Peninsula Boat Training Pty. Ltd.

Australian Waters Qualification (AWQ)

Marine VHF Radio Certificate Course

A study guide for persons attending Peninsula Boat Training Pty. Ltd.

Marine VHF Radio Certificate Course

The handbook has been prepared by the Australian Communications and Media Authority (ACMA). Procedures and requirements in this handbook are based on the rules governing the use of radio transmitters in Australia laid down in the Radiocommunications Act 1992 and maritime station licence determinations and specific licence conditions issued by the Australian Communications and Media Authority (ACMA).

FOREWORD

This handbook is intended for the guidance of all boaters using marine VHF (Very High Frequency) radio equipment to transmit and receive information to and from shore and vessel-based operators within Australian Territorial Waters – defined as all waters within 12 nautical miles from the coastal baseline.

It is also a recommended study guide for candidates undertaking the examination and assessment for obtaining the Australian Waters Qualification (AWQ) for the operators of VHF marine radio.

Procedures and requirements in this handbook are based on the rules governing the use of radio transmitters in Australia laid down in the Radiocommunications Act 1992 and maritime station licence determinations and specific licence conditions issued by the Australian Communications and Media Authority (ACMA).

Careful observance of these procedures is essential for the efficient exchange of communications when using a marine radio, particularly when the safety of life at sea is concerned. Special attention should be given to those sections dealing with distress, urgency and safety.

It should be noted that no provision of this handbook, the International Radio Regulations, or the Radiocommunications Act 1992, prevents the use by a vessel in distress of any means at its disposal to attract attention, make known its position and obtain help.

Similarly, no provision of this handbook, the International radio regulations, or the Radiocommunications Act 1992, prevents the use by vessels engaged in search and rescue operations of any means at their disposal to assist a vessel in distress.

This handbook is based on the relevant unit of competency published by the Transport & Logistics Industry Skills Council (TLISC) covering the main topics of VHF radio equipment, digital selective calling techniques (DSC), emergency position indicating radio beacon (EPIRB), and procedures for their use during distress, urgency, safety, and routine communications.

Table of Contents

INTRODUCTION TO MARINE VHF

OPERATOR REQUIREMENTS

RADIO LICENCE INFORMATION

Under the Australian Radiocommunications Act 1992, the installation and operation of marine radio equipment aboard any Australian vessel must be authorised by a licence. In the interest of safety, ACMA has simplified this requirement by issuing a ship station '*class licence*' for all marine VHF equipment installed on Australian vessels. A copy of this class licence is available from ACMA.

OPERATOR QUALIFICATIONS

As a minimum, under the above class licence, all operators of marine VHF equipment who navigate within 12 nautical miles from the Australian coastal baseline are required to possess the Australian Waters Qualification (AWQ). This qualification is issued by registered training organisations (RTOs) approved to deliver this training.

The class licence does allow unqualified people to use VHF radios, provided they are supervised by a suitably qualified person.

VHF MARINE RADIO EQUIPMENT

GENERAL

Therefore, Marine Radio is the most important safety equipment on board vessels at sea!

In particular, carriage of VHF Marine Radio with Digital Selective Calling (DSC) facility is of paramount importance to the safety of smaller vessels operating in coastal waters. Small vessels may have little time during emergencies and may sink fast because of flooding or may have to be abandoned quickly because of fire. In coastal waters, nearby vessels and coast stations are usually within VHF range and are required by law to monitor the emergency channel (16) at all times. Nearby vessels are in the best position to render timely assistance and save lives.

National and international systems exist to provide prompt and effective search and rescue assistance to ships in distress. In Australia, State and Territory police forces using the resources of recognised marine rescue organisations such as the Australian Volunteer Coast Guard, the Royal Volunteer Coastal Patrol and Volunteer Marine Rescue, as well as their own Water Police, coordinate most inshore boating emergencies.

By complying with the prescribed rules and procedures, described in the following pages, marine radio operators can ensure that these systems continue to work effectively for the benefit of all mariners.

FREQUENCY SPECTRUM

The VHF band frequencies cover the range between 30 and 300 megahertz (MHz), To simplify remembering the frequency numbers such as 156.800 Megahertz, we simply say 'Channel 16'.

Misuse or abuse of marine radio frequencies is illegal, inappropriate, inconsiderate, and rude! In extreme cases, such as transmitting false distress signals or interfering with distress radio traffic, severe penalties including imprisonment may apply!

