

The Seminar will start
at 2100z

*That is
2 PM for non-Sailors*



**** GMDSS and DSC ****
Made Simple for Cruisers

for Enseñada Cruisers



By
TL Sparks

Terry Sparks

- ✓ Over 40 years in Communications
- ✓ Bachelor of Science in Electrical Engineering
- ✓ Past Chief Engineer of TV Station - KVEW
- ✓ Retired Navy Commander
- ✓ Retired Power Engineering Company - ABB

- ✓ General Class Radio Telephone License with Radar Endorsement
- ✓ Global Maritime Distress and Safety System Maintainer License
- ✓ Amateur Extra Ham License & VE (AD7XL)
- ✓ Navy MARS Qualified Operator (NNN0AYM)
- ✓ Ships License (WDA 5497)
- ✓ VHF and HF SSB Phone Number/MMSI: 366820740

Overview

- GMDSS History
- GMDSS Functions and Equipment
- GMDSS Compliance
- US Coast Guard & GMDSS
- GMDSS, DSC, and You
- Search and Rescue in Mexico
- Recommendations

GMDSS History

GMDSS History

- In 1844 ships relied on Morse code, invented by Samuel Morse.
- The Titanic sinking, in 1912, made the industry aware of the value of Morse code at sea.
- The U.S. Congress enacted legislation, requiring U.S. ships to use Morse code radiotelegraph equipment for distress calls.

GMDSS History

- The International Telecommunications Union (ITU) (now a United Nations group) followed suit for ships of all nations.
 - ❑ Required skilled operator Listening for hours at a time
 - ❑ Limited range on the medium frequency (MF) distress band (500 kHz)
 - ❑ Limited amount of traffic via Morse.
 - ❑ Morse distress calling has saved thousands of lives.

GMDSS History

- Stations used long-range communications on HF bands
 - ❑ 3–30 MHz
 - ❑ Radio telegrams

- Worldwide communications with ships
 - ❑ Portishead Radio
 - World's busiest radiotelephony station
 - Provided HF long-range services
 - In 1974, it had 154 radio operators
 - Handled over 20 million words per year

GMDSS History

- Large radiotelephony stations were expensive to operate.
- End of the 1980s, Satellite Services began.
 - ☐ Took a large share of the ship-to-shore communications market.

GMDSS History

- The International Maritime Organization (IMO)
 - ❑ United Nations agency - Specializing in safety of shipping
 - ❑ Defines ways to improve maritime distress and safety communications

- In 1979, IMO experts drafted the “International Convention on Maritime Search and Rescue”
 - ❑ Required a global search and rescue plan.

GMDSS History

- The Expert Group also passed a resolution
 - ❑ IMO to **Develop** a Global Maritime Distress and Safety System (**GMDSS**)
 - ❑ Identified the communication support needed to implement the search and rescue plan.

GMDSS History

- GMDSS is based upon a combination of satellite and terrestrial radio services
 - ❑ Changed distress calls from primarily ship-to-ship to ship-to-shore.
 - Rescue Coordination Center
- Ended Morse code communications other than Amateur Radio Operators (Hams).

GMDSS History

- The GMDSS provides for automatic distress alerting and locating
- Requires ships to Receive broadcasts of maritime safety information
 - ❑ To prevent a distress from happening in the first place.
 - ❑ **Including Cruisers**

GMDSS History

- In 1988, IMO amended the Safety of Life at Sea (SOLAS) Convention
 - ❑ Required ships to have GMDSS equipment.
- Ships were required to carry NAVTEX and satellite EPIRBs by August 1, 1993
- To fit all other GMDSS equipment by February 1, 1999.

