

Inadvertent Distress Beacon Activations



Executive summary

Annually 428 inadvertent PLB activations (IAs) occur in Australia. This greatly concerns the Australian Maritime Safety Authority (AMSA) and other search and rescue related organisations.

The result of these activations and their associated resolution distracts rescue authorities from actual emergencies, adds workload to yacht race organising authorities and it consumes assets. It costs real dollars for all involved stakeholders: from AMSA to the Coast Guard, to Kordia who provides radio monitoring for AMSA, to boat owners who volunteer assistance.

Unfortunately, the inadvertent activation problem and its consequences goes largely unnoticed except for the rescue authorities and emergency beacon manufacturers. Only occasionally does the issue become obvious to the general sailing community, as recently illustrated by the protest of Celestial in the 2021 Rolex Sydney to Hobart Yacht Race (RSHYR).

The Ocean Racing Club of Victoria (ORCV) Special Investigations Group (SIG) has investigated thirteen specific inadvertent activations. The Cruising Yacht Club of Australia (CYCA) provided input on yachts having activations within their fleet. Significant data was provided by AMSA to enable extrapolation of the detailed ORCV dataset. It became evident that a multi-faceted response is required to reduce the high Inadvertent activation rate.

Consideration should be given to:

- knowledge and skill in using EPIRB, PLB, AIS MOB, DSC
- the correct wearing of PLBs
- appropriate testing and maintenance
- the handling of EPIRBs/PLBs, they are your lifeline
- correct stowage of beacons
- prevention of exposure to strong electronic fields
- regular checks for physical damage
- correct use of the test function
- beacons being used beyond their design limits
- appropriate disposal
- improved user attitudes to beacons
- DSC/ AIS MOB processes and of their integration with other technology
- the impact of weather conditions
- crew diligence and improved radio watch keeping
- regular radio skill reaccreditation
- ensure EPIRB and PLB registration as well as trip updates with AMSA

Traditional training will remain a core educational element however the recommendations listed below should reduce the high proportion and impact of inadvertent activations of yachting beacons:

- education via social media
- greater understanding of DSC and AIS MOB
- formalised beacon training certification for racing yachts
- obligations of sailors to monitor the radio
- enhanced radio watch technology and knowledge

- crew watch change check for accidental PLB activations
- leadership in the yachting community
- attitudinal response of sailors
- consider interim use of locally-activated-beacon-detection equipment

The support provided within the yachting industry in preparation of this report is appreciated.

ORCV Special Investigations Group

September 2022

Background

Fourteen activations, all inadvertent, were associated with the RSHYR and the ORCV Westcoaster yacht races to Hobart last December and the subsequent return of the yachts to their home port.

These are two of the most prestigious ocean yacht races in Australia. The PLB activations were received by AMSA and coordinated with the race organising authorities. In one instance an aircraft was deployed to fly over the vessel emitting a PLB signal. Investigation of this event has contributed to further research and development by the manufacturer (Appendix A1).

In the case of the RSHYR the line honours result was decided after the protest of the first yacht across the finish line based on failing to monitor their radio. However, the root cause was an inadvertent PLB activation by a crew member (Reference R1).

The accidental DSC activation incidents were managed locally and have unique issues discussed later in the report.

If fourteen inadvertent activations can occur amongst the cream of Australia's ocean racing yachts then what can be expected of less experienced racers, general cruising, and maritime vessels generally?

The scope of the study completed by the ORCV Special Investigation Group included a range of emergency beacon types including PLBs, EPIRBS, DSC and AIS MOB. In this report the discussion refers to PLBs unless otherwise indicated.

