



# Module 4: Radio Operations

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## Radio equipment

Radio communications provide a quick, simple and efficient means of obtaining the assistance, equipment or information needed during lifesaving operations. SLSA entities maintain a variety of radio systems, and additional local knowledge of basic operating procedures is an important supplement to this module.

### Radio basics

**Frequency (bands)**—frequency waves are divided into bands with conventional names. Common frequency bands in SLS are; very high frequency (VHF, 30–300 MHz) and ultra-high frequency (UHF, 300–3000 MHz). SLS uses different frequency bands depending on coverage requirements. Each SLS state radio network may use a single or combination of frequency bands.

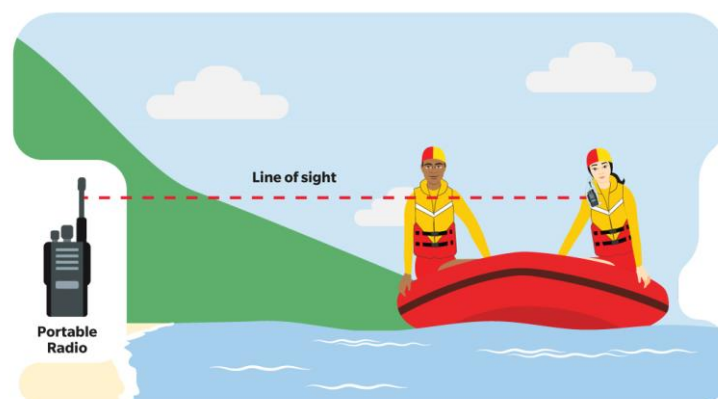
The use of some frequency bands is for commercial use only and requires a licence from the Australian Communications and Media Authority (ACMA). Using unlicensed or incorrect frequencies may result in penalties.

**Analogue radio**—analogue radio transmits radio waves in amplitude modulation ('AM') or frequency modulation ('FM') by a signal. Older SLS radio networks and VHF marine radio use analogue radio technology.

**Digital radio**—digital radio provides greater voice clarity and eliminates unwanted background noise. Most SLS and government radio networks use digital radio technologies. Digital radio networks also support other functionality like GPS tracking.

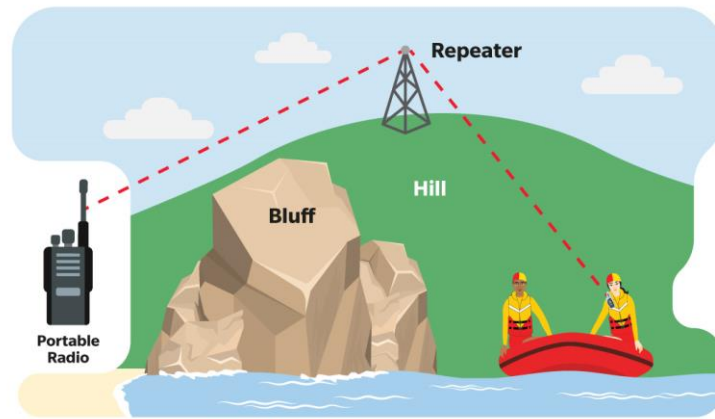
**Channel**—a channel is a frequency (either simplex or duplex) programmed into a radio that is used by SLS or other agencies to communicate with each other. Each SLS branch or state centre may have different channel configurations.

**Simplex channel**—a simplex channel sends information in one direction at a time and may be reversible. The transmitter and receiver are operating on a single (or the same) frequency. You cannot transmit and receive radio transmissions simultaneously on a simplex channel. Simplex channels are limited to line-of-sight communications.



**Duplex channel**—a duplex channel uses a pair of frequencies consisting of one to receive and another to transmit. Duplex channels are used mainly as repeater channels and cannot be used for simplex or direct communications.

**Repeaters**—repeaters receive transmissions on one frequency and transmit on another (or second frequency). They are fixed transceivers that receive line-of-sight signals and transmit them to broaden the radio coverage. Generally speaking, the higher up a repeater is located (e.g., on a hill), the further a message can be re-transmitted.