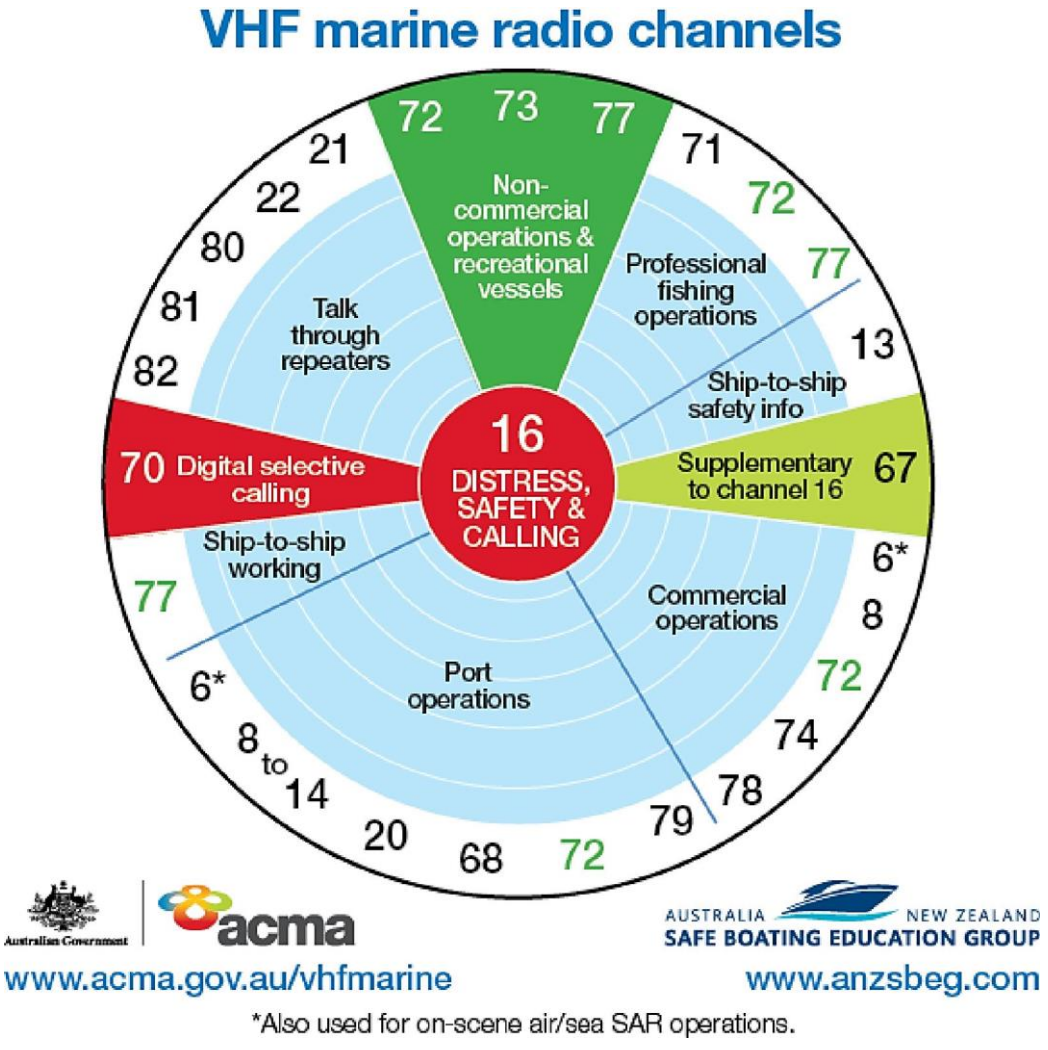
CALLING & WORKING CHANNELS

Channels allocated to ship and coast stations are categorised as either **calling** or **working** channels:

Calling channels are for establishing the initial contact and then switch to a working channel On VHF marine radio band, Channel 16 is the calling channel. and should not be used for routine conversations. The calling channel does not have to be used if the working channel of the callee is already known.

Safety messages such as wind and navigational warnings are always broadcast on a working channel after an "all stations" announcement on the calling channel.

The following diagram shows the designated purpose of commonly used VHF channels:



*Also used for on-scene air/sea SAR operations.

PROTECTION OF CHANNELS

It is important that channels are used only for the purpose for which they have been assigned; e.g. channels authorised for calling are not used as working channels. Calls are initiated on Channel 16 in order to agree on a working channel for the actual conversation.

RANGE OF VHF

VHF ground wave travels in a straight line and will not follow the curvature of the earth.

Range of VHF is therefore considered as 'short' and dependant on the combined heights of transmitting and receiving antennas.

The 'short' range of VHF radio is not necessarily a disadvantage. In distress situations, any station that can receive your Mayday call on VHF channel 16 is close by and can come to your assistance very quickly!

In the interest of safety and to extend the range of your VHF marine transmitter, consider mounting the transmitter antenna as high as possible.

VHF MARINE REPEATERS

PRINCIPLE OF OPERATION

VHF communication range depends mainly on the combined height of the antennas of the transmitting and receiving stations.

VHF marine repeaters are unmanned shore installations usually located at geographically high points. They are designed to transmit and receive simultaneously and will re-transmit or 'repeat' all signals received; significantly extending the communication range. Retransmitted signals can be received by any station listening on the repeater channel.

Not all coastal areas of Australia are served by VHF marine repeaters. For their own safety, boat owners should ensure that they are familiar with the location and operating channel of their local repeater.

