

**NZ LAND  
SEARCH AND RESCUE**



**FIELD GUIDE**

2006

# NZ LAND SEARCH AND RESCUE FIELD GUIDE

NZ LAND SAR Inc.

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Some sections of this guide have been copied from the Land Search and Rescue manual.

## **Foreword**

Volunteer SAR personnel play a key role in Land Search and Rescue in New Zealand due to the limited manpower available to the Police. The SAR system owes its success to the high level of cooperation between Police and civilians and the experience and specialised skills of the people involved.

It is important that those involved are skilled in all aspects of Bushcraft, Outdoor First Aid and SAR and that they practise these skills regularly.

Over the years, methods and procedures have been developed to enable SAR operations to run smoothly and efficiently and it is the intention of this manual to standardise this information into a concise format for ready reference. Further details of the organisation are contained in manuals produced by the Federated Mountain Clubs of NZ Inc. and NZ Land SAR Inc

I would like to thank members of the Auckland District Committee, Auckland Land Search and Rescue and the many others who have contributed to this manual over the years, especially John Walsh, Roscoe Tait, Heather Walsh, Jim Rowe, Ron Renz, Fred Gallas, Ken Whitaker, Frank Wielemaker, Lou Grant, Clive Watson, Dell Hood, Jack McConchie, Peter Davis, Trevor Burgess, Phil Callaghan. My thanks also to Ross Thompson for his hours of effort and contributions.

Roger Curl  
Auckland  
April '97

## **Forward to Second edition**

The NZLSAR Field Guide has proved to be an extremely popular and useful guide for all those involved in Land SAR. The First Edition was reprinted to meet the demand. However, changes to the management structure for SAR operations with the introduction of CIMS; changes to the radio section (especially the VHF frequencies) and the Searching section to reflect more modern search techniques as well as number of corrections to the First Edition has resulted in this, the Second Edition of the Field Guide.

I would like to thank the many people, especially the members of the NZLSAR Training Subcommittee, who have put so much effort into producing this manual.

Should you have any feedback or suggestions on additions or improvements to this manual, please contact the author:

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# **Section 1: The SAR Organisation**

## **Definition**

A Search and Rescue operation is defined as one which is initiated with the aim of saving life, preventing injury or removing a person or persons from a situation of peril. It includes operations mounted solely for the recovery of bodies.

## **SAR in New Zealand**

SAR operations in New Zealand can be separated into three main categories:

- Land searches
- Small area sea searches close to shore
- Wide area sea/air searches

The first two categories are the responsibility of the New Zealand Police who may use their own resources or call on volunteer assistance. Separate volunteer organisations exist for the land and sea operations.

Wide area searches (and those for aircraft within NZ and ships.) are the responsibility of the Ministry of Transport (Aviation Division) and are controlled from the Rescue Coordination Centre New Zealand (RCCNZ) situated in Wellington.

## **Classes of Operations**

There are now two classes of search Class II and Class III. The original Class I search (Police personnel only) has been combined with Class II.

### **Class II Search**

- An operation which is coordinated and controlled by the Police

### **Class III Search**

SAR operations other than Class II searches, being:

- All SAR operations associated with activated emergency locator transmitters
- All SAR operations associated with missing or distressed aircraft
- SAR operations including those for missing or distressed surface vessels or aircraft requiring the use of national and international civil and/or military resources or coordination with other states, controlled from the Rescue Coordination Centre (RCCNZ)
- SAR operations begun as Class II operations when responsibility is transferred by mutual agreement to the RCCNZ by NZ Police

## **The NZ Land SAR Organisation**

New Zealand Land Search and Rescue Incorporated (NZLSAR) was formed in November 1994 as a stand alone organisation. It replaced the FMC (Federated Mountain Clubs) SAR sub-committee as the umbrella organisation for Land SAR in New Zealand.

NZLSAR is a volunteer based organisation that provides highly trained volunteer land search and rescue personnel who have the skills, expertise and knowledge to assist the police in land SAR operations in wilderness, rural and suburban areas. Specialist Groups, such as SAR Search Dogs, Vertical rescue, underground, etc provide specialist search and rescue expertise for many operations and are an integral part of the NZLSAR organisation.

The NZLSAR structure, as illustrated on page 85, consists of local SAR organisations that make up the membership of District SAR committees. Civilian and Police Representatives from each District SAR Committee constitute the membership of the Regional Committee. There are seven region committees across the country. Each regional committee elects a Regional Representative to the NZLSAR National Committee. The other NZLSAR National Committee members are the Chairmen of the five standing Subcommittees (Communications, Specialist, SAR Dogs, Training and Underground), representatives from Police, Department of Conservation and FMC plus the Chairman and Treasurer. The NZLSAR National Committee meets four times a year, usually in Wellington.

NZLSAR has an office in The Office of the Commissioner at Police National Headquarters and has one full-time employee who works along side the Police National SAR Coordinator.

## **Callouts**

Callouts for Class II operations involving civilian volunteers are initiated by the Police. A Land SAR Adviser is contacted by the Police Search Controller and the situation is discussed.

Land SAR Advisers are selected based on their skills, experience, training, etc and standing in the SAR community.

If a search is deemed necessary the Adviser recommends the appointment of a suitable Operations Manager and Planning/Intelligence Manager and then arranges for the callout of volunteers. This is usually done through the local SAR organisation, although in some cases the club contact system is still used.

## **Section 2. Operational Structure**

### **Coordinated Incident Management System (CIMS)**

CIMS is a standardised emergency management system that is currently used in slightly different forms in many countries around the world. All New Zealand Emergency Services have adopted CIMS as the command, control and co-ordination structure for all emergency incidents in New Zealand and the NZ Police and NZ Land SAR use it in the management of searches.

The CIMS structure is similar to the Incident Command System (ICS) as used in the United States, but has been adapted for New Zealand purposes.

Government organisations that have agreed to the implementation of CIMS include NZ Defence Force, NZ Police, NZ Fire Service, NZ Rural Fire Authority, Department of Conservation, Civil Defence, Ambulance Board, and the Prime Minister's Department.)

The major advantages are that the roles and the lines of responsibility are clearly defined. The system is scalable and flexible. One person can take on several of the roles for a minor incident and the model can easily be expanded for a multi-agency disaster type incident.

Search and Rescue can range from a small notification to an extended multi-agency operation. Whoever takes control of the initial notification may take on several of the roles although Police policy dictates that the Incident Controller will be a police employee. As the search escalates, more personnel are brought in to take over the various roles. Each of the managers may have one or more assistants.

The Police have the responsibility for Class II SAR operations and are therefore the Lead Agency, although they may have many support agencies.

### **Organisational Chart**

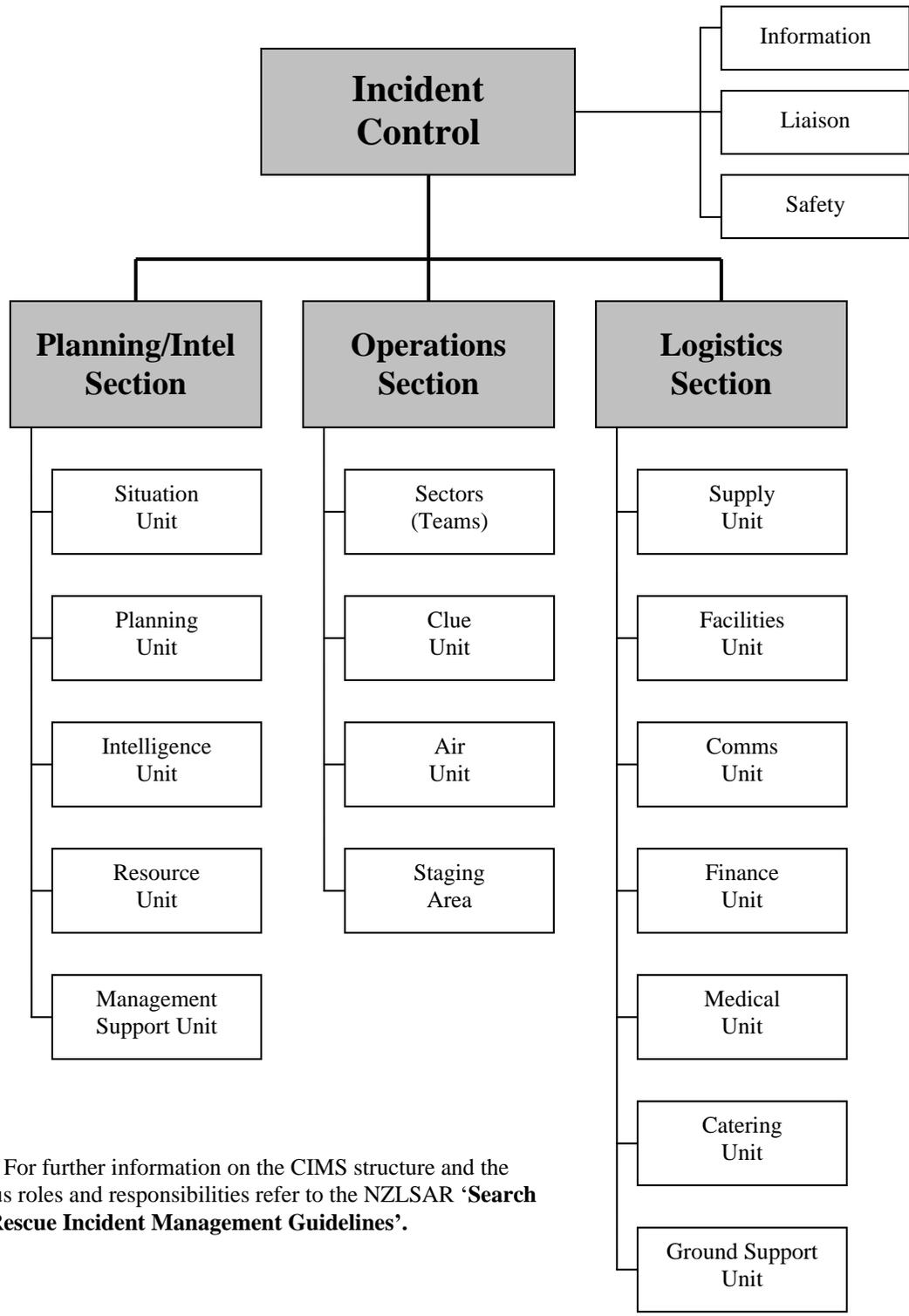
The following chart illustrates the generic CIMS structure, which has been slightly adapted for SAR.

The titles of the IMT reflect a common methodology with other CIMS users.

Specialist resources or units can be used if required by the operation, eg: caving, ACR, jet boats, kayaks, infra-red and other resources. The CIMS organisation is very flexible and so is the structural chart.

The Operations Manager sets up the structure of the Operations Section for a particular search. All SAR Field Team Members will fit into the Operations part of the structure.

SAR field teams and specialist resources all come under the control of the Operations Section.



**Note:** For further information on the CIMS structure and the various roles and responsibilities refer to the NZLSAR ‘Search and Rescue Incident Management Guidelines’.

## **Incident Management Team (IMT)**

The CIMS structure is built around the four major roles of the Incident Management Team:

- **Control**  
Responsible for the management of the incident (**Incident Controller**)
- **Planning/Intelligence**  
Responsible for the collection and analysis of incident information and planning of the response activities. (**Planning/Intelligence Manager**)
- **Operations**  
Responsible for the direction of the available resources in resolving the Incident. (**Operations Manager**)
- **Logistics**  
Responsible for the provision of facilities, services and materials required to resolve the incident. (**Logistics Manager**)

### **Main responsibilities of the Incident Controller (IC)**

- Assuming control
- Establishing Incident Control Point (ICP)
- Protecting life and property
- Establishing CIMS structure
- Appointing, briefing and tasking staff
- Initiating the Incident Action Plan (IAP) planning cycle
- Liaising with outside organisations

### **Main functions of the Planning/Intelligence Manager (PIM)**

- Gathering and disseminating information
- Analysing the incident data
- Identifying resource requirements
- Preparing the Incident Action Plan (IAP)
- Maintaining resource status and location
- May also have a non-operational role as an Adviser – maintains contact system and organises training of volunteers

## **Main functions of the Operations Manager (OPM)**

- Managing operational activities directly related to resolving the incident
- Providing input to the Incident Action Plan (IAP)
- Setting the operational structure
- Identifying resources
- Implementing the IAP
- Briefing and tasking search personnel

The Operations Manager may have several assistants to help with the search.

## **Main functions of the Logistics Manager (LM)**

The Logistics Section is responsible for providing and maintaining all:

- Personnel
- Materials
- Facilities
- Services

## **Other ICP personnel**

### **Communications Manager**

Usually a member of AREC (Amateur Radio Emergency Communications)

Responsible to the Logistics Manager for:

- Providing suitable communications equipment (radios, repeaters etc.)
- Allocating, recording and collecting communications equipment
- Ensuring correct communications procedures are used
- Monitoring and replenishing batteries
- Monitoring the condition of the communications equipment and undertaking or recommending improvements or repairs as necessary

### **Search Assistants**

With the increased use of computers and similar technology in SAR, there is a requirement for people with good keyboard and/or IT skills who can apply these skills within the SAR context. They are members of the Management Support Unit in the Planning/Intelligence Section and are responsible for:

- Establishing and maintaining the IT systems and network
- The accurate recording of all incident related information
- Providing reports to the IMT Sections

All Managers of the sections and the Incident Controller (IC) should wear clearly labelled vests for easy identification.

The managers may have several assistants to share their workload, depending on the size and complexity of the operation.

### **Terminology**

CIMS uses specific terminology, consistent across all rescue agencies. It is essential that SAR personnel understand and become familiar with these terms and their abbreviations.

<b>CIMS</b>	<b>Initials</b>
Co-ordinated Incident Management System	CIMS
Incident Controller	IC
Planning/Intelligence Manager	PIM
Operations Manager	OPM
Logistics Manager	LM
Incident Control Point	ICP
Incident Management Team	IMT
Incident Action Plan	IAP
Assembly area	AA
Safe Forward Point	SFP
Staging Area	SA
Helipad	HP
Helibase	HB
Emergency Operations Centre (For multiple Incidents)	EOC

**Note: For clarity, the IMT/ICP/Operations, etc, are all referred to as Base in this document.**

## **Section 3. Field Personnel**

The Field Personnel involved in any search are the key to its success. It is important that each person knows their specific role in the organisation and is aware of what is expected of them and what their duties are.

