



DSC (Digital Selective Calling): More Than Just an Emergency Solution

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What I'll Cover ...

- What is DSC and how it works
- What is needed for DSC to work for you
- US Coast Guard and Rescue 21 support for DSC
- Basic setup steps
- Typical usage scenarios & demos
 - Emergencies
 - Hailing other DSC users using your VHF radio
 - Tracking other vessels
- Next steps
- Questions

What Is DSC?

- DSC = Digital Selective Calling
- MMSI = Maritime Mobile Service Identity number
 - Your unique registered “phone number” for your vessel
 - When you register to get an MMSI number you provide info on your vessel and emergency contact info
 - Same MMSI can be used for DSC and AIS
- DSC is feature built into all modern VHF radios (& some MF/HF)
- First rolled out as a SOLAS requirement on February 1, 1999
- Uses channel 70 for digital calling / messages
- Can be used for hailing and position polling
 - But you still converse using the normal radio channels
- When set up correctly allows the VHF radio operator to also make an automated emergency call that sends:
 - Your MMSI number
 - Your position (requires GPS connected to radio or manual input)
 - The nature of your emergency
- Any radio that is DSC enabled can receive your DSC calls
 - Usual VHF range (i.e. 20+ miles)

What is needed for DSC to work?

- A VHF radio that supports DSC functionality
 - Multiple types of DSC radios
- An MMSI number
 - From FCC (\$160) or BoatUS, SeaTow, US Power Squadron (free)
 - FCC license required for international use
 - MMSI number needs to be programmed into each radio
 - Consider getting multiple MMSI numbers
 - FCC for the “mother ship”: programmed into main VHF radio, AIS transponder
 - BoatUS or other free MMSI for your tender and a portable handheld VHF
 - This allows you to call & track your tender via DSC
- A GPS attached to the radio providing position information
 - Can be integrated into radio e.g. some handhelds
 - Can be a connection to a chartplotter or NMEA/serial GPS using the NMEA input wires on the radio or NMEA 2000
 - GPS position can be input manually if necessary



