

4 SAR COMMUNICATIONS

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Overview

Most SAROPs will require a large amount of communications on VHF / UHF radio. The ability to communicate clearly relies upon both the correct use of equipment and the ability of the radio operator to think and speak in a clear manner.

Basic 'ship to ship' or 'ship to shore' communication can be relatively straight forward. When working on a major incident, however, there may well be numerous vessels, aircraft and other agencies communicating on one or more channels. This requires a good 'radio ear' and adherence to proper radio procedure and language to ensure an uninterrupted flow of clear communication.

This module also looks at visual and audible signals that are pertinent to SAROPS and communications within the CRV crew itself.

Radio Communications

Every operator of a marine radio must hold the appropriate licence for that radio. The subject of radio operations & procedures is covered in detail in the CBES VHF (Very High Frequency) & MROC (Maritime Restricted Operators Certificate) radio courses. This text is intended as a recap on the more pertinent information and procedures for SAR communications.

Basic Radio Procedures

- Conduct a 'Radio Check' for each radio on board, every time the CRV is 'on the water'. As part of a radio check the CRV should log a Trip Report (TR) every time it is in use. A TR should include;
 - Vessel name & call sign.
 - Destination / intended area of operation.
 - Number of Persons On Board (POB) and their names / crew identification numbers.
 - Estimated Time of Arrival (ETA) at destination or time training should be concluded.
- Maintain a listening watch on channel 16 and local area Coastguard channels.
- Know your local channels — calling and working.
- Know and practice the use of the various functions available on your radio sets.

For Example

Dual Watch

Enables the set to scan between the chosen working channel and channel 16. Whilst using this feature any transmission received on channel 16 will override traffic on a working channel.

Scan

This causes the radio to stop on a programmed channel when a transmission occurs.

Hold

Stops the scanning function on a transmitting channel.

Skip

Allows the operator to select only channels they wish to monitor.

Specialised Communication Equipment

Use of UHF or Satellite Communications equipment, requires specialist training.

Procedure Words (Pro Words)

It is important that they are used in the appropriate context. Some of the more common ones are:

- *“This ison channel 82”*. When making initial contact, identify yourself and the channel you are on. In SAROPS there may be several channels in use.
- *“Over”* This is the end of my transmission. I will listen for your reply.
- *“Out”* This is the end of my transmission. No reply is expected and I have no further messages for you. These two keywords (over — out) have different (almost opposite) meanings and are never used together.
- *“Roger”* or *“Romeo”*. I have received your message and it is understood.
- *“Say again*. I did not receive correctly/I don’t understand your message - Please repeat.
- *“Correction”*. I have made a mistake; the following version is correct.
- *“I spell”*. I will spell the word using the phonetic alphabet.

The syllables to be emphasised are in bold text

Letter	Word	Spoken as	Letter	Word	Spoken as
A	Alpha	al -fah	N	November	no- vem -ber
B	Bravo	brah -voh	O	Oscar	oss -car
C	Charlie	char -lee	P	Papa	pah- pah
D	Delta	dell -tah	Q	Quebec	keh- beck
E	Echo	eck -oh	R	Romeo	row -me-oh
F	Foxtrot	foks -trot	S	Sierra	see- air -rah
G	Golf	golf	T	Tango	tang -go
H	Hotel	hoh- tell	U	Uniform	you -nee-form
I	India	in -dee-ah	V	Victor	vik -tah
J	Juliet	jew -lee-ett	W	Whiskey	wiss -key
K	Kilo	key -loh	X	X-ray	ecks -ray
L	Lima	lee -mah	Y	Yankee	yang -key
M	Mike	mike	Z	Zulu	zoo -loo

- “Wait” or “Standby”. I will call you back soon (sometimes a time period is also given).
- “Affirmative”. Yes.
“Negative”. No (these expressions are less easily lost in noise than the single syllables of ‘yes’ and ‘right’, or ‘no’ and ‘wrong’).
- “Please confirm / repeat my last message”. Repeat my last message so I can confirm you received it correctly.

Important information should be repeated by the receiving station to verify its accuracy.

Without such procedures a SAROP can begin to suffer from misinformation. What was originally reported as a missing vessel with possibly 3 POB can quickly become a vessel that has 3 POB. A vessel described as having a blue boot topping can easily become a vessel with blue topsides.

Radio communications can also be interrupted by radio ‘black spots’, interference from other vessels, or simply someone’s hand slipping off the transmit button. Without confirmation of the message neither party may be aware that vital information has not been received.

Numbers & Positions

Numbers

All numbers are spoken as single digits only. In addition 9 is “*niner*” and 0 is “*zero*”.
For example: 329 is spoken as “three–two–niner”.

If it becomes necessary to spell out figures the following pronunciations should be used.