The following are brief descriptions of the requirements of each of the roles of SAR personnel.

### **Team Member**

**Objective:**

To carry out delegated SAR tasks safely and efficiently

**Responsible to:**

Team Leader

### **Requirements**

#### **Bushcraft Skills**

As a Team Member, you should have a reasonable level of fitness and be experienced in all aspects of bushcraft:

- Navigation (map and compass, grid references, bearings)
- On and off track travel
- River safety
- Shelter building
- Outdoor first aid - all people involved in SAR should hold a current outdoor first aid certificate
- Climbing, mountaineering and snowcraft (where appropriate)

#### **SAR Skills**

Participate in your SAR group's training programme to gain experience and proficiency in all of the necessary SAR skills:

- Search techniques
- Track and Clue Awareness (TCA)
- Rescue techniques
- Communications and message handling
- Helicopter procedures and safety
- Patient care
- Stretcher handling
- Rescue site management

### **Food and equipment**

You should normally be self sufficient for 2 days, depending on conditions and local requirements.

### **Medical**

Ensure that the Team Leader and the Operations Section are aware of any medical problems, allergies, medication, etc. that you may have.

### **Special skills**

Let the Logistics Section, the Operations Section and Team Leader know if you have any special skills such as medical, cliff rescue, local knowledge, etc.

### **General**

Ensure that your SAR organisation or club contact has up to date details of your phone numbers, address and fitness level. Make sure you know who to advise when your details change.

Keep your food and equipment readily available and in good condition to enable you to take part in searches at short notice.

### **On Arrival at the Designated Staging Area**

In areas where personnel are called out individually, supply the Logistics Section with:

- Your name, address and contact details
- Your next of kin and their contact details
- Your fitness level
- Your abilities and/or specialist skills
- Details of any medical conditions you may have
- Pager and/or cell phone number (if you carry one)
- Any specialist equipment you have

You will be allocated to a team in due course.

If you are in an area where teams of personnel are called out, the Team Leader should record and pass on all the information about the Team Members.

If you are member of a SAR organisation your details may already be available via the GMan database system.

### **In the Field**

- Your personal safety and the safety of the team are paramount
- Follow the instructions of your Team Leader and carry out your tasks to the best of your ability
- Advise the Team Leader if you are not happy about your safety

- Remain with the team at all times
- Help anyone in your team who may need assistance
- Advise the Team Leader of any changes in your own health and your ability to perform
- Contribute to group discussions and decision making when appropriate

### **Back at base**

- Be very careful what you say; relatives or friends of the missing party will probably be present at base
- Return any equipment you may have been issued
- Participate in the team debrief
- Let the Logistics Section know when you are departing from the operation

### **Team Leader**

#### **Objective:**

To safely and efficiently lead the search team in the execution of its assigned tasks

#### **Responsible to:**

Operations Manager (or Rescue Controller if one is appointed)

### **Requirements**

In addition to meeting the requirements of the Team Member, you, as Team Leader, are responsible for your team from briefing until the end of the operation. Should a missing person be found by your team, you must assume the role of Rescue Controller. Remain in charge of your team and any other teams that arrive at the rescue and evacuation site unless someone else is appointed as Rescue Controller.

### **On Arrival at the Designated Staging Area**

In areas where teams of personnel are called out, the Team Leader may be asked by the Operations Section to verify the details of the Team Members and any specialist equipment carried by the group.

### **Pre Departure**

#### **Task Briefing**

When called, attend a briefing with the Operations Manager and collect:

- Full details of the missing party
- Full details of the areas to be searched and the search methods expected
- Maps, notebooks, pencils and plastic bag for map
- Make sure you write down all relevant information

- When requested, attend or delegate a competent Team Member to attend a radio briefing
- Write down radio call sign, and radio schedule times
- Collect radio, spare batteries and plastic bag for radio
- Be sure that at least one other team member is fully conversant with radio use
- Write down channel no(s) and when they are to be used
- Record phone numbers of the base (land and cell phone)
- Check GPS accuracy against a known reference point before leaving Base
- Synchronise watches

#### **Brief the team**

- Enquire if any Team Member has any medical problems
- Ensure that all Team Members are capable of undertaking the search tasks
- Ensure that all Team Members are suitably equipped for the task with sufficient spare food, clothing and shelter for the missing person(s) if found (See Section 4, page 18)
- Give the team full details of the missing party, the area to be searched and the search techniques required. Familiarise them with the search area location
- Determine what experience there is within the team and allocate the duties that Team Members will be given should the missing party be found eg. First Aider, Patient Minder
- Task a team member to be responsible for the radio and do a radio check before leaving Base. (Refer to section on radio failure, page 22)
- Monitor/check pack weights of each member as excessive pack weights usually slow progress
- If awaiting transport, make sure that the team is assembled with gear near the pick up point in order to be able to depart immediately the transport arrives

#### **Share equipment**

Make sure that any heavy or extra equipment is shared among Team Members.

**NB:** It is important that as much preparation as possible is done prior to the briefing so the team is ready for the field as soon as possible.

## In the Field

- **The Safety of the Team is Paramount at all Times**  
Make sure no one becomes another victim.
- **Location Awareness**  
Ensure the team is always aware of its current location and destination.
- **Search Procedures**  
Make sure the team follows the required search procedures and that all areas are covered thoroughly. Make plenty of noise (shouting, whistling) where appropriate. (Refer to section on Searching, page 50)
- **Communicate with Base**  
Give clear precise messages to Base when necessary.  
NB: Be careful what you say; friends or family will probably be at base or may be in another team and could hear your transmissions.
- **Monitor the Team**  
Monitor the Team Members' progress regularly. Ensure no one is experiencing too much difficulty. Consider slowing the pace down if necessary. Team Members may need to share the load of anyone who is experiencing difficulty.
- **Rest breaks**  
Take regular rest breaks. Make sure everyone has sufficient food and drink.
- **Liaise with the Team**  
Communication within the team is essential. Discuss problems and situations. Make sure everyone understands the decisions you make and why.
- **Separation**  
If the team has to separate for any reason, such as to search stream tributaries, you must ensure that everyone has very clear instructions on where, when and how to rendezvous, especially if there are insufficient radios for each group.
- **Courtesy**  
Make sure all gates, property, etc. are left as you find them.  
  
Always identify yourself with landowners and the public, and be respectful. Appraise them of the search and seek any information on sightings of the missing party, etc. Tell them how they can contact Base in case they discover something later.

- **Area identification**

Identify any of your team's areas of impact (campsites etc.) so as not to confuse other search teams.

- **Task documentation**

Detailed notes should be kept relating to the search effort; recording such things as:

- Area covered
- Search methods used
- Sign, or lack of
- Estimated POD (Probability of Detection)
- People met (names, contact details, etc.)

### **Back at Base**

- Notify the Operations Section of your return.
- Make sure all your team is accounted for. Team Leaders who have been part of a rescue party must still account for their original Team Members.
- Hand in your radio and batteries. Report any faults or problems.
- Be very careful what you say; relatives and friends of the missing party will probably be present at base.
- Expect to be debriefed. Show and state the exact areas searched, the methods used and any other relevant details including POD. Give details of conditions encountered, locations and descriptions of items found, or comment on the absence of clues.
- Hand in any maps, notebooks, team equipment, items found, etc.

## **Rescue Controller**

### **Objective:**

To safely coordinate the patient care, site management and rescue of the missing party

### **Responsible to:**

Operations Manager

### **Responsibilities**

- Safety of the team(s) and the missing party
- Management of the rescue site
- Management of the evacuation of the missing party
- Welfare of the team(s)

The Leader of the Team that finds the missing party assumes the role of Rescue Controller unless instructed otherwise, or unless someone else is appointed by the Operations Manager.

The Rescue Controller is in charge of all teams that combine to form the rescue party.

Refer to the section on rescue site management on page 66

## **Section 4. Food and Equipment**

As a general rule, you should be self sufficient for at least two days (in some areas, four days - check with your local organisation) and be able to comfortably spend the nights in the bush.

You must expect extremes from carrying a heavy stretcher with a pack under hot sun for long distances, to standing about for several hours in cold, wet, windy conditions, and must therefore be prepared for any eventuality.

It is important to remember that you will need extra food and gear for the missing party should they be found, or if a team member is injured. Certain conditions or situations may dictate extra gear or clothing.

You should be able to prepare for a search within half an hour.

You should always arrive fully equipped to any search or SAREX.

### **What to Wear**

Wear wool or polypropylene top, socks, shorts, sound tramping boots and high gaiters. Adjust this for winter and colder climates. Also keep your compass and whistle handy.

### **What to Carry with you**

- Parka
- Leggings
- Wool or polyprop balaclava
- Wool or polyprop gloves or mittens
- Wool or polyprop longjohns
- Sunhat and sunblock in summer
- Wool or polyprop long sleeve top
- Jacket or Swandri
- Compass (Silva type)
- Whistle
- Toilet paper - (Personal and for track marking)
- Plastic bags - for maps, radios etc.
- For cold climates: extra cold weather clothing.
- Notebook and pencil
- A copy of this manual
- Small billy
- \* Small portable stove and fuel
- Knife, spoon and mug
- Full water bottle
- Lightweight sleeping bag
- Water filter or purifiers (optional)
- Ground sheet or foam mat
- Small fly sheet (optional), not required if survival tube carried
- Torches with spare bulbs and batteries  
Several torches (3 or 4) of various strengths with spare bulbs and batteries. LED type lights are a good backup.
- Rope (optional)
- Leather gloves (optional)
- Secateurs (optional)

\* NB: Keep your portable stove and fuel in a separate bag. If you are transported by helicopter, hand this bag to the crew as you enter and tell them what it is. They will jettison this rather than your entire pack if they suspect a fuel leak.

### Personal Survival Kit

(Sealed in a waterproof container) comprising:

- Pocket knife
- Survival tube and cord
- Fire starters (candle, fire starters)
- Small compass
- Barley sugars
- Waterproof matches or lighter

NB: A "survival kit" only contains a few essential items. What you are wearing and carrying in your pack constitutes your full survival kit. Never discard anything or become separated from your pack.

### First aid kit

(Sealed in a waterproof container) comprising:

1	Small notebook and pencil	1 pkt	Anti-histamine tablets
1	10 or 15cm crepe bandage	1 pkt	Painkillers
1	Triangular bandage	1 roll	Adhesive tape
1	Sani-napkin or wound dressing	1 pr	Disposable gloves
6	Safety pins	1 pr	Iris or fine scissors
1	Outdoor first aid manual	1 pr	Tweezers
1	Small cake soap	1 pkt	Paraffin or non stick dressings
1	Insect repellent	1 pkt	Steristrips or butterfly closures
10	Band-aids		

Make sure you check the contents of your kit regularly and replace any items that may have deteriorated or passed their use-by date.

### Packs

If possible, pack your gear in a medium sized comfortable pack and also take a small daypack or pikau. If the party has doubled up on some gear or you find you have gear that is surplus to your requirements, you can leave it back at Base in your daypack. If you find that you will be doing a short local search and are unlikely to spend a night in the bush, you can transfer your essentials into your daypack and take that. Don't forget first aid kit, survival kit, parka, snacks, drink bottle and a warm top. Line your pack with a large plastic bag or pack liner.

It is advisable to have a small rope loop securely attached to the top of your pack to enable it to be clipped to a helicopter grabber hook.

Avoid having gear hanging from your pack or a pack that is too high.

### Each Team Should Have:

- Map of the search area
- \* Radio (1 or more if VHF)
- GPS
- First Aid Kit
- Plastic bag(s) for radio
- Plastic bag for map
- Notebook and pencil
- Rope

**Other Items:**

- Machete, axe (if required)
- \* Orange smoke flare
- \* (Normally supplied at base)
- Cell Phone
- Cyalumes (light sticks)

**Sharing gear**

You may not be placed in a team with your mates. Wait until you have been made into teams before redistributing gear to equalise loads.

**Food**

Food must be lightweight, nourishing and easily prepared. Always carry your own food. If you get separated from the person who has your food, you could go hungry.

Listed below are the contents of an army ration pack ("rat pack.") These can be purchased made up or you may make up your own and customise them to suit. Having them on hand will save a lot of time in preparing for a search.

**1 x Breakfast:**

½ cup porridge (precooked type)  
(add salt & 1 cup water, boil 3 min.)

**2 x Lunches**, each containing:

4 x Cabin bread  
1 x Segment cheese  
1 x Cup-a-soup

**1 x Dinner:**

1 x Freeze dried meat & rice  
1 x Freeze dried dessert  
1 x cup-a-soup

**Supplementary:**

3 x Tea  
3 x Coffee  
3 x Milo  
2 x Oxo cubes  
8 x Sachets sugar  
1/2 Cup milk powder  
1/2 Cup sultanas  
2 x Muesli bars  
2 x Chocolate bars  
6 x Barley sugars  
1 x Refresh  
Salt

Back Country Foods provide a range of dehydrated meals.

This should be sufficient for two days, but you may wish to add more.  
(Barley sugars, biscuits, scroggin, cheese etc.)

The Freeze dried meals could be substituted with Rice Risotto, macaroni cheese etc. Breakfast alternatives can be rice, cereal, bacon, etc. Ensure that meals have a high energy content. The above may not be sufficient for some people, especially during arduous searches, and in cold climates.

If these packs are sealed in airtight bags, they should have a reasonable shelf life. Make sure you check them regularly and replace as necessary.

## **Section 5. Communications**

Good communications between Base and the search teams is essential for the smooth running of a search. It is important that all Team Members have a good working knowledge of the equipment and are able to use it competently.

A brief description of some of the more common types of equipment used is shown below. Most sets will be similar to those mentioned. More detailed information on current VHF/UHF and HF radios is included at the end of the section.

### **VHF (Very High Frequency) Radios**

These are hand-held radios, normally used for short-range communication with line of sight between stations. However, when used with one or more suitable repeaters (land based or portable) the range can be extended considerably.

This type of set can normally be kept running whilst travelling so that teams can monitor the progress of the search continuously and they can normally be contacted by Base at any time

### **HF (High Frequency) Radios**

HF radios are used for many backcountry searches and are often used as back-up for VHF radio systems. The equipment used is capable of long distance communication, but it can be dependent on the time of day and atmospheric conditions for good reception.

At night, interference from overseas stations is possible. Problems can also occur when several searches are in progress simultaneously. A long aerial wire normally needs to be erected to transmit and receive, limiting mobile contact with base.