**Network**—a radio network is a number of fixed and mobile repeaters linked together to cover a larger area. A network may service a SLS branch, geographic region or even an entire state.

**Station**—a station relates to the call sign of a particular radio user, group of users or SLS entity.

Check your SLS state centre SOPs regarding the specific radios, radio network and channels used at your surf lifesaving club or service.

## Types of radios

The common types of radio equipment used are:

- portable radios—an all-in-one radio with antenna, speaker, microphone and battery. Portable radios may be carried by hand, clipped on to clothing, or secured in a waterproof pouch or harness. Portable radios are often low power transmissions and have less coverage than a mobile radio
- mobile radios—usually mounted in a radio room or a vehicle. They are capable of sending more powerful transmissions and have larger external antennas. They may work in areas where a portable radio does not work and are often referred to as ‘base sets’.



## Your radio

You will need to become familiar with the radio units used in your local lifesaving club or service.

Make sure you can identify the following:

- antenna
- battery or power supply indicator
- channel selector
- inbuilt microphone (or speaker microphone)
- on/off switch
- 'press to talk' (PTT) button
- volume control.

Some radios may have additional features such as:

- dual watch (ability to monitor two channels)
- keypad lock
- roaming (automatically select the strongest repeater)
- scan.

It is vitally important that you protect radio equipment from water, sand, heat, shock (drop/impact) and theft. Refer to your local SOPs for procedures on how to protect your lifesaving club or service's radio.



## Surf lifesaving communication centre

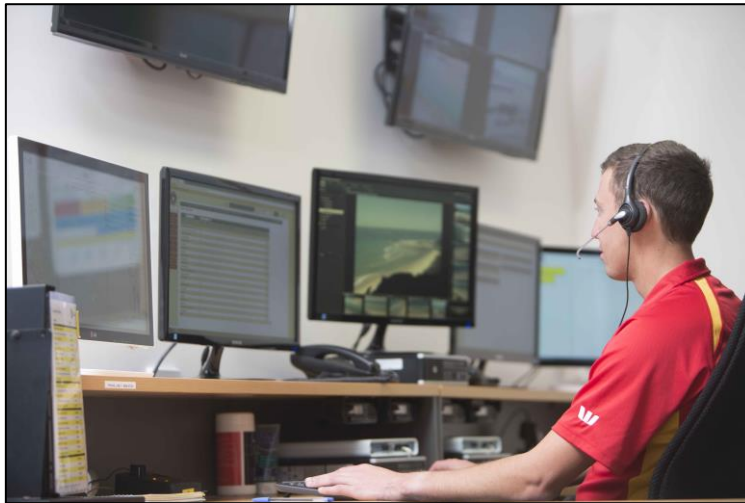
Each SLS state centre has a surf lifesaving communication centre. These vary in name depending on your location and examples include SurfCom, State Operations Centre and LSV Comms.

The main roles of these communication centres are to:

- assist with the coordination of major incidents when several lifesaving services are involved
- gather and record operational information
- liaise with other emergency services
- provide general information to all lifesaving services.

These communication centres can be contacted by using your local radio network or by telephone. Check your SLS state centre SOPs regarding your communication centre.

For simplicity in this manual, SurfCom is used to refer to a surf lifesaving communication centre



## Radio transmissions

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### Radio technique

Radios need to be operating on the same channel for communication to occur. Only one radio operator can transmit on a channel at a time, so you will need to take it in turns speaking in order for messages to be transmitted and received effectively.

#### Do:

- ensure that the channel is not in use before transmitting your message
- ensure you are clear of obstructions that may block your radio signal, e.g., thick concrete walls or sand dunes
- ensure the antenna of the portable radio is as vertical as possible at all times (always point it to the sky)
- hold the portable radio, or the microphone from a mobile radio, approximately 10 cm from your mouth and to the side
- press and hold the PTT button for 2 seconds before speaking clearly to transmit your message
- release the PTT button once you have finished your message
- remain stationary when transmitting if possible, as running to an incident while trying to transmit can make it difficult for other stations to understand your message
- shield the microphone when talking in high noise and windy areas
- speak as if you were talking to someone next to you
- think about radio procedures before transmitting as well as what you are going to say, e.g., include call signs, prowords and other radio terminology wherever possible.