GMDSS History

- The US Telecommunications Act of 1996
 - ❑ US ships were allowed to install GMDSS
 - ❑ Replacing Morse type telegraphy equipment

GMDSS Functions and Equipment

GMDSS

- Internationally agreed-upon set of
 - ❑ Safety procedures
 - ❑ Types of equipment
 - ❑ Communication protocols

- Simplifies rescue of distressed ships, boats, aircraft *and Even Cruisers.*

GMDSS Functions

- Alerting
 - Including position of the unit in distress
- Search and rescue coordination
- Locating
- Maritime safety information broadcasts
- General communications
- Bridge-to-bridge communications

Required Equipment

- GMDSS Vessels: Over 300 Gross tonnage (GT)
- Depend on the ship's area of operation.
- Requires redundant means of:
 - ❑ GMDSS Equipment
 - ❑ Distress alerting
 - ❑ Emergency sources of power

Components of GMDSS

- Emergency Position Indicating Radio Beacon (EPIRB)
- NAVTEX
- Inmarsat
- High Frequency Radio Equipment
- Search and Rescue Locating device
- Digital Selective Calling Equipment
- Power Supply Requirements

Vessel That Have GMDSS

- Use Digital Selective Calling (DSC) VHF/HF SSB radios.
 - ❑ DSC is major part of GMDSS
 - ❑ **Cruisers** link into the GMDSS world

Cruiser EPIRB

- Check Your EPIRBs monthly and annually
 - ☐ Make sure the battery is still good
- Limited battery life between 2 to 5 years

Cruiser EPIRB

- 406 MHz EPIRB's transmit a registration number
 - ❑ Linked to a database of information about your vessel.
- You must keep the database up to date!

<https://beaconregistration.noaa.gov/rgdb/>

Navtex

- International, automated system for instantly distributing maritime safety information (MSI)
 - ❑ Navigational warnings
 - ❑ Weather forecasts
 - ❑ Weather warnings
 - ❑ Search and rescue notices
 - ❑ Similar information to ships.

Navtex

- 518 kHz in English,
- 490 kHz is sometime used to broadcast in a local language.

GMDSS Satellite System

- Operated by the Inmarsat
 - ❑ Overseen by the International Mobile Satellite Organization (IMSO).
 - ❑ Provide ship/shore, ship/ship and shore/ship
 - ❑ Telephone, telex and high-speed data services,
 - ❑ Includes a distress priority telephone and telex service to and from rescue coordination centers.

Inmarsat

- The Inmarsat C SafetyNET service
 - ❑ High seas weather warnings
 - ❑ NAVAREA navigational warnings
 - ❑ Radio navigation warnings
 - ❑ Ice reports and warnings
 - ❑ Other similar information not provided by NAVTEX.
 - ❑ SafetyNET works similarly to NAVTEX in areas outside NAVTEX coverage.

High Frequency

- High Frequency (HF) Radiotelephone is a part of a GMDSS system
 - ❑ Only digital selective calling (DSC) HF Equipment
 - ❑ Requirement Dependent on operational Sea Area
 - Not required for Coastal Only Vessels

Digital Selective Calling

- The IMO introduced Digital Selective Calling (DSC) on MF, HF and VHF maritime radios.
- DSC is primarily intended to initiate ship-to-ship, ship-to-shore and shore-to-ship radiotelephone and MF/HF radiotelex calls.

Digital Selective Calling

- DSC calls can also be made to individual stations, groups of stations, or "all stations" in one's radio range.
- Uses Maritime Mobile Service Identity (MMSI).
- DSC distress alerts received by GMDSS ships and rescue coordination centers.

Digital Selective Calling

- DSC eliminates the need for persons listening for voice May Day Calls
- The MF/HF listening watch aboard GMDSS ended on February 1, 1999.
- IMO maintained the Distress VHF (Channel 16) listening watch aboard ships until 2005.
- 01 Feb 2005 The VHF (Channel 16) Distress Voice watch requirement ended for GMDSS vessels.

Digital Selective Calling

- IMO and ITU both require that the DSC-equipped MF/HF and VHF radios be connected to GPS.
- Ensure accurate location information is sent to a rescue coordination center.
- The FCC requires that all new VHF and MF/HF maritime radiotelephones “type accepted” after June 1999 have at least a basic DSC capability.

Digital Selective Calling

- GMDSS telecommunications equipment is not reserved for only emergency use.
- The IMO encourages mariners to use DSC for routine as well as safety telecommunications.
 - ❑ Make DSC calls instead of Hailing on emergency channels!

GMDSS Compliance

GMDSS Compliance?