### **Cell Phones**

Cell phones can be used for communications if there is good coverage in the search area. Often coverage can be obtained from ridges and high points many kilometres from a cell site. Although they should not be relied upon, they can often provide backup communications. Remember to list any cell phone numbers you may need before leaving base.

### **Michie Phones**

These are used for cave rescues, since radios have a very limited range in caves. A single insulated wire is laid out through the cave and connected to a base set at the cave entrance. Search teams requiring communications connect a handset to the wire (puncturing the insulation). The earth path return is created via the Michie phone case through the operator or by touching the cave surface. Reception may be improved if the operator is standing on a wet or damp surface.

The Michie phone base set, which is usually at the cave entrance, is earthed with a steel peg driven into the ground.

### **Satellite Phones**

Satellite phones can be used for communications if they are available. While in theory they can be used anywhere, they do have limitations in some terrain such as near bluffs, in gorges and under heavy or wet canopy. Like GPS, they do not work well unless you have a good clear view of the sky, preferably from horizon to horizon. Although they should not be relied upon, they may be able to provide backup communications. Remember to list any Satellite phone numbers you may need before leaving base. Note that they are expensive to operate with call costs around \$3 - \$20 per minute depending on the number called.

### **Batteries**

All batteries, particularly alkaline, perform better and last longer when kept warm during discharge. Keep the radio close to the body, shield from wind and cold wherever possible. Frozen batteries should not be used until re-warmed. Ensure that spares are carried, and don't mix new and used cells.

### **Care of Radios and Phones**

- Radios are expensive pieces of equipment and care in the field is essential.
- Protect all radios from physical abuse. Take care not to drop or bump them.
- Protect radios and cell phones with a plastic bag in wet conditions or if you are about to cross a river. Ensure that earphone sockets, etc. are sealed.

### **Radio Failure**

**IMPORTANT: Always test your radio before leaving Base and entering the Field.**

Should your radio fail during the course of a search you must decide whether to return to Base the way you have come or make physical contact with another team. You may also decide to continue with your allocated task but remember you have no means of reporting your movements or findings. A team adrift in a search area will only distract the search operation. The decision will be based on the amount of ground you have covered and the ease of returning to Base. The carrying of multiple VHF's, cell/sat phone(s) and/or a HF radio will minimize this problem. The Operations Manager will be informed of your non check-in at a sched time or, if you can't be contacted, and will take appropriate actions according to the circumstances.

## Using VHF and UHF Radios

- Make sure you are fully conversant with the radio you have been issued before leaving Base. If in doubt, ask for assistance. You should list any other channels that may be in use and take note of where the repeater(s) are situated and what areas they are expected to cover. If you don't have a plastic bag for the radio, get one from Base. Test your radio before leaving and ensure that you have spare batteries and know how to install them. You should also test the radio before dismissing any transport.
- Ensure you know how to lock and unlock the keypad, change channel and adjust the power output. Leave the keypad locked unless changing settings
- Do not use the antenna as a handle. It will break off.
- Always ensure that the push to talk button is not accidentally depressed, especially when the radio is in a pack. This will lock up the repeater station and jam communications for the other parties as well as rapidly flattening the battery.

## Battery Failure

- With a fully charged battery, sets may normally be left on all day to maintain a listening watch, however excessive transmitting will cause rapid battery drain. Use the radio's low power setting to conserve battery power whenever possible.
- Should you suspect that your batteries are failing and you have no replacements, inform Base of the fact and that you will not be maintaining a listening watch. Switch the set off and follow the procedure for radio schedules as described on page 29.

## Using High Frequency (HF) Sets

Condor/Codan, Polsar (SR3)

Note: Base station sets are usually more powerful than the mobile sets so you may be able to hear Base even though they can't hear you. As the portable sets are low power, care should be taken with aerial positioning, as described below.

The call sign for Base should be established in consultation with the Communications Manager and should be based on the name of the nearest city or large town or other nationally well known geographical name.

## Setting Up

Note that an instruction card is normally supplied with each set or instructions are printed on the set.

Different aerial lengths are required for the two primary channels.

### Channel 1. Daytime Dipole Aerial: (5680KHZ)

This is the most commonly used aerial and consists of two 12-metre lengths of wire coupled together and wrapped around two flat plastic spools. Ensure that any clip-on lengths are disconnected.

### Channel 2. Night Time Dipole Aerial: (3023KHZ)

This aerial is longer than the daytime aerial (2 x 23m) and should be used only with the night channel. In some cases (Codan/Condor/Polsar) additional end sections are clipped on to the end of the day aerial to achieve the correct lengths.

### To Erect Dipoles:

Select the correct aerial to be used (short for day, long for night). Partially unwind the two spools of wire and mount the centre coupling which joins the two wires as high as possible on a tree or stick, leaving sufficient twin feeder wire hanging down to enable the two terminal lugs to reach the radio. Unwind the remaining wires completely, stretch them out in opposite directions and secure them as high as possible with the strings at the ends. The erected aerial should be at right angles to the base station, as high as possible at the centre and ends and clear of structures, wet bush etc.

Connect the two terminal lugs to the radio by loosening the two aerial screws, sliding one terminal lug under each screw and tightening it.

NOTE – ensure all the aerial wires are FULLY unwound and the terminal lugs are not touching each other.

### End fed Aerials:

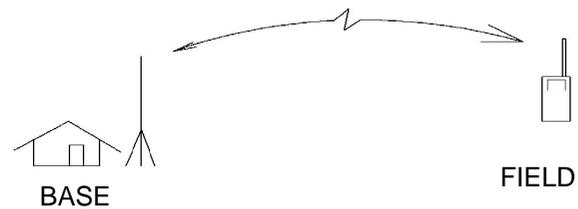
Alternatively an end-fed aerial may be supplied that can be used for either channel. A throwing line and weight is supplied with the aerial. This should be unrolled from the round spool and erected with the centre loop lifted some 5 metres (15-20 feet) above the ground. The wire end (possibly with plug) should be connected to one radio terminal. Insert the two earth spikes supplied into the ground and connected to the second aerial terminal on the radio. The radio should be held so the wire forms a rising catenary between the radio and the supporting loop. The remaining wire should hang from the support loop to lie on the ground. Use the earth spike in the centre spool hole when rewinding the aerial after use. (Note that radios need modification before these aerials can be used.)

## Channel Selection

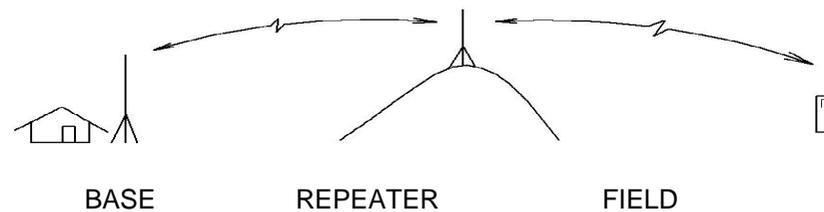
Ensure you know what channel is being used before leaving base. Normally because of atmospheric conditions, the 5680KHz channel (channel 1) is used during the day and the 3023KHz channel (Channel 2) at night. Note that some sets have the option of upper and lower sideband. Upper sideband is normally the only option used.

## Repeaters

Unless search teams are working close to Base, one or more repeaters may be set up to increase the communication range of VHF radios.



**Fig. 5.1 SIMPLEX OPERATION (No repeater)**



**Fig. 5.2 DUPLEX OPERATION (Repeater in use)**

Radios working through a repeater will transmit and receive at a different frequency.

See the notes on setting up repeaters (page 36).

## Transmitting and Receiving

- Switch on the radio and make sure it is set to the correct channel.
- Repeaters have a battery save function, which will operate approximately 20 seconds after the last received transmission. Therefore when calling, press and hold the push to talk button for one second to “wake up” the repeater before speaking, or your first few words will not be transmitted.
- Hold the set vertically while in use.
- Remain stationary while transmitting.
- Check that the wind is not blowing across the microphone. If Base cannot hear you because of wind noise, shield the set with your body and try again.
- In some situations when you cannot hear Base they may still be able to hear you. It is sometimes worth trying a “blind” transmission especially in an emergency. (You may be heard by another station that can relay your message. Take care not to over do this, as other stations may be using the same channel.)
- If you can hear a team calling and it is obvious Base cannot hear them, offer to act as a relay for the team. This will usually be the case only when using a simplex channel.
- If reception is poor, move to another position, preferably higher and try again. Try High Power, if currently on Low. Try to get “line-of-sight” of the repeater (or Base, if using simplex) if possible. If this fails then try “Talk-Around” to raise another team to relay for you.
- If “Talk Around” is a feature of the radio (usually P3 on the Icom handhelds), it can be used to enable simplex communication between radios, bypassing the repeater. Press once (“tk on” is displayed briefly) - the set is now on simplex; press again (“tk off” is displayed) to return to repeater mode. This is used only with duplex (repeater) channels. (You need to tell the other station that you are using “talk around” as they will need to change to “talk around” to be able to talk back to you)

**NOTE:** If you have trouble with one-way communication (either receive but no transmit, or transmit but no receive) check that “Talk Around” is OFF and the correct channel is selected.

## Message Handling

### Message Handling at Base

- Radio communications are often handled by specially trained members of AREC (Amateur Radio Emergency Communications.)
- Normally, all messages to the people in the field from the Operations Manager are passed to a Radio Operator, who will then dictate the message to the appropriate team in the field. Messages from Teams are passed on to the Operations Manager for processing. Depending on the preferences of the management team, messages may either be passed verbally, by written messages, computer logs or a mixture of all three.
- Be aware that the Radio Operator takes no part in giving instructions or making decisions. He or she is merely the go between for handling messages.

### Log Keeping

- An accurate log of all communications is usually kept at Base. This should show date, time, Team name, the team's grid reference and a transcript of the message.
- Team Radio Operators should also keep details and times of messages sent and received wherever possible. This also applies to instructions given by other means.

## Messages

### Preparation

- Write down your message before calling Base. If you don't, you will have trouble repeating the message exactly as before, if requested.
- Keep your message clear and CONCISE but not so abbreviated that it makes no sense. (Does it make sense to you? Will it make sense to someone else?) Each message must be self-contained, eg. if asked the colour of a hat, reply: "The hat is red." rather than just "Red." Extra messages sent asking for clarification are time consuming.
- All messages must include your team number and current grid reference – six digits. (Make sure that another Team Member checks your GR.)
- Messages must be in plain English without codes, medical or technical terms. Include any relevant details regarding terrain, conditions etc. (e.g. the Ops Manager needs to know who you are, where you are and how you are).
- Have a pencil (works in the wet) and paper ready to record reply.
- Never transmit personal details (eg: addresses or phone numbers) about any SAR personnel or missing party unless specifically requested by Base.

- Log the time you transmit your message.

## **Important Note - Death or Severe Injuries**

**Refer to the section on death (page 69) or follow instructions given at the briefing, before transmitting any message concerning death or serious injuries.**

### **Calling Base**

- Listen to ensure no one else is using the same channel.
- When clear, press the push to talk button, wait one second and call Base, eg: "Huia Base, This is Huia 1, Over." Release the button immediately you have finished talking. Indicate if you have a long message to send by adding "I have a long message for you". Long messages are best sent in short segments.
- When Base says "send your message, over", transmit your message. Speak slowly and clearly at dictation speed. Give the message in short phases. Remember that the Base Radio Operator is writing down your message. Say "Stop" at the end of each sentence.
- Conclude each transmission with the word "Over" or if message has been completely sent "End of Message - Over".
- When transmitting long messages, send one sentence at a time, ending each transmission with: "More follows, over" and waiting to be asked to continue. The last sentence should be followed by: "End of message, Over".
- Stay in one place while transmitting unless requested to move by Base to enable clearer reception, or you think Base cannot hear you.
- When you have completed all communications with Base, give your call sign and say "Out" e.g. "Huia 1 Out." This is not necessary if Base has already said "Out", however you should not close down until one of the stations has cleared by saying "Out".
- If the missing party is found dead, send the message "we have a message for the Incident Controller, Over" (this will indicate to the Base Radio Operator that you have a serious message and you may be asked questions with a yes/no answer, to retain some form of confidentiality). Transmit further details only as prompted by Base.

### **Receiving Messages**

- When called by Base, you must reply immediately.
- When you are ready to receive the message, tell Base to send their message eg: "This is Huia 1, send your message, over."

- If you need time to get equipment together or prepare for a message, tell Base to stand by e.g. "This is Huia 1, stand by, over" then call back when ready.

### **Communication between teams**

It is not normal procedure to communicate directly with other teams, however it is permissible in certain circumstances provided you obtain permission from Base first. You may also be asked to relay messages to or from teams that are out of radio range. Refer to the notes on using the talk around feature on the radio (see pages 26 & 32).

### **Radio Schedules**

Before you leave for the field, you may be given a schedule time to call Base at regular intervals throughout the day. Try to adhere to these times as they are designed to spread out message handling. You may also call Base at any time should the situation warrant it, e.g. A find, the completion of a task etc.

**Important Note:** When contact with base is intermittent, e.g. low batteries or using an HF radio, ensure that all instructions are received and are clearly understood before switching off your radio and proceeding.

Therefore a typical message could be: "Base this is Team Two. Grid reference: 567456. Going is easy. Nothing to report. Awaiting further instructions. Over.

You must then wait for a reply from Base before moving on. If you get no further instructions after 10 minutes, call Base again and remind them that you are still standing by.

## **Urgent Messages**

### **Genuine messages**

If you are on a SAREX and a genuine injury or incident occurs which is not part of the scenario, start your message with:

**"This is a genuine message."**

This is preferred to the sometimes used "No Duff" urgent messages

If your message needs priority, start your message with:

**"This is a Priority message."**

### **Emergencies**

**"Mayday"** three times should precede any message if your message indicates that assistance is required for serious and/or imminent danger.

When these prefixes are used, they will give your transmission priority over other users. If you hear such words preceding a message for another station, stop using the channel immediately.

## Commonly Used Words

<b>Over:</b>	This part of the message complete, waiting for reply
<b>Roger:</b>	Message understood (It does not mean “Yes”)
<b>Negative:</b>	No
<b>Affirmative:</b>	Yes
<b>Figures:</b>	Numerals to follow
<b>I spell:</b>	Next words spelt phonetically (See below)
<b>Say again:</b>	Repeat last transmission
<b>Say again all after:</b>	Repeat last transmission from nominated word
<b>End of message:</b>	Sent at end of all completed messages
<b>Out:</b>	End of transmission (Never say over and out)
<b>Standby:</b>	Wait until invited to continue your transmission

## Phonetic Alphabet

Sometimes poor reception may necessitate the use of the phonetic alphabet to spell out messages so they can be understood. The emphasis should be on the syllables in upper case.

