

Accelerated
Location Detection
with GPS & Galileo
receivers



 **mcmurdo**
SEAS OF SOLUTIONS BRAND



SmartFind G8

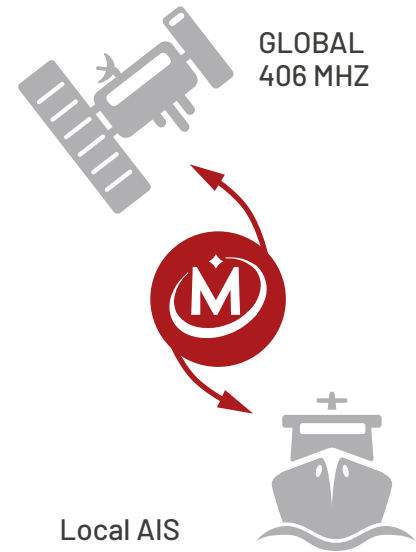
EPIRB Range

MEOSAR Compatible[®] for enhanced detection and location performance, the G8 range includes an industry first; a four-frequency EPIRB, combining the global alerting of 406 MHz with the localised locating and tracking power of AIS.

SmartFind G8 EPIRB Range

The world's most powerful EPIRBs, driving accelerated rescue times via:

- Faster alert detection on the 406 MHz frequency through our MEOSAR compatibility
- The world's first QUADROTECH® EPIRB, with four search and rescue frequencies, the SmartFind G8 AIS supports the Alert, Locate, Tracking and Recovery elements of search and rescue
- Greater location accuracy by receiving GNSS coordinates from a wider range of satellite constellations including Galileo
- World's first convergence of 406 and AIS, combining the global alerting of 406 MHz with the localised locating and tracking power of AIS



McMurdo SmartFind EPIRBs include innovation as standard with ruggedized base, easy service battery, MEOSAR compatibility and compliance with the new United States Coast Guard emergency hands free transport mandate. The additional false activation protection and multiple self-tests also offer total user confidence. Coupled with an unparalleled marine heritage, commitment to quality and a history of innovation, customers know they can trust McMurdo when their lives are at risk.

The G8 AIS is the first EPIRB to have standard 406 MHz, 121.5 MHz & GPS capabilities AND include AIS for localised rescue. This combination is a result of new technology but also new attitudes to AIS as a search and rescue tool, plus the realisation that accelerated alert detection and location accuracy will save even more lives. This technology partnership will also help reduce demands on the Search & Rescue authorities as it should help vessel owners detect and resolve accidental activations through visibility of AIS signals.

SmartFind E8/G8 Auto-Housing

A fully protective, spring loaded enclosure, the auto-housing automatically deploys and activates the EPIRB when it is submerged between 1 - 4m. The SmartFind E8/G8 auto-housing incorporates fixing points which ensure previous McMurdo auto-housing units can be retrofitted with minimum impact, when upgrading your vessels EPIRB.

Each of the 3 models (E8, G8 and G8 AIS) detailed on the comparison table opposite are available as either a category 1 or category 2 EPIRBs:

Category 1 EPIRB models

Supplied inside an auto-housing and automatically deployed and activated when in contact with water (although they can also be manually activated).

Category 2 EPIRB models

Supplied with a unique SmartTransfer bracket to prevent accidental activation, once manually removed from the bracket the EPIRB is activated manually or via water contact.