Numeral	Spoken as	Numeral	Spoken as
0	ze-ro	5	fife
1	wun	6	six
2	too	7	sev-en
3	tree	8	ait
4	fower	9	nin-er

Compass Bearings / Courses

Bearings must always be stated as either ‘true’ or ‘magnetic’. A difference of around 20° or more between true and magnetic (Variation) can make a huge difference to a plotted position. Values less than 100 should always be preceded with zeros.

For example:

034°M is spoken as “*Zero–three–four degrees magnetic*”.

Position by Distance & Bearing

The convention is that any positions given by distance and bearing are expressed as a bearing **from** a charted object. Persons unfamiliar with this convention or untrained in navigation are just as likely to give the bearing **to** a charted object.

If a position by distance and bearing is received from another vessel, confirm whether the bearing is from the object or from the vessel.

The diagram opposite illustrates the difference between a yacht in position 230°T from the North cardinal beacon (lower left), and a position where the North Cardinal bears 230° T from the yacht (upper right).



There have been instances of a search directed to the wrong side of an island simply because of confusion over the direction of a bearing.

Latitude and Longitude

Lat & Long should be given in degrees, minutes, and decimals of minutes. Where possible, add a geographic reference to the lat / long to confirm the position.

When transmitting lat / longs, one decimal is sufficiently accurate and reduces the sheer volume of numbers and therefore the risk of error (by the time you get to the third decimal each increment is only approx 2 metres). For example:

36° 40.3' S, 175° 10.7 E would be spoken as:

“Three six degrees, four zero, decimal three minutes south. One seven five degrees, one zero, decimal seven minutes east.”

Sensitive Information

Avoid passing sensitive information over VHF channels (e.g. names of victims, status of victim(s) if severely injured or deceased). If possible, these should be passed by secure UHF radio (if available), or cell phone. Every radio operator is bound by the Privacy Act. (See Module Legal Considerations)

Logging Radio Traffic

Crew need to have a trained ‘radio ear’, especially for weak or panicked / garbled transmissions that can be part of a distress incident. Pen and paper should be kept near to the radio, and all details from any distress call noted down.

It is usually impractical during a SAROP for every radio communication to be logged by the CRV, but important information and time of receipt should be recorded.

For example;

- Positions.
- Vessel names.
- Vessel call signs.
- Description of target(s) in a search.
- Tasking instructions.
- Details of search pattern such as type of search, speed, search area etc.

Microphone Technique

Good microphone technique is crucial.

- Most hand microphones are designed to be held about 5 centimetres from the mouth of the speaker. The person should use their normal speaking voice, as they would use to speak to someone standing about 2 metres away.
- In bad conditions, it is necessary to speak more slowly than normal, particularly if the listener has to make written notes (shouting just degrades clarity).
- Speaking across the face of the microphone, rather than directly into it, avoids disturbances from the 'explosive consonants' in speech (for example, 'p' and 'b') and it also minimises moisture condensation in the microphone.
- Holding the microphone too far from the face accentuates background noise in noisy environments (e.g. boat engines).
- Unless requested by the other operator, repetition of words and phrases merely wastes time.
- Clear and succinct communication is vital. Contact between two radio operators is purely for the exchange of relevant information.

Radio Black Spots


There are areas around the coast where VHF communications are difficult if not impossible due to high land blocking the radio signal. Coastguard crew must be aware of any such black spots within their operational area, and the IMT / other resources informed if communications are likely to be affected.

Distress Signals

All Coastguard Crew should be thoroughly familiar with the International Distress Signals and alternative signals that might be used.

International Distress Signals

Audible

- A radio message containing word MAYDAY.
- The continuous sounding of a horn, bell, whistle, or any other sound apparatus.
- Morse code SOS by any sound apparatus. 

Not common but still a recognised distress signal;

- A gun or explosive signal fired at intervals of approx one minute.

Visual

- Red parachute flares.
- Red hand held flares.
- Orange smoke flares.
- Morse code SOS by any visual signalling equipment.
- Slowly & repeatedly raising & lowering outstretched arms to each side.

Not common but still a recognised distress signal;

- Code signal N.C. - pictured right (Signal flags and their Morse code are listed on the back of the NZ Nautical Almanac).
- Square flag having above or below it a ball.
- Flames on the vessel (burning tar barrel, oil barrel etc).



Alternative Distress Signals

There are other distress signals that may be used, but it is vital to remember that;

A person(s) in distress may use whatever means available to attract attention. During a SAROP any unusual sound or visual signal should be investigated.

- White lights, fixed or strobe - may be attached to lifejackets, life rings or liferaft.
- White flares - for indicating position in collision avoidance, but may also be used to attract attention.
- Dye marker in the water.
- SOLAS V flag (opposite top).
- Orange flag with a black square & circle (opposite middle).
- SART (Search and Rescue Transponder).