USCG DSC Support

U.S. Department of
Homeland Security
**United States
Coast Guard**

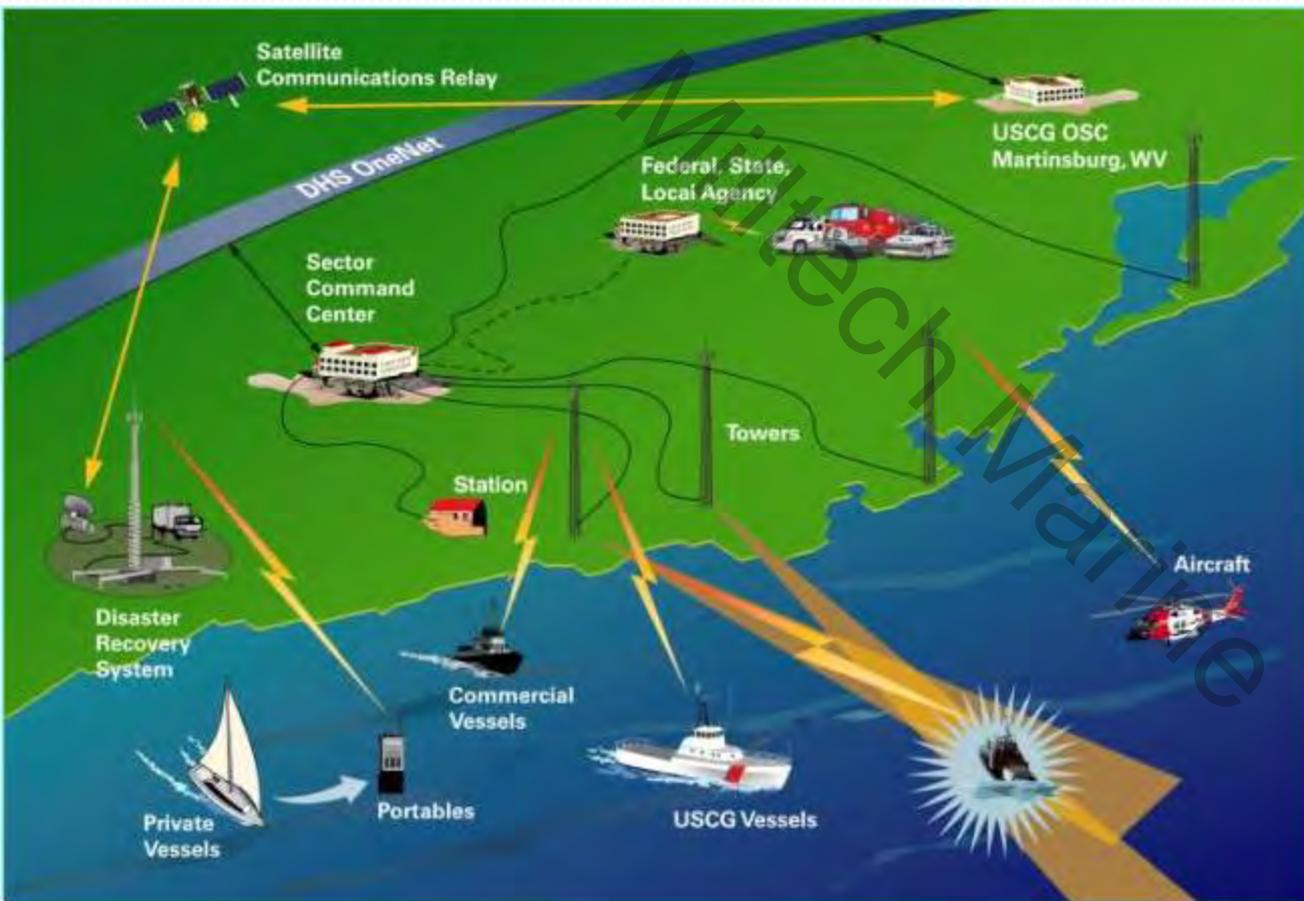


- DSC part of the Global Marine Distress Signaling System or GMDSS
 - Governed by the international SOLAS treaty
 - Mandated for use on commercial vessels, recreational use is voluntary
- DSC used worldwide and adopted by most nations for rescue assistance
- Rescue 21 is the official USCG CCC system for rescue & distress response
- US Coast Guard started deploying Rescue 21 in 2005 with goal of total coastal, great lakes, US islands & major river coverage
- Over 41,000 miles of coastline coverage
- If you initiate an emergency DSC call, the Coast Guard will receive it (if in range) and acknowledge your call
 - Direction finding technology even if you don't have DSC
- Digital call allows USCG to know who you are, where you are, nature of distress
- Follow up communications via voice call or allows you to tend to the emergency
- Check out <http://www.uscg.mil/acquisition/rescue21/benefits.asp>



***“UNDER NO CIRCUMSTANCES SHALL A DSC DISTRESS ALERT
BE SENT TO TEST YOUR RADIO. IT IS A VIOLATION OF THE
RULES AND CAN RESULT IN HEAVY FINES.”***

Rescue 21 - Major Components



- **Remote Fixed Facilities (Hundreds of towers)**
- **DHS OneNet Interface**
- **Sector Command Center Equipment**
- **Station Equipment**
- **Operations System Center Equipment**
- **Vessel Radios**
- **Disaster Recovery Systems (DRS)**

Slide courtesy of USCG

Basic steps to setup DSC radio

1. Make sure your VHF radio supports DSC
2. Get an MMSI number if you don't have one
3. Enter your MMSI number into your radio using the radio's setup program (make sure it is right!)
4. Connect a GPS source to the radio and make sure the radio has a valid GPS position (NMEA 0183/2000)
5. Get your friends' MMSI numbers (and make sure they setup their radios as well)
6. Enter your friends' names and MMSI numbers into your radio's DSC directory
 - And the Coast Guard (USCG Puget Sound 003669938)

How DSC can be used?

1. Emergency VHF calls using the “big red button”
2. Calling known DSC stations listening on VHF
 - E.g. US Coast Guard Puget Sound = MMSI 003669938
3. Hailing buddy boats (they also need a DSC radio and an MMSI)
 - Alleviates the need to use channel 16 for hailing
4. Group calls
 - E.g. call all the vessels in your club
5. Getting the GPS position of another buddy boat
 - Can request the position of another DSC vessel
 - Remote vessel can accept or reject call (manual or automatic)
 - Then use that position as a waypoint
 - With DSC-enabled chartplotter or nav program remote vessel shows up on the chart
 - Can even “auto poll” another vessel and automatically plot their track
 - Can also send your position to another DSC radio

