

SAIL IN ASIA



VHF RADIO

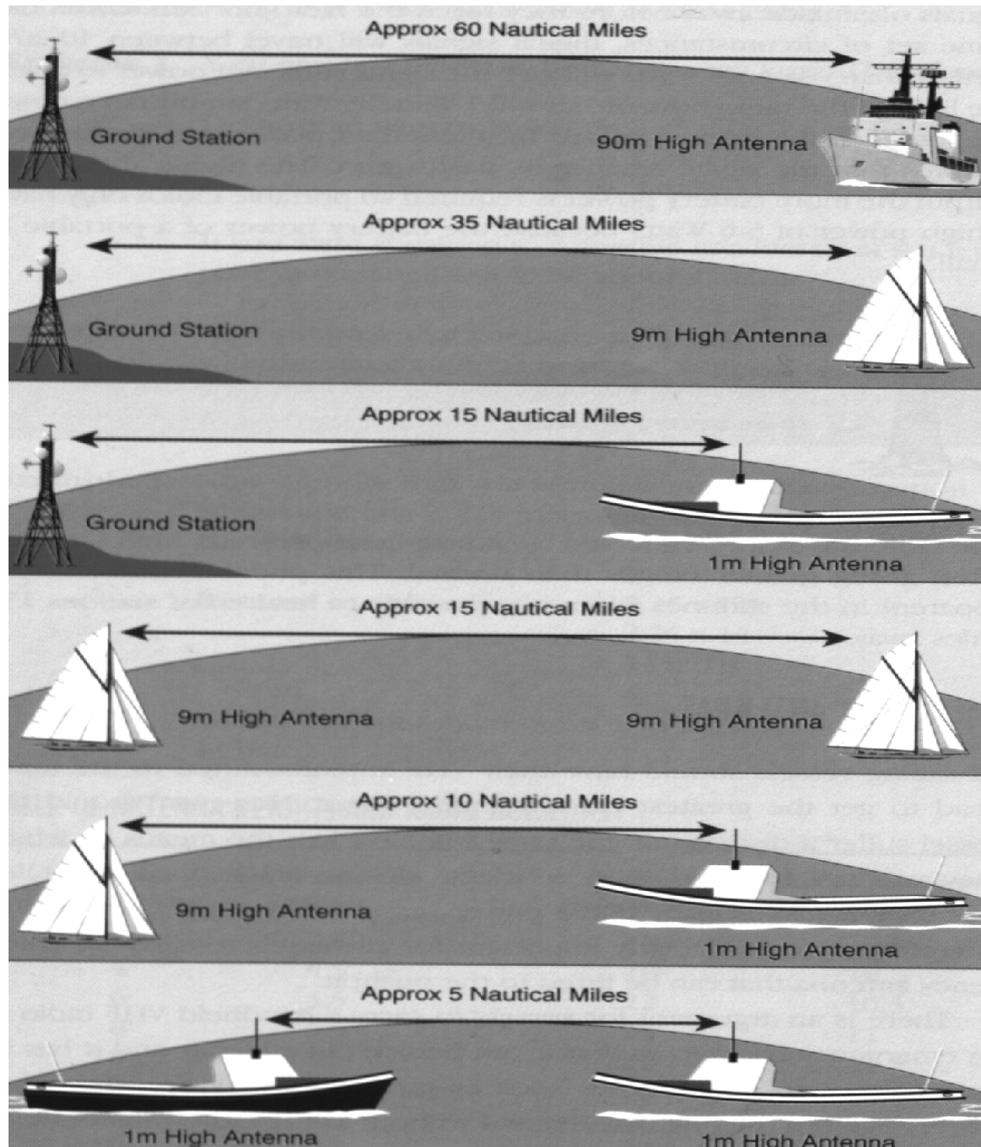
Student Handout

Updated: March 2017

VHF INTRODUCTION

Marine VHF radio equipment is installed on all large ships and most seagoing small craft. It is used for a wide variety of purposes, including summoning rescue services and communicating with harbors, locks, bridges and marinas. It operates in the very high frequency (VHF) range, between 156 and 162.025 MHz.

VHF Radio is usually described as a line of sight system



Depending on factors such as weather, topography and mainly the height of your VHF antenna the distances it can be used for are approximately:

Boat to Boat – 5 to 15 nautical miles

Boat to shore side station – Up to 60 nautical miles

VHF INTRODUCTION

Basic Radio Controls



VHF MARINE CHANNELS

Simplex

Simplex channels send and receive on the same frequency. These channels require a certain level of discipline to achieve two-way conversation as only one person can talk at a time.

Duplex

This means Dual Frequency and uses **one frequency to transmit and another to receive**. The advantage is that transmission is possible simultaneously in both directions. This requires two aerials, which is not practical on smaller vessels so Semi Duplex is most commonly used. It is most common on large and commercial vessels. It is also important to remember that only some channels are Duplex channels. For example, channel 80 is a duplex channel that sends and receives on different frequencies.