Some facts on Personal Locator Beacons (PLBs):

In 2021	Total	Yacht-specific
Total PLBs registered In Australia as of 1Jan22	222,285	<i>not known</i>
PLB activations detected	588	33
Of the above PLB activations detected, for PLBs registered with AMSA	523	27
PLB inadvertent activations	428 (73%)	31

Specifically:

- Beacon registrations may include those intended for carriage onboard Vessels, Vehicles and Aircraft and so it is not possible to specifically categorise the number of yachts
- The international number of inadvertent activations is 95-97% [Source annual reports for countries worldwide - Reference 2)
- Approximately 180-200 activations per annum relate to incorrect beacon disposal

Areas of concern for the marine industry in Australia:

- The number of PLB inadvertent activations (73%)
- The number of PLB activations detected that were not registered with AMSA was 65
- The number of PLBs detected where the registration information is not current (10%)
- The high degree of difficulty contacting vessels with alerting beacons

Of inadvertent activations from yachts, approximately one third arise from racing yachts even though they have higher mandated standards of equipment and regulations. Specifically, Australian Sailing in the Special Regulations mandate PLB and AIS MOB training see section 5.05.3. Further It is required that all new AIS and radio equipment include DSC capability.

The cruising community is of major concern, not just in Australia, but also in the USA where it is understood USCG, SRSAT and NOAA are targeting social media and education sessions to increase

the uptake of EPIRBs and PLBs and knowledge of their use [Sources USCG, SARSAT and NOAA websites, Facebook, and social Media Groups].

VHF AIS MOB and VHF DSC only have local area transmission and hence are only heard by yachts or shore stations within VHF radio range. These alerts mostly go undocumented, except perhaps for individual boat logs or shore station records. DSC events in the state of Victoria are required to be recorded by Kordia. This data is aggregated into four urgency rankings: routine, safety, urgent and distress. Unfortunately, no specific data is available on distress DSCs, the vessel type or if the alert was inadvertent.

Inadvertent activation investigation

The ORCV Special Investigations Group, SIG, has been in contact with Australian Sailing AMSA, CYCA, ACR, B&G, VFA, Kordia and yacht owners. The SIG was able to assemble a useful dataset of thirteen accidental activations in Australia. The SIG investigator completed interviews and analysis for the thirteen incidents, the fourteenth that was from overseas already had a documented conclusive outcome. The key drivers of these inadvertent activations are one or more of:

- **PLBs not being worn correctly**

This is a major cause of inadvertent activations. PLB owners are encouraged to follow the manufacturers guidance contained in the user manual or website to minimise the risk of IA's whilst wearing or carrying. AMSA recommends "your PLB should be attached to the upper portion of your life jacket above water. PLBs do not float vertically in the water as the aerial is top-heavy and must be pointing at the sky. Do not hold the PLB as you might inadvertently reduce the GPS reception or PLB transmission."

- **Lack of maintenance**

Beacons require regular maintenance including:

- operation of the Test function
- a check that all moving parts are functional, including the antenna
- maintenance on the **AMSA Beacon Registration website** detailing voyage, Next of Kin and Emergency Contact information
- a check of the battery life
- physical inspection for broken or damaged parts, cracks, and corrosion
- ensuring that lanyards, Velcro straps and the case are in good order

- **Inappropriate stowage**

Beacons should be stowed carefully when not worn. Preferably, they should be stored in their own custom holder, wrapped to protect from jolts and external pressure and stowed away from other equipment which could physically push the trigger and activate. Store PLBs in a locker or other secure location where they cannot fall onto the deck or be tossed around within the stowage space.

- **Exposure to electromagnetic fields**

Beacons should be kept away from strong electrical fields that could trigger them, such as compass, winch motors and speaker coils

- **Damaged beacons** (cracks, water ingress, corrosion)

Beacons can be damaged from rough handling or their stowage resulting in fractures, cracks, or broken components such as the trigger protective flap, making inadvertent activations possible. Damage allows water ingress causing corrosion or triggering of the PLB. A damaged antenna will not radiate effectively

- **Inappropriate disposal**

Currently there is no national scheme for disposal and recycling Beacons. Many are left in a hardware locker, passed on for others to use or are disposed of as domestic waste. Hence the opportunity for activation is high. The ORCV investigator spent significant time investigating existing beacon and associated battery disposal processes. It was discovered that AMSA had a beacon disposal project underway and, therefore, ORCV stopped further investigation on this matter.

- Incorrect test function use
Follow the manufacturers guidelines for testing to ensure the beacon does not activate. If it does activate, turn OFF the beacon and call the AMSA Rescue Coordination Centre immediately Ph: 1800 641 792 or +612 62306899.
- Use of beacon equipment beyond its design limits
There are stringent design and testing and certification requirements for beacons to be compliant to the national and international standards, including being fit for use in the marine environment.