Transmitting and receiving

- Ship-to-ship distress alerts
- Search and rescue coordinating communications
- On-scene communications

GMDSS Compliance?

Under Safety of Life at Sea (SOLAS), every ship at sea, must also have equipment for:

- Maritime safety information
- General radio communications to and from shore-based radio systems or networks
- Bridge-to-bridge communications.

US Coast Guard & GMDSS

GMDSS System

- 01 August 2013 CG terminated its radio guard on:
 - ❑ 2182.0 kHz Safety and Calling Frequency
 - ❑ 2187.5 kHz international digital selective calling (DSC) distress and safety frequency
 - ❑ 2670.0 kHz Marine Broadcasts

CG Monitored GMDSS Frequencies

➤ Hailing

➤ Frequencies

● Working

● Frequencies

➤ 4,125.0

RX

TX

➤ 6,215.0

➤ 4,426.0

4,134.0

➤ 8,291.0

➤ 6,501.0

6,200.0

➤ 12,290.0

➤ 8,764.0

8,240.0

➤ 16,420.0

➤ 13,089.0

12,242.0

➤ 17,314.0

16,432.0

US CG Monitoring Schedule

kHz SHIP STATION	kHz COAST STATION	NMF	NMN	NMA	NMG
4125	4125	2300-1100Z	2300-1100Z	2300-1100Z	2300-1100Z
6215	6215	24 HRS	24 HRS	24 HRS	24 HRS
8291	8291	24 HRS	24 HRS	24 HRS	24 HRS
12290	12290	1100-2300Z	1100-2300Z	1100-2300Z	1100-2300Z

kHz SHIP STATION	kHz COAST STATION	Station and Schedule (UTC)		
		NMC	NMO	NOJ
4125	4125	24 HRS	0600-1800Z	24 HRS
6215	6215	24 HRS	24 HRS	24 HRS
8291	8291	24 HRS	24 HRS	
12290	12290	24 HRS	1800-0600Z	

kHz SHIP STATION	kHz COAST STATION	Station and Schedule (UTC) Guam
6215	6215	0900-2100Z
12290	12290	2100-0900Z

Station	SELCAL	MARITIME MOBILE SERVICE IDENTITY
USCG Communications Area Master Station Atlantic, Chesapeake VA/ NMN	-	003669995
USCG Communications Area Master Station Atlantic, remotely keying transmitters at Boston/ NMF	-	003669991
USCG Communications Area Master Station Atlantic, remotely keying transmitters at Miami/ NMA	--	003669997
USCG Communications Area Master Station Atlantic, remotely keying transmitters at New Orleans/ NMG	--	003669998
USCG Communications Area Master Station Pacific, Pt. Reyes CA/ NMC	--	003669990
USCG Communications Area Master Station Pacific, remotely keying transmitters at Guam/ NRV	1096	--
USCG Communications Area Master Station Pacific, remotely keying transmitters at Honolulu HI/ NMO	--	003669993
USCG Communications Station Kodiak AK/ NOJ	-	003669899
USCG Marianas Section Guam	--	003669994

DSC Testing

**Portsmouth/NMN, Boston/NMF, Miami/NMA, New Orleans/NMG,
Pt. Reyes/NMC, Honolulu HI/NMO, Kodiak AK/NOJ**

4207.5

6312

DSC test calls on 4207.5 KHz will be automatically acknowledged from Portsmouth/NMN and Pt Reyes/NMC. Responses to test calls on other frequencies and at the other locations may be delayed and cannot be assured.

8414.5

12577

16804.5

GMDSS, DSC, and You!

GMDSS

- Lot of Potential Help from GMDSS Vessels
- GMDSS Vessels - for Distress and General Help
 - ☐ Doctors
 - ☐ Medicine
 - ☐ Parts
 - ☐ Floating vessel
- Link with Search and Rescue (SAR)
 - ☐ Distress Help

Digital Selective Calling

DSC CALL RECOMMENDATIONS FOR CRUISERS

- Call large Ships via DSC to assure a response.
- (Per IMO) Call your friends Via DSC
- Call all your Friends at once with a group call

- Call everyone with a Safety Call (Geographic Call)
- If you need Help Make an Urgent Call
- If Life or Property is threatened Make a Distress Call

Setting Up Your DSC Capability

If your Radio has a Distress Button!