SmartFind G8 EPIRB Range Features Comparison

Feature	Description	SmartFind E8	SmartFind G8	SmartFind G8 AIS
Optimised for MEOSAR	Enhanced detection capability for accelerated rescue	◇	◇	◇
VHF homer	121.5MHz swept tone	◇	◇	◇
406 frequency	International rescue frequency	◇	◇	◇
GNSS receiver	72 channels multi-constellation (see Note 3)		◇	◇
AIS capability	AIS for localized rescue			◇
SmartTransfer	Manual bracket allowing transport without activating water switch	◇	◇	◇
Auto-housing option	Automatic deployment when submerged 1-4 m	◇	◇	◇
Activation method	Manual or water activation	◇	◇	◇
SmartCarry	Concealed hands-free easy carry strap	◇	◇	◇
SmartBase	Impact protection	◇	◇	◇
SmartLight	3 lights, 360 degree coverage	◇	◇	◇
SmartSwitch	Reusable ON power button cover, to prevent accidental activation	◇	◇	◇
Battery storage life	10 years (Lithium Iron Disulphide)(see Note 4)	◇	◇	◇
SmartChange	Easy service battery	◇	◇	◇
Global service network	200+ service centres across 80+ countries	◇	◇	◇
Multiple self tests	120 short tests for system check and 20 Long tests which include testing of the GNSS receivers (see Note 1)	◇	◇	◇
Warranty	1 + 4 years with 1 year extension on safety check (see Note 2)	◇	◇	◇
Part of McMurdo Ecosystem	Developed with McMurdo's unique understanding of the technical requirements to fully utilise the Cospas-Sarsat infrastructure	◇	◇	◇

NOTE 1 Recommendation – 1 test a month over a period of 10 years. Long tests twice a year over a 10 year period. Long tests to be conducted in full view of sky. Obstacles will increase time taken for GPS lock, reducing the battery life. Long Tests can also only be performed if GNSS receiver workability seems suspect.

NOTE 2 Warranty is 1 year from date of purchase, an additional 4 years upon registration with Seas Of Solutions. On 5 year health check, an additional year will be put in place.

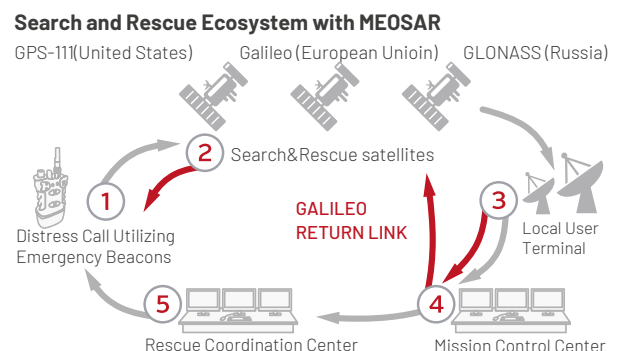
NOTE 3 GPS and GLONASS has been approved. Galileo will be in place once active in early 2017.

NOTE 4 As a responsible manufacturer, Seas Of Solutions recommends a 5 year health check. Shore-based maintenance mandated vessels, battery health check or replacements should be carried out in accordance with flag Administration requirements and not exceeding 5 years.

Understanding the MEOSAR Ecosystem

MEOSAR Improvements: Better Accuracy, Timeliness and Reliability. Cospas Sarsat has rolled out a new search and rescue infrastructure known as MEOSAR. The aim is: Determine beacon location within 5km, 95% of the time, within 10 minutes.

- 72 MEOSAR satellites positioned at Medium Earth Orbit altitude
- Near instantaneous beacon signal detection using bent pipe technology – average 46 minutes faster compared to LEOSAR
- Reduced response times with multiple signal bursts to improve speed and accuracy of location calculation
- Close to 100% reliability due to multiple antenna systems and MEOLUT networking
- When fully operational next generation beacons will also have a Return Link signal through Galileo satellites
- Lives have already been saved with the early operational MEOSAR through faster alerts and greater accuracy, for example in Australia where McMurdo previously completed MEOSAR ground infrastructure installation.



406 MHZ TRANSMITTER

Frequency	406.040 MHz + 1kHz
Power output	5 W nominal
Modulation	Phase (16KOG1D)

121.5 MHZ TRANSMITTER

Frequency	121.5 MHz + 3 kHz
Power output	100 mW nominal
Modulation	Swept tone AM (3K20A3X)

AIS TRANSMITTER (SEE NOTE 1)

Frequencies	161.975 MHz (AIS1); 162.025 MHz (AIS2)
Power output	1 W nominal
Modulation	Phase (16KOGXW)

GNSS RECEIVER (SEE NOTE 2)

Constellations	GPS, GLONASS, Galileo
Frequencies	1575.42 MHz (GPS, Galileo); 1602.00 MHz (GLONASS)
Sensitivity	-167 dBm minimum
Satellites tracked	72 channel

STROBE LIGHT

Type	3 high intensity LEDs
Light output	0.2 cd minimum
Flash rate	23 flashes per minute