Semi Duplex

This is simply when we use a radio that is able to operate on the duplex channels. It simply switches between the sending and receiving frequencies when the PTT switch is pressed and released. So in reality it is the same as simplex but allows us to use both the simplex and duplex VHF channels. These VHF units are cheaper and only require one antenna, hence why they are popular on pleasure craft.

DSC

DSC Radios operate on all channels but also listen to Ch70 which is the digital selective channel. These can be either semi-duplex or duplex sets. The advantage to DSC radios is that they are part of the GMDSS (Global Maritime Distress and Safety System) and offer enhanced urgency and distress calls as well as the ability to 'ring' other DSC VHF radios.

VHF PHONETIC ALPHABET

A – Alpha

N – November

0 – Zero

B – Bravo

O – Oscar

1 – Wun

C – Charlie

P – Papa

2 – Too

D – Delta

Q – Quebec

3 – Tree

E – Echo

R – Romeo

4 – Fow er

F – Foxtrot

S – Sierra

5 – Fife

G – Golf

T – Tango

6 – Six

H – Hotel

U – Uniform

7 – Sev en

I – India

V – Victor

8 – Ait

J – Juliet

W – Whiskey

9 – Nin er

K – Kilo

X – X-ray

L – Lima

Y – Yankee

M – Mike

Z – Zulu

VHF PRO-WORDS

Over	I have finished speaking and expect a reply
Out	I have finished speaking and do not expect a reply
Received	I have received your message (understanding implied)
Say Again	I didn't understand your message please repeat it
I Say Again	I will repeat all or part of the last message
Radio Check	Please confirm the strength & clarity of this message
I Spell	I will spell a word or words using the phonetic alphabet
Correction	I have made a mistake, the correct message follows
Station Calling	I hear you but cannot understand your call sign (Name)
This is	My call-sign (Name) is
I Read Back	I will read back the message to confirm I understand it
Wrong	Incorrect, you have not understood my message
Standing By	I am waiting for your next call (specify channel)
Go to	Use the following channel for the rest of the call
Pan Pan	Emergency with no immediate danger to vessel or crew
Mayday	Emergency with imminent danger to vessel or crew

KNOWLEDGE REVIEW

Try to complete the following questions without looking at the previous pages.

1. VHF is usually referred to what type of communication due to the radio waves being unable to bend?

2. What approximate distance can you expect from boat to boat comms?

3. What does the squelch control do?

4. If a transmission is finished with the word OVER, what is the sender expecting?

5. What does the Pro-Word SAY AGAIN mean?

6. Spell out SAILING using the phonetic alphabet.

7. Spell out TRANSOM using the phonetic alphabet.

VHF CHANNELS

16	International Distress Channel and meeting place for normal ship to ship calls
10/75	United Kingdom Coast Guard, MSI warning information
6/8/72/77	Inter-ship calling
13	Ship safety navigation information
11/12/13/14	Port working operations
70	DSC Channel

Note: Each country may have specific channels for certain operations or functions.

EG: UK has Ch80 for marina traffic

CHANNEL 16 – HOW IT IS USED

Meeting place – Calls to other vessels can be made here but **MUST** be transferred to inter-ship channels once contact is made.

Radio Check – A radio check can be broadcast to all stations from this channel.

Distress Calls – All Pan Pan and Mayday distress calls should be made from here.

Remember that channel 16 is used for distress calls so all communications on this channel should be kept short to keep the airwaves free.

INTER-SHIP CHANNELS

Channels 6, 8, 72, and 77 are inter ship channels. Switch from channel 16 to one of these channels once contact with recipient has been made.

Example of inter-ship calling process:

Start on Ch16.

Call the vessel followed by your call sign and over.

Tag, Tag, Tag. This is Piccolo, Piccolo, Piccolo. Over

Wait for a response. The receiving vessel should acknowledge your call and instruct for you to go to an inter-ship channel.

Piccolo, Piccolo, Piccolo this is Tag, Tag, Tag. Go to channel Seven Two Over. If they don't give the go to instruction, then you should.

Both vessels switch to stated inter-ship channel and continue transmission.

VHF DISTRESS AND URGENCY CALLS

PAN PAN Urgency Calls are made on Channel 16. Use **HIGH** power.

The Pro-Word Pan Pan indicates that the station sending the call has a very important message concerning the safety of a ship, aircraft, vehicle or person when there is **no imminent danger** and **immediate assistance is NOT required**.