ORCV research showed that two DSC activations resulted from a cockpit mounted VHF DSC unit being used as a boot rest by the helmsman. The alert button, mounted on the top of the unit, is protected by a plastic guard. The boot force was sufficient to compress the guard and activate the DSC. These activations cannot be considered a design fault.

ACR, a leading manufacturer of emergency distress alerting products, has been working with the sailing community, including AMSA, CYCA and ORCV, to review how their equipment is treated and develop modifications to better cope with the real-life marine environment (Appendix A1)

Accidental activation impact

Given 73% of all PLB detections are inadvertent, this unnecessarily diverts resources from their primary task of responding to actual emergencies. It is also a cost to both the Government and the community. There is significant cost for a rescue aircraft to overfly a yacht, attract their attention and confirm an accidentally activated beacon.

The ORCV SIG review concluded, based on the case studies, that Inadvertent activations and associated expenses are compounded by:

- poor radio watch keeping. All yachts are required to monitor VHF 16 whilst at sea. Upon receiving a beacon alert, AMSA attempts to contact the vessel concerned to validate the emergency, either directly or via one of their multitude of support organisations. Unfortunately, a few yachts are not able to be contacted via radio in a timely manner. Celestial was a case in point in the recent RSHYR. Communication difficulties can occur even if the radio is working, and the crew watch is in place. Add engine noise, wind noise, reduced radio performance due to LED light interference or faulty antennas, etc. and it becomes almost impossible to hear the radio. Double handed yachts face all these challenges, with the addition of normally only one crew member being on watch. The risk of not hearing the radio is high.
- weather conditions. These were found to be a significant factor in the ORCV SIG research. High wind drowns out the radio being heard while on deck, rain and wind causes crew to wear hoods that muffle hearing the radio or cause it not to be heard at all. A heavy sea state causes noise such as banging on the hull, etc which can obscure hearing the radio. There is also general distraction of the crew from hearing the radio as they focus on their sailing tasks and personal safety in heavy weather.

- onboard systems integration. It is common for a yacht to have on board AIS MOB, PLB, EPIRB and DSC units. AIS MOB and DSC may or may not be linked to an onboard alarm system, plotter or there may be multiple alarm systems. Having crew trained to understand and interpret these systems is critical to recognising what alerts are occurring
- quality of communications equipment. If equipment is outdated technology, poorly maintained, or the operating procedures are complex then there is potential for emergency communications to be compromised
- user attitudes. These vary from cavalier to conscientious. Yachts with a lax attitude to safety and regulation will be less likely to monitor their radios, maintain their safety equipment and generally apply minimal effort on safety protocols and briefings. They are more likely to have an inadvertent activation and less likely to respond promptly.
Delivery crews are classic examples of complacency. They are often very relaxed as they are not racing focused. There is generally less crew on board, crew are wanting to sleep or party and may include use of alcohol. The risk of inadvertent activations escalates dramatically.
- insufficient beacon knowledge and associated protocols. This impacts on how each type of beacon activation is managed. Generally, there is not good knowledge of the functional attributes and capabilities of the various beacon types and what actions should be taken. For example, a PLB distress signal is detected by satellite relayed to the Mission Control Centre (MCC) then forwarded to the Joint Rescue Coordination Centre (JRCC) but, at this time, the activation is not known on board a yacht. Conversely, for a yacht inadvertent EPIRB/PLB activation AMSA must be immediately advised of the inadvertent activation by the vessel or Race Organiser so assets and resources are not tasked unnecessarily.
- An AIS MOB is normally only received by adjacent yachts/vessels with operational AIS. These activations cannot be received by AMSA. Nearby yachts without AIS will be unaware of an AIS MOB activation, accidental or not. Conversely, yacht with no AIS where a person has gone overboard may not be aware that they have lost a crew member for a considerable period, let alone any nearby vessels.
- DSC alarms are common and often integrated in other equipment including VHF Handheld radios. Many crew members do not understand the use of DSC - how do you trigger, what do the messages/alarms mean, how to respond and what is the alarm shutdown process following an accidental activation. Along with a lack of knowledge, DSC has not had wide acceptance in yachting within Australia.
A compounding factor is that Radio licences are issued for life. Many people obtained licences prior to DSC being introduced and there is no requirement to refresh their knowledge. DSC has several advantages including that the audio alert gets louder each time if the DSC alert is not acknowledged and is repeated.
- equipment handling. Your beacon is your lifeline and treating it accordingly is critical. It is clear in our research that many people throw their beacons about, stow them amongst a variety of hard objects and generally mistreat them. The result is damage and broken components e.g., alert button flaps, and antennae. One example studied showed that a PLB missing the alert button protective latch resulted in an inadvertent activation. The latch was not observed as missing until repeated checks for damage was requested by the ORCV investigator.
- crew diligence. Diligence begins with each person taking responsibility to:
 - regularly check their own beacon for accidental activation
 - monitor the radio
- lack of knowledge on beacon disposal systems. Currently there is no nationally agreed process for disposal. Individuals must consider the implications of their decisions in the disposal process. At its simplest, disposal should include deregistering the unit with AMSA