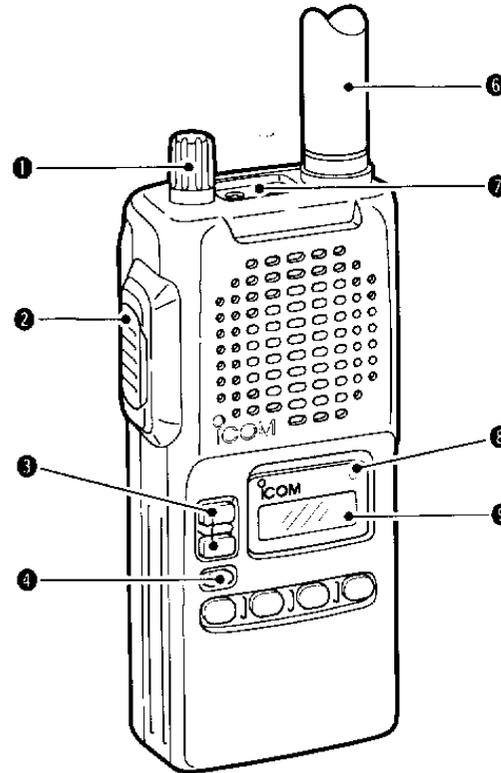
### Alphabetic Pronunciation:

<b>A</b>	<b>ALpha</b>	<b>N</b>	<b>noVEMber</b>
<b>B</b>	<b>BRAvo</b>	<b>O</b>	<b>OScar</b>
<b>C</b>	<b>CHARlie</b>	<b>P</b>	<b>paPA</b>
<b>D</b>	<b>DELta</b>	<b>O</b>	<b>queBEC</b>
<b>E</b>	<b>ECho</b>	<b>R</b>	<b>ROmeo</b>
<b>F</b>	<b>FOXtrot</b>	<b>S</b>	<b>siERra</b>
<b>G</b>	<b>GOLF</b>	<b>T</b>	<b>TANgo</b>
<b>H</b>	<b>hoTEL</b>	<b>U</b>	<b>Uniform</b>
<b>I</b>	<b>INdia</b>	<b>V</b>	<b>VICtor</b>
<b>J</b>	<b>JUliETT</b>	<b>W</b>	<b>WHIskey</b>
<b>K</b>	<b>Kilo</b>	<b>X</b>	<b>X-ray</b>
<b>L</b>	<b>Lima</b>	<b>Y</b>	<b>Yankee</b>
<b>M</b>	<b>MIKE</b>	<b>Z</b>	<b>ZUlu</b>

### Numeric Pronunciation:

<b>0</b>	<b>ZERO</b>	<b>5</b>	<b>FIFE</b>
<b>1</b>	<b>WUN</b>	<b>6</b>	<b>SIX</b>
<b>2</b>	<b>TOO</b>	<b>7</b>	<b>SEVen</b>
<b>3</b>	<b>TREE</b>	<b>8</b>	<b>AIT</b>
<b>4</b>	<b>FOWer</b>	<b>9</b>	<b>NINer</b>

**Fig. 5.3 ICOM F3 Handheld Instructions**



1. VOLUME CONTROL AND ON/OFF SWITCH
2. PUSH TO TALK SWITCH [PTT]
3. UP/DOWN KEYS CHANNEL SELECT [SEE NOTES]
4. PROGRAMABLE BUTTONS [SEE NOTES]
6. ANTENNA CONNECTOR
7. SPEAKER/MIC SOCKETS
8. TRANSMIT LIGHT
9. FUNCTION DISPLAY [SEE NOTES]

## ICOM F3 Operations

### Push Button and Display Description

#### 3. UP/DOWN Channel buttons

Used to change to a channel as shown in the frequency locations chart. The channel number and channel description will show in the display.

#### 2. PTT (push to talk)

Press this for one second before sending your message and release to receive. The red transmit light (8) will light while you are transmitting.

#### 4. Programmable buttons are used for the following:

##### - Mute over-ride

When this button is pressed and held down the mute is over ridden and noise will radiate from the speaker. This function is used to listen for very weak stations, which will not open or hold open the mute. A BUSY sign will show in the display. Useful for setting volume to a suitable level.

#### P0 Keypad Lock

When this button is pressed for more than one second a KEY symbol will be displayed in the display and the keyboard will be locked i.e. front panel push buttons will not function when pressed.

To unlock press and hold P0 button for more than one second and the KEY symbol will disappear.

#### P1 High/Low Power.

Press this button to change the transmit power setting. Press once and LOW will be displayed in the display press again and the LOW disappears.

#### P2 Bank Change

The Icom F3 has two banks of sixteen channels (see page 33). The first bank has the channels required for LSAR. The second bank can be programmed by your local ICOM agent to other channels you require.

Press this button once to swap to the other bank; press again to swap back.

#### P3 Talk-around (Duplex/Repeater Channels only)

Press this button to change the transmit frequency to simplex, (which will bypass the repeater). **tk on** or **tk off** will be displayed in the display briefly as the button is pressed. **tk on** means you are now using simplex,(the radio frequency) **tk off** means you are using the repeater. (NB: Defaults to tk off when radio turned on.)

## ICOM F3 Frequency allocation

Bank 1 is a common bank for all radios throughout the country.

The frequencies in this bank must not be altered

Channel	RX	TX	Channel	Channel	Character
Bank 1	Frequency	Frequency	Description	Offset	Display
1	140.58750	140.58750	ESB SAR simplex 1	simplex	01ESX07
2	143.66250	143.66250	ESB SAR simplex 2	simplex	02ESX53
3	141.71250	138.71250	ESB SAR Portable rptr 1	duplex	03ESB57
4	141.72500	138.72500	ESB SAR Portable rptr 2	duplex	04ESB58
5	141.73750	138.73750	ESB SAR Portable rptr 3	duplex	05ESB59
6	141.75000	138.75000	ESB SAR Portable rptr 4	duplex	06ESB60
7	161.15000	158.25000	SAR VHF MS Fixed rptr 1	duplex	07MS08
8	161.37500	158.47500	SAR VHF MS Fixed rptr 2	duplex	08MS17
9	163.72500	168.32500	SAR VHF EE Fixed rptr 1	duplex	09EE122
10	164.65000	169.25000	SAR VHF EE Fixed rptr 2	duplex	10EE196
11	140.98750	140.98750	ESX 39 Liaison simplex	liaison	11ESX39
12	143.05000	140.05000	ESB 164 Liaison Rptr	liaison	12ES164
13	158.72500	158.72500	Ground to Air	simplex	13MSX27
14	143.03750	140.03750	DOC 20 Rptr ESB163	PRU	14DOC20
15	156.30000	156.30000	Marine 06	simplex	15 MM06
16	156.80000	156.80000	Marine 16 emergency/call	simplex	16 MM16

Bank 2 is for radio frequencies used in the local area

Channel	RX	TX	Channel	Channel	Character
Bank 2	Frequency	Frequency	Description	Offset	Display
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

**Note that Channel 13 is licensed by NZ Police for SAR use, and while it is intended primarily for communications to Air Force Iroquois, it can also be used by other air operators.**

**Fig. 5.4 Icom F310 VHF Base Radio**



Function buttons are similar to the F3 Handheld.

Some radios are set up with bank change similar to the F3 handheld and other radios are set up with a single 32 channel selection. Refer to the card that comes with the radio.

The function buttons are usually set up as follows:

- P0: Keypad Lock** – see F3 handheld instructions for explanation.
- P1: Low Power**  
Low power setting is set at 1.5w output (1.6A). High power 25w (6.0A)  
(Receive standby current, 200mA)
- P2: Display backlight / Bank Select** (depending on set)
- P3: Talk around** - see notes on Icom F3 radio for explanation.

## Repeaters

**Fig. 5.5 Police Portable VHF Repeater**



- There are two types of Police repeater. The Yellow type is a repeater only; the Green type is a Repeater and Inter-Repeater-Link unit.
- Follow set up instructions in the lid. However, the settings should already have been set at Base and tested.

### **Yellow repeater programming**

DISPLAY	CHANNEL	TONE SQ	TAIL
CH01	ESB-57	N	N
CH02	ESB-58	N	N
CH03	ESB-59	N	N
CH04	ESB-60	N	N
CH05	ESB-57	Y	N
CH06	ESB-58	Y	N
CH07	ESB-59	Y	N
CH08	ESB-60	Y	N

DISPLAY	CHANNEL	STONE SQ	TAIL
CH09	ESB-57	N	Y
CH10	ESB-58	N	Y
CH11	ESB-59	N	Y
CH12	ESB-60	N	Y
CH13	ESB-57	Y	Y
CH14	ESB-58	Y	Y
CH15	ESB-59	Y	Y
CH16	ESB-60	Y	Y

- Select correct option – with/without tail, with/without CTCSS control tones (four options uses 16 channel positions - see instructions supplied with the repeater.) Where interference is a problem, consider using CTCSS squelch control. The use of the tail option will enable field parties to more easily know when they are within repeater coverage. Repeater channel positions 9-16 will assist field parties in areas with marginal coverage to obtain the best position for operating. If a link repeater is planned then the tail option should not be selected.

**Note: When linking repeaters, all repeater tails should be disabled.**

- Check the repeater is on the correct channel before leaving Base and again when installing in the field. NB: Both radios must be set to the same frequency.

#### **Setting up in the Field:**

- On the elected site, assemble and erect the aerial, connect to the repeater before turning the power switch on. Never operate the repeater without an aerial or 50 ohm dummy load.
- Ensure you have a VHF radio set to the corresponding frequency as the repeater.
- After the repeater has been installed in the field, confirm with a remote station that the repeater is working (move 100m away before testing). Note: some repeaters may not have a “tail” to confirm that the repeater is working. (The repeater “tail” is the noise heard at the end of the transmission when the PTT is released. This is normally half to one second in duration.)
- Site the aerial clear of power lines.
- Do not co-site with Fixed Radio Stations.
- Erect aerial clear of canopy.
- At least 100m from any other radio equipment.

- Always use all aerial sections to get the maximum height.

### **Operating the Green type Inter-Repeater Link.**

- Select a site, which has good communications with Ch1 and Ch2 repeaters. Use a handheld to confirm good communications with both standard repeaters. Do not site the linking repeater within 200 metres of a base trigger radio, another repeater or powerlines, as blocking of the link may occur.
- Turn on the power switch, open the case and select the switch to mid position “Link Ch1/Ch2 Repeaters” – the light should flash.

- Confirm that the repeaters are linked correctly before leaving the site.

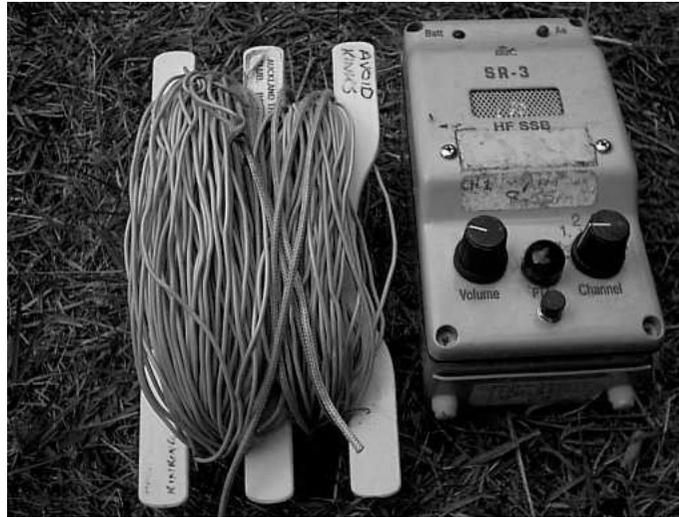
Note: testing the system with a handheld near the link unit will likely result in blocking. Move 100 meters away to test.

- Four (green cased link repeaters) Police owned units are available nationally (Auckland, Wellington, Christchurch, Wellington/PHQ). These are set to link channels ESB57/ESB58 (Auckland, Wellington) or ESB59/ESB60 (Christchurch, Wellington/PHQ). If planning to use a linking repeater ensure what combination of channels is available. (CTCSS can be used between handhelds and yellow repeater but no CTCSS provision has been made for the green linking units.)
- The green repeater may also be used as a stand-a-lone repeater. The Channel selection will be either ESB57 and ESB58 (Auckland, Wellington) or ESB59 and ESB60 (Christchurch, Wellington). No CTCSS tones are available on these units.
- Note: When linking repeaters, all repeater tails should be disabled. (In some cases it may be possible to retain the tail on one repeater but not the second).

### **Battery Care**

- Low Battery warning (approx 11.5v) is a tone on the transmit signal. The repeater will switch off completely when the battery reaches 10.7volts. Turn power switch off and on again to reset the repeater.
- Ensure batteries are recharged as soon as possible after use.
- The multi-pin connector on the side of the case can take an external battery when used with the appropriate cable (Available from the manufacturer and supplied to all repeater stores). Turn the power switch to the “OFF” position to operate from external battery.
- Note – when charging the internal battery, connect the smart charger to the DC socket first then connect to the mains last. The charger should be left connected on float charge when the repeater is not in use. The internal battery is a 17A/hr Sealed Lead Acid battery and should be tested once a year for discharge capacity.