Example

PAN PAN, PAN PAN, PAN PAN

ALL STATIONS, ALL STATIONS, ALL STATIONS

THIS IS PICCOLO, PICCOLO, PICCOLO

CALL SIGN F545H MMSI 234 000232 *(If you have DSC)*

MY POSITION IS

MY ENGINE HAS FAILED AND I AM DRIFTING EAST ALONG THE COASTLINE

I REQUIRE ASSISTANCE

MY VESSEL IS A 34ft MOTOR CRUISER WITH BLUE HULL AND SUPERSTRUCTURE

WE ARE 3 CREW ON BOARD

OVER

In this situation, a PAN PAN is used because there is not imminent danger to the vessel or crew. If the circumstances change a PAN PAN can be upgraded to a MAYDAY.

Note this message is addressed to all stations.

VHF DISTRESS AND URGENCY CALLS

MAYDAY Distress Calls are made on channel 16. Use **HIGH** power.

The Pro word MAYDAY indicates that the station sending the call has a very important message concerning the safety of a ship, aircraft, vehicle or person when there is **imminent danger** and **immediate assistance IS REQUIRED**.

Example

MAYDAY, MAYDAY, MAYDAY

THIS IS PICCOLO, PICCOLO, PICCOLO

CALL SIGN F545H MMSI 234 000232 *(If you have DSC)*

MAYDAY PICCOLO

MY POSITION IS

I HAVE STRUCK A SUBMERGED OBJECT AND AM TAKING ON WATER

I REQUIRE IMMEDIATE ASSISTANCE

MY VESSEL IS A 34ft MOTOR CRUISER WITH BLUE HULL AND SUPERSTRUCTURE

WE ARE 3 CREW ON BOARD

WE ARE TAKING TO LIFERAFT AND WILL ACTIVATE EPIRB

OVER

If no response repeat every 1-2 minutes

International Safety of Life at Sea Regulations (SOLAS) state that ‘the obligation to accept distress calls and messages is absolute in the case of every station without distinction, and such messages must be accepted with priority over all other messages.

They must be answered and the necessary steps must be taken immediately to give effect to them.’

VHF DISTRESS AND URGENCY CALLS

Responding to an unacknowledged MAYDAY and the MAYDAY RELAY procedure

If you hear a distress message which has not been acknowledged, or the vessel in distress cannot send its own distress message, or is out of range of the coast guard, you are obliged to take necessary steps to assist. **Use HIGH power.**

Step 1 – Acknowledge the call

MAYDAY MINX, MAYDAY MINX, MAYDAY MINX
THIS IS PICCOLO, PICCOLO, PICCOLO,
RECEIVED MAYDAY, STANDBY ON CHANNEL 16
OUT

Step 2 – As soon as possible after that

MAYDAY MINX, MAYDAY MINX, MAYDAY MINX
THIS IS PICCOLO, PICCOLO, PICCOLO,
MY POSITION IS

State the action you intend to take e.g. I am heading towards your position and expect to be there in 25 minutes
SENDING MAYDAY RELAY
OUT.

VHF DISTRESS AND URGENCY CALLS

Step 3 – Send urgency on DSC, if you have it, then relay the message.

MAYDAY RELAY, MAYDAY RELAY, MAYDAY RELAY

THIS IS PICCOLO, PICCOLO, PICCOLO

CALL SIGN F545H MMSI 234 000232

MAYDAY YACHT MINX

CALL SIGN P298G MMSI 234 344343

Repeat the original Mayday message from yacht Minx as completely as possible.

OVER

The Vessel sending the Mayday Relay would then wait for a response from the Rescue Authority.

SEELONCE MAYDAY

Imposing Radio Silence.

During Distress, it is vital that the frequency used is only for the rescue in hand. The station that is controlling the search and rescue effort will impose radio silence to all non-distress traffic.

MAYDAY ALL STATIONS ALL STATIONS ALL STATIONS
THIS IS COASTGUARD, COASTGUARD, COASTGUARD
MAYDAY YACHT MINX

SEELONCE MAYDAY

OUT

Only the controlling station can use the Pro-Words SEELONCE MAYDAY.

If you hear channel 16 being used by people that have not heard the Seelonce instruction, you may send the same message replacing it with your boat name and the Pro-Words SEELONCE DISTRESS in place of SEELONCE MAYDAY.

Relaxing Radio Silence

When complete silence is no longer considered necessary then the controlling station will indicate that restricted working may be resumed using the following transmission.

MAYDAY, ALL STATIONS, ALL STATIONS, ALL STATIONS
THIS IS COASTGUARD, COASTGUARD, COASTGUARD
YACHT MINX

PRU-DONCE

OUT

Lifting Radio Silence

When the emergency is over, a return to normal VHF usage is signaled by using the same format message using the Pro-Words SEELONCE FEENEE.

VHF DSC RADIOS

Digital Selective Calling (DSC) is a paging system that uses data signals to automate the transmission and reception of calls on **VHF marine radio channel 70**.