and removal of the battery. Battery removal from a PLB is a complex process with high risk of an accidental activation.

- beacon nonregistration with AMSA. Non-registration is a major issue in slowing down the emergency response. If not registered AMSA only has geographic location reference but no emergency contact information and virtually no ability to identify or contact the vessel without a fly over.

Implication of inadvertent activations

The impact of any inadvertent activation can be significant in terms of:

- cost and unnecessary deployment of assets and resources
- distraction from supporting non-accidental activations
- loss of operational focus
- resultant severe injury or death

Other outcomes of inadvertent activations for racing yachts can have unintended consequences such as race protests, impact on race results, placing other vessels at risk searching for the supposed emergency and creation of a punitive regime.

Current training and education

Significant effort to educate users has already been initiated by AMSA, Australian Sailing, and other organisations, unfortunately with minimal effect. This outcome has been measured by AMSA by tracking their data pre and post training and other interventions.

The current significant amount of traditional training and market information appears to be having limited impact. During the period of this research one manufacturer, ACR, has created a quality resource on PLBs (Appendix A2).

It is suggested that any training must be carried out and reinforced over a period of years to show a meaningful reduction in accidental activations and any impact on the statistics. Rule of thumb suggests set up training now and review results each calendar year.

In the United States the challenge is not only teaching how to look after and use beacons, but also convincing the boating community to purchase appropriate PLBs and EPIRBs. Local Coastguard stations spend time on social media promoting the value of beacons and offering free training.

New methods of education and training should be considered. The people who need to hear the message are not getting the message.

Discussion and Recommendations

The yachting industry must play their part in reducing inadvertent activations.

1. Enhance understanding and training via social media

It is **recommended** that the Internet and social media be utilised to engage with a wider cohort of people. It is suggested that recognised expertise be used to monitor and participate in social media

group discussions relevant to sailing and yacht racing and contribute relevant beacon and safety related understanding within these media groups.

Traditional face-to-face and online training programs should continue and maintain brochures, charts, and user manuals.

2. Formalised beacon training certification for racing yachts

it is **recommended** that formalised beacon and safety training on a rolling cycle be adopted to maintain mandatory sailor certification for ocean racing.

This is modelled on aviation sector systems for ongoing mandated training and certification currency or some other structured training model could be used. Any model used would require monitoring and refinement with time.

It is **recommended** that the beacon training cover all emergency beacon types: PLB, DSC, AIS MOB and EPIRBS and mention of ELTs for completeness. Whilst there is some commonality in the inadvertent activation of each type of beacon, sailors need to understand and respond to the specifics of each.

The Australian Sailing Sea and Safety Survival Course training program fits as an example of repetitive certification (only every 5 years) and covers many aspects of beacon use. Unfortunately, the course curriculum is already overwhelming for participants and instructors alike. Adding additional beacon understanding may be difficult.