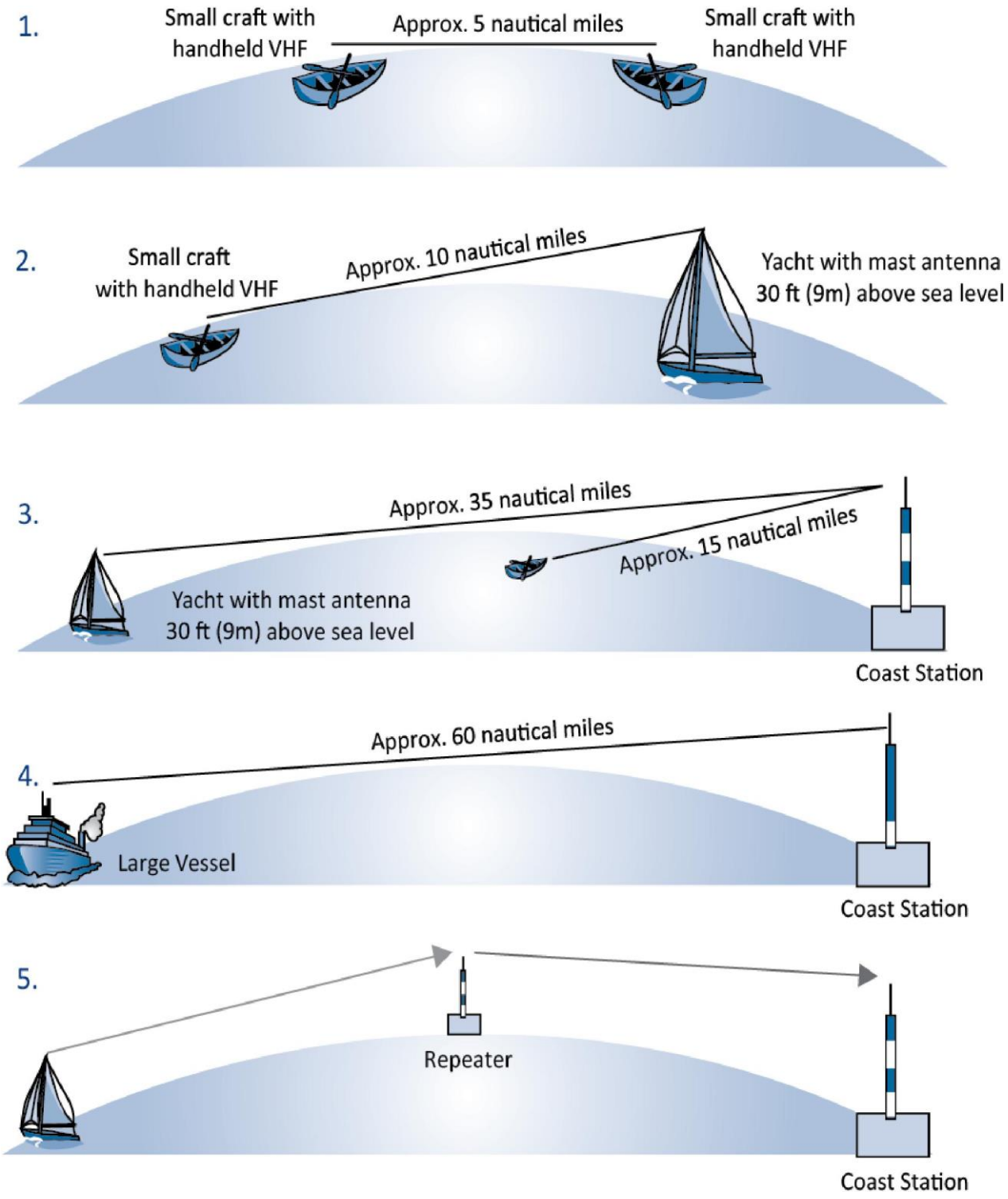
USE OF VHF MARINE REPEATERS

VHF marine repeaters are used to EXTEND the range of VHF communications. By selecting the channel used in your area, your message can be "repeated" over a far greater distance. operate on channels **21, 22, 80, 81 or 82**. Each repeater operates one of the channels **21, 22, 80, 81 or 82.**

Repeater channels must not be used as 'chatter channels' and have an automatic 30 seconds time restriction. Communications must be restricted to those concerning the movements of vessels and safety of vessels and persons.

A ship station can test its ability to access a repeater by momentarily depressing the microphone button. If a brief "burst" or 'tail' of noise is heard when the button is released, then the vessel is in range of the repeater.

Typical coverage of VHF



THE MAJOR PARTS OF RADIO EQUIPMENT

GENERAL

Marine radio equipment in the VHF band is made up of three major parts:

- The power supply;
- The transceiver; and
- The antenna or aerial.

Each part is dependent on the other. A fault in any one of the parts will not allow the equipment to function correctly.

The power to operate the radio equipment may be supplied by the vessel's engine or from an independent battery. Consider mounting the battery high on the vessel's structure so it is not the first thing that goes under the water should the vessel sink!

The antenna for a marine VHF transceiver should be mounted as high as possible, preferably at the top of a mast, in order to give greater range, and is described as 'a short vertical whip or rod antenna'.

TRANSCEIVER CONTROLS

On/Off and Volume Control: Often these functions are combined into a single control. It is used to turn the equipment on or off, and to adjust the level of sound coming from the loudspeaker.

Squelch Control: This control allows the operator to stop the constant and annoying, internally generated, background noise from the receiver in the absence of an incoming signal.

The correct setting is found by turning the control clockwise until the noise stops, but no further. If the control is adjusted beyond this point, the receiver will be de-sensitised and may not receive weak signals.

Channel Selector: This control is used to select the channel on which transmission or reception is required.

Dual Watch (DW): This control will permit the operator to keep a listening watch on a working channel and channel 16.

Scan: This control may offer the operator the choice of scanning all or selected marine VHF channels.

Power Selector: This control varies the power of the transmitted signal. On VHF marine equipment it may be marked '25W/1W' or 'high/low'. The correct transmitter power setting is generally referred to as "*the minimum power to maintain reliable communication*".

International/USA Control: This control should be kept in the 'International' position at all times when operating in Australian waters.

OPERATING PROCEDURES

All radio distress, urgency and safety calls and messages should be spoken slowly and clearly. Use of the standard marine vocabulary is recommended in the case of language difficulties.