#### Do not:

- carry a radio by the antenna or touch the antenna while the radio is in operation
- expect an immediate reply from a powercraft operator if they are in the surf zone or performing a rescue
- hold the radio like a mobile phone as you will not be speaking into the microphone
- press the PTT button when another station is transmitting, as you may interfere with that transmission
- yell into the radio even if there is a lot of noise around as this may cause distortion and make your message unintelligible.



## Interruptions to transmissions

A radio network may become unavailable for a number of reasons, including power failure or faulty equipment. If unsure about your radio's operation, you may use the following troubleshooting checklist

1. Check that the radio is switched on and the correct channel is selected.
2. Perform a radio check to ensure that the problem is not isolated to your radio (See Radio checks).
3. Change locations and try again.
4. Report the issue to your patrol captain if the problem persists.

As a backup, phones may be used to contact SurfCom and other lifesaving or emergency services.

## Prowords

You may hear or use procedural words ('prowords') when operating a radio. Prowords are a single word or phrase with a common meaning and provide a quick and simple way to keep transmissions short. Prowords should be used where possible.

Proword	Functional meaning
<b>Over</b>	I've finished my message and am handing over to you for a reply.
<b>Go ahead</b>	Go ahead with your message.
<b>Stand by</b>	Stand by for more information while I do something. Other stations may transmit.
<b>Break</b>	Wait for my reply while I break to call another station, e.g., SurfCom.
<b>Roger</b>	I understand.
<b>Wilco</b>	I understand and will go do what you have asked me to do.
<b>Say again</b>	Please say your message again.
<b>Correction</b>	The correct information will follow after I say 'correction'. An error has been made.
<b>Affirmative</b>	'Yes' or 'Permission granted'.
<b>Negative</b>	'No' or 'Permission denied'.
<b>Out</b>	I am getting out of this conversation. End of conversation, network is clear and free for use.

Table 1 – Prowords

## The NATO phonetic alphabet

The NATO phonetic alphabet is an internationally agreed system for pronouncing letters and numbers in a radio transmission. Letters are pronounced as a word and numbers are pronounced individually. Phonetics are a useful tool for ensuring clear communication on a radio and spelling out words or codes.

Letter	Spelling	Pronunciation	Letter	Spelling	Pronunciation
A	Alpha	AL FA	N	November	NO VEM BAR
B	Bravo	BRAH VOH	O	Oscar	OSS CAH
C	Charlie	CHAR LEE	P	Papa	PAH PAH
D	Delta	DEL TAH	Q	Quebec	KEY 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	VIC 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

Table 2 – NATO phonetic alphabet

## Call signs

Call signs uniquely identify each station on a radio network. A number of standard call signs exist.

Standard call signs		
Standard	Used for	Example
SurfCom (or similar)	Contacting the SLS communication centre for your state/territory	SurfCom
All stations	Everyone on the network	<i>All call signs across all surf lifesaving clubs on the network</i>
Patrol	Patrol captain (or next available patrol member)	<i>Venus Bay patrol</i>
Roving	A roving patrol	<i>Portsea roving</i>
Outpost	An outpost patrol	<i>Carlton Park southern outpost</i>
IRB	Inflatable rescue boat	<i>Denmark IRB</i>
SSV	Side-by-side vehicle	<i>Yeppoon SSV</i>
Tower #	Surveillance tower	<i>Tower one</i>
Offshore #	Offshore rescue boat	<i>Offshore rescue boat two</i>
Support Ski # RWC # Wave runner #	Personal watercraft (jet ski)	<i>Support ski six RWC six Wave runner six</i>
Lifesaver #  UAV #	Rescue helicopter  Remotely piloted aircraft (unmanned aerial vehicle/drone)	<i>Lifesaver two-one  UAV one</i>


Table 3 – Standard call signs


Other call signs may be used in your local area, e.g., DO #, Surf Rescue #, Westpac #, PC. Check your local SOPs for more information on call signs used in your area.