3. Obligation to monitor radio

it is important for authorities to continually encourage sailors to take their radio monitoring obligations seriously. The requirement is already in most race documents. However, it is **recommended** that requirement is **actively reinforced** in pre-race briefings and with spot checks.

Maintaining a continual radio watch is essential under all circumstances whether racing or cruising.

Since radio certification is issued for life with no review, it is **recommended** that radio refresher training be part of any rolling training programs. DSC is a specific case since many license holders predate the introduction of DSC and have no formal training on DSC. Also recently introduced AIS MOB is not necessarily well understood. AIS EPIRB and PLB devices will be introduced shortly

4. Radio watch technology

There appear to be several reasons why operational radio traffic may not be heard:

- noise of the engine
- high wind noise
- sea state
- no actual crew watch assigned and relying on anyone to hear the radio
- sailor head coverings such as hoods and beanies
- distance from radio speakers
- volume adjustment/location of speakers, and
- poor radio performance due to such issues as poor antenna performance, LED interference

It is **recommended** that yachts conduct an audit to confirm that their radio can be heard in adverse conditions. Consider key crew members monitoring the radio, use tools such as wireless-based headsets, possibly with bone conduction and greater speaker amplification

5. Greater understanding of DSC

Digital Selective Calling (DSC) distress activations are included in this report as ORCV yachts have experienced these situations. Similar root causes exist for DSC inadvertent activations as for other beacon types. DSC provides a local alert requiring a local response.

It is **recommended** that specific training occur and cover:

- operational protocols of setting up and operating DSC
- skills to interpret and respond to the messages transmitted
- The reset process for DSC after an inadvertent alert
- Benefits of the DSC System such as the repeat of alerts until acknowledged

ORCV SIG experience is only with VHF DSC, but the issue can also apply to HF DSC technology

6. Crew watch change check for accidental PLB activation

At the change of watch It is **recommended** a handover checklist is completed.

This checklist should include each crew member checking and verifying that their electronic safety equipment such as PLB has not inadvertently activated, along with allocation of radio watch roster and checking correct radio operation.

7. Leadership in the yachting community

It is **recommended** that yachting organisations in the community take a leadership role in implementing these recommendations on electronic beacons.

The initial aim would be to provide links between stakeholders to obtain commitment to a common goal and set of actions. Such stakeholders include marine safety organisations in each state, Coast Guard, Police, AMSA, Kordia, Australian Sailing, sailing clubs throughout Australia and others as appropriate. Potentially industry representatives would be involved.

8. Attitudinal response of sailors

Amongst the sailing community, as in any group, there are a range of different opinions and attitudes towards safety. This investigation identified a range of attitudes from “She’ll be right mate” to total diligence. Even in the best run yachts there is the potential for complacency if their skills and knowledge are not challenged from time to time.

It is clear from our research and reporting by USCG, NOAA and SARSAT that there is a significant cadre within the boating world, particularly cruising, who under equip their vessels with the relevant communication and safety equipment, whilst lacking the knowledge of what can go wrong while at

sea and the importance and relevance of beacons. Similarly, they tend not to participate in training on skills required to safely operate a vessel, either due to naivete or stubbornness.

Since all sailors share the seas and work together especially in emergencies it is in everyone's interest to have the highest standards of safety, avoiding incidents and responding appropriately if one occurs.

It is **recommended** that the leading yachting stakeholders Australian Sailing, ORCV, CYCA, and AMSA carefully review and assess attitudes toward safety within the sailing community, to develop strategies to promote more responsible attitudes to marine safety.

It is in the interest of Race Organising Authorities and racing sailors to champion safety for the benefit of all who go to sea. The champions must lead the stakeholders in driving this initiative forward. A key outcome must be the understanding of the causal issues of an inadvertent activation and the factors that compound to hinder swift resolution once activated.

9. Use of Locally Activated Beacon Detection (LABD) equipment

For racing yachts with concerns over accidental beacon activations consideration could be given to a Locally Activated Beacon Detector. A working prototype has been developed and demonstrated to a member of the SIG in Melbourne. It can alert the crew to any EPIRB/PLB activation on or within the vicinity of a vessel.