A SART is an emergency beacon that detects when it has been swept by another vessel / aircrafts Radar. It responds by transmitting 12 separate pulses, for as long as it continues to detect the other Radar (pictured opposite).



What it looks like on the Radar screen;

- Appears on Radar as a series of 12 dots each 0.6NM apart. – fig 1
- Position of SART is the nearest dot / centre of nearest arc. – fig 2
- As range to SART decreases, dots grow into concentric arcs. – fig 3
- Arcs will eventually form complete circles at close range (typically around 1NM or less).

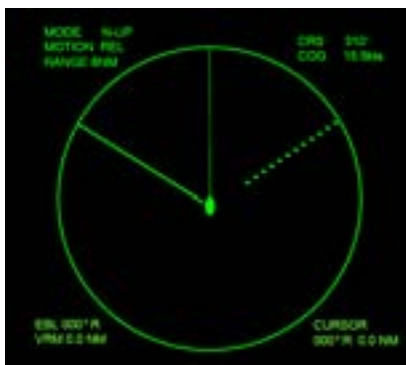


Fig 1



Fig 2



Fig 3

Communications with Aircraft

Most dedicated SAR aircraft have marine VHF radio capabilities, (see Module Working with Aircraft) but occasionally a SAR operation may involve aircraft without marine VHF. There are internationally recognised signals for visual communication with which you should be familiar. These visual signals apply equally to fixed wing aircraft and helicopters.

'Follow Me'

- Aircraft will circle vessel at least once.
- Then fly at low level across the vessel's bow, rocking wings and / or opening and closing the throttle or altering propeller pitch.
- Then head in the required direction.



'Vessel's Assistance No Longer Required'

- Aircraft will fly at low level across the vessels stern, rocking wings and / or opening and closing the throttle or altering propeller pitch.



'Instructions Understood'

- By night - Flash the landing lights or navigation lights on and off twice.
- By day - Rocking the wings.

No signal is used to indicate instructions have not been understood.

Identifying the Vessel

Aircraft or other vessels may have difficulty visually identifying the CRV. To aid identification the CRV can use the following methods;

By night

- Flash the vessels navigation lights on and off.
- Use strobes.
- Use torches / searchlight to sweep the water around the vessel.

By day (for aircraft)

Steer the vessel in as large a circle as possible while maintaining an unbroken wake (sometimes referred to as power circle). This is an extremely effective method which allows to aircraft to identify vessels from a considerable distance and height.



Other Communication

For most Coastguard operations communication with other vessels or persons in need of assistance will be verbal or by VHF radio. There may be times where this is not possible. The situation may be rectified by;

- Putting one of the CRV's crew (equipped with a hand held VHF if necessary) on board the other vessel.
- Passing a hand held VHF (in a suitable container) to the distressed vessel via a messenger line. To avoid possible loss of communications it may be prudent to 'lock' the hand held on the desired channel.
- Written instructions and especially diagrams transferred in the same way may also help the situation. You may not share a common language with the distressed vessel. Even where this is not the case some people's entire nautical vocabulary may be limited to bow, stern, port & starboard (sometimes even less than that). This can make explaining and coordinating an operation difficult.
- Pre arranged hand, light or sound signals in place of, or complementary to VHF radio should also be considered in the execution of an operation.

Internal Communication

The preceding text has looked at external communication, but one vital factor that is often overlooked is the importance of internal communications. Good communication on board is essential for the safe and efficient operation of a CRV.

The crew that works in silence – with little or no verbal communication may give the impression of professional efficiency – they may indeed be an experienced, highly competent crew who are used to working together.

This lack of verbal communication however, will sooner or later lead to someone assuming incorrectly that a task is being attended to, or has been completed. Assumptions like these will one day inevitably result in damage to vessel and / or crew.

A crew which is used to such a 'silent' culture on board the CRV may find itself in trouble in complex or high pressure situations, or where their normal standard of communications is inadequate, i.e. when it's pitch black and blowing a gale.

The quality of communication on board is determined by several factors. First, communication has to remain open and interactive.

- 'Open' means that the concerns, comments and opinions of crew members can be expressed.
- 'Interactive' means that every member of the crew is participating in the communication process.

The next step is to avoid misinterpretation. This is often referred to as using 'closed-loop communication'.

Closed-loop Communication

In closed-loop communication the sender transmits the message, and the recipient acknowledges by repeating all the important information. Then the sender confirms the accuracy of what the recipient understood.

This may sound complex but is something which is commonly used, for example the repetition of helm orders.

Example of closed loop communication

Skipper *"Alter course to 275 degrees"*

Helm *"275 degrees"*

Skipper *"275"*

This form of communication should not just be confined to helm orders, but should be used every time important information is exchanged.

