UNITED STATES COAST GUARD
U.S. Department of Homeland Security

MARINE SAFETY ADVISORY

Office of Search and Rescue

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Maritime Distress Communication Devices

This Marine Safety Advisory addresses maritime distress communication devices available to recreational and commercial mariners. Over the past decade, these devices have proliferated in the marketplace, and there are key differences to consider when purchasing one. Some devices transmit via satellite, while others transmit on terrestrial frequencies, and these devices use different technologies to relay the distress notice. Furthermore, not all devices notify the U. S. Coast Guard directly.

The Coast Guard **strongly recommends** that mariners fully understand the capabilities and limitations of devices when purchasing a distress communication device. It is imperative that mariners know how the devices work and who is notified when a distress signal is transmitted. Below is a list of the common devices, their capabilities, and potential considerations.

The following devices NOTIFY *the U.S. Coast Guard:*

- **Digital Selective Calling (DSC)** – DSC is an internationally recognized radio system protocol to facilitate establishing digital and voice communications between other maritime and terrestrial-based radio stations on the same network. A radio equipped with DSC can generate a distress alert with vessel ID and position data, and an alert is relayed by other DSC-capable radios. The user must register their Maritime Mobile Service Identity (MMSI) to link the radio to the vessel. Information to register MMSI can be found at https://www.navcen.uscg.gov/maritime-mobile-service-identity.
  *Failure to do so may delay rescue.

The following DSC frequencies are for distress and calling purposes and monitored by the U.S. Coast Guard

- **High Frequency (HF):**
  - 4207.5 kHz
  - 6312.0 kHz
  - 8414.5 kHz
  - 12577.0 kHz
  - 16804.5 kHz

  *USCG no longer monitors HF DSC voice only distress frequencies with the exception of 4207.5 kHz in Kodiak Alaska and Guam. When alerted, the USCG will activate and respond via the associated HF voice frequency. (Associated HF voice frequencies in the table on page 2)

- **Very High Frequency (VHF):**
  - 156.525 MHz

- **High Frequency (HF) Radio** – HF- radios with DSC are not typically carried by recreational vessels near shore but are useful for vessels operating in the open ocean or on transoceanic voyages. The frequencies may also be used for routine ship-to-ship communications with distress communications having priority, and for receipt of high seas marine weather forecasts and warnings. When alerted, the USCG will activate and respond via the associated HF voice frequency. (Associated HF voice frequencies below)

HF DSC Frequency	Associated Voice Frequency
4207.5 kHz	4125 kHz*
6312 kHz	6215 kHz
8414.5 kHz	8291 kHz
12577 kHz	12290 kHz
16804.5 kHz	16420 kHz

*Voice only distress frequencies are monitored in Kodiak Alaska and Guam on 4125 kHz. This is the only HF voice distress frequency monitored by the USCG.

- **Very High Frequency (VHF) Radio** – The VHF maritime radio operates in the maritime very high frequency band of 156 to 162 MHz (channel 01A to channel 88) and provides digital and voice communications within the radio line of sight range (approximately 5-20 miles depending on the antenna height above water). A radio equipped with DSC can use channel 70 (156.525 MHz) for reporting a distress or to contact other stations by entering their MMSI and then switching to a voice channel for further communications. The U.S. Coast Guard monitors channels 16 (voice) and 70 (DSC).

- **Electronic Position Indicating Radio Beacon (EPIRB)** – The EPIRB is an emergency alerting device operating in the dedicated 406.0 – 406.1 MHz distress band monitored by the International Cospas-Sarsat Programme. It may be water-activated or manually activated, depending on the model. Orbiting satellites detect and relay the signals to ground operating stations, which can locate the source and relay the coordinates and associated registration information to the appropriate internationally recognized Rescue Coordination Center worldwide. Newer EPIRBs also include encoded Global Navigation Satellite System (GNSS) position data and an Automatic Identification System Search and Rescue Transmitter (AIS-SART) locating signal. EPIRB distress alerts from U.S. coded beacons, as well as any EPIRB alert located in a U.S. SAR Region, are routed directly to a U.S. Coast Guard Rescue Coordination Center.

- **Personal Locator Beacon (PLB)** – The PLB is a manually activated emergency alerting device operating in the dedicated 406.0 – 406.1 MHz distress band monitored by the International Cospas-Sarsat Programme. Orbiting satellites detect and relay the signals to ground operating stations, which can locate the source and relay the coordinates and

associated registration information to the appropriate Rescue Coordination Center worldwide. Newer PLBs also provide an AIS-SART locating signal as well as GNSS position data. Similar to EPIRBs, PLB distress alerts are routed directly to a Rescue Coordination Center based on the beacon location.

- **Maritime Survivor Locating Device (MSLD)** – The MSLD, also called a Man Over-Board (MOB) device, is a personal device intended for use by persons at risk of falling into the water such as mariners and workers on marine installations or docks, or by divers returning to the surface out of sight of their dive boats. The Federal Communications Commission (FCC) requires that a MSLD transmit on at least one of the following frequencies: 121.5 MHz (aviation distress), 156.525 MHz (channel 70), 156.750 MHz (channel 15), 156.800 MHz (channel 16), 156.850 MHz (channel 17), 161.975 MHz (AIS1), 162.025 MHz (AIS2), or include a function intended to send a distress message directly to the U.S. Coast Guard or any other search and rescue organization. MSLDs transmit on frequencies that are received on a device monitored by personnel at the MSLD-wearer's vessel or facility. The devices typically provide only line of sight (5-15 miles) communications and the functionality varies by the device model and the operating frequencies used. MSLDs that transmit a DSC signal (156.525 MHz) are generally best for alerting, and those that transmit an AIS signal (161.975/162.025 MHz) are generally best for locating. Those that transmit both DSC and AIS signals are best for alerting and locating. ***Note, MSLDs may NOT notify a search and rescue authority, such as the U.S. Coast Guard, depending on the device capabilities and operating location.***

