered by their own vessel; nearby vessels often assist. If you are close to shore, and there are likely to be other boats nearby with receivers, you will benefit from a local device which alerts other nearby vessels to your distress. A local device will also alert your vessel's crew should you go overboard.

If the Coastguard receives your distress message they will try and locate nearby vessels that are in a position to assist.

A local device can communicate with nearby vessels.

If, however, you are far offshore and out of range of the local technologies, any Coastguard receiver or other vessels, the 406 MHz Cospas-Sarsat technology is more suitable. All the more so if you are a lone sailor.
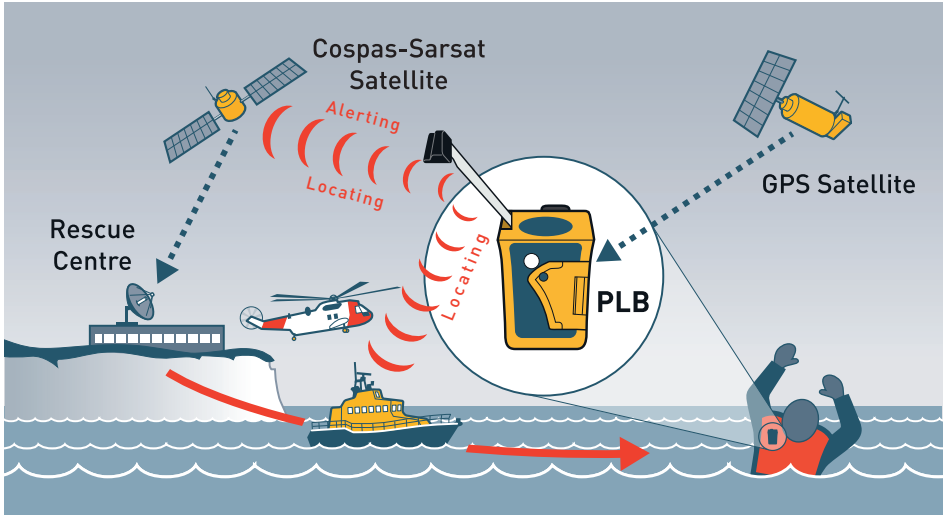
Worldwide devices can raise an alert on shore.

In deciding which device is most suitable for your needs you need to assess the risk. For example, after an incident, is it likely that your vessel is going to be left with no competent person on-board able to pick you up? In this situation at least one person should have a 406 MHz Cospas-Sarsat device available. It is worth noting that not everybody on board needs to have the same device. Most crew could carry local alerting and locating devices, providing there is a 406 MHz Cospas-Sarsat device available if required.

The following table provides guidance on which technology should be considered. However, only you know the environment and activities you will participate in and are best placed to decide which device and combination of technologies is most suitable for your needs.

	Alerting technologies		Locating technologies		
	DSC	406 MHz Cospas-Sarsat	AIS	121.5 MHz homing signal	406 MHz Cospas-Sarsat
Lone sailor					
Inshore – busy location*	🟢	🟢	🟢	🟡	🟡
Inshore – quiet location	🔴	🟢	🟢	🟢	🟡
Offshore	🔴	🟢	🟢	🟢	🟡
Vessels with 2 or more competent crew					
Inshore – busy location*	🟢	🟡	🟢	🟡	🟡
Inshore – quiet location	🟢	🟡	🟢	🟡	🟡
Offshore	🟡	🟢	🟢	🟢	🟡

🟢 Option to be considered.
🟡 Other option to be considered, but probably not the most suitable.
🔴 Not likely to be suitable for your activity.

* busy location means a location that has numerous vessels with suitable receiving equipment or within range of a Coastguard antenna.

Using your new device

Before Use

Please refer to the manufacturer's instruction for advice in setting up your new device, making sure you follow the instructions carefully. There will be instructions on how to attach the device to a person, how to activate it and, if necessary, how to deploy the antenna. It is important to familiarise yourself with how to use the device correctly.

False Alerts

False alerts remain a problem for search and rescue organisations. In order for personal emergency devices to be easy to use in an emergency they must be easy to operate. It is inevitable that occasionally they may be inadvertently activated when there is no distress situation. In this event, the device should be switched off immediately and the Coastguard contacted.

Registration

You **must** register your 406 MHz Cospas-Sarsat device with the Coastguard and keep your registration up to date. If your beacon is activated and a distress signal received, the search and rescue authorities will use the emergency contact information you have put on the register.

Registration and updates are free and available online at **www.gov.uk/406beacon**.

The UK Beacon Registry Telephone: **01326 211 569**.

Licensing

For advice on the licensing requirements for your device please contact Ofcom. Telephone: **0300 123 1000**.

Testing

Devices should be tested in accordance with the manufacturer's methods and at recommended intervals.

Disposing of your device

If you wish to dispose of your device you should follow the manufacturer's guidance. As a minimum you should remove the batteries to ensure that the device will not accidentally activate and for registered devices, inform the UK Beacon Registry to remove the beacon from the database.

Photos and diagrams courtesy of McMurdo and Ocean Signal.
The photos in this leaflet are for illustrative purposes only. Other devices are available.