BATTERY

Type	Lithium iron disulphide
Operating life	48 hours minimum
Shelf life (in-service life)	10 years typical in service (see Note3)

ENVIRONMENT

Operating temperature	20 °C to +55 °C (-4° F to +131° F)
Storage temperature	-30 °C to +70 °C (-22° F to +158° F)
Automatic release depth	4 m maximum

NOTE 1: AIS is available on the G8-AIS model only

NOTE 2: GNSS is available on the G8 and G8-AIS models only

NOTE 3: As a responsible manufacturer, McMurdo recommends a 5-year health check at the nearest McMurdo approved service agent. Shore-based maintenance mandated vessels, battery health check or replacements should be carried out in accordance with flag Administration requirements and not exceeding 5 years.

NOTE 4: Approvals for the various standards is pending

DIMENSIONS (EPIRB)

Weight	710 g
Height/Width/Depth	423x104x103 mm (incl. antenna)
Length of antenna	206 mm

DIMENSIONS (MANUAL BRACKET)

Weight	110 g
Height/Width/Depth	270x125x121 mm

DIMENSIONS (FLOAT FREE ENCLOSURE)

Weight	1075 g
Height/Width/Depth	416x126x132 mm

STANDARDS APPLIED (SEE NOTE 4)

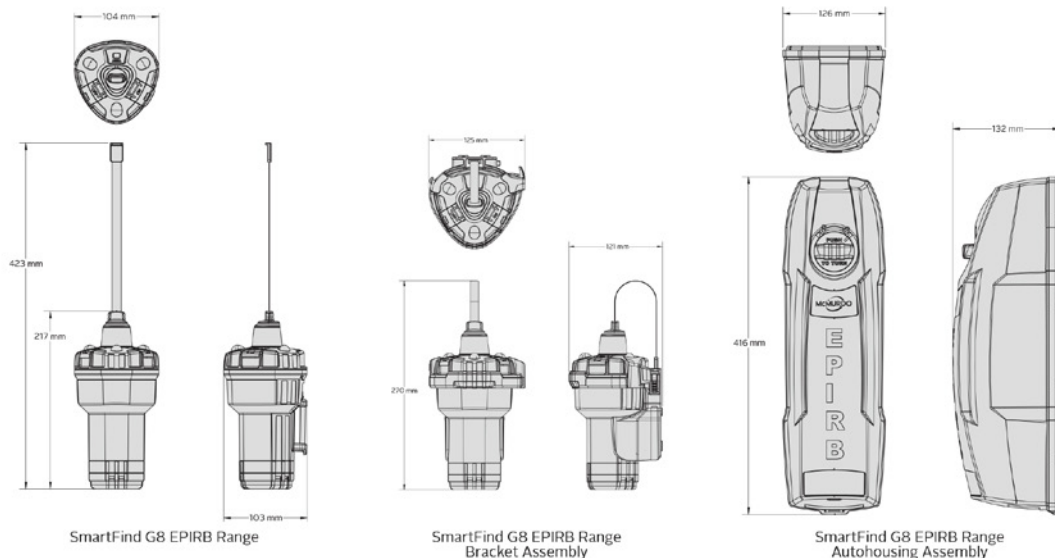
COSPAS-SARSAT	C/S 1.001 C/S T.007
Europe	MED (wheelmark)
USA	USCG & FCC; FCC ID; TBA; 47 CFR Parts 80, 2;
International standards	Dependant on variant IEC 61097-2; IEC 60945 incl. Corrigendum1; Industry Canada RSS-287; AS/NZS 4280.1; IMO MSC/Circ. 862
M0 regulations	A.662(16); A.694(17); A.810(19); A.814(19)

PART NUMBERS

SmartFind E8 Manual EPIRB	23-001-004A
SmartFind E8 Auto EPIRB	23-001-504A
SmartFind G8 Manual EPIRB	23-001-002A
SmartFind G8 Auto EPIRB	23-001-502A
SmartFind G8 AIS Manual EPIRB	23-001-001A
SmartFind G8 AIS Auto EPIRB	23-001-501A

Safe Operational EPIRB Life

Seas of Solutions Safe Operational EPIRB Life guidance is that EPIRBs should be considered for decommissioning after 12-15 years, as this reduces the risk of environmental impact on beacon performance and ensures end users have beacons with the latest technology. As a result, the SmartFind G8 EPIRB range is supplied with a ten-year battery, but battery replacement kits have a minimum five-year battery, to encourage regular professional checks of the units and reduce the likelihood of the beacons remaining on board vessels beyond the recommended operational life.



