

# *The Future in Marine Radio Communication*

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## GMDSS

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Department of Transportation  
United States Coast Guard

## Do you use a Maritime Radio System?

If so, the new Global Maritime Distress and Safety System (GMDSS) **will** affect you. GMDSS will be mandatory for all ships subject to the Safety of Life at Sea (SOLAS) Convention. This includes all U.S. ships of 300 or more gross tons and passenger ships carrying more than 12 passengers under certain circumstances. Whether or not your vessel carries GMDSS equipment, you will be sharing the waters with vessels that are GMDSS equipped.

## How does this affect you?

On 1 February 1999, the voice watchkeeping requirement on 2182 kHz for GMDSS ships will cease. Sometime afterward, on a date yet to be determined, GMDSS ships may no longer be required to maintain a voice listening watch on channel 16 VHF. Considerable difficulty could then be experienced in establishing communications between GMDSS and non-GMDSS equipped vessels in an emergency situation. [Non-GMDSS vessels which routinely operate near large ships may wish to voluntarily equip with VHF-DSC to facilitate emergency contact.]

The Coast Guard shore network now maintains a voice guard on channel 16 VHF and 2182 kHz MF. These networks are being upgraded to include the GMDSS Digital Selective Calling (DSC) on channel 70 VHF and 2187.5 kHz MF. While the Coast Guard plans to maintain the shore watch on channel 16 VHF for a number of years, there is no assurance that the 2182 kHz MF and HF voice watches will be continued after the new system becomes mandatory. Existing Coast Guard MF and HF watches are being augmented with DSC to improve high seas telecommunications services to the maritime public.

## What is GMDSS?

In 1979, the International Maritime Organization (IMO) recognized the need for an updated maritime communication system and helped create the Inmarsat system employing geostationary satellites positioned above the Atlantic, Indian, and Pacific Oceans. Shortly thereafter, a polar orbiting satellite system was established to locate Emergency Position-Indicating Radio Beacons (EPIRBs). The IMO also decided to commence a general upgrade of the distress and safety system to be known as the GMDSS. This system would provide rapid and automated distress reporting and improved telecommunications for the maritime community.

In 1988, the IMO amended its SOLAS convention to complete this upgrade of the maritime safety communications procedures and equipment for the GMDSS. GMDSS applies system automation techniques to the traditional maritime VHF, MF, and HF bands, which previously required a continuous listening watch. GMDSS incorporates the Inmarsat and the EPIRB satellite systems to improve the reliability and effectiveness of the distress and safety system on a global basis. GMDSS also provides for the timely dissemination of maritime safety information, including navigational and meteorological warnings and weather forecasts.

## How can you prepare?

The IMO and the Coast Guard strongly encourage all vessels not required to participate in GMDSS to voluntarily carry selected GMDSS systems to enhance their safety. The primary systems would be a DSC-equipped marine radio suitable for your area of operations and the 406 MHz satellite EPIRB. If you use GMDSS systems voluntarily, training is not required but is highly recommended.

## Digital Selective Calling (DSC)

DSC-equipped marine radios are used for routine communications and for transmitting, acknowledging, and relaying distress alerts. DSC allows a specific station to be contacted and indicates the method and channel on which to reply. It can also make “all ships” calls. Follow-up communications are made on an appropriate non-DSC frequency. DSC radio users need to understand the basic operation of the radio, how DSC acts as an automated watch, the importance of registering the radio identity and keeping it on and tuned to the DSC channel. DSC is on channel 70 VHF and on the frequency 2187.5 kHz MF. There are DSC calling channels in each HF band.

## Satellite EPIRBs

One of the most useful GMDSS systems is the satellite EPIRB, a small device designed for automated transmission of distress alerts. The 406 MHz satellite EPIRB (which is far superior to the 121.5 MHz EPIRB) is a newer and more reliable device designed to provide rapid alerting, identification, and accurate location information to search and rescue authorities.

