

## Digital Selective Calling Remains Largely Untapped

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**Most new models of fixed mount VHF radios on the market now come with a little red “Distress” button and a lot of hoopla about being “DSC compliant.”** Digital Selective Calling is being touted as the next great step in marine safety and a huge advance in convenience and communication effectiveness. The problem with DSC on marine VHF is that for many owners, currently it’s not very useful.

The VHF selective calling feature does work for those users, like many commercial fishermen, who build a directory of other vessels with which they wish to have exclusive communication. And DSC in MF/HF (single-sideband) is a workable safety technology for those operators who can afford the more expensive equipment. More on these points later. But for most users DSC hasn’t yet lived up to its potential.

DSC has been used in Europe since the 1970s. In 1992 it became part of an international marine safety system called Global Maritime Distress and Safety System (GMDSS), developed to improve the effectiveness of distress calling and monitoring. Commercial fishing, recreational, and small passenger vessels generally are exempt from GMDSS equipment requirements, but DSC technology is adaptable to inexpensive VHF radios and is required on all newly approved fixed-mount radios since June of 1999. The Coast Guard has declared that, eventually, it will incorporate DSC into its emergency response system, so the electronics industry has embraced it.

### What DSC Can Do

**A DSC-equipped radio can transmit short bursts of digital code.** Most applications of this capability are used only on the dedicated frequency, VHF Channel 70. Theoretically this digital code transmission could be used in at least three different ways:

1. The radio can generate an emergency message that can be received by Coast Guard or commercial shore stations, or by other DSC-equipped

vessel radios. The message includes an alert (equivalent to calling “Mayday”), and carries an ID code that identifies the calling vessel. If the transmitter is interfaced with a Loran or GPS, the message will include vessel position. The operator can include a code that indicates the nature of the distress.

2. The radio can be programmed to call one or a group of other specific DSC-equipped radios, essentially contacting them and instructing them to switch to a pre-selected working channel. This signal also goes out on Ch. 70. No radios other than the ones dialed up will receive the contact call, although anyone monitoring the working channel will be able to hear any conversation that ensues, unless the transmitting stations use voice scramblers.
3. Using the calling function above, the transmitter can contact a DSC-equipped public correspondence (marine operator) system and place a direct-dial telephone call without going through a live operator.

### What DSC Currently Does and Doesn’t Do

**No U.S. Coast Guard shore station is equipped to receive and respond to a DSC-generated VHF distress signal.** The Coast Guard is saying it will be at least 2005 before full implementation, as part of the National Distress and Response System Modernization Project. Some Coast Guard vessels are DSC equipped; aircraft are not.

In British Columbia, the Canadian Coast Guard has two shore stations—Tofino and Victoria—with working DSC, and two more scheduled for activation by late 2001, those being at Comox and Vancouver Harbor. Each site controls from two to twelve remote transceivers. However, virtually the entire coast north of Vancouver Island won’t

be served until Prince Rupert comes on line in 2003. When that process is complete, the Canadian Coast Guard will provide DSC area A-1 (at least 20 miles and as much as 40 miles off shore) emergency coverage from southern Southeast Alaska to southern Washington state.

Although U.S. Coast Guard coastal stations aren’t equipped to handle DSC emergency calls, all other DSC-equipped radios within VHF signal range will receive a DSC emergency message. If your radio is properly registered and interfaced with a GPS, you may get help from another vessel if you trigger the Distress button.

Currently no marine telephone operator service on the West Coast is equipped to handle DSC-generated calls. MariTel has public correspondence stations operating on the East Coast and has purchased FCC broadcast licenses for coastal stations around the country. The company plans to offer public correspondence service on the West Coast in the future.

### Calling Other Vessels

**The one DSC function that fishermen like is the ability to hail selected other vessels.** To contact another DSC radio, the operator programs in the Maritime Mobile Service Identity (MMSI) number of the other and pushes the “call” button; the designated receiving radio responds and shifts to the pre-selected working channel. Fishermen add voice scramblers to keep their conversations private.

What if you don’t know the MMSI of the vessel you want to call? Some DSC radios have an All Ships call (routine) function. The operator of the vessel placing a non-emergency call chooses among three options: Urgency, Safety, or Routine and then sends the digital alerting signal, again over Ch. 70. If it is an Urgency or Safety call, all receiving radios sound an alarm and then automatically switch to Ch. 16. If the caller designates the call Routine, receiving radios then automatically switch to the

caller-selected working channel. In an area with many vessels, an All Ships call would take momentary control of perhaps dozens of radios, many of which might be at that moment engaged in other uses. That's why it is illegal to use All Ships for routine calls.