McMurdo: Shaping the Future of Search and Rescue



New Product Family

The promises of innovation and technology go hand in hand and nowhere is that more important than in the field of search and rescue (SAR). The establishment of an international Cospas-Sarsat organisation to coordinate search and rescue operations on the dedicated 406MHz frequency has saved over 40,000 lives since 1982. *Where next for Search and Rescue...?*

McMurdo is helping shape that future with the imminent release of the world's most powerful search and rescue beacons. **The new McMurdo SmartFind G8 and Kannad SafePro family of EPIRBs continue McMurdo's heritage of driving standards in safety and innovation through the convergence of technologies.**

MEOSAR

In the next few years the world of search and rescue will be revolutionised with MEOSAR, a network of 72 – Medium Earth Orbit Search and Rescue satellites that will accelerate rescue times and ultimately save even more lives. The existing Cospas-Sarsat SAR ecosystem will have enhanced capabilities, offering near instantaneous signal detection with greater coverage, reliability and location accuracy.

McMurdo's new family of McMurdo SmartFind and Kannad SafePro EPIRBs are MEOSAR compatible, ready to offer faster detection and more accurate location by working with the EOC (Early Operation Capability) MEOSAR Satellite Ground Stations, Mission Control Centres and Rescue Coordination Centres, like those designed and installed by McMurdo in Australia, New Zealand and the United States.



The Future is Here

With our commitment to improving search and rescue through innovation, the **McMurdo SmartFind** and **Kannad SafePro EPIRB** product family brings advanced technology to create an even safer future. In addition to being **MEOSAR** compatible, these EPIRBs improve the critical components of the search and rescue process: **Alert, Locate and Track** for a successful **Recovery**.

The World's First Four Frequency EPIRBs

The **McMurdo SmartFind G8 AIS** and the **Kannad SafePro AIS** are the world's first EPIRBs to include **406MHz, 121.5MHz, AIS and GNSS** (better known as **GPS**) to accelerate search and rescue. The unique power of these new beacons is in the flexibility and additional tracking capabilities long demanded by maritime customers. This will further reduce rescue times by combining the global location power of 406MHz with the localised rescue capacities of AIS, first introduced to the world in **McMurdo's AIS MOB range**.

Multi-GNSS Receiver

The new range also offers greater location accuracy by including multiple GNSS receivers, meaning the EPIRBs will receive GNSS (more generally known by the brand name **GPS**) from more than one source of satellite frequency, increasing the speed and accuracy of locating your position on the water.

Unique Products from a Unique Company

Only **McMurdo** beacons offer this gold standard EPIRB range based on our unique contribution to the **Cospas-Sarsat** search and rescue ecosystem. **McMurdo** is the world's only beacon manufacturer to provide an end-to-end search and rescue solution, from the distress beacons to **Satellite Ground Stations, Mission Control Centres** and **Rescue Coordination Centres** that facilitate rescues.

Innovative Features and Service

McMurdo SmartFind and **Kannad SafePro EPIRBs**

include innovation as standard with ruggedized base, easy service battery and compliance with the new United States emergency hands free transport mandate. The additional false activation protection, multiple self-tests and professional safety checks also offer total user confidence.

Coupled with an unparalleled marine heritage, commitment to quality and a history of innovation, customers know they can trust us to help bring the future of search and rescue to life.



The World's Most Powerful EPIRBs

The new **McMurdo SmartFind G8 AIS** and **Kannad SafePro AIS** beacons offer **Accelerated Rescue** via..

- Four search and rescue frequencies
- Greater location accuracy
- Faster alert detection
- Combined Global Alerting - 406 MHz with the localised recovery power of AIS
- The only EPIRB manufacturer that also builds and supports the **Cospas-Sarsat** ecosystem infrastructure
- The only EPIRB manufacturer making **MEOSAR** a reality.