AUTHORITY OF THE MASTER

A ship radio station and the service it provides are placed under the authority of the master, skipper, or the person responsible for the safety of the vessel.

SECRECY OF COMMUNICATIONS

Article 17 of the ITU Radio Regulations prohibits the unauthorised interception of Radio Communications not intended for the general use of the public.

Secrecy of communications applies to routine communications but DOES NOT apply to the broadcast of distress, urgency or safety traffic addressed to all stations.

WATCH KEEPING

Whilst at sea it is a requirement for small craft to maintain a listening watch on Channel 16.

UNNECESSARY COMMUNICATIONS

Transmissions should be as brief as possible. Non-essential remarks, bad language and unnecessary conversations should be avoided.

TEST TRANSMISSIONS

Test transmissions should be made on a working channel and kept to a minimum or avoided altogether on distress, urgency, or safety channels. A "RADIO CHECK" should be carried out after equipment alterations or if you are unsure of the reliability of the radio.

LOG KEEPING

Operators should keep a written record of all distress alerts and messages transmitted or received.

CONTROL OF COMMUNICATIONS

During routine communications from ship to shore and ship to ship, the station being called 'controls' the communication process. In order that communications may be conducted efficiently, and with the minimum of delay, instructions issued by Coast or Limited Coast Stations should be followed without delay.

CALLING PROCEDURES

CALL & MESSAGE

Every radio voice transmissions consists of 2 parts:

Call is the initial transmission to attract the attention of the receiving station(s) and to agree on a working channel for the exchange of messages. On marine VHF equipment, Channel 16 is the calling channel.

Message is the content of the subsequent conversation. Routine and safety messages should always be broadcast on working channels. Urgent messages can use either CH 16 or a working channel depending on the situation at hand (see below). Distress messages are always broadcast on CH 16 so they can reach everyone.

PRIORITY OF COMMUNICATIONS

All radio voice communications have been prioritized as follows:

Distress MAYDAY calls and messages are broadcast to all stations on distress Channel 16

Urgency PAN PAN call and messages can be broadcast to all stations on Channel 16. Cyclone warnings and Man Overboard (MOB) are examples of "all stations" calls, whereas Medical Requests or calling overdue vessels are usually addressed to single stations.

Safety SECURITE calls and messages are usually broadcast to all The safety message will always be transmitted on a working channel. An acknowledgment is not expected for a safety broadcast.

Routine communications have no priority signal. After the initial contact, routine messages MUST be exchanged on working channels without exception.

DISTRESS CALLING PROCEDURES

RESPONSIBILITY

Maritime search and rescue around the world and in Australian waters is heavily dependent on the "Buddy System". All vessels are required, by law, to monitor distress channels and, when able to do so, render assistance to other vessels in distress without exception.

Remember, one day you may need the help of others in the same way that others may need your help. Monitor Channel 16 at all times!

AUTHORITY TO TRANSMIT A DISTRESS CALL AND MESSAGE

A distress priority message may only be sent on the authority of the master, skipper, or the person responsible for the safety of the vessel.

CHANNEL FOR DISTRESS

Channel 16 is the International Marine VHF channel for radio distress communication. In Australian waters, VHF Channel 67 is the supplementary channel to Channel 16. Channel 67 should be left vacant for emergencies such as lengthy medical advice.

DISTRESS ALERT (DSC)

If the equipment is installed on-board, priority should be given to transmitting a DSC Distress Alert on VHF CH 70 followed by the distress call and message by voice on VHF CH 16.

THE DISTRESS SIGNAL

The distress signal is the word MAYDAY. The transmission of the word MAYDAY three times indicates that the vessel, or persons on-board that vessel, are in GRAVE AND IMMINENT DANGER and require immediate assistance.

THE DISTRESS CALL AND MESSAGE

The distress call and message is broadcast to ALL STATIONS, on CH 16. Transmissions must be in the correct order using the following format:

CALL
MAYDAY, MAYDAY,
MAYDAY THIS IS
Station identity (x3)
MESSAGE
MAYDAY
Station identity/MMSI
Position
Nature of distress
Other useful information
OVER

EXAMPLE OF A COMPLETE DISTRESS CALL AND MESSAGE:	
The VHF DSC Distress Alert, if facility fitted, followed by:	
DISTRESS CALL	
Distress signal (x3)	MAYDAY, MAYDAY, MAYDAY
The words “this is”	THIS IS
Station calling (x3)	LAZY SUE, LAZY SUE, LAZY SUE
DISTRESS MESSAGE	
Distress signal	MAYDAY
Name/MMSI	LAZY SUE 503000123
Position	50 NAUTICAL MILES DUE EAST FROM POINT DANGER
Nature of distress	SINKING AFTER STRIKING SUBMERGED OBJECT
Other information	4 PERSONS ON-BOARD, EPIRB ACTIVATED, 10 METRE
(if time permits)	SINGLE MAST YACHT RED HULL.
OVER	

The distress call and message may be repeated as often as necessary until an answer is received.

If no answer is received on distress channels, the message should be repeated on any other available channel where attention might be attracted, e.g. a relevant VHF marine repeater channel.

DISTRESS POSITION INFORMATION

Preference should be given to indicating the position by latitude and longitude or true bearing and distance (the unit of distance should always be specified).If afloat and drifting, the rate and direction of drift could be stated in the distress message.