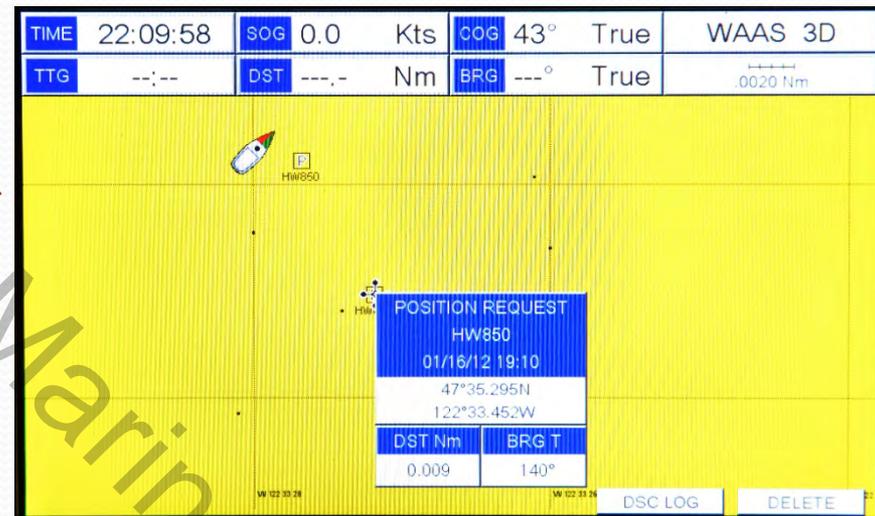
Typical DSC Setup

VHF DSC Radio & Chartplotter

Chartplotter with DSC support



Plotter with DSC position display

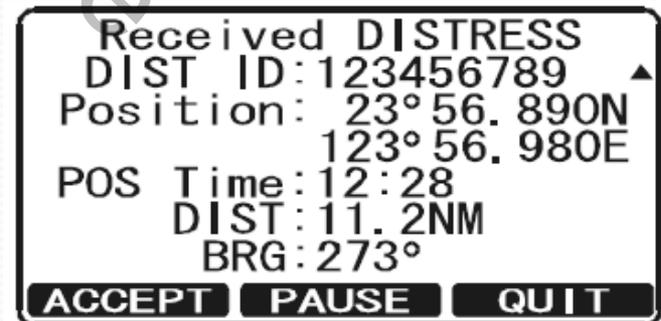


DSC NMEA to plotter

GPS NMEA to VHF

VHF Antenna to VHF radio

VHF DSC radio



Radio DSC distress call display

Example: Emergency distress call

1. Push and hold RED button
2. Input nature of emergency
3. Follow up with standard voice distress call on Channel 16
4. All DSC calls logged by all receiving stations
5. Let your DSC radio do its thing while you deal with your emergency

```
!DISTRESS ALERT!  
Nature of:Undesignate  
Position: 23° 56.890N  
          123° 56.980E  
POS Time: 12:28  
  
Time for 3sec  
[NATURE] [POS/TM] [QUIT]
```

```
!NATURE OF!  
UNDESIGNATE  
Fire  
Flooding  
Collision  
Grounding  
Capsizing  
[SELECT] [QUIT]
```

```
!DISTRESS ALERT!  
Nature of:Undesignate  
Position: 23° 56.890N  
          123° 56.980E  
POS Time: 12:28  
  
Time for 3sec
```

```
!DISTRESS ALERT!  
Nature of:Undesignate  
Position: 23° 56.890N  
          123° 56.980E  
POS Time: 12:28  
  
Transmitting
```

```
!DISTRESS ALERT!  
Nature of:Undesignate  
Position: 23° 56.890N  
          123° 56.980E  
POS Time: 12:28  
TX in: 02:25  
Wait for ACK  
[PAUSE] [CANCEL]
```

```
!DISTRESS ALERT!  
Received Acknowledged  
Name:USCG  
ID:001234567  
  
Since: 00:15  
[OK]
```

Example: Calling a buddy

1. Push the CALL button
2. Select buddy
3. Select channel
4. Initiate call
5. Wait for ACK
6. Radio will switch to channel
7. Talk when clear

```
-DSC Menu-  
INDIVIDUAL  
Group  
All Ships  
POS Request  
POS Report  
Auto POS Polling  
SELECT QUIT
```

```
-Individual Call-  
HORIZON  
BOB  
USCG  
VERTEX 2  
Standard  
Sun Lead  
SELECT NEW ID QUIT
```

```
-Select Intership CH.  
06  
08  
09  
10  
13  
14  
SELECT MANUAL QUIT
```

```
-Individual Call-  
Name:HORIZON  
ID:123456789  
Category:Routine  
CH: 06  
Transmit?  
YES QUIT
```