You should start your initial transmission by using the call sign of the station you want to contact, twice, followed by your call sign. It is imperative to wait for a reply to confirm that communication is established before continuing with any message. You may not need to use your call sign for each transmission after you have established communication with the desired party.



Example radio calls at Alexandra Headland Surf Life Saving Club:


 **SurfCom, SurfCom.  
This is Alex Patrol. Over.**


**Alex Patrol. This is SurfCom.  
Go ahead.** 


**We are at Alexandra Headland -  
Beach access number  
one-eight-five.**


**Problem is a major laceration to  
their right leg caused by a  
surfboard fin and victim showing  
signs of shock.**

**Victim is a 16-year-old male in  
pink boardshorts...**

 **We have applied pressure to stop  
the bleeding and the victim is  
receiving oxygen therapy.  
Stand by...**

**Roger Alex Patrol. Update us if the  
victim's condition changes.  
SurfCom standing by...** 

 **SurfCom, this is Alex Patrol. We  
now require an ambulance. Patrol  
members are carrying him to the  
first aid room to provide further**

**Roger Alex Patrol. Tasking an  
ambulance to your first aid room.  
SurfCom standing by...** 

# Radio protocols

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## Signing on

Your SLS state centre may require you to sign on with SurfCom at the start of patrol over the radio network, *SLS Patrol Operations App* ([iTunes](#) or [Google Play](#)) or Lifesaving Incident Management System and Operations Control (LIMSOC). Check your SLS state centre SOPs regarding the method of sign on.

Possible information required for sign on includes:


- beach status—open or closed
- IRB status—operational or not
- patrol status—number of patrolling members.

**Note:** Provide a reason if the beach is closed, e.g., dangerous surf, carnival, stingers.


## Radio checks

Radio checks are the simplest form of radio transmission and are the quickest way of checking that your radio equipment is functioning correctly. Carry out a radio check between your surf lifesaving club and SurfCom only if you feel your equipment is faulty.


### Example radio check:

 **Seacliff Patrol. Seacliff Patrol. This is Seacliff Tower. Over.**

 **Seacliff tower. This is Seacliff Patrol. Go ahead.**

 **Requesting radio check. Over.**

 **You message is loud and clear\*. How do you read me? Over.**

 **Your message is also loud and clear\*. Out.**

*\* Your message can be loud and clear, unreadable or nothing heard.*

\*Messages can be loud and clear, unreadable, or nothing heard.

Radio check readability scale	
Loud and clear	Can receive and understand transmissions
Unreadable	Can receive but cannot understand transmissions
Nothing heard	No transmission received

Table 4 – Radio check readability scale.

## During patrol

You should be aware that many people monitor radio channels so you should be careful when communicating details about incidents, victims and their injuries.

Do not:

- declare a victim as deceased over the radio
- provide personal information such as phone numbers
- use bad language/profanity
- use personal names unless absolutely necessary
- use radios for social conversation.

## Signing off

Your SLS state centre may require you to sign off with SurfCom at the end of patrol over the radio network, *SLS Patrol Operations App* or *LIMSOC*. Check your SLS state centre SOPs regarding the method of sign off.

## Incidents and emergencies

### Emergency call

Where a patrol requires urgent assistance for a life-threatening incident or any incident outside of the patrol capabilities (e.g., mass rescue), the correct radio procedure to clear a channel is to call 'Rescue, Rescue, Rescue'. For example:



**Rescue, Rescue, Rescue (pause).  
'Surfcom, Surfcom, this is Gove  
Peninsula. Over.**

**All stations stand by. Break. Gove  
Peninsula this is SurfCom.  
Go ahead.**



Any rescue or life-threatening incident should be communicated to your SLS state centre communication centre. They can assist you by calling the most appropriate rescue services and recording key information. It is important that you follow any directions they provide.