Trusted for Life™



MEOSAR

The Future of Search and Rescue is Here

Trusted for Life™

In the next few years the world of search and rescue will be revolutionised with MEOSAR, offering near instantaneous signal detection with greater coverage, reliability and location accuracy ultimately saving even more lives.



Cospas-Sarsat

The International Cospas-Sarsat Programme is a satellite-based search and rescue distress alert detection and information distribution system, best known for detecting and locating emergency beacons activated by aircraft, ships and hikers in distress. Since its launch in 1982, Cospas-Sarsat has helped to save over 40,000 lives.

What happens between an emergency beacon being activated and an actual rescue? Below is a diagram of the Cospas-Sarsat Ecosystem which shows the 5 critical stages to the search and rescue process.



All you need to access this free of charge ecosystem is an emergency beacon that operates on the 406 MHz frequency.

- 1** The process begins with the activation of a distress beacon (EPRIBs for maritime use, PLBs for personal use and ELTs for aviation use) in an emergency situation, sending out a 406MHz signal.
- 2** The Cospas-Sarsat satellite system picks up the signal and transmits it back to a ground receiving station on earth – these are called Local User Terminals or LUTs.
- 3** The LUT processes the signal to generate a distress alert and relays it to a Mission Control Center.
- 4** The Mission Control Center receives the alert and relays this with location information to a Rescue Coordination Center, often looking up the unique beacon ID number to gather information about the registered owner.
- 5** The Rescue Coordination Center alerts the appropriate emergency response teams to deploy a rescue effort.



The Existing System

The Cospas-Sarsat System today includes two types of satellites: Low-altitude Earth orbit (LEOSAR) and Geostationary Earth orbit (GEOSAR), each contributing respective advantages to detection and location of distress beacons that have been activated.

The GEOSAR system constantly covers the entire Earth except the high-latitude (e.g., polar) regions. receiving distress alerts across most of the globe. However, it cannot locate the beacon unless the location is encoded in the beacon's message from a local navigation receiver such as a GPS.

The LEOSAR system can locate a beacon without the aid of a GPS, but the LEOSAR satellites only view a small part of the Earth at any given time and may require multiple passes of a satellite resulting in delay to the search and rescue process.



- Locations are calculated much more quickly because multiple satellites are receiving and relaying signals at once.
- The flow is more reliable because there will be redundancy created by the increase in satellites and antennas the system can choose from.
- The flow data will be more accurate because of more precise measurements of frequency and time.

MEOSAR will improve the speed, accuracy and reliability of the Cospas-Sarsat System as well as additional features such as a Return Link Transmission that will allow next generation beacons to provide the user confirmation that the distress message has been received.

MEOSAR Today

MEOSAR installations began in 2011 and are ongoing around the world as countries work to become MEOSAR ready in North America, South America, Asia, Asia Pacific, Europe and Africa. While these systems are in test mode of operation, the first MEOSAR rescues are already being documented such as the dramatic rescue of Don Stevens in April 2016 when he activated his McMurdo PLB after falling more than 90 feet and breaking his leg. The distress signal was relayed by the MEOSAR satellite system to McMurdo built infrastructure in only four minutes – 50 minutes sooner than the existing system – enabling a critical search operation before nightfall.