## Inmarsat

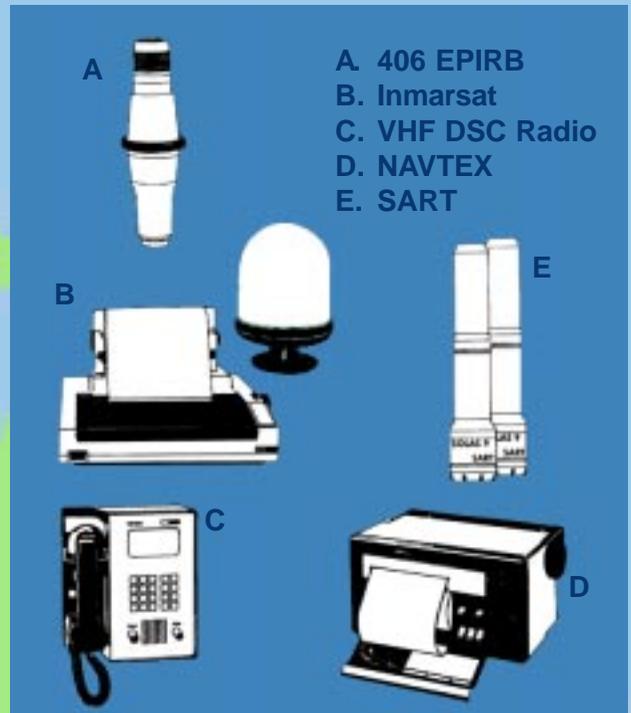
The International Mobile Satellite Organization (Inmarsat) operates a global satellite network which provides high quality voice and data services for ships at sea. Shipboard Inmarsat terminals (A, B, or C) are formally accepted for the use of GMDSS. These terminals come in a variety of sizes, weights, and costs so that Inmarsat is feasible for use on smaller vessels.

## Equipment with safety in mind

Other elements of the GMDSS that small vessels should be aware of include:

- The coastal NAVTEX broadcast system provides marine weather forecasts, navigation warnings, and search and rescue alerts.
- High seas SafetyNET broadcast system (delivered by the Inmarsat-C system) provides information similar to NAVTEX, but to vessels on the high seas.
- The Search and Rescue Transponder (SART) for life rafts is used to aid in the location of survivors by enhancing the radar visibility of small targets.

Global Positioning System (GPS) receivers should be interconnected with DSC radios and Inmarsat terminals to transmit an automatic distress alert including an accurate position.



## Ocean area coverage

**Area A1** Covered by VHF coast radio stations providing DSC alerting services (typically 20 NM from the coast).

**Area A2** Covered by MF coast radio stations providing continuous DSC alerting (typically about 100 NM from the coast).

**Area A3** Covered by the Inmarsat geostationary satellites (typically global coverage from about 70N to 70S latitude) or DSC HF radio.

**Area A4** For those outside the other areas (only required for vessels sailing in the polar regions out of Inmarsat satellite coverage). Served by DSC HF radio.

## Safety in action. . . Hope for Help in Hostile Seas

What began as a routine day for fishermen working the unpredictable winter waters off the coast of Nantucket, Massachusetts, quickly turned into an event destined for disaster. Late in the evening of January 17, 1997, the vessel **COMMODORE** was fishing south of Nantucket Island with a

crew of six on board. They suddenly lost all electrical power and began to take on water in

heavy seas. Unable to control the flooding, the six person crew of the **COMMODORE** was forced to abandon ship into their life raft in 15 to 20 foot seas with a water temperature of 42

degrees. The crew was very fortunate in that the boat was equipped with a 406 MHz EPIRB. The master activated the EPIRB and took it with him when he joined his crew on the life raft, just before the **COMMODORE** sank. Soon after midnight the U.S. Coast Guard Rescue Coordination Center



(RCC) in Boston received notification of the EPIRB distress alert through the Cospas-Sarsat satellite rescue system. The RCC was able to identify the **COMMODORE** as the source of the signal, and they made contact with the vessel's owner, who stated its planned location. The U.S.



Coast Guard responded quickly by launching an HU-25 fixed-wing aircraft and an HH-60 helicopter from Cape Cod, MA, and a C-130 fixed-wing aircraft from Elizabeth

City, NC. The Canadian Coast Guard diverted their rescue vessel **TERRA NOVA** to assist, joining the U.S. Coast Guard Cutter **SPENCER**. The U.S. Coast Guard HH-60 helicopter arrived on scene and, fighting fierce winds, hoisted all six crewmembers on board and transported them to U.S. Coast Guard Air Station Cape Cod, where they received medical attention and were released in good health.



This information bulletin has been endorsed by the National GMDSS Implementation Task Force, a U.S. Coast Guard sponsored group established to coordinate implementation problems and assist in disseminating GMDSS information.

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**Also, visit our Web site for more information on GMDSS:**

<http://www.navcen.uscg.mil/marcomms/marcomms.htm>

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