DISTRESS TRAFFIC

All communications relating to the the vessel in distress, should use the distress signal MAYDAY, spoken once, to precede each call and message.

ACCEPTANCE OF DISTRESS CALLS AND MESSAGES

The obligation to accept distress calls is absolute and they must be given priority over all other communications.

AUTHORITY TO TRANSMIT A DISTRESS ACKNOWLEDGEMENT

A distress acknowledgement may only be sent on the authority of the master, skipper, or the person responsible for the safety of the vessel.

OBLIGATION TO ACKNOWLEDGE RECEIPT OF A DISTRESS MESSAGE

Ship stations that receive a distress message from another vessel which is, beyond any possible doubt, in their vicinity, should immediately acknowledge receipt. However, in areas where reliable communications with a coast station is practicable, ship stations should defer this acknowledgment for a short interval to allow the coast station to acknowledge receipt.

Ship stations which receive a distress message from another vessel which, beyond any possible doubt, is not in their vicinity should defer their acknowledgment to allow vessels nearer to the distressed vessel to acknowledge without interference.

When a ship station hears a distress message which has not been acknowledged by other stations, but is not itself in a position to provide assistance, it should acknowledge the call and then take steps to attract the attention of a coast station or vessels which might be able to assist.

ACKNOWLEDGMENT OF RECEIPT OF A DISTRESS MESSAGE

Acknowledgment of receipt of a distress message by a vessel or coast station should be made in the following way:

DISTRESS ACKNOWLEDGMENT
MAYDAY
Identity of station in distress
(x3) THIS IS
Identity of station acknowledging(X3)
RECEIVED MAYDAY
OVER

CONTROL OF DISTRESS TRAFFIC

The control of distress traffic is the responsibility of the vessel in distress. However, this station may delegate the control of distress traffic to another vessel, or coast station.

IMPOSING SILENCE ON INTERFEREING STATIONS

Distress traffic has priority over all other communications.

If the station in control believes silence is necessary, it should use the instruction SEELONCE MAYDAY in the following format:

IMPOSING SILENCE
MAYDAY
All stations (x3)
THIS IS
Identity of station imposing silence(X3)
SEELONCE MAYDAY
OUT (optional)

"Over" and "Out" should never be used together!

"Over" is an invitation to other station to reply.

"Out" means that the transmission is concluded and no further response is required.

Saying "over and out" is like saying "hello and goodbye!"

RESUMPTION OF NORMAL WORKING

When distress traffic has ceased on a channel that has been used for distress traffic, the station that has been controlling that traffic should transmit a message addressed to all stations indicating that normal working may be resumed. The message announcing resumption of normal working should take the following form:

EXAMPLE OF A CONTROLING STATION RELEASING THE DISTRESS CHANNEL FOR NORMAL WORKING:

MAYDAY

ALL STATIONS, ALL STATIONS, ALL STATIONS

THIS IS

COAST RADIO HOBART, COAST RADIO HOBART, COAST RADIO HOBART

TIME 16:27 GMT*

SEELONCE FEENEE

OUT

TRANSMISSION OF A DISTRESS MESSAGE BY A STATION NOT ITSELF IN DISTRESS

A ship or coast station which learns of a vessel in distress may transmit a distress message on behalf of that vessel.

This is also known as a '*distress relay*'.

URGENCY CALLING PROCEDURES

THE URGENCY SIGNAL

The urgency signal consists of the words PAN PAN, and indicates that the caller has an urgent message to transmit concerning the safety of the vessel, aircraft or person. It has priority over all other communications except distress.

Both urgency and safety calls should be given the same attention as distress calls. Their priority level is only relative to each other and does not make any situation less important than the other.

The urgency signal may be used to precede a message concerning a man overboard (MOB) where urgent assistance is required to locate that person.

A man overboard situation is generally considered as an urgency (PAN PAN) but can be upgraded to distress level if deemed necessary.

The urgency message may only be sent on the authority of the master, skipper or person responsible for the safety of the vessel. The urgency message may be broadcast to all stations on the distress, urgency or safety channel (Ch16) or to an individual station on a working channel after the announcement on Ch16.

A lengthy urgency message requesting medical advice or assistance, or repetition of a message relating to a vessel overdue would also be transmitted on a working channel.

The urgency call and message should be broadcast in the following format:

EXAMPLE OF AN URGENCY CALL
PAN PAN, PAN PAN, PAN PAN Some Coast Guard, Some Coast Guard, Some Coast Guard THIS IS Tirpitz , Tirpitz, Tirpitz
MESSAGE
Request urgent medical assistance, crew member sustained a broken leg, suggest change to channel 67.
OVER

SAFETY CALLING PROCEDURES

THE SAFETY SIGNAL

The safety signal consists of the word SECURITE (pronounced SAY-CURE-E-TAY), and indicates that the caller is about to broadcast a message concerning an important navigational or weather warning. It has priority over all other messages except distress or urgency messages.

The safety warning is announced on the distress, urgency or safety channel (Ch 16) with the safety message always broadcast on a working channel.

EXAMPLE OF A SAFETY CALL FROM A COAST STATION

SECURITE, SECURITE, SECURITE

All stations, All stations, All stations

THIS IS

Coast Radio Somewhere, Coast Radio Somewhere, Coast Radio Somewhere

Navigation warning, listen on Channel 67

ROUTINE CALLING PROCEDURES

These frequencies must be used responsibly by following the prescribed procedures, protocols and the appropriate social etiquette. Conducting private conversation, gossip, chit-chat, fishing stories and such are highly inappropriate social behaviour on working channels and outright illegal on calling and emergency channels.