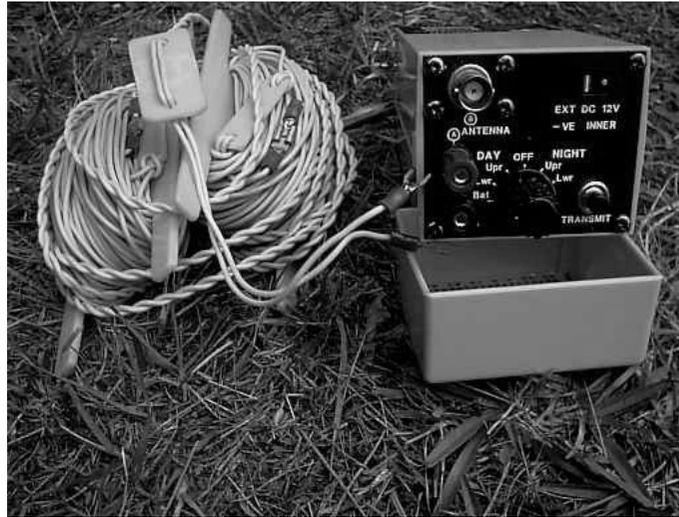
**Fig. 5.6 Polsar (SR3) HF Radio**



- Turn On-Off volume control to On and set volume level as required
- Select the required channel on the Channel Switch
- To transmit, using the internal microphone (hole between lights), hold radio approximately 5cm from the mouth, press the push to talk button and speak. During transmit the TX light will pulse with speech to confirm the unit is transmitting.
- After approximately 60 seconds of continuous transmission the transmitter will time-out and return to receive.
- The low battery indicator (Red Batt light) is active only when the unit is transmitting. When the batteries are full, the Batt light will light continuously on transmit. Batteries should be replaced when the Batt light blinks deeply on speech peaks or when transmit audio is distorted.
- To replace batteries, undo the two nylon thumbscrews on the end of the radio and remove the battery compartment cover. Unplug the battery pack and remove the twin battery holders from the radio. Replace the batteries and re-install the battery pack. Do not over tighten the nylon thumbscrews.
- A later version of the Polsar (or SR3) is available. They are likely to be fitted with the end fed aerial. The battery compartment on these is on the back of the radio and the Press to Talk (PTT) button is on the side of the radio. In all other aspects the radio operation is similar to the above.

- Note that battery compartments in particular are not waterproof. Use plastic bags to keep the radios dry.

**Fig. 5.7 Codan/Condor HF Radios:-**



These are a lightweight HF radio.

- Attach the appropriate aerial as described earlier on page 24.
- The Condor has no volume control and the radio is switched on when you select the channel. Remember to set this control to OFF before packing away.
- Select channel. Day Upper - (5680KHz Upper sideband,) or Night Upper - (3023KHz Upper sideband.)
- To transmit, press the Push To Talk button on the radio and speak across the speaker (front case of set).
- Correct aerial erection is essential for efficient use of the radio.

### **Batteries**

The Codan/Condor operates on 8 AA size cells (Alkaline type battery recommended) which should give 2-4 days of use if used for short periods and transmit time is limited. Batteries that are too flat to transmit may still have enough power to receive.

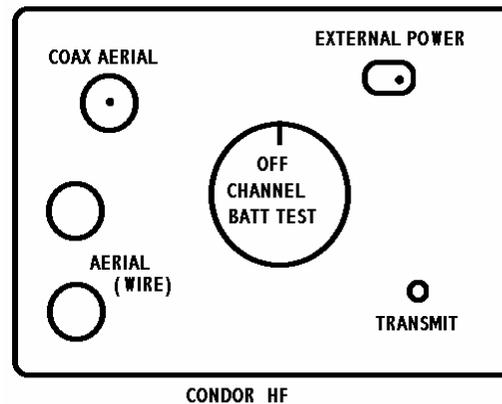
### Battery Condition Indicator Lamp

Select the “battery” position on the channel selector. The lamp will indicate the state of the batteries. DO NOT leave in this position - return to the correct channel immediately. The brighter the lamp, the better condition the batteries are in.

### To Replace the Batteries

- Turn the radio upside down.
- Undo the two screws or ½ turn fasteners and remove the battery cover. Note that a screwdriver or knife will be needed to fit the screw heads (a coin is not suitable). On some Condors there is a length of cord with a tool to undo the ½ turn fasteners. Remove the old batteries.
- Fit the new batteries observing the correct battery polarity. (The polarity marked on the radio case, indicates the end of the battery that should be showing when fitted).
- Replace the battery cover and screws. DO NOT OVERTIGHTEN.

Fig. 5.8



### **AWA TR-105 HF Radios:**

- Attach the appropriate aerial as described on page 24.
- Switch on- rotate the volume knob clockwise to adjust the volume.
- Select channel. Day – Channel 2 (5680KHz), Night – Channel 1 (3023KHz)
- Tune the aerial:
  - Listen to ensure the channel is not in use. Press the tune button and adjust the aerial tune button until the highest pitched sound is heard. The aerial must be re-tuned each time it is moved or the channel is changed.
  - NOTE: Tuning should be done quickly to minimise interference to other users and to conserve batteries.
- To transmit, press the push to talk button on the microphone and speak across the microphone.
- Adjust the clarifier knob while receiving to achieve the best reception.
- Correct aerial erection is essential for efficient use of the radio.

### **Batteries**

The TR105 operates on 9 D size cells which should give up to 2 days of use if used with short transmissions. Batteries that are too flat to transmit may still have enough power to receive.

### **To replace batteries**

- Remove the radio from its carrying case and turn it upside down
- Undo wing-head screws and remove the cover and old batteries.
- Fit new batteries - observe correct battery polarity.
- Replace the battery cover and tighten the screws.

DO NOT OVERTIGHTEN.

### **Battery Condition Indicator Lamps**

Two lamps, in the centre of the control panel light up when transmitting:

Top lamp only:	New batteries
Both lamps:	Partially used
Bottom lamp only:	Nearly flat
Neither lit:	Flat

## **Section 6. Helicopters**

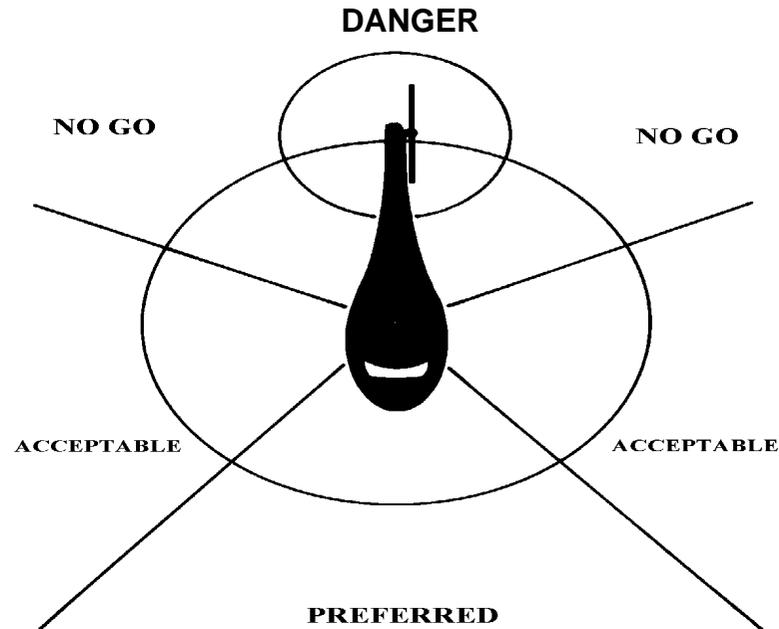
With the increasing use of helicopters in SAR, it is important that SAR personnel are fully conversant with all aspects of helicopter operation and safety. If in doubt, ASK!

### **Helicopter Safety**

It is essential that all personnel who approach or leave a helicopter or its landing area are within the pilot's field of vision at all times. The illustration below shows the preferred and acceptable zones.

Always wait for a "thumbs up" from the pilot before approaching or leaving a helicopter.

Put cooking stoves and fuel containers in a separate bag and hand them to the crew as you enter. Tell them what it is. (The crew will jettison this bag rather than your entire pack if they suspect a fuel leak.)



**Fig. 6.1 Safe approach angles around a helicopter**

**Make eye contact with the pilot before approaching the helicopter.  
Always follow pilot/crew instructions.**

**Fig. 6.2 Helicopter Safety**



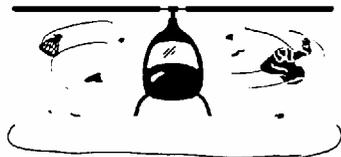
1. Approach and leave helicopter in a crouching manner.



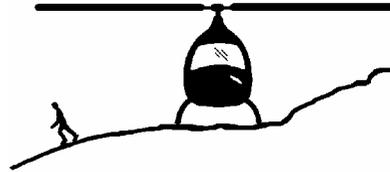
3. Carry equipment horizontally, below waist level, never upright or on shoulder. Remove or secure loose hats, clothing, etc.



5. If embarking on a helicopter with one skid resting on slope, approach across front of machine from downhill slope, staying very close to uphill side before boarding. Reverse applies for disembarking.



7. Keep landing site clear of loose clothing, equipment and debris.



2. On sloping ground always leave and approach helicopter on the downhill side for maximum clearance.



4. Teams being picked up or dropped off should stay well to one side of the landing site. They must be ready to board on signal from the pilot but, as much as possible, should protect their eyes by facing away from helicopter.



6. If helicopter is hovering, use smooth, unhurried movement. Only one person may be on the skid at any time. Enter and exit only on signal from the pilot or crew.



8. When helicopter engine is running down in windy conditions, proceed with caution due to rotor 'sailing'.

### **Briefing**

It is important that any people who are not familiar with helicopter safety are fully briefed before being escorted to the machine.

- Explain the basic danger areas and safety rules.
- Escort them to the machine. Keep a firm hold on children or anyone you think may panic.
- Load their equipment.
- Check that their safety belts are correctly fitted.
- Check that all doors are firmly secured.

### **Inside the Helicopter**

- Keep an eye on the crew as much as possible so you are able to follow any directions.
- Be careful to maintain your balance and avoid bumping the crew or damaging equipment.
- Remain seated with your seat belt firmly fastened at all times.
- If you need to talk to the crew, ask for a headset. (Due to the noise you may have to use hand signals). Some have a push button on the lead to activate the microphone, others are voice activated. Position the microphone as close to your mouth as possible. Avoid talking while the pilot is maneuvering or the crew are conversing.
- When leaving the helicopter, always leave the seat belt on the seat or better still, refasten it to prevent it becoming caught in the door.

### **Winching**

There may be occasions when a team needs to be winched in or out of a helicopter if a suitable landing site is not available. It is essential that the following procedures are carefully followed.

Move quickly and efficiently so that hovering time is kept to a minimum.

### **Winching Up**

- When the strop is lowered from the helicopter, allow it to touch the ground first to earth any static charge and prevent electric shock.
- Put the chest sling over your shoulders and under arms with the adjusting ring at the front. (See diagram on page 45.)
- Slide the adjusting ring towards you until the sling is secure.
- Attach your pack to the cargo hook. (If your pack has wide straps and no loop, attach a small, secure rope loop beforehand.)

- When ready, give the "thumbs up" sign to the crew. (Thumb pointing backwards so that it can be seen from the air.)
- Immediately put your arms down by your sides and keep them there at all times otherwise you could slide out of the sling. Alternatively, hold the strop, keeping your elbows down at your sides.
- Allow the crew to assist you into the helicopter and to stow your gear. Follow their instructions carefully.
- Keep the sling on until you are seated and your seat belt is secured.

### **Winching Down**

- Leave your seat belt on until the sling is firmly in place.
- Put the sling over your shoulders and under your arms with the adjusting ring to the front. (See diagram below.)
- Slide the adjusting ring towards you until the sling is secure.
- Release your seat belt and allow the crewman to attach your pack to the cargo hook and assist you to stand on the skid.
- You will now be lowered to the ground. Make sure you keep your arms to your sides at all times otherwise you could slide out of the sling. Alternatively, hold the strop, keeping your elbows down by your sides.
- If you start to spin, spreading your arms (not too much!) and legs may help to slow down the spin.
- When firmly on the ground with slack in the rope, kneel down and remove your pack from the hook and then the sling from your body.
- When all is clear, give the crewman the "thumbs up" (remember to have your thumb pointing towards the back, so it can be seen from the air).



**Fig. 6.3 Winching with a chest sling**

## Landing Sites

All helicopter landings are at the discretion of the pilot. The size of the landing site required will depend on the type of machine being used and the prevailing conditions.

Unless a natural landing site exists nearby, in most cases it will be easier to have an injured person or personnel winched in and out of the machine rather than spending a lot of time clearing a special landing site.

Landing sites must be cleared of any loose material that could be blown around by the rotor wash and injure people or damage the machine. Helicopters need to land into the wind and the pilot will appreciate some indication of the prevailing wind as the helicopter approaches the landing site. This can be achieved by having one clearly visible person standing at the edge of the landing site with his/her back to the wind with arms held aloft at 10 and 2 o'clock. Alternatively, hold a strip of toilet paper aloft.



**Fig. 6.4** Showing wind direction at Helo site

## **Section 7. Navigation**

Navigation is a very broad field and is well covered in many excellent publications. However, mentioned below are brief reminders on topics that often cause confusion. A reasonable knowledge of navigation is assumed.

For more information refer to the NZ Mountain Safety Council Bushcraft Manual.

### **Grid References**

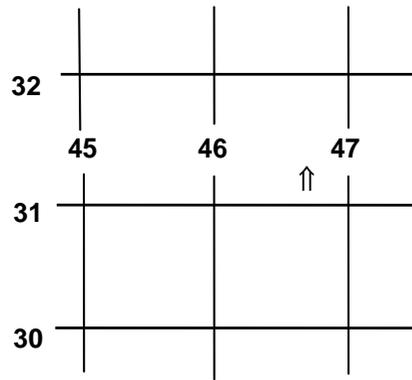
Accurate grid references are essential in SAR. The Operations Section must know where each team is whenever they call in. Much valuable time is lost during a search each time a team gives an incorrect reference.

Always make sure you are referring to the same map as Base.

### **To give a 6 figure grid reference**

- Locate your position on the map. You may know your position if you are near a recognisable feature that is shown on the map or you may be able to triangulate from known features. Another method is to use dead reckoning - estimating your distance travelled from a known feature.
- Take the **west** edge of the square in which the feature lies and read off the number of the grid line from the map (46 in the example).
- Estimate the number of tenths **east** of the line to the feature (7 tenths in the example).
- Write the number of tenths after the line number. The number in the example becomes 467. (If the feature is on the grid line, add a 0 after the line number.) These are the first 3 figures of the Grid Reference (sometimes referred to as the Easting).
- Take the **south** edge of the square in which the feature lies and read off the number of the grid line from the map (31 in the example).
- Estimate the number of tenths **north** of the line to the feature. (2 tenths in the example).
- Write the number of tenths after the line number. The number in the example becomes 312. (If the feature is on the grid line, add a 0 to the line number) These are the last 3 figures of the Grid Reference (sometimes referred to as the Northing).
- Combine the numbers. The six-figure grid reference in the example becomes 467312. (The grid square would be referred to as 4631).