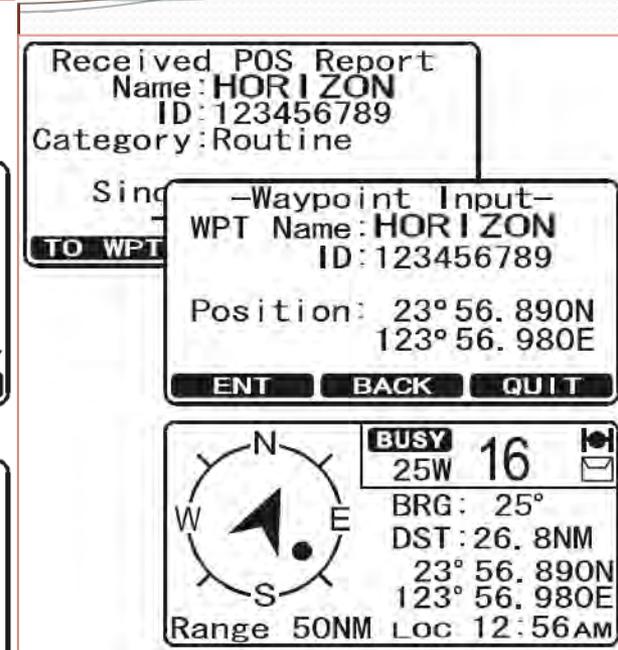
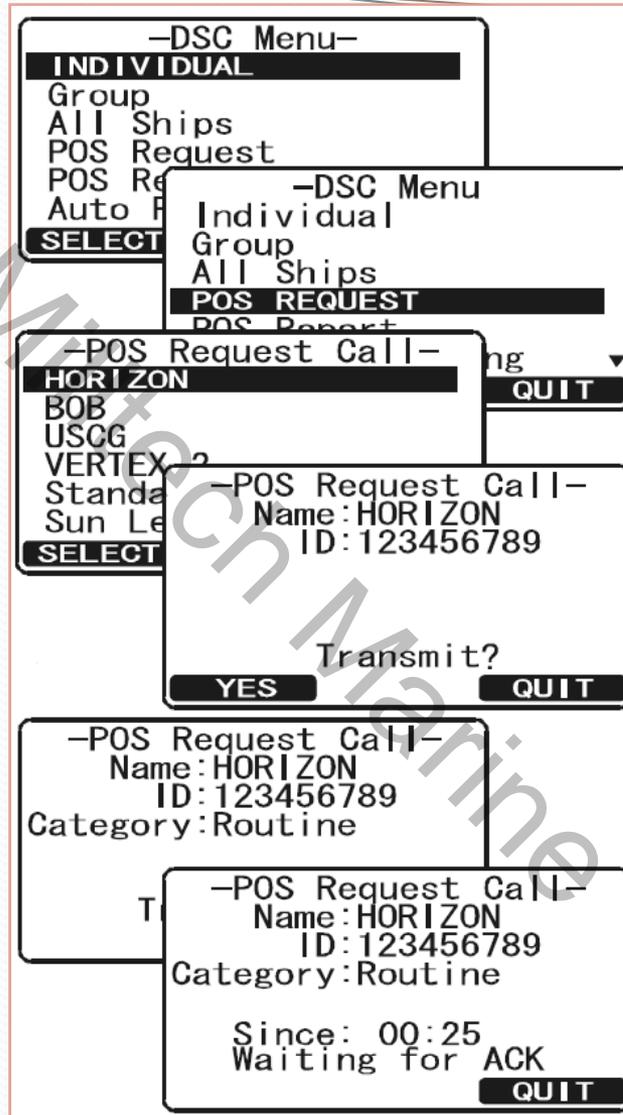
```
-Individual Call-  
Name:HORIZON  
ID:123456789  
Category:Routine  
CH: 06  
Transmitting
```

```
-Individual Call-  
Name:HORIZON  
ID:123456789  
Category:Routine  
CH: 06  
Since: 00:25  
Waiting for ACK  
QUIT
```

Example:

Position Request

1. Auto reply on?
2. Push CALL button
3. POS REQUEST
4. Select buddy
5. Transmit
6. Wait for ACK
7. Position can be used as a waypoint
8. Can even auto-poll up to 4 stations



Or on plotter....



Or on a computer nav program....

Next steps

- What to do tomorrow?
 - Check to see if you already have DSC-capable radios.
- What to do over the next month?
 - Get your MMSI(s) if you don't already have one (or two).
 - Look at your other gear and see if these are DSC compatible.
- What to do before your next major cruise?
 - Make sure you have at least one DSC radio
 - Make sure all DSC equipment is properly programmed with the appropriate MMSI
 - Make sure DSC equipment is integrated properly especially GPS
 - Program your buddies into your DSC radio directories

More info...

- <http://www.uscg.mil/acquisition/rescue21/benefits.asp>
- http://en.wikipedia.org/wiki/Digital_Selective_Calling
- <http://www.boatus.com/mmsi>
- <http://www.boatus.com/foundation/dsc/player.html>

Questions?



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Thank you!

And special thanks to Standard Horizon for demo equipment!!!