A DSC message is a brief burst of digitized information transmitted from one station to alert another station or stations. The DSC message automatically indicates the identity of the calling station and the priority/purpose of the call.

Every DSC radio has a unique number (Maritime Mobile Service Identity, or MMSI), which you use to call other radios, just like a mobile phone. However, unlike mobile phones, **DSC allows you to call every other radio in range at the same time if you are in trouble**.

Following an alert by DSC message, communications are established between the transmitting station and the receiving station(s) **by radiotelephone on a different channel** to that used for the DSC call.

DSC is used by ship and coast stations for **sending and relaying distress alerts** and for other urgency and safety communication. It can also be used for routine calls.

DSC also offers the ability to send and receive GPS positions - all DSC radios can be connected to a GPS receiver.

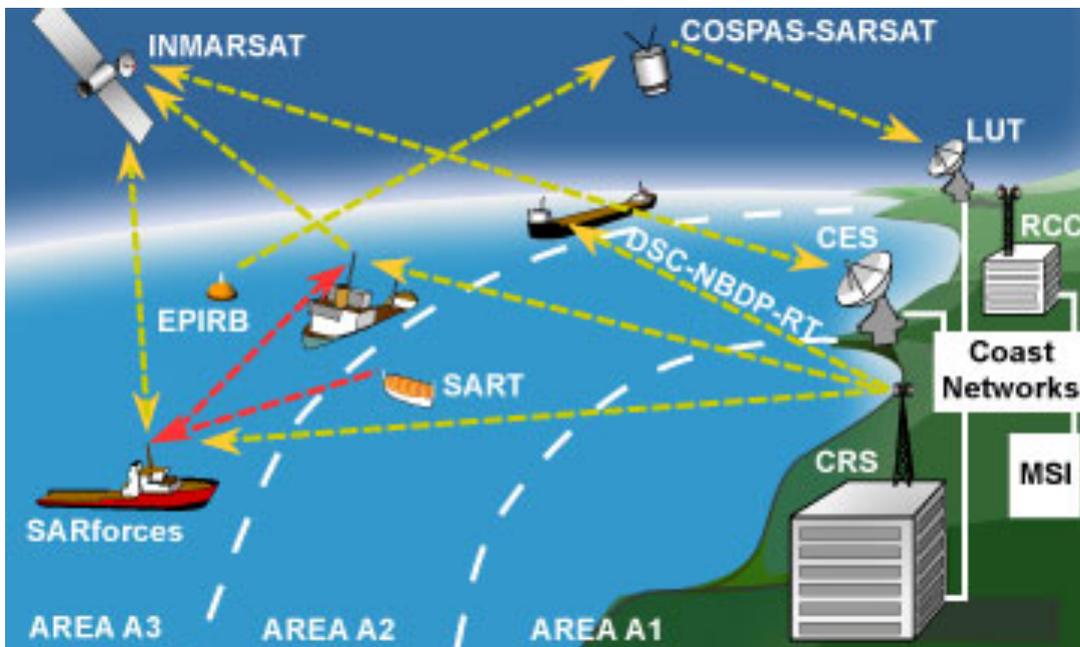
GMDSS

The **Global Maritime Distress and Safety System (GMDSS)** is an internationally agreed-upon set of safety procedures, types of equipment, and communication protocols used to increase safety and make it easier to rescue distressed ships, boats and aircraft.

GMDSS consists of several systems, some of which are new, but many of which have been in operation for many years.

The system is intended to perform the following functions:

1. Alerting (including position determination of the unit in distress),
2. Search and Rescue Coordination
3. Locating (homing)
4. Maritime Safety Information (Broadcasts)
5. General communications
6. Bridge-to-bridge communications.



Recreational vessels do not need to comply with GMDSS radio carriage requirements, but will increasingly use the Digital Selective Calling (DSC) VHF radios. Offshore vessels may elect to equip themselves further. Vessels under 300 tonnes (GT) are not subject to GMDSS requirements.

GMDSS

Specific radio carriage requirements depend upon the ship's area of operation, rather than its tonnage. The system also provides additional means of distress alerting, and emergency sources of power.

Sea Areas:

A1- VHF DSC (50NM offshore)

A2- MF DSC (150NM offshore)

A3- Inmarsat Satellite communication (Between 70°N and 70°S)

A4- HF DSC (Polar Regions)

KNOWLEDGE REVIEW

Try to complete the following questions without looking at the previous pages.

1. What does EPIRB stand for?

2. What channel does a DSC radio send data on?

3. How many areas are there in the GMDSS?

4. Who should use the Pro-Word SEELONCE MAYDAY?

5. What 9-digit number should every boat with a DSC radio have?

6. If you are relaying a Mayday call using DSC should you push the red distress button?

7. How do you send a DSC Mayday relay?