ROUTINE CALLING

Before initiating radio communication, the operator should listen for a period long enough to be satisfied that harmful interference will not be caused to communications already in place (counting to 5 before pressing the push to talk button is a good practice)..

When using radiotelephony channels in the VHF marine band and communications are good, the initial call would be as follows:

- the name and/or other identifying information of the station being called, spoken once only;
- the words THIS IS;
- the name and/or other identifying information of the station calling, spoken twice;
- the purpose of the call; followed by the word OVER. (The invitation to reply)

Some Station

THIS IS

Titanium, Titanium

OVER

REPLYING TO CALLS

During routine radio exchanges, the receiving station controls the flow of communications. In this example the receiving station reply would be:

The original caller now acknowledges the suggested channel:

Note: Once the contact is established there is no need to start with the call sign of the station being called. However transmission without station identification is illegal. All transmissions must include the words

EXAMPLE OF A ROUTINE CALL
THIS IS
Titanium
OUT

"THIS IS" followed by the transmitting stations identification.

. The message is then exchanged between stations who must use the word "OVER" to control the direction of communications.

At the end of transmissions on the working channel, both stations must use the word "OUT" to indicate that they have finished using the working channel.

At this point both stations return to monitoring Channel 16.

REPEATING CALLS

If no immediate reply is received to the initial call, wait two minutes and repeat the call. After two calls, wait a further three minutes before calling again. At this point it may be necessary to call another station or to consider whether the required station is in range. Restrictions with regard to repetition of calls do not apply to distress or urgency calls.

DIFFICULTIES IN ESTABLISHING CONTACT WITH OTHER STATIONS

When a station receives a call and is not certain for whom the call was intended, it should not reply. Instead it should wait for a repetition of the call. When a station receives a call which is intended for it, but is uncertain of the caller, then the called station may reply requesting the identity of the calling station.

DIGITAL SELECTIVE CALLING (DSC)

GENERAL

Digital Selective Calling (DSC) is a reliable, inexpensive, and effective extension to marine radio technology. DSC, dramatically increases the chances of rescue in distress situations by reducing the human error in search and rescue operations.

ALL VHF transceivers equipped with DSC automatically listen on channel 70 at all times. This monitoring is done in the background and operators never need to change to channel 70 for receiving or transmitting DSC alerts.

Pressing and holding the red distress button for 3 to 5 seconds (depending on model) will transmit a distress signal that includes:

- The vessels, unique 9 digit, identity (MMSI)
- The position of the vessel in distress (obtained from a connected or built-in GPS)
- and, the nature of the distress, selected by the operator from a displayed list of options

All vessels equipped with DSC, and within range, will automatically receive the DSC distress signal, sound a loud alarm, and display the information.

Unless cancelled, or acknowledged, the transmission is repeated 5 times with a 4 minute pause between each transmission.

All commercial, and many recreational vessels, carry DSC and will be alerted to the distress situations even if they are distracted from monitoring channel 16 or busy talking on a working channel.

As far as safety is concerned, DSC represents the best value for money and it is highly recommended.

STATION IDENTITY

VHF DSC controller is enabled when permanently programmed with a unique nine digit identification number known as a Maritime Mobile Service Identity. The MMSI is issued by AMSA upon request. http://amsa.gov.au/mmsi/ . Applicants applying for the issue of MMSI must hold a current marine radio operators qualification. AMSA will accept AWQ for issuing MMSI.

The first three digits of the MMSI, known as the Maritime Identity Digits (MID), indicate the country of registry.

The MID for Australian vessels is 503 and is followed by six digits uniquely identifying the vessel itself.

ROUTINE DSC CALLS

During routine communications, DSC equipped transceivers act very similar to mobile phones. One stations can call another station by entering the MMSI of receiving station and nominating a working channel. Upon transmission the receiving station will ring a bell and, if call is accepted by the operator, switch to the nominated working channel. The conversation can then continue on the working channel without the need to first establish contact by voice on Channel 16.

POSITION REQUESTS

VHF DSC controllers can enquire each other's position without the need of engaging human operators. This can be very useful during emergencies. Position reporting can be disabled by the operator and is not compulsory.

GPS CONNECTION

By a simple process, most modern DSC equipped marine VHF units can be connected to a Global Position System (GPS) receiver in order to ensure accurate and up to date position information that will be automatically included in a distress alert. DSC equipment also offer the operator the facility to manually update vessel position information.

DISTRESS ALERT PROCEDURES

As with a radiotelephony distress call, the DSC distress alert may only be sent on the authority of the master, skipper or person responsible for the safety of the vessel. The DSC distress alert also indicates that the vessel or persons on board that vessel is in grave and imminent danger and requests immediate assistance.

All stations receiving a DSC distress alert must immediately cease all transmissions capable of interfering with distress communications.

Operators of VHF DSC can transmit a distress alert by pressing a dedicated Distress Alert button. This must be followed by a voice MAYDAY transmission on channel 16 to maximise the chances of rescue.

ACKNOWLWDGEMENT OF A VHF DSC DISTRESS ALERT

Ship stations receiving a distress alert from another vessel should take note of the contents and immediately listen on Channel 16 for any radiotelephony MAYDAY traffic that should follow.