This could be a stopgap measure until the AIS equipped EPIRBs and PLBs become common place.

Crew members still need to understand the response process if a beacon is activated, either intentionally or accidentally.

Conclusion

It is the opinion of this report's authors that a comprehensive approach is required to make headway on the issue of inadvertent activations. It is a complex and multi-factorial problem.

There is no one quick fix. The solution requires a combination of education, communication, training, practices, and policies to change attitudes and behaviours.

Post Report Note: Beacon Battery recycling

AMSA has been exploring options for a national beacon disposal and recycling program, this body of work is continuing.

***ORCV Special Investigations Group
September 2022***

SIG Team Members and Acknowledgements

ORCV Special Interest Group members

Bruce Reidy, lead researcher, past committee member ORCV, Incident Management team member

Ray Shaw, chair of the Australian Sailing Safety Committee, past commodore ORCV

Grant Dunoon, 2020-2022 commodore ORCV

Donald Fraser, past commodore ORCV

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Acknowledgements

This report would not have been possible without the full cooperation and **support** of the following organisations:

AMSA	CYCA	ORCV
Kordia	Victorian Fisheries Authority	PLB manufacturers – ACR, B&G
Battery Recycling Collective	Planet Ark	The Yacht Guy

The individual yacht owners, skippers, and crew members for details of incidents.

References

Reference R1: <https://au.sports.yahoo.com/amphml/sydney-hobart-yacht-race-2021-celestial-denied-line-honours-after-protest-upheld-223617108.html>

Reference R2: <http://www.cospas-sarsat.int/en/documents-pro/system-documents>

Appendices

Appendix A1: ACR Report (with permission)

Appendix A2: ACR PLB Training document (with permission)

Distribution

- ORCV Special Investigation Group
- ORCV Committee
- Australian Sailing – Glen Stanaway
- AMSA – Linda Berryman
- ACR – Mark Kindell/ Darren Hogg
- Yacht - John Handley
- Yacht - Robert D’Arcy
- CYCA - Tara Blanc Ramos

Subject: ORCV PLB400 Inadvertent Activation

Date: Sept 7, 2022

Problem Statement: BOTH UNITS INADVERTENT ACTIVATION DURING
MELBOURNE TO HOBART RACE

1. S/N 2535 FOR [REDACTED]
2. S/N 14250 FOR [REDACTED]



Investigation:

Both units passed all test and functioned appropriately as per design.

Key characteristics and performance values that were assessed during test are provided in the attached test analysis.

Battery Voltage with load	: 8.004884 V	Battery Voltage with load	: 8.673993 V
406 RF SSI	: 1.071795 V	406 RF SSI	: 1.009744 V
121.5 RF SSI	: 0.2675458 V	121.5 RF SSI	: 0.02498168 V
Temperature	: 999	Temperature	: 970
Total Elapsed on Time	: 2335 seconds	Total Elapsed on Time	: 15570 seconds
GPS module com port check	: Pass.	GPS module com port check	: Pass.
Battery Open voltage check	: Pass.	Battery Open voltage check	: Pass.
Battery During 406 Burst	: Pass.	Battery During 406 Burst	: Pass.
406 MHz RF detect check	: Pass.	406 MHz RF detect check	: Pass.
121.5 MHz RF detect check	: Pass.	121.5 MHz RF detect check	: Pass.
Code checksum check	: Pass.	Code checksum check	: Pass.
PA control 406 voltage	: 0.8791941 V	PA control 406 voltage	: 0.8147253 V
PA control 121.5 voltage	: 2.086374 V	PA control 121.5 voltage	: 2.086374 V
MOD 406 low voltage	: 1.087106 V	MOD 406 low voltage	: 1.087106 V
MOD 406 mid voltage	: 1.458608 V	MOD 406 mid voltage	: 1.458608 V
MOD 406 high voltage	: 1.892967 V	MOD 406 high voltage	: 1.892967 V
Number of self-test	: 17	Number of self-test	: 7
Number of GNSS test	: 0	Number of GNSS test	: 0
Software version	: 0RevC2	Software version	: 0RevC2
Hardware ID:	: 02	Hardware ID:	: 02
Test result	: Pass.	Test result	: Failed.
Firmware checksum	: 56748	Firmware checksum	: 56748