Some radios also have a Geographical Call function, similar to All Ships, except that it only contacts radios whose GPS interface indicates they are within a designated geographical area.

Unless the operator uses the programmable functions frequently, it takes some time to look up instructions in the owner's manual, and some skippers say using them is too much trouble. Even a distress call requires as many as five steps to complete, which could dissuade someone from using the capability in a panic situation. The option remains to use Ch. 16 for distress calls and the hailing channels 16 and 9 for calling other vessels, and that's probably what most owners will continue to do into the foreseeable future. However, after Feb. 1, 2005 most classes of ships will cease to monitor Ch. 16. The Coast Guard is mandated to monitor Ch. 16 until Feb. 2005, and says it plans to continue monitoring Ch. 16 for many years after full implementation of DSC emergency service.

It is legal to use the All Ships call for a safety or urgent call, and it should continue to be possible to reach any seagoing ship on the bridge-to-bridge frequency, which is Ch. 13.

## Bells and Whistles

**Once you put a microchip into a radio, there's almost no limit to the features it can include,** and the radio makers are fully exploiting this potential. Mid-range DSC units include built-in loud hailer and automated fog signal capabilities, screens for displaying navigation information, weather alert and other alarm tones, scrollable memory for storing MMSIs and land-line phone numbers, dual watch, distress and individual call waiting directories, voice scramblers, intercoms, and of course data inputs from navigation equipment.

One interesting feature is called "position polling" or "position request." One radio can be programmed to contact a selected other radio and ask it that vessel's position. The other radio will reply with the Loran or GPS-generated position information (assuming it is connected to a receiver) and the calling set will display the called set's position on its screen. Of course, there's also a position-polling disable function that pre-

vents your radio from giving away your position to someone else if you don't want it to.

Members of fishing code groups like the high end (\$1,500) Ross DSC500 due to features that include a 100-call library (directory) which allows storage of up to 100 MMSIs with vessel and owner names, and indicates on screen the names and numbers of the vessels calling in. It also has a DSC-initiated voice scrambler capability. Other companies are selling DSC units with fewer features for under \$200.

## MF/HF

**Although Coast Guard shore stations are not DSC compliant on VHF, they are on MF/HF (single-sideband).** Coast Guard communications stations at Kodiak, San Francisco, and Honolulu currently are DSC operational. Canadian stations in British Columbia are not.

The digital calling and emergency frequency on MF is 2,187.5 kHz, very close to the 2,182 kHz long in use as the emergency frequency, but now phased out under international agreement. (Note, the 2,182 kHz "alarm generator" feature on some lower-priced SSB radios is not a DSC alert.) The official effective range of this area A-2 coverage is about 200 miles, although in reality the signal may carry much farther. There are also HF emergency frequencies in the 4, 6, 8, 12, and 16 megahertz bands.

One problem with DSC on MF/HF is that emergency transmissions can be relayed from one station to another, which means that the same distress signal may be picked up by numerous stations over thousands of miles. This has the potential of causing a lot of work for rescue coordination centers, and making it more difficult to pinpoint the position of the calling vessel.

The other problem is that, so far, single-sideband radio sets with DSC capability have been GMDSS compliant and fairly pricey. Familiar brands (SEA, Furuno, Icom) list at around \$6,000 with coupler and associated components. Manufacturers reportedly are coming out with lower priced models with most of the DSC features.

## MMSI

**To achieve benefit from DSC, your radio must be registered with the FCC.** Registration provides the MMSI that the owner programs into the radio, which serves essentially as a "phone number" that other vessels can dial up on their keypads. Registration also files information on the vessel and operator with

the National Distress Database. When a vessel issues a distress call the signal identifies the vessel and the Coast Guard accesses the database for that information and then makes "pre-coms" by calling the home number of the owner and the harbor master in the vessel's home port. As with 406 EPIRB registration, this information helps the Coast Guard to determine whether it is a false alarm before committing lives and equipment to a search. Registration can be done when applying for, or by modifying, an FCC marine mobile station license, if required. A recreational boaters group, BOAT/US, offers free MMSI registration to members and non-members through their Web site ([www.Boat/US.com](http://www.Boat/US.com)), both online and with a down loadable fax form. Both Maritel and West Marine have also signed agreements to do the same thing.