If a MAYDAY is received on VHF Channel 16 it should be acknowledged using the standard radiotelephony procedure.

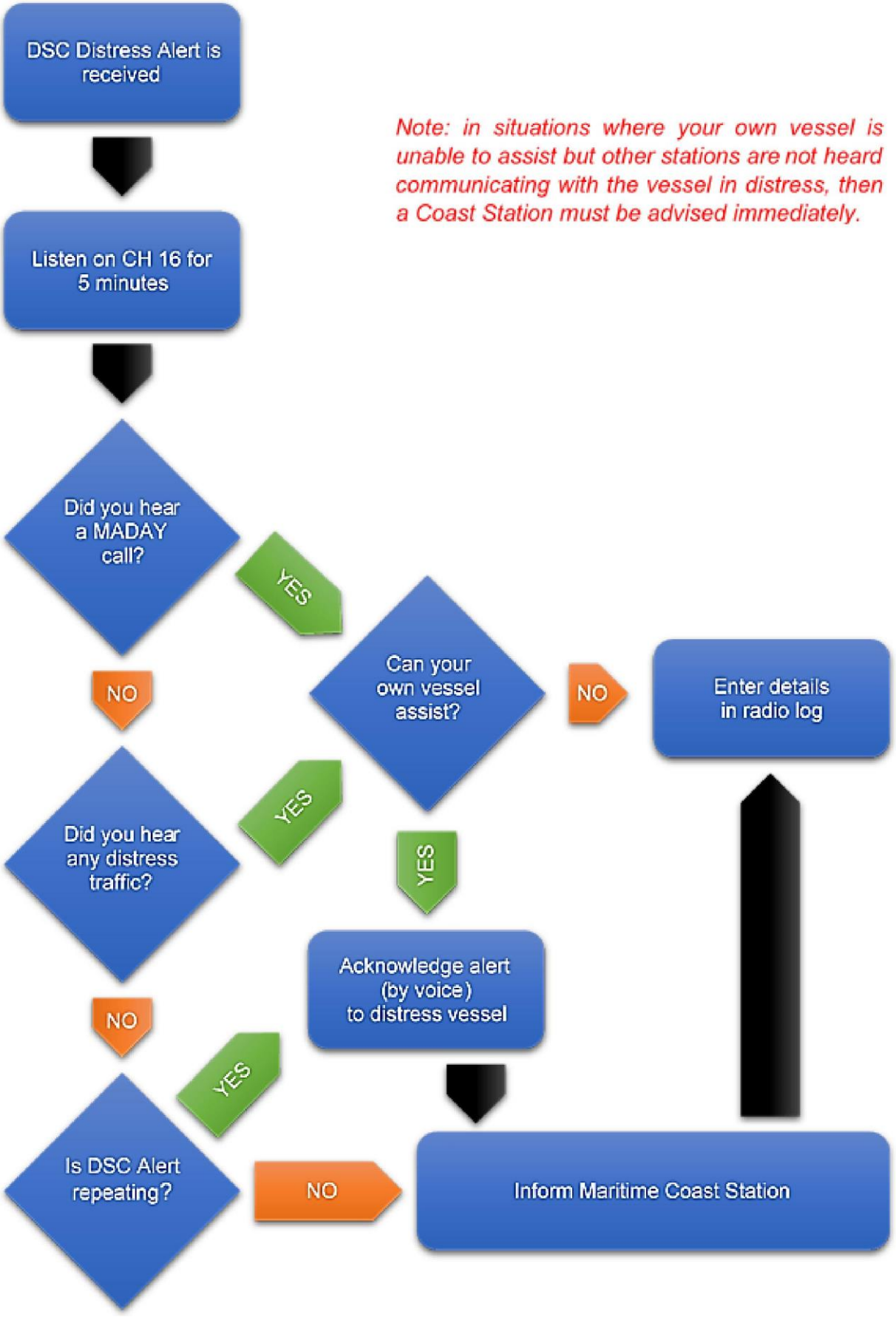
If DSC alert is repeated, without acknowledgement, ship stations should acknowledge it by voice on channel 16 and if unable to assist alert coast stations or other vessel by relaying the alert.

CANCELLATION OF AN INADVERTANT DSC DISTRESS ALERT

In the event of an accidental transmission of a DSC distress alert, the transmitting station should immediately:

- switch off the VHF transceiver (this will block any transmission repeats of the DSC alert which would continue until an acknowledgement is received);
- switch on the VHF transceiver and select Channel 16; and then
- broadcast an 'All stations' call, indicating the vessel's name, MMSI, time of the accidental alert and an expression of cancellation of the distress alert.

Stations receiving a DSC Distress Alert should follow the steps described in the flowchart below:



The EPIRB -- Emergency Position Indicating Radio Beacon

GENERAL

An EPIRB is described as a small, self-contained, battery-operated radio transmitter which is both watertight and buoyant. The distress signal from an EPIRB is received by shore stations only (via specialised satellites). Nearby ships WILL NOT detect EPIRB signals.

The essential purpose of an EPIRB is to assist in determining the geographic position of survivors in search and rescue operations. The EPIRB should not be considered as an alternative to an approved marine radio transceiver.

Operation of the EPIRB should be a simple two step action and, once switched on or activated, should not be switched off until rescue has been completed. International Radio Regulations state that the EPIRB battery should be capable of supplying power to the EPIRB for a minimum of 48 hours.

The EPIRB signal is designed to be received by the Cospas-Sarsat satellite System.