The following devices DO NOT NOTIFY the U.S. Coast Guard:

- **Satellite Emergency Notification Device (SEND)** – A SEND is a portable emergency notification and locating device, which uses commercial satellite systems. The devices use an internal GNSS chip to gather location information. When the SEND is triggered, this information is sent via commercial satellite to a commercial monitoring agency whose role is to relay the information to an appropriate responding agency based on the device's reported location. Examples of responding agencies could be local search and rescue authorities, local police, or voluntary search and rescue. At present, no SEND operators have established formal arrangements or procedures with the U.S. Coast Guard for receiving SEND reports. A subscription service is required for a SEND and the service area coverage depends on the satellite service provider and may not provide worldwide coverage. Examples of SENDs are the Garmin inReach and the Globalstar SPOT.

> *The following devices*
> *DO NOT NOTIFY*
> *The U.S. Coast Guard*
> *when activated:*
>
> - SEND
> - AIS-SART
> - Radar-SART
>
> **!**

- **Automatic Identification System Search and Rescue Transmitter (AIS-SART)** – The AIS-SART is a SAR transmitter used for locating survival craft. It may be used in lieu of the radar SART. It transmits messages from the survival craft received and displayed on AIS

installations (SOLAS regulated ships are required to carry AIS installations). The position and time synchronization for the class A position report is derived from a built in Global Navigation Satellite System (GNSS) receiver (e.g., global positioning system (GPS)) and updated at a rate of once a minute. The AIS-SART operates on VHF-FM Channels AIS 1 (161.975 MHz) and AIS 2 (162.025 MHz).

- **Radar Search and Rescue Transponder (Radar-SART)** – The radar-SART may be water-activated or manually activated, depending on the model. Once activated, the radar-SART listens for a 9 GHz X-Band radar signal and, when one is detected, transmits a response that is displayed by the triggering radar as a line of 12 dots equally spaced by about 0.64 nautical mile (1,185 km) from the center of the radar display. The performance of the radar-SART relies upon nearby vessels having a compatible radar operating in the 9 GHz X-Band. Radar-SARTs do not function with radars operating outside the 9 GHz band, such as S-Band radars. The detection range is limited to the radar line of sight, typically 12-15 miles. The radar-SART is not designed as a distress-alerting device, but does assist the locating those in distress.

In addition, the following recommendations are made to all owners and operators of recreational or commercial vessels:

- **Life jackets**
  - **Always wear a Coast Guard-approved life jacket while underway**. People rarely have time to locate and don a life jacket during an actual emergency.
  - **Make sure your life jacket fits properly.** People can slip out of ill-fitting life jackets when they hit the water, which immediately decreases their chances of survival.

- **Communication Devices**
  - **Locator beacons can help us find you faster.** Attaching a functional EPIRB to your vessel, or a PLB to your life jacket, and knowing how to use them can help rescuers locate you in an emergency.
  - **Use a marine VHF radio.** A cell phone may go out of range or run out of battery power when you need it the most. Make sure you familiarize yourself with how to use and properly maintain your radio.
  - **Have more than one way to communicate**. It is important to have more than one communication device on your vessel. We recommend having a properly working marine VHF radio, a well-charged cell phone in a waterproof case, and a properly registered EPIRB, PLB, or both.

- **Boating Knowledge**
  - **Know what gear you need.** Get a free safety inspection from the Coast Guard Auxiliary to make sure you have all the gear and safety equipment required by your state and federal laws. Find your local Coast Guard Auxiliary Examiner at http://cgaux.org/vsc/.
  - **Some major safety features you should have on your vessel.**

- Life jackets and a throw-able floatation device
- Kill switch for the engines
- Working carbon monoxide alarm
- Functioning marine VHF radio
- Fire extinguisher
- Sound-producing devices
- Visual distress signals

- **Take a boating safety course.**
  The Coast Guard Auxiliary is one of many organizations that offer valuable boating safety courses ranging from electronic navigation to boat handling.
- **Know your navigation rules.** Know how to properly navigate waterways and maintain lookouts to keep yourself and everyone else around you safe.
- **Know your vessel's limits.** Vessels carrying too much weight are more likely to become unstable and capsize.

- **Have a float plan**
  - **Tell someone where you're going and when you'll be back.** That way if you don't return, we've got a good starting point to find you.
  - **Check out the Coast Guard Boating Safety app.** You can file a float plan, request emergency assistance, request a vessel safety check, and report pollution and hazards to navigation.

- **Weather and Tides**
  - **Look at the weather and tides before you head out**. It might look like a nice day, but squalls and shifting tides can pose sudden dangers. Safety Alert 07-21 (USCGSA_0721.pdf) provides excellent tips to prepare for heavy weather events.
  - **Dress for the water, not for the weather**. Just because the weather is warm doesn't mean the water is warm, too. Check water temperatures before you go out and dress accordingly. Extended immersion in water with a temperature less than 95 degrees will result in hypothermia.

The following online resources are available to provide information on these topics.

- USCG Boating Safety - https://www.uscgboating.org/

- National Safe Boating Council - https://www.safeboatingcouncil.org/

- Boating Safety Tips and Resources (weather.gov) - https://www.weather.gov/safety/safeboating

- Downloadable USCG Auxiliary Float Plan -
  http://www.floatplancentral.cgaux.org/download/USCGFloatPlan.pdf

- Maritime Telecommunications | Navigation Center (uscg.gov)

- SARSAT | Search and Rescue Satellite Aided Tracking (noaa.gov)

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