MEOSAR Complete

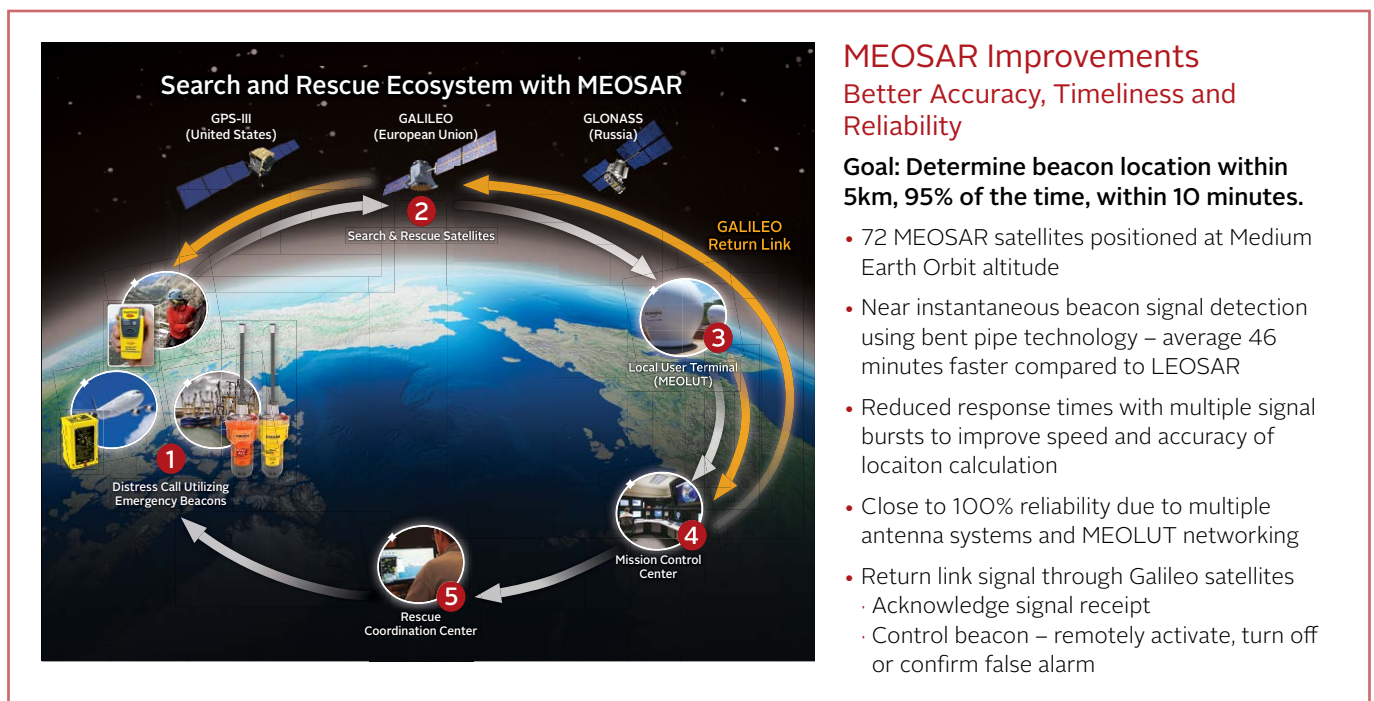
Once complete over the next three to five years, MEOSAR will put over 6 times the number of existing Cospas-Sarsat satellites into orbit, resulting in greater global coverage and more position accuracy. Those 72 MEOSAR satellites will immediately relay more beacon signals to ground stations – and it will relay them faster by using a new relay technique, known as bent pipe. This is a great improvement over LEOSAR which currently uses store and forward and can take 46 minutes longer on average to process a beacon signal.

Introducing MEOSAR

The Medium-altitude Earth Orbit Search and Rescue System, MEOSAR, is an advanced next generation satellite based technology that is revolutionizing the Cospas-Sarsat ecosystem.

The MEOSAR system offers the advantages of both LEOSAR and GEOSAR without their current limitations by providing transmission of the distress message, and independent location of the beacon, with near real time worldwide coverage.

To the right is the Cospas-Sarsat Search and Rescue ecosystem with MEOSAR added. As you can see, the flow of information remains the same, but the performance of that flow is greatly improved.



MEOSAR Improvements Better Accuracy, Timeliness and Reliability

Goal: Determine beacon location within 5km, 95% of the time, within 10 minutes.

- 72 MEOSAR satellites positioned at Medium Earth Orbit altitude
- Near instantaneous beacon signal detection using bent pipe technology – average 46 minutes faster compared to LEOSAR
- Reduced response times with multiple signal bursts to improve speed and accuracy of location calculation
- Close to 100% reliability due to multiple antenna systems and MEOLUT networking
- Return link signal through Galileo satellites
- Acknowledge signal receipt
- Control beacon – remotely activate, turn off or confirm false alarm

MEOSAR ground stations, called MEOLUTs, can also connect to different MEOLUT locations creating layers of redundancy. This results in a highly reliable and near 100% available network to help achieve one of the key goals of MEOSAR: to determine beacon location within 100 meters, 95% of the time within 5 minutes.