- Program in your MMSI number
- Add your Friends to your Individual Directory
- Add Groups in Group Directory

- MSSIs
 - ❑ Start with a number for a vessel
 - ❑ Start with a “0” for a Group
 - ❑ Start with “00” for a shore station including shore station Groups

Putting in your MMSI

- Refer to your Radio Manual
- Programming is a DSC function
- Most radios limit the number of times you can Enter
 - ❑ Maybe changed only once after Entered.
 - ❑ If you buy a used Radio / Boat you may have to send the radio to the factory to allow a new MMSI.
- Some radios have you type in the number twice and will only program if they match.
 - ❑ Counts as one Programming

Adding Individuals

- Refer to your Radio Manual Again
- Basic Steps, but may vary with radio manufacture
 - ❑ Select Menu
 - ❑ DSC Setup
 - ❑ Individual Directory
 - ❑ Add
 - ❑ Name the individual or boat (Terry or Sunnyside)
 - ❑ Add the MMSI Number (366820740)
 - My Phone Number is on my boat cards!

Adding Groups

- Refer to your Radio Manual Again
- Basic Steps, but may vary with radio manufacture
 - ❑ Select Menu
 - ❑ DSC Setup
 - ❑ Group Directory
 - ❑ Add
 - ❑ Name the Group (Ensenada)
 - ❑ Add the MMSI Number (036682074)

Making an Individual Call

- Refer to your Radio Manual Again for Differences
- Press Call
- Select Individual
- Select the Boat or Name
- Select a Channel to transmit on
- Display asks if OK to “Transmit?”
- Select “Yes”
- Waiting for Acknowledgement (ACK)
- When you Press “Quit” the radio will go to the selected channel.

Receiving an Individual Call

- Radio will make a sound or ring and display
 - ❑ If caller is programmed you see the name
 - ❑ If caller is not programmed you see the MMSI
- Radios vary on the next steps
 - ❑ Some have an Enter key
 - ❑ Some have soft keys that say Accept or Quit
- Follow Display pressing
- Your radio will go to the channel selected by the caller.

Making a Group Call

- Refer to your Radio Manual Again for Differences
- Press Call
- Select Group
- Select the Group Name
- Select a Channel to transmit on
- Display asks if OK to “Transmit?”
- Select “Yes”
- Radio will go to the appropriate channel.
- Wait a few minutes and announce you are present.

Receiving a Group Call

- Radio will make a sound or ring and display
 - ❑ **Only** if the Group MMSI is programmed in the Radio
- Radios vary on the next steps again
 - ❑ Some have an Enter key or soft keys again.

- Follow Display pressing
- Your radio will go to the channel selected by the caller.
- When you are on Channel, listen then announce you are in the group

Making a All Ships Call

- Select Call
- Select All Ships or Geographic
- Select Safety or Urgency
 - ❑ Safety is like a Security Call (Safety Information)
 - ❑ Urgency is like a Pan Pan Call (Need Help)

- Pick a channel (16 is OK)
- Say “Yes” to Transmit
- To go to Channel will be the same as a group call for you radio.
 - ❑ Practice Group Calls

Making a Distress Call

- Lift the Red cover on the radio or microphone
- Press and hold the button for ~5 seconds
 - ❑ Display may do a Countdown
- When an Acknowledgment (ACK) is Received
 - ❑ A loud tone will be heard
 - ❑ The radio will shift to Channel 16
 - ❑ Responders MMSI will be displayed
 - ❑ Announce **Your Name, Vessel Name, Number on Board, Situation, Over!**

Making a Distress Call

- If no ACK is Received, the radio will re-transmit Distress call
 - ❑ Every 4-5 minutes until canceled or ACK received.
- If Situation Changes Do a Distress Cancel.

Other DSC Calls

➤ Position Requests

- ❑ Request a Digital position of someone you are traveling with.

