

Digital Selective Calling (DSC) - An Underutilized Maritime Distress Alerting Option

Question

What is this red **Distress** button for on my marine radio and how does it work?



Photo Credit: ICOM America

Short Answer

The Digital Selective Calling (DSC) distress alert button.

When pressed, this button sends a digital distress alert to vessels and coast stations within range of the distress alert signal **if** the radio is properly programmed with a Maritime Mobile Service Identity (MMSI)¹ number and Global Positioning System (GPS) input. The alert provides vessels and coast stations within range with the identity and location of the vessel in distress. The DSC protocol enables shore stations to recognize that there's a distress situation and establish voice communications with the alerting vessel.

Owners/operators should check to ensure that their DSC equipped radio is properly configured with both the MMSI number and GPS input before using this button. If it is not properly programmed, search and rescue (SAR) responders will not know who is in distress, nor where to find you. Many new VHF radios include an integral GPS receiver. If you have a choice, purchase a radio that includes an internal GPS. Otherwise, you will need to connect the radio to an external GPS receiver in order for the distress alerts to include a position.

Information regarding MMSIs and how to obtain a number can be found at: USCG NAVCEN (<https://www.navcen.uscg.gov/maritime-mobile-service-identity>) and FCC - Maritime Mobile (<https://www.fcc.gov/wireless/bureau-divisions/mobility-division/maritime-mobile/ship-radio-stations/maritime-mobile>).

Background and Discussion

Issue

Every day, vessels equipped with DSC marine Very High Frequency (VHF) and/or Medium Frequency/High Frequency (MF/HF) radios leave U.S. ports and sail seaward of the boundary line² without their DSC functions properly configured to provide immediate identification and precise location

¹ The MMSI is a nine-digit number assigned to a vessel for identification in DSC and Automatic Identification Systems (AIS) equipment.

² 46 CFR § 7.5 (c) Except as otherwise described in this part, Boundary Lines are lines drawn following the general trend of the seaward, highwater shorelines and lines continuing the general trend of the seaward, highwater shorelines across entrances to small bays, inlets and rivers.

Digital Selective Calling (DSC) - An Underutilized Maritime Distress Alerting Option

of the vessel in distress to U.S. Coast Guard watchstanders and surrounding vessels who may be able to assist.

Some of these vessels are required to carry and properly configure VHF and MF/HF radios with DSC capability, while others carry them voluntarily. In either case, the failure to understand, properly configure, and utilize the DSC equipment could potentially be devastating.

Digital Selective Calling (DSC)

DSC provides an immediate means of transmitting a distress alert signal from a vessel in distress to other vessels and coast stations within range of the DSC distress alert signal.

The International Maritime Organization (IMO) introduced DSC as a required function on VHF, MF and HF maritime radios as part of the Global Maritime Distress and Safety System (GMDSS) requirements. It was intended to reduce the need for persons on board ships or shoreside maritime stations to maintain a continuous listening watch on voice radio distress and emergency channels or frequencies. Distress calls would be automatically received through DSC equipped radios on vessels and coast stations within range.

It was also intended that all ships subject to the International Convention for the Safety of Life at Sea (SOLAS) be equipped with DSC radios capable of sending a distress alert ashore from all areas of operation while at sea. This meant that depending on the ship size/class and operating areas, it would be equipped with a VHF DSC radio (for vessels near shore), MF DSC radio (for vessels farther from shore) and HF DSC Marine radio (for vessel's farthest from shore in open ocean) capable of sending distress alerts to coast stations with DSC capabilities.

Because GMDSS equipped vessels would no longer be required to monitor voice emergency marine channels like VHF Ch 16³ and 2182 kHz, the U.S. Coast Guard requested that the Federal Communications Commission (FCC) order all type-accepted marine radios sold or installed on U.S. vessels on or after June 17, 1999, to have DSC capabilities. This meant that every new marine VHF and MF/HF radio installed aboard a vessel in the U.S. after 1999 would be DSC capable.

