

# *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

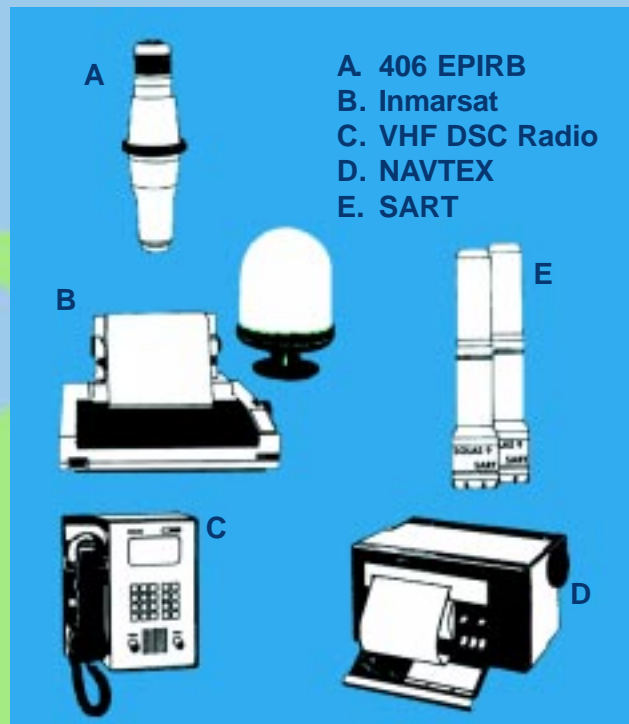
The International Mobile Satellite Organization (Inmarsat) operates a global satellite network which provides high quality voice and data services for ships at sea. Shipboard Inmarsat terminals (A, B, or C) are formally accepted for the use of GMDSS. These terminals come in a variety of sizes, weights,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



On August 7, 1997, 63 year-old Antonio Collado left New York on his first transatlantic voyage. He was heading for Spain via the Azores in a 28 foot sailing vessel FINAL CALL. Before leaving on his journey, Mr. Collado filed a float plan with his family and equipped his boat with a 406 MHz EPIRB.

One week into the voyage, the vessel FINAL CALL encountered rough seas. Although Mr. Collado had considerable experience sailing along the coast and in lakes, he was rather inexperienced in ocean sailing. During the early morning hours of August 18, after experiencing rough seas for three days, the vessel began to take on water. Unable to locate the source of the flooding and unable to keep ahead of the incoming water, Mr. Collado was forced to abandon the vessel. He quickly donned a winter jacket and a lifejacket. After manually activating his 406 MHz EPIRB, he swiftly tied it to his



arm and entered the life raft. The vessel sank shortly thereafter.

Early that same morning, the U.S. Coast Guard Rescue Coordination Center (RCC) Boston received notification of the EPIRB distress alert through the Cospas-Sarsat satellite rescue system. The RCC was able to identify the FINAL CALL as the source of the signal, and made contact with Mr. Collado's family, who relayed his travel plans.



The U.S. Coast Guard responded quickly by launching an HU-25 fixed-wing aircraft and an HH-60 helicopter from Cape Cod, MA.

A C-130 fixed-wing aircraft launched from Elizabeth City, NC for cover. The HU-25 was the first to locate the life raft. The HH-60 helicopter arrived moments later, hoisted Mr. Collado on board and transported him to U.S. Coast Guard Air Station Cape Cod. There he received a medical evaluation and was 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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