Note that instructions for obtaining grid references appear on all NZ topographical maps.



**Fig. 7.1 Map grid**

### Compass Bearings

It is often necessary to take a compass bearing from a feature and use it to help locate your position on a map. Because magnetic north deviates from true north by approximately 21 degrees in NZ, it is necessary to convert the bearing. (Although true north and grid north are not exactly the same, for the purposes of bush navigation the terms are interchangeable).

To convert a magnetic bearing to a grid bearing, ADD 21 degrees.

(Subtract 360 if the total exceeds 360 degrees)

Degrees Magnetic	Degrees Grid
180	201
350	11
341	2

To convert a grid bearing to a magnetic bearing, SUBTRACT 21 degrees.

Degrees Grid	Degrees Magnetic
153	132
13	352
341	320

**Note:**

- Instructions for converting bearings appear on all NZ topographical maps.
- The magnetic deviation varies throughout the country - refer to the map.
- The magnetic deviation varies year by year - refer to the map.

## **Section 8. Searching**

### **Introduction**

Search Team members are the “eyes and ears” of the Operations Manager and are required to observe and report back anything that may help the search reach a successful conclusion. The role is one of gathering information (looking for clues) that will assist the IMT in developing and revising the search plan, and possibly adding avenues for inquiries by the Planning/Intelligence Team..

This information may arise from clues left by the missing party, discussions with land owners or members of the public that the search party comes across during the search and also from the lack of clues.

The absence of any sign (ie no one has been in the area) is generally more important than sign that someone has been in the area, and must be reported.

The IMT will be using a number of tools and techniques to determine what areas should be searched and the methods to be used. Using information provided by the search teams, Police inquiries, etc. and the analysis done by the Planning/Intelligence Manager’s team, a reasonably accurate assessment can be made of the area the missing party is likely to be in, and the probability of finding them.

Generally the missing person(s) will fall into one of four groups; either mobile or immobile and either responsive or unresponsive. The Planning/Intelligence Section will analyse information that has been gathered and make an assessment of which group the missing subject is likely to best fit. This will then assist in determining the search methods that are most likely to find the missing person(s).

Generally an area is searched physically, but in some cases, eg. open country, an area may be visually searched from a vantage point. An area can only be totally eliminated by a thorough physical search.

### **You could be searching for any of the following:**

- **Children** (Including runaways who may not want to be found)
- **Hunters, trampers or day trippers** - could be experienced or inexperienced
- **Elderly people** (May be confused and/or not want to be found)
- **Mentally disturbed/intellectually handicapped or Dementia. sufferers.** (Actions may be irrational, confused. May avoid being found and/or may not realise that they are lost.)
- **Accident victims** (Motor vehicle, rafting, canoeing, windsurfing, boating, fishing, hunting, caving, hang gliding, climbing or tramping).
- **Suicide victims** (It is often not known whether the missing party is a potential suicide victim. The person is always assumed to be alive unless strong evidence suggests otherwise.)

- **Homicide victims.**
- **Criminal evidence** (Clothing, weapons, etc.)
- **Aircraft or aircraft wreckage.**
- **Boats or boat wreckage**

The Operations Manager will structure the search according to the circumstances and the possible behaviour of the missing party. While the search is taking place, the Police, Planning/Intelligence Managers and Operations Manager will be collecting more information and background about the missing party from friends, relatives, workmates, etc. As a result of these investigations the focus of the search, the areas of highest probability and search techniques may change accordingly.

The use of searchers trained in Track and Clue Awareness (TCA) techniques can provide extremely valuable information such as:

- Determining the direction of travel of the missing party
- Determining areas of high or low probability
- Tracking and finding the missing party
- Determining areas where no one has been

These people need to be used early on in the search, ie before the general search teams and/or the public contaminate any sign left by the missing party. It is a good idea to have, if possible, a Track and Clue Awareness trained person in each search team. They are then in a position to be able to react to and follow up on any “sign” that is found by the search team. These techniques can make a significant impact on the duration of the search.

The search methods and techniques described below may need to be adapted to suit the terrain and the personnel involved.

## **Searching**

### **All Searching Must be Thorough - Look Continuously**

- At the ground.
- Under banks, trees, bushes.
- Up in the trees.
- In pools and streams.
- Deep into the bush.
- Behind you.

### **Be Observant - Look For Clues**

- Camp sites or shelters.

- Flattened or broken vegetation.
- Footprints or scuff marks.
- Clothing.
- Blood.
- Notes or signs left by the missing party.
- Places where the missing party may have left the track or river.

**NB:** You are more likely to see something if your eyes sweep from right to left (the opposite direction to reading). Report back to Base any areas such as pools, cliffs, etc that you are unable to search adequately or safely.

### **Talk To People**

You may come across people during your search task. Check that they are not the missing party - some missing people may not even be aware that there is a search underway for them. Give them a description of the missing party and the situation. They may have seen something that could be of relevance. Ask them what route they have taken and what their intended route is.

Report back to Base the fact that you have met people and the areas they have covered. If possible, ask the people to wait while you contact Base in case the Operations Manager needs any more information from them. Record their contact details and ask them to record the details of any people they meet. Ask them to contact the Police or Search Base should they see anything later. Tell them where the Base is and/or how to make contact with it.

### **Make Plenty of Noise**

Where appropriate, call out the name(s) of the missing party and/or use a whistle and listen frequently for replies. Block your ears while using a whistle. Be consistent in the noise you make otherwise it may be difficult to identify sounds made by the missing party.

If children or intellectually handicapped people are involved, take care not to sound aggressive or do anything that may frighten them. In these cases a command such as “Bill, come here” is more effective than just callout their name.

### **Warning**

There are many areas where cannabis is grown and some of these have been known to be booby-trapped. Should you come across such an area, leave very cautiously the way you came in. Watch for trip wires, sharpened stakes, covered holes etc. Give the area a wide berth, note its position and inform Base.

## Types of search

### Reconnaissance Search

This is generally the first search that is done, usually by Hasty Teams. The object of this search is to quickly search the most obvious or likely routes that the missing party could have taken. Areas such as tracks and huts the missing party is thought to have used or the intended route of a boat or aircraft are checked. Aircraft, boats or vehicles may also be involved in this search. Routes searched by a reconnaissance search may be covered by a general search later on.

This is the best opportunity to look for any clues along the track and searchers trained in TCA should be involved at this stage where possible.

When doing a reconnaissance search, stay on the track but look all around you and look for places where the missing party may have left the track or intended route (decision points), left signs or made shelter. Search any obvious places.

### General Search

If the reconnaissance search is unsuccessful, a general search is initiated in the areas of high probability. A general search is usually based on tracks, streams, ridges or coastline.

The Team Leader should rotate Team Members and may delegate competent people to direct the search. It is however the Team Leader's responsibility to ensure the search is being carried out thoroughly and in accordance with the tasking given to the team.

## Searching Tracks, Streams and Ridges

### Technique

- The person directing the search stays on the track/ridge or beside or in the stream, with the other team members on either side of the track or stream.
- The spacing will depend on the terrain, visibility and the Operations Manager's instructions. Normally, you should be close enough to be able to thoroughly check the area, missing nothing in between Team Members. There will obviously be areas where the terrain closes in making it impossible to remain spread out.

### Searching coastlines

- **Warning:** The safety of the team is your first priority. Keep a close eye on waves and the tide. Make sure you know the tide times. Be aware that a rising tide may trap a search team leaving it with no line of retreat.
- On a coastline search you could be looking for a body or boat wreckage, either in the water or washed up on shore. You could also be looking for a

person who has swum ashore, made it to above the high water mark, and moved inland. Look for areas/signs where this may have happened.

### **Technique**

- The person directing the search follows the waterline with the other searchers spaced out in a line at right angles to the coastline.
- Depending on the terrain, some areas may be able to be searched from a distance, while others may need thorough checking, such as gaps and holes in rocks and bushy areas above high water mark. In some cases it may be necessary to zigzag across the area to ensure thorough coverage, while in others you may have to do two or more sweeps.
- Make sure you also look out to sea.
- There may be rocky outcrops offshore or other areas that you cannot search. If this is the case, note their position and inform Base so they can either be searched by boat or at low tide.

### **Night searching**

It is often necessary for a search to be started at night. The missing party is far less likely to be moving around and can be alerted by the light from torches.

All searchers should be familiar with night searching. Be aware that some people may not feel comfortable with searching at night for a variety of reasons.

Searchers should have a minimum of at least 2 torches. Some torches are better than others, and it is a good idea to test several types to determine the most suitable. Make sure you have plenty of spare batteries and bulbs.

Torches held low and shone across the ground will often pick up footprints etc. not normally visible during the day.

It is essential that searchers take extra care to avoid injury.

## **Track and Clue Awareness (TCA)**

**Note:** Track and clue awareness is a skill that requires specialised training and many hours of practice. This section is intended only as a checklist for those who have undertaken TCA courses. The terms used below for Types of Sign are explained during TCA training.

It is important to remember that a *lack* of sign is just as important as finding physical clues. If there is no sign of anyone having been there, entire areas can be either eliminated from the search area or given lower priorities.

### **About TCA**

Every person who moves through the bush or over any terrain leaves small traces of their passing. A trained person can spot and examine these clues and determine a direction of travel (DOT) and also glean further information about the person(s).

Techniques can be employed to match tracks against the footwear of the subject if known. It can also be used to determine a direction of travel from a vehicle or hut or any last known point (LKP.) It is important that these techniques are used as early as possible in the search, before the area becomes contaminated and clues disturbed.

All searchers should have at least a working knowledge of TCA so that they do not contaminate areas inadvertently and can assist where necessary.

### **TCA Equipment**

The following is a list of equipment that may prove useful for searchers. Individual requirements and preferences will vary.

- Acetate sheets
- Magnifying glass
- Ruler
- Mirror
- OHP pens (soluble & insoluble)
- Pad & pen
- Tracking stick
- \*Clue markers

\* Very effective clue markers can be made from brightly painted ice cream sticks or bamboo skewers, or improvised on site with sticks or stones.

### **Types of Bottom Sign (Clues at ground level)**

- Footprints
- Broken seals
- U bolts
- Bruised vegetation
- Blood
- Discarded property
- Transfer (of dirt etc. to other surfaces)
- Broken twigs, branches etc
- Disturbed vegetation
- Compression

### **Types of Top Sign (Clues above ground level)**

- Disturbed vegetation
- Discarded articles
- Re-positioned vegetation (swept)
- Broken twigs, branches etc.
- Transfer (of dirt, etc. to other surfaces)
- Bruised/scuffed vegetation

### **Clue Management**

The area around any significant clue or hut, vehicle, etc must be managed so as to preserve any sign for later analysis and follow up by trained personnel. It is essential that the direction of travel (DOT) of the missing party associated with the clue is established and hence the importance of preserving the area.

### **Controlled entry**

Sometimes an area of ground or a car, hut, etc. may need to be checked by several people, or the area may need to be preserved for future reference. The area must be cordoned off by whatever means are available. Entry and exit points clearly marked and defined. The area must be cordoned off and access to the area limited to only authorised people to ensure that it does not become contaminated. A trail around the area that gives access to the clues must be clearly marked. People entering the area must follow a defined path to ensure that no clues are disturbed.

### **Sign cutting**

This is a technique for either establishing or re-establishing the trail of the subject when a clear direction of travel is not obvious. It involves marking concentric circles around the last known point and searching along the perimeter of the circle for clues. This technique is often used at decision points (track junctions, etc) to establish which direction the missing party has gone.

## Search Methods

### Contact or Comb Search

This type of search is only used in areas of very high probability that require a very detailed search as it requires a considerable number of people and time to cover even a small area. It is particularly suited to looking for clues or unresponsive subjects.

#### Teams

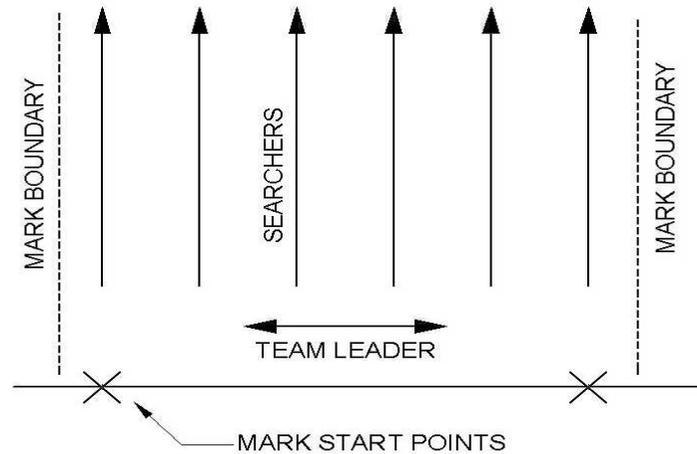
Contact search teams should normally consist of 6-8 people, depending on terrain and conditions. Several small teams are a lot easier to manage than one large one.

Depending on the terrain, searchers may need to be equipped with leather gloves, secateurs, gaiters, leggings etc. for protection.

#### Technique

- It is sometimes preferable to work up and down a slope, rather than across it. Depending on the terrain, it may be necessary to mark off artificial boundaries with string lines rather than follow the curves of a track or stream.
- If you do not start your search at a definite feature such as a track junction, mark your start/finish lines clearly with strings & notes so others can determine the areas covered.
- Establish a start line and end line with string or toilet paper. Team Leaders of adjacent teams should agree on whose responsibility it is to search a common boundary to ensure that the boundary is not omitted from the search.
- The team lines up at right angles to the side boundary. The spacing between each person will depend on the openness of the terrain and must be such as to ensure that every portion of the ground and surrounding areas between searchers is actually covered.
- The Team Leader remains behind the line near the centre and is free to move backwards and forwards along the line to help everyone maintain position and check on finds. See Fig. 8.1.
- Where the Team Leader is unable to see all of the team, It may be helpful to have the team number off periodically. This will also help team members to check their relative position.
- Searchers should use a compass and be given a bearing to follow. (Note: It is important that each person points the compass at a distant object along the bearing and walks towards it, otherwise they will drift off course.)

