SOLAS Safety Radio — study guide

The Global Maritime Distress and Safety System (GMDSS) is the radio system every SOLAS ship uses to call for help and to receive alerts. This guide covers the sea areas, the equipment, the distress calls and the routine testing.[1][2]

GMDSS sea areas and capability

The GMDSS sea areas (A1–A4) define which radio equipment a GMDSS ship must carry and describe where GMDSS services are available. As per SOLAS, every GMDSS must, while at sea, be able to transmit and receive search-and-rescue co-ordinating communications, transmit and receive on-scene communications when another vessel is in distress, and receive shore-to-ship distress alerts.[1]

Key components

The key components of the GMDSS are Short Range Radio (VHF), Long Range Radio (MF/HF), the Emergency Position-Indicating Radio Beacon (EPIRB) and the Search and Rescue Transponder (SART). GMDSS does **not** use Morse code. On most vessels the emergency power or generator starts automatically on loss of main power — it does not need to be turned on by hand.[1]

Radio theory and range

VHF range is increased by raising the height of the antenna. The most common high-frequency communication is the sky wave. Over longer distances, lower-frequency radio waves (below 3 MHz) travel efficiently as ground waves, while radio waves above 30 MHz travel as direct waves — line of sight — between transmitter and receiver. The phrase "Greek alphabet" is a misunderstanding: the International (NATO/ICAO) phonetic alphabet is used, not the Greek alphabet.

Distress communication

Mayday is the international emergency word used as a distress signal on radio voice communications. It is the most important call that can be made, signalling an imminent threat to life or to the vessel. The three common words that indicate distress via radio are **Mayday**, **Pan-pan** and **Securite**. VHF **channel 16** is used to signal distress. Sending SOS by Morse code, light flashes or sounds when there is no emergency attracts a large penalty.

Certificates and identification

The General Operator's Certificate (GOC) covers knowledge of search-and-rescue procedures, including those in the International Aeronautical and Maritime Search and Rescue (IAMSAR) manual; transmitting and receiving information using GMDSS equipment and fulfilling its functional requirements; and carrying out radio services in emergencies such as abandon ship, fire on board, or radio breakdown.[3] A **call sign** is a

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unique identification code issued to vessels with radio licences to make communication easier.

Equipment by sea area

In Sea Area A1 a vessel carries short-range VHF equipment, including approved portable survival craft VHF radios (three for vessels over fifty gross tonnes), two SARTs (or one if the vessel is under 500 gross tonnes), and a NAVTEX receiver.[1] As per SOLAS, vessels may carry portable **survival craft VHF radios** operating on VHF channel 16 and at least one other channel (channel 6 recommended); the radios are kept on charge at the navigational bridge.

NAVTEX message types and testing

NAVTEX message-type letters include: **A** for navigational warnings, **B** for weather warnings, and **D** for search-and-rescue and piracy/armed-robbery messages. Devices are tested routinely: an **EPIRB** can be tested with the test button without sending a distress signal; a **SART** is self-tested briefly and checked on the X-band (3 cm) radar display for concentric circles; **NAVTEX** has an internal test of the battery and general functions, with a printed result; and **SAT-C** has an internal diagnostic test plus a performance verification (PV) test from a local earth station. The function of all VHF and MF/HF DSC facilities should be tested daily.

Key facts to remember

- GMDSS sea areas define required equipment and where services exist.
- Components: VHF, MF/HF, EPIRB, SART. GMDSS does not use Morse.
- Mayday = distress (imminent threat to life/vessel); also Pan-pan and Securite. Channel 16 = distress.
- False distress signals (for example SOS by any means with no emergency) carry a large penalty.
- VHF range up: raise the antenna. HF: sky wave. <3 MHz ground wave; >30 MHz line of sight.
- A1: survival craft VHF radios, SARTs, NAVTEX. NAVTEX letters: A nav warnings, B weather, D SAR/piracy.
- Test: EPIRB (button), SART (self-test + radar), NAVTEX (printed), SAT-C (PV from earth station).

Sources

1. SOLAS Chapter IV — Radiocommunications (GMDSS carriage requirements, sea areas, distress and safety functions).
2. IMO — GMDSS handbook and the ITU Radio Regulations (distress frequencies, channel 16, distress signals).
3. STCW Convention and Code — GMDSS radio operator certification (General Operator's Certificate, Section A-IV).