Conclusion: There are no known defects associated with the units that experienced the inadvertent activations. All regulatory requirements were satisfied based upon the test conditions that were exercised at ACR. It is recommended that consumers review the user manual and understand proper operational conditions to limit the potential inadvertent operations that may be experienced with the unit ([PLB Tips Guide](#)). In addition, ACR has taken additional preventative measures that will be reflected in PLB product enhancements that limit inadvertent activations starting in 4Q2022. *See below:*

To introduce a new part to the PLB. A spacer that will be place between the front cover and the PCB in order to address inadvertent activations



Any further questions regarding the matter, please contact the undersigned at 954.862.2105, or via email at mark.kindell@acrartex.com

Sincerely,

Mark L. Kindell

Quality Director

Do's & Don'ts

PERSONAL LOCATOR BEACON GUIDE

ENHANCING YOUR PRODUCT EXPERIENCE

Having made the important decision to acquire a Personal Locator Beacon (PLB), it's equally important to understand the factors that can impact the overall product experience. This helpful guide provides users with awareness of the ideal circumstances for keeping your beacon in perfect working order, thereby ensuring it is always ready for use when needed the most.

- Best Practices
- Operation Tips
- Storage Recommendations
- And more!



BACKPACK STORAGE

Backpacks and other sack-based storage systems are a great traditional cargo option for nearly all environments. However, there are always challenges to both protecting and preserving the performance of equipment stored within.

Here are tips on how best to store your communication devices inside!

Don't

❌ CLUSTERING & CRAMMING



Usually the normal behavior would be to drop whatever items into your backpack or sack, but this can lead to 'clustering or cramming' of items. This could put added strain on your valuables and also lead to a potential false activation.

❌ CRUSHING & PRESSURE



A common occurrence on the trail or during other adventures is leaning on, or placing our weight on, our backpack. This scenario also creates strain on backpack contents and can potentially reduce the battery life of your PLB due to potential inadvertent activation.

❌ RESTING & SITTING



Use of equipment as a cushion or pillow can seem practical on the journey, but be aware of the weight being placed on your valuables. Gives new meaning to the phrase; "Between a rock and a hard place".

Do

✅ DEDICATED POCKETS & EXTERIOR



Dedicated pockets, or exterior mounting options not only allow for easier access to your PLB but also provide greater protection for your device when it's stored in an upper compartment or mounted in a higher position on the backpack.

✅ BANDS, CLIP & CARABINERS



Use of bands, clips and carabiners also allow for rapid access on your person and provide a direct connection between you and your PLB. But be aware of your position and influence on the unit.

DRYBAG/PACKS/POUCHES

The benefits of drybags' water-resistant enclosures include distinct advantages for electronic equipment. However, protection against the elements is unfortunately not mirrored in regards to the protection offered against hard impact and heavy pressure.

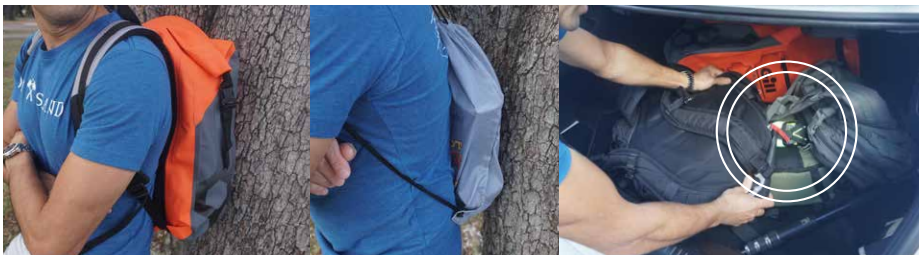
Don't

❌ CLUSTERING & CRAMMING



Drybags, while protecting from water and dust, often offer little to no protection from impact or shock. Be conscious of other items also being stored as these can potentially impact your beacon and other valuable devices.

❌ CRUSHING & PRESSURE



Pressure and weight are even more important with these types of storage options as they often don't have any kind of foam or cushion. Also be aware of loosely storing your beacon in crowded compartments within your vehicle/vessel.