- On the command "Move forward," the line moves forward. The Team Leader must ensure the line moves sufficiently slowly to allow everyone to search thoroughly and maintain a straight line.
- It is essential that the group remain in a straight line. If one person is slowed due to an obstacle, the entire team must wait.
- Each person must look:
  - To the front
  - To the sides
  - Behind
  - Under logs, bushes, obstacles etc.
  - Up in the trees
- Pay special attention to areas where falls could have occurred and where shelter is available.
- As the line progresses, the person at each outer edge marks the edge of the line by placing sections of toilet paper on trees or bushes.
- If something is found, the finder calls out "find" and the group stops. The Team Leader investigates the find and either informs base and/or instructs the group to proceed.
- If the line starts to deteriorate or areas get missed, the Team Leader must stop the line, take it back to where it started to deteriorate and start again.
- When the end line is reached, the group moves across and reforms for the next sweep. The person who marked off the outer boundary moves to the other end of the line so that they can easily find the markers they placed on the previous sweep.
- It is advisable to practise in a small area until everyone is comfortable with the technique and suitable spacings are determined.
- It is advisable to practise in a small open area until everyone is comfortable with the technique and suitable spacings are determined.



**Fig. 8.1 Contact searching**

## Purposeful Wandering

This is a variation of the Comb search and allows searchers more discretion as to areas they search and does not need to be as disciplined. Like Comb searching, this type of search is used to look for clues or unresponsive subjects in areas of high probability. The method requires less people than Comb searching to cover a given area, but is still labour intensive.

### Teams

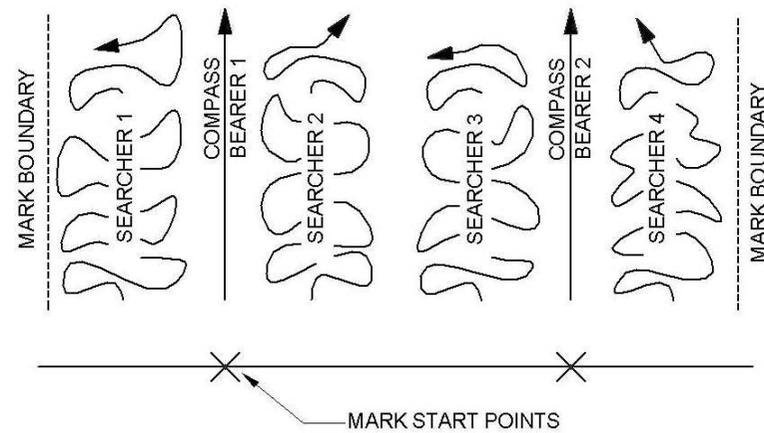
Purposeful wandering teams should consist of 6 or 9 people, depending on terrain and conditions. The Team leader normally takes part in the search. Depending on the terrain, searchers may need to be equipped with leather gloves, secateurs, gaiters, leggings etc. for protection.

### Technique

- The team consists of 2 or 3 compass bearers, with a searcher on either side – see Figure 8.2.
- If you do not start your search at a definite feature such as a track junction, mark your start/finish lines clearly with strings & notes so others can determine the areas covered.
- Establish a start line and end line with string or toilet paper. Team Leaders of adjacent teams should agree on whose responsibility it is to search a common boundary to ensure that the boundary is not omitted from the search.

- A compass bearing to follow is determined and the searchers line up at right angles to the side boundary and spread out a suitable distance apart along the start line. The spacing between each person will depend on the openness of the terrain and must be such as to ensure that adjacent searchers can remain in communication with each other.
- The team moves forward with the compass bearers following the correct route. The searchers on each side of the compass bearers are free to wander and search within their area, while staying in contact with their compass bearer. (NB: It is important that each compass bearer points the compass at a distant object along the bearing and walks towards it, otherwise they will drift off course.)
- Each searcher must be able to communicate with the person next to them to ensure that all areas are thoroughly covered. It is preferable to overlap slightly rather than risk missing areas. While the line does not need to move forward in unison, it is important that searchers do not become too widely separated and unable to communicate with each other.
- While each compass bearer is chiefly responsible for the navigation, they can also visually search the adjacent areas close to them.
- Each person must look:
  - To the front
  - To the sides
  - Behind
  - Under logs, bushes, obstacles etc.
  - Up in the trees
- It is advisable to practise in a small area until everyone is comfortable with the technique and suitable spacings are determined.
- Pay special attention to areas where falls could have occurred and where shelter is available.
- As the line progresses, the person at each outer edge marks the edge of the line by placing sections of toilet paper on trees or bushes.
- If something is found, the finder calls out "find" and the group stops. The Team Leader investigates the find and either informs base and/or instructs the group to proceed.
- If the formation starts to deteriorate or areas get missed, the Team Leader must stop the line, take it back to where it started to deteriorate and start again.

- When the end line is reached, the group moves across and reforms for the next sweep. The person who marked off the outer boundary moves to the other end of the line so that they can easily find the markers they placed on the previous sweep.



**Fig. 8.2 Purposeful Wandering**

### Sound Sweep

Sound sweeps work on a similar principle to comb searches but can cover a much larger off-track area. They will normally only find a conscious person who wants to be found.

### Teams

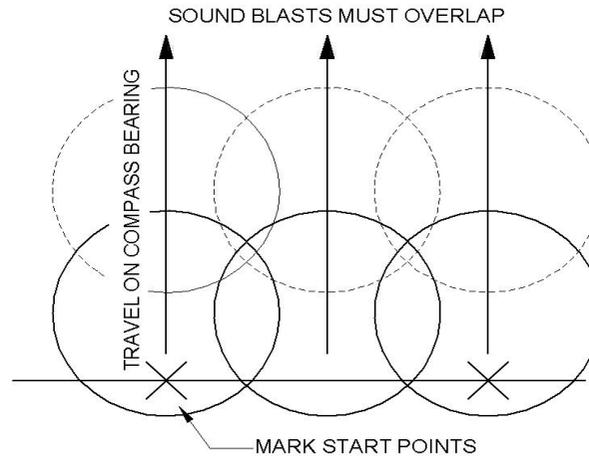
Normally teams of 3-4 searchers. Each person needs to be equipped with a handheld radio, whistle and compass.

### Technique

- Depending on the terrain, it may be necessary to mark off artificial boundaries with string lines or markers rather than follow the curves of a track or stream.
- If you do not start your search at a definite feature such as a track junction, mark your start/finish lines clearly with strings, markers, notes etc. so others can determine the areas covered.

- If necessary, establish a start line and end line with string or toilet paper. Team Leaders of adjacent teams should agree on whose responsibility it is to search a common boundary to ensure that the boundary is not omitted from the search.
- The team is given a compass bearing (usually the direction of the side boundaries or at 90° to the start line) to follow. (NB: It is important that each person points the compass at a distant object along the bearing and walks towards it, otherwise they will drift off course.)
- The team lines up at right angles to compass bearing. The spacing between each person will be much larger than in a comb search. Approximately 50m is a good guideline, but it will depend on the circumstances and terrain.
- The Team Leader remains behind the line near the centre and is free to move backwards and forwards across the line to help everyone maintain position and check on finds. Because of the distances involved, it is important that each Team Member has a handheld radio. If some members do not have a radio, keep them in between those that do and make sure someone is responsible for passing messages and instructions to them. Also ensure they are given any instructions to regroup, or they could get lost.
- In difficult terrain, it may prove easier to divide into smaller groups, each with its own Leader.
- On the command "Move forward," the line moves forward. The Team Leader must ensure the line moves sufficiently slowly to allow everyone to maintain a straight line.
- It is essential that the group remain in a straight line. If one person is slowed due to an obstacle, the entire team must wait.
- Every 50m or so, the Team Leader instructs the team to stop. Each Team Member then blows their whistles or calls out on a predetermined signal e.g. "One, two, blow." Searchers should block their ears while blowing.
- Each person then remains still and listens carefully for any response from the missing party.
- If a response is heard nearby, the closest searchers should be sent to investigate. If a distant reply is heard from an uncertain direction, the line should be moved forward and the process repeated until a definite location is established.
- As the line progresses, the person at each outer edge marks the edge of the line, such as by placing sections of toilet paper on trees or bushes.

- If the line starts to deteriorate or areas get missed, the Team Leader must stop the line, take it back to where it started to deteriorate and start again.
- When the end line is reached, the group moves across and reforms for the next sweep. The person who marked off the outer boundary moves to the other end of the line so that they can easily find the markers they placed on the previous sweep.
- It is advisable to practise in a small area until everyone is comfortable with the technique and suitable spacings are determined.



**Fig. 8.3 Sound sweep**

## Sound Line

Sound lines will normally only find a conscious person who wants to be found.

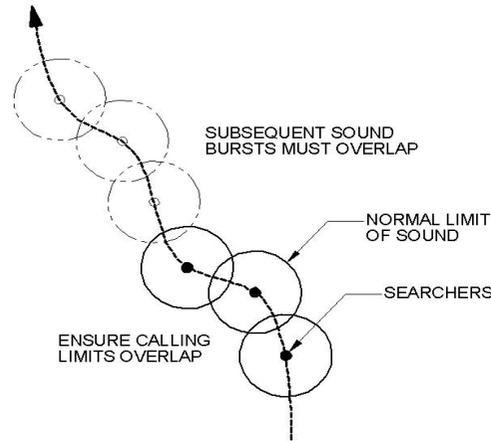
## Teams

Teams of 3 to 5 people. The Team Leader will normally be in the middle of the group. Each searcher needs to be equipped with a handheld radio and a whistle. They will generally follow a track or stream. The searcher with the best TCA skills should be at the front of the line and should be looking for possible clues during the search.

## Technique

- If you do not start your search at a definite feature such as a track junction, mark your start/finish points clearly with strings, markers, notes etc. so others can determine the areas covered. Record your grid references at your start and finish points
- Team Leaders of nearby teams should agree on whose responsibility it is to search adjacent areas to ensure that no part is omitted from the search.
- The team lines up along the track, stream or predetermined line. The spacing between each person will depend on the thoroughness required, the terrain and the people involved. Approximately 50m is a good guideline.
- On a predetermined signal eg. "One, two, blow." each Team Member blows their whistles or calls out. Searchers should block their ears while blowing.
- Each searcher then remains still and listens carefully for any response from the missing party for 10-15 seconds.
- If insufficient handheld radios are available, the Team Leader should give a short whistle blast when in position. Each searcher then counts to five before giving a full whistle blast. If a searcher establishes contact with the subject, they should give three short blasts. The Team Leader gives two short blasts to signal to the team to move forward. Other signals may be established within the team if necessary.
- The searcher in front should mark their position so that the following searchers can stop at the correct location for the next sound burst.
- If no response is heard, the line moves forward until the rear person has passed the point where the front person was for the previous blast.
- If a response is heard nearby, the closest searchers should be sent to investigate. If a reply is heard from an uncertain direction, the process should be repeated from a slightly different position until a definite location is established.

- It is advisable to practise in a small area until everyone is comfortable with the technique and suitable spacings are determined.



**Fig. 8.4 Sound Line**

### **Sound/Light Line**

This is a variation on the sound line and is used when searching at night.

#### **Technique**

The set-up is the same as for a sound line, but the searchers shine torches on the bush canopy to attract the attention of the subject. Waving the torch in a figure of eight motion has been found to be the most effective method.

### **Critical separation**

Critical separation is a method of determining a suitable spacing between searchers in a variety of searches, including contact searches and purposeful wandering.

An object of similar size to the subject or clue being searched for is thrown into the bush. Searchers then determine the maximum distance that the object can be seen from after walking around it. This should be repeated a couple of times. This distance doubled is the spacing that should be maintained between searchers during the search. This should be used as a guideline in setting up the search, but it may need to be altered during the search.

## **SAR Dogs:**

SAR dogs are valuable resource to assist in finding a missing person as it can significantly decrease the time required to find the missing party. A set of standards are in place and NZLSAR runs annual assessment courses for SAR dogs and their handlers. The Handler and Search Dog work as a team and only Handlers and Search Dogs that have been assessed and met the standard are to be used on a SAR operation. You may be asked to assist the Handler and Search Dog on an operation, especially with navigation and defining the area searched. This is so the Handler can concentrate on the search and working his/her dog and not on navigational, etc issues.

While search dogs can discriminate human scent (from animal) they can (generally) not distinguish an individual human scent.

There are four types of search dog used in New Zealand:-

- Air scenting,
- Ground scenting
- Avalanche
- Victim Recovery

**Air scent dogs** are trained to detect the scent that a person gives off continuously and is carried on the wind. Therefore, it does not matter if searchers have been in the area where an air scenting dog is to be deployed, provided the area is cleared of searchers before the handler and dog are deployed. The SAR dog and handler will work from the downwind side of the area they are tasked to search

**Ground scenting dogs** follow a trail left by the missing person(s). Therefore, a start point for the missing party needs to be established. In addition, ground parties need to be kept clear of the area if the use of ground scenting dogs is being considered as an option.

**Avalanche dogs** are essentially an air sent dog. However, as the name implies, they have been specially trained to find people who have been buried by an avalanche.

**Victim Recovery dogs** are specifically trained to search for the bodies of deceased persons.

All search team members need to be aware that SAR dogs may be used during a search. The search Team needs to be able to establish, in some detail, where they went in the search area, especially if a ground scenting dog is going to be used.

## **Section 9. When Missing Party Found**

### **Rescue Site Management**

#### **Introduction**

- Rescue site management is the responsibility of the Rescue Controller and its success depends on good management, delegation and communication.
- The Team Leader of the team that finds the missing party assumes the role of Rescue Controller unless/until someone else is appointed. The Rescue Controller is in charge of all teams at the site and the entire group is known as the Rescue Party.
- It is important that the Rescue Controller establishes their authority with the other teams as they arrive on the scene.
- The Rescue Controller should determine if there are any specialist skills within teams that arrive on the scene and use these to the best advantage

#### **Main Priorities**

##### **Team Safety**

The safety of the team is your first priority.

##### **Patient Safety**

Ensure that nothing you do will worsen the condition of the patient.

##### **Delegation**

As many tasks as possible should be delegated.

##### **First aid and patient care**

Delegate the Nominated Field First Aider(s) to prioritise and treat all urgent injuries and to arrange patient care.

##### **Communication**

Delegate the Radio Operator to transmit relevant details as soon as available.

##### **Evacuation**

#### **Important Note: Death or Near Death**

In the event of one or more of the missing party being found dead, or if you consider it unlikely that the patient may survive, refer to the section on death (see page 69) before contacting Base.