LOCAL USER TERMINALS

Stations established on land for the purpose of receiving signals from the Cospas-Sarsat satellites are known as Local User Terminals (LUTs).

There are two LUTs in Australia, one located at Albany, in Western Australia, and another at Bundaberg, Queensland, both of which are linked to the Rescue Coordination Centre (RCC) Canberra.

TYPES OF EPIRB

There is currently only one type of EPIRB available for use by all vessels. It operates on the UHF frequencies of 406.025 MHz or 406.037 MHz. It is commonly referred to as the 406 MHz EPIRB.

IDENTIFICATION OF A 406 MHZ EPIRB

Purchasers of a 406 MHz EPIRB are required to complete a registration form which is lodged with the Australian Maritime Safety Authority, Canberra. Each 406 MHz EPIRB has a unique identity code which is transmitted as part of its digitised signal and indicates its country of registration.

METHODS OF DETECTION AND LOCATION

The 406 MHz EPIRB transmits a short burst of digital data on the frequencies of 406.025 MHz, 406.028 MHz and 406.037 MHz. This burst of data is typically a 5 watt signal of 0.5 of a second duration every 50 seconds.

The 406 MHz EPIRBs manufactured to Australian specifications also transmit on 121.5 MHz for aircraft homing purposes. Transmission on 121.5 MHz simultaneously radiates a continuous series of distinctive descending tones which contain no station identification.

The 406 MHz EPIRB is therefore capable of being detected by:

- aircraft within range AND monitoring the civil aviation frequency of 121.5 MHz; and
- satellites operating in the Cospas-Sarsat system.

DETECTION BY SATELLITE

Satellites receive 406.025 MHz signal and relay it back to earth in the 'real time' mode, as long as the EPIRB and LUT are in the satellite footprint at the same time.

Because signals from a 406 MHz EPIRB are in a digitised form, they can also be stored in the satellite's memory.

As the satellite's path brings it into view of an LUT, information, including time of first detection, is retrieved from the satellite's memory and relayed down to the LUT.).

EPIRBs operating on 406.028 and 406.037 MHz operate in a similar manner to the 406.025 MHz EPIRB. However, the 406.028 and 406.037 MHz EPIRBs also have an inbuilt Global Position System (GPS) unit installed. Once activated, the GPS unit can receive position information from GPS satellites and within 5 minutes include that information in the burst of data that is received by the LUT, which is then relayed to the RCC. Position accuracy is less than 150 metres of the activated EPIRB.

ACTIVATION OF THE 406 MHZ EPIRB

Two types of 406 MHz EPIRBs are manufactured:

- those requiring manual activation, the controls of which may simply be on or off; and

those that can be activated manually in addition to being kept in a float free bracket and released automatically by way of a hydrostatic release system.

ACCIDENTAL ACTIVATION OF AN EPIRB

The RCC should immediately be advised by telephone, 1800 641 792 (24 hour service) or, if at sea, via a Coast Radio Station, or another vessel. There are no penalties for advising of accidental activation of an EPIRB.

SERVICING OF EPIRBS

An EPIRB must not be tested except strictly in accordance with manufacturer's instructions. Owners of EPIRBs should refer to the relevant regulation concerning performance verification tests and the owner's manual concerning servicing and recommended battery replacement dates. Hydrostatic release mechanisms should be inspected and serviced at regular intervals.

STOWAGE OF EPIRBS

EPIRBs should be stowed in a safe, easily accessible position, or in a secure float free bracket.

Note: Search and rescue of vessels in distress is often conducted in conditions of poor visibility where the difference between 5 kilometres and 150 meters can determine the success or failure of the mission. Given the relative low cost of the additional GPS feature, it is highly recommended for new purchases.

PHONETIC ALPHABET AND FIGURE CODE

When spelling is necessary, only the following spelling table should be used:

Letter to be transmitted	Code word to be used	Spoken as*
A	Alfa	**AL** FAH
B	Bravo	**BRAH** VOH
C	Charlie	**CHAR** LEE
D	Delta	**DELL** TAH
E	Echo	**ECK** OH
F	Foxtrot	**FOKS** TROT
G	Golf	GOLF
H	Hotel	HOH **TELL**
I	India	**IN** DEE AH
J	Juliet	JEW LEE **ETT**
K	Kilo	**KEY** LOH
L	Lima	**LEE** MAH
M	Mike	MIKE
N	November	NO **VEM** BER
O	Oscar	**OSS** CAH
P	Papa	PAH **PAH**
Q	Quebec	KEH **BECK**
R	Romeo	**ROW** ME OH
S	Sierra	SEE **AIR** RAH
T	Tango	**TAN** GO
Y	Uniform	**YOU** NEE FORM
V	Victor	**VIK** TAH
W	Whisky	**WISS** KEY
X	X-ray	**ECKS** RAY
Y	Yankee	**Yang** Key
Z	Zulu	**ZOO** LOO

MISCELLANEOUS

Letter to be transmitted	Meaning	Spoken as*
R	Your message is received and understood	ROMEO
OVER	Invitation to reply	OVER
OUT	This transmission is ended	OUT
DECIMAL POINT	Decimal	DAY-SEE-MAL
FULL STOP	Stop	STOP
COMMA	Comma	COMMA
/	Oblique Stroke	OBLIQUE

Note: It is of paramount importance that figure 9 should be spoken as "NINER". Nine is often misheard