❌ RESTING & SITTING



With pouches, be aware of the environment around you. Remain cognizant of your posture when leaning, sitting, or resting to negate the possibility of an accidental activation.

Do

✅ SIDE-PACKS, BUMBAGS & POUCHES



We recommend when using side-packs, bumbags and/or pouches to keep the beacon relatively clear of other items and the activation area free from outside influence. Awareness of one's surroundings is also advised to keep your unit safe.

✅ STRAPS & BANDS



Hooking your unit to straps and bands can be very appealing when traveling, however be sure to place it in an area where minimal physical interaction can occur. Also make sure that your unit is securely attached to prevent loss or theft.

MARINE & VESSELS

Out on the water the condition can be wide and varied. As weather, vessel type, and activity can have an effect on how you store and use your equipment.

Don't

❌ CLUSTERING & CRAMMING



Providing ample space and not simply dropping your beacon into tight and highly compressed environments can provide for situation where a false activation can occur.

Please avoid cramming or cluttered storage compartments.

❌ CRUSHING & PRESSURE



Leaning or placing weight on your equipment could inadvertently damage or tamper the placement of your beacon. Such as your life jacket deployment, for example.

Do

✅ LIFE JACKETS



When not placing your device within the life jacket, external placement is possible. Just be aware of not only placement in regards your external area but also in terms of where the life jacket will inflate to.

✅ BAGS AND POCKETS



Pockets are a viable option of keeping your beacon close and accessible. Like other areas, please be aware of what other objects could come in contact with your unit. Also be aware of any weight you may inadvertently place on your unit.

406 MHZ & 121.5 MHZ: GLOBAL & LOCAL

With the inception of 406 MHz as the global standard for Cospas-Sarsat rescue beacons, more detailed and reliable communication has become the norm. Allowing for global coverage which previous 121.5 MHz homing signal was not capable of.



Beacon is Activated

406 MHz distress message, including GPS coordinates, is sent to worldwide emergency satellite network.



Distress Message Relayed

406 message and GPS coordinates are sent to the nearest Search and Rescue Organization.



Return Link Service (RLS)

Provides direct to beacon confirmation that distress message has been received and location detected.



Search and Rescue Dispatched

GPS coordinates and a 121.5 MHz homing signal lead rescuers to your locations



THE RLS DIFFERENCE

The Return Link Service (RLS) offers a new feature to all compatible Cospas-Sarsat beacons. A blue light which provides feedback to users that their emergency rescue message has been received by a mission control center.

HOW DOES IT WORK?

406 MHz and Return Link Service, Global Coverage and User Awareness



Building a better network: With RLS, 406 MHz, 121.5 MHz, and other robust features emergency beacons create a dependable and tested framework for rescue.

OPERATION TIPS

Here's some quick tips on how to insure the best performance out of your beacon.



Insure your beacons antenna is fully and properly deployed.



As your beacon is functioning, ensure it has a clear path to the sky.

Don't



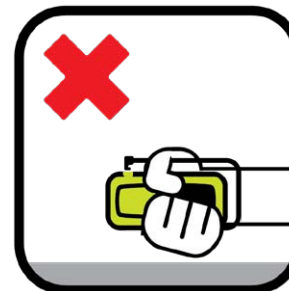
Hold you beacon in a manner that will tamper with it's antenna or transmission system



Operate it without it's antenna fully deployed.



Hold the unit by the antenna.



Prevent the unit from have a clear access to the sky and as such the satellite network.

In Summary,

While storage is important and proper preparation is key. It is your knowledge of your own life saving equipment which can save not only your life but that of your love ones.

Test your beacons prior to your journeys,
Know the proper light sequence associated to your units.
Communications is more than just transmission,
it's understanding.

LOOK AFTER YOUR BEACON AND IT WILL LOOK AFTER YOU

If you want to learn more about emergency beacons, and other life saving equipment please visit:

- www.amsa.gov.au
- www.maritimenz.govt.nz/
- www.ACRARTEX.com
- www.OceanSignal.com



**SAFETY STARTS
WITH PREPARATION**