Another feature of MEOSAR system will be the ability to send a return link signal. Today this feature is only available through Galileo satellites and will be part of the functionality of next generation 406MHz beacons currently in development by McMurdo. McMurdo was selected by the European Commission to lead the development of next-generation search and rescue distress beacons under the Horizon 2020 HELIOS Project. With this functionality, great things are expected to improve the search and rescue process. A confirmation message can be sent back to the beacon acknowledging

that the emergency signal was received. It will be possible to remotely activate a beacon, turn off a beacon transmission or even confirm if the emergency signal is an actual distress situation or a false alert.

Look For the M

MEOSAR is already demonstrating the significant impact it will have on the speed and accuracy of locating people in distress. More rescues are being documented as systems continue their test phases around the globe, demonstrating the benefits to search and rescue agencies to ultimately save even more lives, faster and with greater efficiency. McMurdo is proud to be a leader in the development and implementation of MEOSAR as part of our ongoing efforts to increase awareness, foster innovation and drive the standardization of these systems worldwide.



First life saved through next-generation MEOSAR search and rescue network

McMurdo instrumental in upgraded Cospas-Sarsat satellite system that found hiker 50 minutes faster than the existing system.

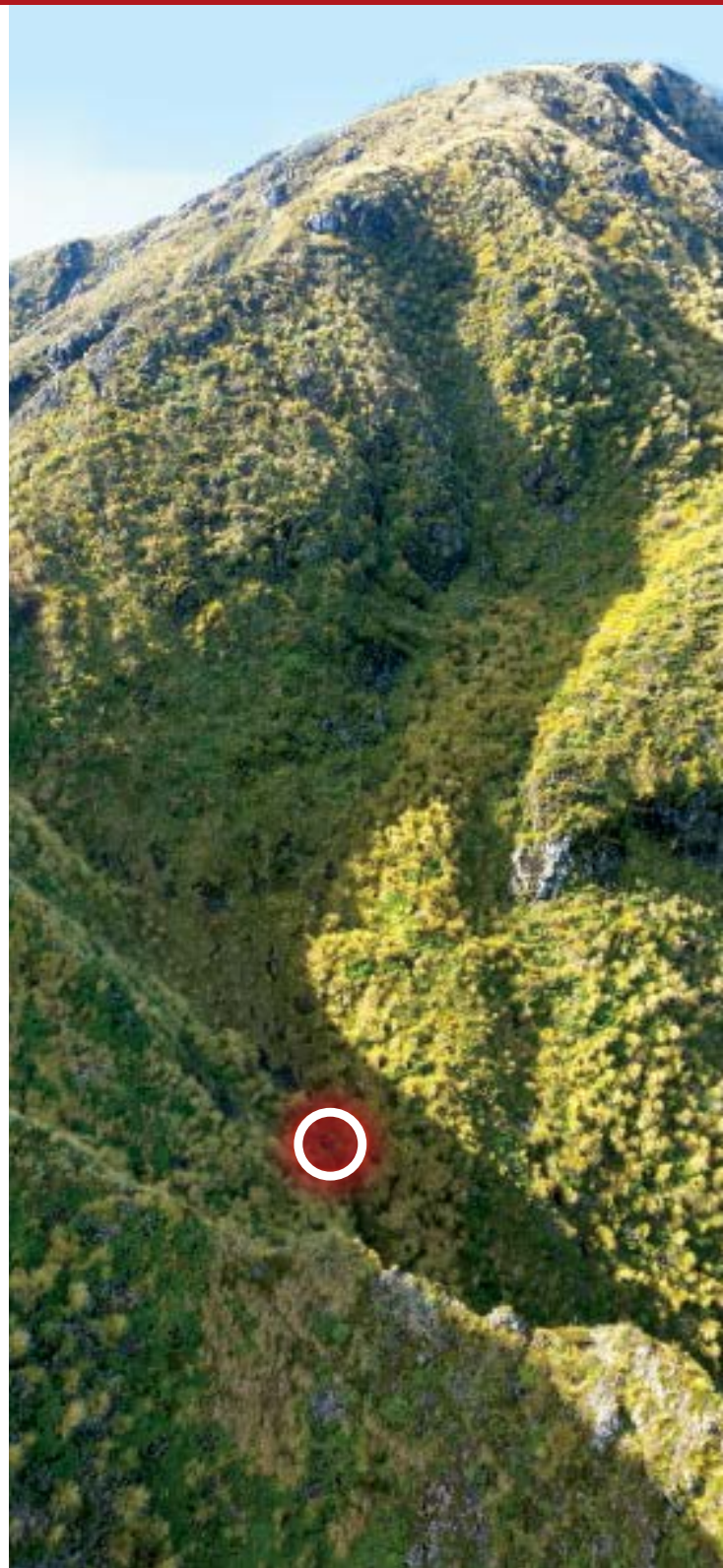
Don Stevens, a 53-year-old teacher from Wellington, New Zealand, was hiking over rugged terrain in the Tararua Range when he fell more than 90 feet, breaking his leg and leaving him unable to walk. After he activated his McMurdo FastFind 220 personal locator beacon (PLB), the distress signal was relayed by the MEOSAR satellite system to the Rescue Coordination Centre New Zealand in only four minutes – 50 minutes sooner than the existing system picked up the same distress signal.