DSC equipped radios have a **RED** button used to send out a distress alert and only requires two data inputs to provide search and rescue (SAR) responders information needed to respond quickly and adequately to a vessel in distress: (1) the station's MMSI number, and (2) the position input from either an external GPS or built-in GPS receiver.

Once initiated, a DSC distress alert on VHF is repeated automatically at intervals of approximately every 4 minutes until it is either acknowledged or stopped manually.

Discussion

Marine DSC VHF radios are very common onboard many types of vessels, both recreational and commercial. They can offer a reliable means of sending and receiving distress alerts and location signals

³ Note: Voice listening watch on 2182 kHz ended Feb. 1, 1999. However, listening watch on VHF Ch. 16 is still required today.

Digital Selective Calling (DSC) - An Underutilized Maritime Distress Alerting Option

for search and rescue (SAR) responders and vessels in the area if the transmitting radio is properly configured with an MMSI and GPS input.

Considering certain vessels are not allowed to leave port or safe harbor to sail in the open ocean without an Emergency Position-Indicating Radio Beacon (EPIRB) or any other required lifesaving equipment, a properly configured DSC radio should receive the same level of attention as a critical piece of the vessel's lifesaving equipment. DSC provides an additional means of alerting the SAR authorities of a distress situation from a piece of equipment that is typically already on board and utilized every day. It only takes a few minutes to configure and routinely verify the DSC radio functionality prior to sailing and affords an extra layer of protection for the mariners and other personnel onboard.

EPIRBs, while very effective and reliable even in adverse weather conditions, relay their transmission through satellites, then to a Land User Terminal (LUT), then finally to a Rescue Coordination Center (RCC) who can issue radio broadcasts to be on the lookout and assist the distressed vessel in the affected area and launch assets to the distress location. Alternatively, a VHF DSC distress signal is received by all DSC VHF radios within range, in addition to the receiving shore station. This means that all VHF DSC equipped vessels and coast stations within range will receive the distress signal (which would include a precise location of the vessel in distress if properly configured) immediately without need for relay. The same applies for those vessels and coast stations equipped with MF/HF DSC equipped marine radios.

There are some newer models of EPIRBs which incorporate an Automatic Identification System (AIS) alert in addition to the traditional satellite notifications. These EPIRBs also notify nearby vessels in VHF range (not MF or HF frequencies) similar to a DSC radio and offer a great upgrade option for mariners wanting the most coverage possible. However, this is not a feature of a large portion of existing units and each operator should be familiar with the equipment onboard their vessel.

EPIRBs remain a very valuable tool for effectively sending a distress alert to RCCs ashore and supplements DSC on vessels that require the carriage of EPIRBs. They are still recommended for all vessel voyages offshore.

According to NOAA's Search and Rescue Satellite-Aided Tracking (SARSAT) office (<https://www.sarsat.noaa.gov/preventing-false-alerts/>), 98% of all EPIRB, Emergency Locator Transmitter (ELT) and Personal Locating Beacon (PLB) activations are false alerts. This puts extreme workload on watchstanders because the receiving RCC must investigate and confirm each EPIRB alert received. However, if the RCC receives a distress alert from another system such as DSC in conjunction with the EPIRB alert, it would signify validity of the EPIRB alert due to correlating signals indicating a true distress situation and resources could potentially be deployed sooner.

U.S. Coast Guard Radio Listening Watches

The U.S. Coast Guard published [Marine Safety Alert 06-13](#) in 2013 notifying the public that the Coast Guard terminated radio watch on voice and DSC frequencies on the 2 MHz MF band. However, the Coast Guard will continue voice watch on VHF Channel 16 (156.8 MHz), DSC watch on channel 70 on VHF, and DSC watch on 4/6/8/12 MHz HF bands. The Coast Guard does continue to monitor HF voice frequencies

Digital Selective Calling (DSC) - An Underutilized Maritime Distress Alerting Option

in Alaska and Guam. More information is provided at the NAVCEN webpage at <https://www.navcen.uscg.gov/hf-distress-uscg-contact-frequencies>.