At the conclusion of the life-threatening incident, your SLS state centre communication centre will advise 'All stations' that the incident has finished, and normal patrol operations may recommence on that radio channel.

## Incident procedures

For any incident, you should use the '4 Ps' to pass on accurate information.

When describing your position, use the correct name of the beach/location and/or cross street. Local 'slang' names should be avoided.

4 Ps for incident procedures			
P	Meaning	Answers the question(s)	Examples
1	Position	What is the specific position of the person that is as close and accurate as possible?	<ul style="list-style-type: none"> <li>• About 50 m north of the Avalon Beach Surf Life Saving Club on the corner of Barrenjoey Road and Avalon Parade...</li> <li>• At the fixed rip about 5 m south of the flags, and 20 m offshore...</li> <li>• Approximately 10 m east of the Glenelg Jetty...</li> <li>• Northern end of the beach on the rocks...</li> </ul>
2	Problem	What is the victim's problem? What do you require?	<ul style="list-style-type: none"> <li>• Problem is minor cuts to the victim's arms. We require a first aid kit...</li> <li>• Swimmers are caught in the rip and fatigued. We require the IRB to assist...</li> <li>• Problem is a dislocated shoulder. We require a triangle bandage and an ambulance...</li> <li>• Problem is a major fin chop to the left leg. We require an ambulance and a first aid kit...</li> </ul>
3	People	How many people? How to identify them— age, gender, clothing?	<ul style="list-style-type: none"> <li>• Victims include a teenage female and a teenage male both wearing gym clothes...</li> <li>• Victims are two female children wearing pink rash shirts...</li> <li>• Victim is a female in her late 70s wearing a red hat...</li> <li>• Victim is a male surfer in his late 20s with a beard and many tattoos....</li> </ul>
4	Progress	What is happening now to progress the scene?	<ul style="list-style-type: none"> <li>• The female is now unconscious and not breathing. We are commencing CPR and require a defibrillator...</li> <li>• The IRB is on the way to rescue the children and we will assess their condition once they have been returned to shore...</li> <li>• The ambulance has arrived on the scene...</li> <li>• The bandages are not controlling the severe bleeding and they are losing consciousness. We require a trauma kit and a defibrillator...</li> </ul>

Table 5 – 4 Ps for incident procedures

## Radio maintenance

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To maintain maximum operating efficiency of radio equipment, and to prolong service life, all equipment should be regularly maintained and serviced annually, as well as checked prior to, and after, its use.

Maintenance of radios used at your surf lifesaving club should follow your SLS state centre SOPs.

After use, radio bags, cases and harnesses should be rinsed lightly with fresh water to remove salt water and sand, then air-dried.

Immediately follow the manufacturer's recommendations if your radio shows physical signs of damage after it has been dropped or immersed in water. Then advise your patrol captain of your actions. Damaged radio equipment should be taken to an approved radio repairer or service agent as soon as possible.



## Battery charging

Most surf lifesaving clubs and services have portable radio chargers set up so that radio battery charging is easy and convenient.

Radio batteries should always be fully charged for the next patrol duty or lifesaving operation. A radio with a low or a flat battery may emit a warning beep or turn off when trying to transmit. Turn this radio off and put it on to charge immediately, ensuring that the charge light is on.

The charging of radios used at your surf lifesaving club should follow the manufacturer's recommendations and your local SOPs.



## General information

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- Many radio networks are automatically voice-recorded. Always follow radio procedures and use the correct call signs.
- Most radios are fitted with an identification number ('IN') to uniquely identify a transmitting radio.
- Radios should not be used in thunderstorms except when there is an emergency.
- There are many SLS clubs and support operations that have VHF marine radios. Strict laws apply to the operation of VHF marine radios and only those holding the appropriate qualifications should operate them to avoid penalties outlined in The Radiocommunications Act 1992.
- Where possible, use simplex channels for SLS club-specific transmissions such as water safety, training or carnivals. Refer to your local SOPs.