“I wouldn't be here if it weren't for that beacon”
Don Stevens

McMurdo was instrumental in all phases of the rescue, from the McMurdo FastFind 220 PLB to the McMurdo designed and installed MEOSAR satellite ground stations, Mission Control Centres and Rescue Coordination Centres.

Rescue Coordination Centre New Zealand Manager Mike Hill, said: “The extra time created by receiving the signal faster was invaluable and potentially lifesaving. It meant we could get the search operation underway earlier, and that made all the difference with the limited daylight hours that are available at this time of year.”



SmartFind G8 EPIRB Range Features Comparison

Feature	Description	SmartFind E8	SmartFind G8	SmartFind G8 AIS
Optimised for MEOSAR	Enhanced detection capability for accelerated rescue	✓	✓	✓
VHF homer	121.5MHz swept tone	✓	✓	✓
406 frequency	International rescue frequency	✓	✓	✓
GNSS receiver	72 channels multi-constellation (see Note 3)		✓	✓
AIS capability	AIS for localized rescue			✓
SmartTransfer	Manual bracket allowing transport without activating water switch	✓	✓	✓
Auto-housing option	Automatic deployment when submerged 1 - 4m	✓	✓	✓
Activation method	Manual or water activation	✓	✓	✓
SmartCarry	Concealed hands-free easy carry strap		✓	✓
SmartBase	Impact protection	✓	✓	✓
SmartLight	3 lights, 360 degree coverage	✓	✓	✓
SmartSwitch	Reusable ON power button cover, to prevent accidental activation	✓	✓	✓
Battery storage life	10 years (Lithium Iron Disulphide) (see Note 4)	✓	✓	✓
SmartChange	Easy service battery	✓	✓	✓
Global service network	200+ service centres across 80+ countries	✓	✓	✓
Multiple self tests	120 short tests for system check and 20 Long tests which include testing of the GNSS receivers (see Note 1)	✓	✓	✓
Warranty	1 + 4 years with 1 year extension on safety check (see Note 2)	✓	✓	✓
Part of McMurdo Ecosystem	Developed with McMurdo's unique understanding of the technical requirements to fully utilise the Cospas-Sarsat infrastructure	✓	✓	✓

NOTE 1 Recommendation — 1 test a month over a period of 10 years. Long tests twice a year over a 10 year period. Long tests to be conducted in full view of sky. Obstacles will increase time taken for GPS lock, reducing the battery life. Long Tests can also only be performed if GNSS receiver workability seems suspect.

NOTE 2 Warranty is 1 year from date of purchase, an additional 4 years upon registration with McMurdo group. On 5 year health check, an additional year will be put in place.

NOTE 3 GPS and GLONASS has been approved. Galileo will be in place once active in early 2017.

NOTE 4 As a responsible manufacturer, McMurdo recommends a 5 year health check. Shore-based maintenance mandated vessels, battery health check or replacements should be carried out in accordance with flag Administration requirements and not exceeding 5 years

If you're looking for quality epirbs & plbs, visit our website.