➤ Position Reports

- ❑ Report your position to someone that has not requested the report.

➤ Auto Position Polling

- ❑ Get updates on others position

HF Radio

- Similar Functions on DSC Capable HF SSB
- Added Step for DSC calling because it is HF
 - ❑ VHF Sends DSC message on Channel 70
 - ❑ For HF You need to select 2, 4, 6, 8, 12, or 16 MHz

HF Radio

- Added Step to Receive DSC Calls on HF SSB
 - ❑ Receiving Radio must be scanning in “DSC Watch”
 - ❑ DSC Watch listens on 2, 4, 6, 8, 12, and 16 MHz
 - ❑ Looking for a DSC call to the radio’s MMSI or a programmed Group number.

Search and Rescue in Mexico

Mexican SAR



- SAR Part of Armada de México (Mexican Navy)
- Accomplish SAR Operations, in a timely manner, within 50 miles of the Mexican coast line
- Presently Five (5) Active SAR Naval Stations.



Naval Jack

Search and Rescue Naval Stations

➤ Estaciones Navales de Búsqueda y Rescate (**ENSAR**). (Naval Search and Rescue Stations)

□ Type A (Alfa) Naval Stations Equipped with:

- (1) 47-Foot Motor Lifeboat
- (2) 33-Foot Defender Class boats



Uniform and Boat logo

□ Type B (Bravo) Equipped with:

- (1) 33-Foot Defender Class boats



Service Mark

Maritime SAR Inventory

- 47-Foot Motor Lifeboat
 - ❑ Equipped with two Detroit Diesel engines
- 33-Foot Defender Class
- MD Helicopters MD Explorer



Present SAR Stations in Mexico

- Puerto Vallarta ENSAR station – Jalisco
 - ❑ 1st Station - April 6, 2007

- Ensenada ENSAR station - Baja California
 - ❑ Monitors channels 16, 14, and DSC VHF radio
 - ❑ Phone: 646 172 4000 for Help
 - ❑ Responsible for the Mexican Border south to about San Quintín
 - ❑ HF SSB frequency 8284.4 kHz USB radio for emergencies
 - ❑ Located to the right side of the Navy Station

- Los Cabos ENSAR station - Baja California Sur

Search and Rescue Naval Stations

- Huatulco ENSAR station – Oaxaca
 - ❑ Southern Pacific Mexico

- Isla Mujeres ENSAR station - Quintana Roo
 - ❑ Northeast of Cancún in the Caribbean Sea

- Goal is 19 ENSAR Stations
 - ❑ 6 Type A's
 - ❑ 13 Type B's

My Experience Ensenada SAR

- One Distress Call Important to Cruisers
- Quickly Acknowledged by Ensenada SAR
- Answered when I called the Elan, the vessel making the Distress call.
 - ❑ Elan never answered.
 - ❑ Sent a Distress Cancellation
- Ensenada SAR had Excellent Spoken English

Summary Comments

- IMO wants you to use DSC
 - ❑ Eliminates clutter on 16
 - ❑ Large ships may not hear you except for DSC

- Learn to use your DSC radio functions
 - ❑ Will eliminate frustration later when Cruising
 - ❑ May Save your Life!

- GMDSS vessels may be your best bet for help

- Mexico has a good SAR organization and will Help

Have Fun Ensenada Cruisers

WWW.Made-Simplefor-Cruisers.com

My Cruising Books



- **Cruising Starting from Scratch**
- **Communications Made Simple for Cruisers**
- **ICOM IC M802 Made Simple for Cruisers**
- **Radar Made Simple for Cruisers**
- **Icom IC M802 Starting from Scratch**
- ***A New Ham I Am* Made Simple for Cruisers**



- ❖ Allende Books of La Paz MX
- ❖ West Marine
- ❖ Sea Breeze Books and Charts
- ❖ Captain's Nautical Supplies
- ❖ Barnes and Nobel
- ❖ Blue Water Books and Charts
- ❖ Nautical Mind Bookstore
- ❖ Creative Space.com
- ❖ Amazon.com & Amazon.CO.UK
- ❖ Brunei Bay Radio in Brunei Darussalam