The Coast Guard later published [Marine Safety Information Bulletin \(MSIB\) 10-21](#) stating the cessation of monitoring all HF voice distress frequencies within the contiguous United States and Hawaii, effective Feb. 7, 2022, but the DSC watch on all HF distress and safety DSC frequencies would continue at all locations.

The Coast Guard's Rescue 21 program provides VHF DSC coverage along 90% of the U.S. Coast, approximately 20 nautical miles out, according to NAVCEN's website: Rescue 21 Distress System Coverage (<https://www.navcen.uscg.gov/rescue-21-distress-system-coverage>).

The Coast Guard has published several Alerts and MSIBs regarding DSC equipment being properly installed and configured. Additional information and resource links regarding the use and testing of DSC equipment are available at NAVCEN's website (<https://www.navcen.uscg.gov/maritime-telecommunications>).

Recent Incident Reports recommending the use of DSC Alerting

There have been several incidents that DSC has been mentioned as a recommendation that could have helped in response. Here are a few of them.

- **Fishing Vessel *Scandies Rose*:** [Coast Guard Report of Investigations #6881487 Sinking and Loss of the Commercial Fishing Vessel SCANDIES ROSE](#), "Recommendation 10: Recommend that the Commandant of the Coast Guard promote the use of a properly installed and configured Digital Selective Calling feature on marine VHF radios throughout the maritime regions of the U.S. aboard all vessels, as this will enhance the saving of life and property and the potential timeliness of rescue in marine emergencies."
- **Seacor Power:** [Coast Guard Report of Investigation #7175076 "The Capsizing of the Commercial Liftboat SEACOR POWER](#), "Recommendation 19: The Commandant should create a

Digital Selective Calling (DSC) - An Underutilized Maritime Distress Alerting Option

campaign to educate vessel owners, operators, and crew members on Digital Selective Calling (DSC) procedures and benefits.”

- **MSC Rita and Fishing Vessel Tremont:** In the [NTSB Report MIR-23-27](#), Released Dec 18, 2023, **Collision between Containership MSC Rita and Fishing Vessel Tremont**, the NTSB report emphasized the use of DSC on modern VHF radios.

Conclusion

A properly installed and programmed DSC equipped marine radio could be used to provide a reliable means of immediate notification of a distress situation to the Coast Guard and other vessels within range of the DSC alert and provide the identification and location of the distressed vessel. In fact, on many vessels it is a required piece of safety equipment. Even for those vessels which are not required to carry an EPIRB, a properly installed and programmed DSC marine VHF can be used as a reliable means of sending distress alerts ashore to the Coast Guard.

Having two separate and independent means of sending a distress alert ashore would improve the chances of at least one alert reaching shore. Plus, if both alerts are received by the Coast Guard, it would validate to the watchstander that an emergency does exist and the location of that emergency, rather than having to verify that it is not a false alert.

Most commercial vessels in the U.S. fleet are required to carry DSC equipped marine radios based on their size/class and voyages away from shore: VHF DSC equipped radios for inland and near shore, and MF/HF DSC equipped radios for vessels operating farther offshore and in open ocean. Check the Coast Guard’s NAVCEN website (<https://www.navcen.uscg.gov/digital-selective-calling>) for information regarding the locations of U.S. Coast Stations with DSC capabilities.

The DSC function has been around for many years; however, the critical importance and full capabilities of the DSC system’s use has not been fully embraced by the maritime community.

Remember, timely distress alerting initiates timely response and will saves lives.



Eric P. Verdin
1600/3000 ITC Master Oceans
GMDSS Operator/Maintainer
CG OSV Marine Inspector
OCS NCOE