For example:

Helm *"Turning to Port, hold on!"*

Crew *"Ok / holding on"*

Helm *"Turning!"*

Skipper *"Mike - ease out the towline to around 50m, and make fast"*

Mike *"Ease to 50m and make fast"*

Skipper *"Thanks Mike"*

Using the closed loop system of communication can initially make people feel a little self conscious. Never the less it is a habit that should be adopted and encouraged for the safety of all on board.

Verbal Communication

Since verbal communication is so important within a SAR crew, messages must be clear and direct.

The following guidelines on verbal communication apply equally to Skipper and crew:

- Say the person's name and wait for a reply / acknowledgement before giving the message.
- If possible make direct eye contact.
- Direct your speech to ensure that you've been heard.
- Acknowledge any requests / commands by repeating the key information (closed loop).
- If you don't understand the information given to you, ask that the instruction be repeated or explained.
- Do not shout - only shout when there is imminent danger and there is no better way of alerting others.

Briefings

Briefings, when properly conducted, will minimise the risk of confusion. When conducting a briefing, be certain that everyone understands his or her tasks. To conduct efficient briefings, the following rules should be remembered:

Make the Time

For an efficient briefing, take enough time to avoid rushing any critical information. Every minute invested in such briefings will save significant time that would have been lost due to confusion.

A Briefing must be Interactive

Under no circumstances should a briefing be purely a 'one man show'. Contributions from other crew members should be welcome. After a good briefing, every crew member should know what their responsibilities are. Use closed loop communications when assigning tasks to avoid misunderstandings.

Answer All Questions

Allow everybody the opportunity to ask last minute questions before ending the briefing.

Challenge and Response

There is another facet to internal communications that is essential for the efficiency and safety of the CRV. That is to ensure that the CRV has an on board culture that allows 'challenges'. There are statistics to show that lack of challenge is involved in more than 30% of marine incidents.

For example – the crew member who realises that leaving the buoyed channel will be taking the vessel into shallow water with a risk of grounding, but doesn't feel it's their place to question the helm order.

Extract from accident report

At 0554 the Malaysian container vessel Bunga Teratai Satu dropped off the pilot at Yorkeys Knob near Cairns. At 0630 the master handed over to the mate and left the bridge. At around 0640 the duty able seaman (AB) started to clean the bridge.

The mate went out to the starboard bridge wing and made a call on his cell phone. At 0700 the AB finished cleaning and plotted the GPS position on the chart of his own accord.

The AB expected the mate to come into the wheelhouse to alter course, but he did not enter until about 0715 whereupon he went to the chart, questioned the veracity of the 0700 GPS position, and told the AB that his position was incorrect.

Shortly after that he asked the AB what the heading was – to which the AB replied "120°". The mate now ordered a change of course to 180° but the AB could see a sand cay on the starboard bow and, instead of altering course, asked if the mate really wanted to steer 180° saying "chief, can we go over shallow water?" The mate replied by saying: "turn 180° to port". This was quite confusing to the AB and as a consequence he did nothing.

A few seconds later the Bunga Teratai Satu charged with a speed of more than 20 knots up the northern end of Sudbury Reef.

Not all challenges are good for teamwork. Challenging authority or decisions is certainly not always helpful. On the other hand, challenging concepts or ideas can minimise the risk of error and hence, the risk of getting into trouble.

Steps in a Challenge

- A concept is stated and limits are set.
- The situation moves outside the limits that were set.
- A challenge is issued.
- A proper response to the challenge is given.

For example:

Skipper: *"We'll turn to port at the fourth red buoy"*

Crewmember: *"Port at the fourth buoy..."*

Skipper: *"That's right"*

A little later:

Skipper: *"Ok. Let's turn to port now"*

Crewmember: *"But ... don't we have another buoy to pass before we turn?"*

Skipper: *"Damm! You're right! We'll turn after the next buoy"*

- The concept was the need to turn to port and the limit was set at the fourth red buoy.
- The situation moved outside the limits when the Skipper asked to turn before the fourth buoy.
- A challenge was issued and a proper response was given.

Taking Advantage of Challenges

An effective Skipper or crew member should always endeavour to take advantage of challenges.

- Challenges should be allowed and encouraged in a SAR crew.
- Challenges should be seen as a safety measure – no one is infallible, and a Skipper is just as capable of mistakes or misjudgement as anyone else.

The answer given to a challenge is as important as the challenge itself. When you are responding to a challenge, consider the following guidelines:

- Always check the validity of the challenge. If a crew member voices concern over something, it must never be just dismissed out of hand.
- Be diplomatic when you respond to a challenge. Never laugh at someone who has issued an invalid challenge. If you do, the person may no longer challenge. If a challenge isn't valid then it's probably due to a break down in communication, or it's because of lack of knowledge / training on the part of the crew member.