#### **Important Note: Crashed Aircraft**

- Do not place yourself or your team in any danger
- Avoid the risk of fire
- Only move wreckage to save lives
- Secure the site to keep members of the public away

- Save any papers or log books found in or near the aircraft.
- Extreme caution is required when dealing with military aircraft because they may be carrying weapons and may have ejector seats fitted.
- If a member of the Police is in your team, they will assume responsibility for the crash site.

#### **Obtain Further Details**

- Take time to properly assess the situation before rushing in.
- You may need to discuss things with other team members before organising the site.
- Establish if there are any other missing or injured people involved.

#### **Delegate**

It is important that the Rescue Controller delegates all tasks wherever possible. Obviously, the amount of people available and the number of tasks to be done will dictate how much can be done straight away, therefore it is important to prioritise. As more teams arrive on the scene, there will be more people available to take care of other jobs.

Delegate team members to the following tasks where necessary. Give clear instructions and make sure your instructions are carried out.

**NB.** These tasks should have been allocated during team briefing.

- **Nominated Field First Aider (Patient Minder)**

See Patient care, pages 72-74, and Nominated Field First Aider, page 76.

- **Radio Operator**

As more teams arrive, insist that their sets are shut down unless required for logistics within the group and that all communications with base are through this operator and under your authority. The Radio Operator should stay in touch with the Rescue Controller at all times.

#### **Communicate with Base**

- Initial message to ICP (found missing party and your location) (If missing party found dead or near death, refer to section on death, page 69)
- Further details once established.

#### **Monitor the site**

- Ensure the ongoing safety of the patient and teams.
- Ensure that correct first aid procedures are being used.
- Ensure that the patient is being correctly cared for.

### **Further assess the situation**

- Determine the best method of evacuation e.g. helicopter, overland stretcher, walk patient out.
- Determine if any other equipment is required for the evacuation eg. stretcher, ropes, axes, sleeping bags, blankets, medical supplies.
- Determine if any specialist personnel are required for the evacuation eg. cliff rescue, medical.
- Determine whether more Personnel are required at the site.
- Ensure that full and correct details of patient's condition and evacuation requirements are transmitted to the ICP.
- Determine whether immediate evacuation is possible or if you are likely to be at the site for some time, eg overnight.

### **Delegate further tasks:**

- Gofers
- Position/route finding.
- Track clearing for patient evacuation.
- Setting up shelter.
- Setting up camp for the night
- Preparation of drinks/meals.
- Guiding for incoming teams.
- Landing site/visibility for incoming helicopter.
- Stretcher preparation.
- Care of patient's property.

### **Long range planning**

If the evacuation has to be delayed, further planning will be required:

- Setting up camp for the night;
- Overnight patient care and monitoring;
- Team welfare - food and drinks, shelter, warmth.

### **.Team welfare**

- Make sure all team members are adequately clothed and fed, especially if the evacuation is likely to take some time.
- Consider stopping for a meal or snack. The welfare of the team is just as important as that of the patient and will have to be weighed against the urgency of the situation.

- Keep an eye on team members. People in a rescue party often push themselves beyond normal limits. Consider giving lighter duties to those who are showing signs of strain or fatigue.

### **Death / Near Death**

There is sometimes a chance that the missing party may be found dead or dying, either as the result of an accident, foul play or suicide. If this is the case, the correct procedures are essential. If the patient dies or is found dead, you will probably be required to testify at a Coroner's Court. It is also possible that other people may be involved.

Sometimes a team will have a Police Officer as a Team Member. If so, they will take charge of the scene and from that point, the Team Leader and Team Members must follow Police instructions.

If the missing party is badly injured or dead, observe the following procedures:

#### **A. Initial Action**

- The safety of the team is your first priority!
- Stop the team where it is.
- Treat the death or injury as suspicious.
- One person only should approach the missing party close enough to establish death or the extent of injuries. In some cases death will be obvious from a distance, in others you must check for vital signs.
- If the missing party is alive, administer first aid to the best of your ability.
- Keep the patient warm, comfortable and reassured.
- Do not trample around the area. Disturb as little as possible. Should foul play be involved, it is essential that any evidence is left untouched.
- Have non-essential members of the team move away from the scene along the same route they took when they approach the area, disturbing as little as possible.
- Secure the area around the patients/body(s) to prevent other teams, the news media or the public from disturbing the area.
- Start a log detailing all your actions and the times involved.

#### **B. Radio Procedure**

Remember that there could be family members or friends of the victim at the Base or in another team, so discretion is vital.

- Call up base: eg. "Huia Base this is Huia 1, over."
- The first message should be: "We have a message for the Incident Controller, over."
- Transmit details only as prompted by Base.

- Local groups may use their own codes. These need to be agreed upon by all involved prior to the search.
- In the absence of an agreed code, you may wish to use the standard Police code.

### **C. Police Code**

It is preferable to use the standard Police code when transmitting messages. For a sudden death, use 1 S (One Sierra) Eg. "We have found a One Sierra."

### **Situation Reports**

Radio in frequent situation reports (SITREPS) detailing:

- Patient condition.
- Party location/progress.
- Requirements.

#### **Further action - Conscious Patient**

- Write down everything that the patient says in their own words. Do not try to put words into their mouth. Write down all questions and answers.
- Comfort and reassure the patient, but do not try to offer false hope.
- Ask what happened, when, how, why, who else was involved.
- Do not try to offer your theories.

#### **Further information**

- If third party(s) involved, do not question them other than to seek a history of the injuries in order to aid treatment.
- Record accurately all relevant details and your observations.
- If you disturb the body or scene in any way, it is important that you record details and advise the Police.
- Record the names and details of all people present including Team Members, members of the public, trampers etc.
- Make a note of any other people, vehicles etc. in the area
- If a possible suspect is present, do not question them.

If possible, photograph the scene and give the film or files to the Incident Controller on return to Base. They may be used at a subsequent Coroner's Court hearing.

#### **Evacuation options**

**Note:** In some cases the patient's injuries and/or condition may such that it may be necessary to camp for a time to stabilise the patient's condition before they can be evacuated. This is often the situation with severe injuries if air evacuation is not possible due to bad weather, etc.

**By Air** (Refer to section on helicopters, pages 42-46)

Air evacuation is generally only carried out when evacuation by any other means would be detrimental to the wellbeing of the patient. For severely injured people, this is the most common method. It allows for swift and comfortable evacuation and allows the patient to get urgent medical attention.

- Ensure the safety of patient and team members at all times.
- Clear the landing/winch site of any debris that could fly about.
- Give very accurate details of your location. Include grid reference and terrain description. Also include any local hazards e.g. overhead wires.
- Make sure you are visible by means of smoke flares, strobe lights, bright clothing etc.

**By water**

- Ensure the safety of patient and team members at all times.
- Ensure the vessel has safe access to the landing point.
- Give very accurate details of your location. Include grid reference and terrain description. Also include any local hazards e.g. submerged rocks.
- Make sure you are visible by means of smoke flares, strobe lights, bright clothing.

**By stretcher** (Refer to section on stretchers, pages 76-79).

Consider:

- Safety of patient and team members.
- Time and manpower required.
- Patient's injuries and comfort.
- Terrain, rivers, weather.
- Resources required e.g. stretcher(s) ropes, blankets, axes.

**By walking out**

If the patient's injuries are relatively minor or non-life threatening, consider walking them out to a vehicle. Consider:

- Safety of patient, their injuries and comfort.
- Time it would take for alternative evacuation options.
- Terrain.

## **Section 10. Patient care**

**NB:** This section is intended to be used as a guide and checklist only. For further details, refer to the Mountain Safety Council Outdoor First Aid Manual. All people involved in SAR should hold a current Outdoor First Aid certificate.

The management of patient care is the responsibility of the Rescue Controller, however as much as possible should be delegated.

Note that in some cases all that can be done is to stabilise the patient and wait until professional medical care arrives.

### **Personal safety**

Your safety and the safety of the team are your first priority.

### **Multiple Patients**

If there is more than one injured person it will be necessary to prioritise the injuries and spread Rescuers among the patients (see site management).

### **Medical Advice**

If necessary, seek medical advice through Base to determine the correct treatment. Keep a note of all messages and times on a Patient Assessment Form. See Pages 86 and 87.

### **Primary Assessment**

Check and treat A.B.C. (Airway, Breathing, Circulation)

These basics must be attended to first before dealing with other injuries.

### **Secondary assessment**

Once the basics (A.B.C.) have been attended to, it is important that a secondary survey is performed on the patient to establish if there are any other injuries or conditions that may cause problems.

### **General check**

- Check breathing and pulse and note your findings on the Patient Assessment Form.
- Talk to the patient and/or their companions to obtain a history of their injuries and details of any medication required or any allergies they may have.

### **Full Examination**

A full examination of the patient will be necessary to determine if there are any other injuries.

Look and feel for:

- Bleeding
- Unusual colour
- Tenderness and bruising
- Lack of symmetry
- Loss of sensation

## Full Examination Checklist

- Head:**
- Inspect and gently palpate scalp, checking for lacerations, bleeding, depressions and bruising.
- Face:**
- Look for blood or fluid coming from ears, nose or mouth.
  - Inspect the eyes and check for pupil symmetry and reaction to light.
  - Look for any broken teeth.
  - Check skin colour, temperature and moisture.
  - Check for any obvious fracture of the jaw.
- Neck:**
- Gently inspect and palpate the neck checking for tenderness, deformities and rigidity.
- Chest:**
- Check for bruising.
  - Check for asymmetry of movement.
  - Gently palpate for tenderness and deformity.
- Back:**
- Check for muscle spasm along spine.
  - Look for bruises, injuries, entry or exit wounds.
- Abdomen:**
- Look for bruising, penetrating injuries.
  - Check for distension and masses.
  - Palpate (with warm hands) for rigidity.
- Pelvis:**
- Palpate gently for tenderness and deformity.
- Extremities:**
- Look for deformities.
  - Gently palpate for tenderness and deformities.
  - Check for bruising.
  - Check for equality of pulses.
  - Check for strength and sensation.
  - Check for symmetry

## Further Care

**Warmth, Comfort and Reassurance:** Insulate the patient from the ground. See to warmth and comfort and provide reassurance.

**Patient Minder:** A person should be appointed to stay with an injured person to monitor their condition, ensure their needs are met and provide the reassurance required. Refer to section on Patient Minders (Nominated Field First Aider, page 76).

**Log keeping:** It is essential that an accurate and comprehensive log is kept of all significant events as they occur.

**Monitoring:** The vital signs of the injured person(s) should be monitored regularly (usually by the Patient Minder) and recorded on the patient assessment form. The Operations Manager must be kept fully informed of the patient's condition, particularly if there are sudden changes or a noticeable trend. If a delayed rescue means an overnight stay, the monitoring will need to be maintained throughout the night. Breathing, pulse, temperature (blood pressure, if facility available) should be monitored at 10-15 minute intervals as a minimum. The frequency of course, will depend on the nature of the injuries and the condition of the patient.

**Toileting:** Tend to Patient's toilet needs. You may need to improvise. Be discreet and respect the patient's need for privacy.

**Privacy:** Keep those members of the party who are not tending to the patient's needs away from the patient.

**Shelter, food:** See that shelter and food is provided. Consider carefully the need for food and water. Do not give the patient food or drink if internal injuries are suspected. Seek medical advice.

**Safety:** Safety of rescuers is paramount. Consider the need to move to a safer location (along with the consequences of increasing injuries.)

**Death:** Occasionally, there is the possibility that the patient could die before being rescued. See that any needs or requests of the dying person are met and provide whatever comfort you can. Refer to the section on death (page 69).

## **Section 11. Rescue**

**Rescue management is the responsibility of the Rescue Controller. However, as many tasks as possible should be delegated to allow the Rescue Controller's full concentration on keeping an overview of the rescue operation.**

**NB: If back, neck or other serious injuries are suspected, it is preferable not to move the patient, but to request expert assistance eg., a paramedic team.**

If this is the case, control bleeding and keep the patient immobile, warm, dry and reassured. Insulate from the ground and provide shelter. Minor injuries can be attended to if the patient is not moved. Provide padding and support to injured areas and monitor vital signs. In the event of non-critical injuries or if air support is unavailable, the following structure and procedures are recommended:

### **Planning**

Take time to plan the rescue. Ensure you have the equipment and resources required, and that it can be safely executed. Consider:

- Safety of team(s) and patient(s)
- Time required and daylight (or torchlight) available
- Conditions: terrain, river crossings, weather etc
- Patient's injuries
- Method of rescue: Stretcher party, helicopter, fixed wing, boat, 4WD
- Personnel: Abilities, numbers required, resting, feeding, shelter, etc
- Equipment: stretchers, ropes, blankets, axes, further first aid equipment
- Specialist skills required: Paramedics, ACR (Alpine and Cliff Rescue) or Cave Rescue Teams should be requested when necessary

### **Structure**

A suitable rescue control structure should be established, including the tasks covered separately in this guide:

- Site management
- First aid (Refer to the Mountain Safety Council First Aid Manual)
- Patient care
- Communications
- Advance party to find best route out
- Track clearing party if required
- Stretcher handling party

## **Section 12. Stretchers**

To ensure a safe, comfortable stretcher carry the Rescue Controller should appoint and delegate tasks to:

### **Stretcher Leader**

Appointed by and responsible to the Rescue Controller for coordinating and monitoring the correct loading and handling of the stretcher(s).

- Stretcher Leaders can be changed or alternated as necessary.
- It is important for the Stretcher Leader to brief the team on what is required, the correct methods to be used, and to coordinate a smooth team effort.
- Successful stretcher handling requires good leadership, communications and cooperation.

### **Nominated Field First Aider (Patient Minder)**

Appointed by and responsible to the Rescue Controller. The Nominated Field First Aider should be a calm, caring, competent person.

- Stay close to the patient at all times whenever practical and provide comfort, reassurance and frequent situation reports to the patient.
- Monitor and record the patient's condition regularly. The frequency will depend on the nature and severity of the patient's condition. Report any changes to the Rescue Controller or Stretcher Leader.
- Ensure that all possible is done to maintain the patient's comfort.
- Tend to the patient's personal and toilet needs before and during the stretcher carry.

### **Remember:**

- Introduce yourself to the patient and explain your role and the situation.
- The patient may be in pain, distressed, embarrassed, frightened. You will need to react accordingly, providing comfort and reassurance.
- Talk to and reassure the patient even if he/she is unconscious. An apparently unconscious person is still capable of hearing and remembering what is said. Be careful what you say about the patient's condition.
- Hold the patient's hand or maintain physical contact whenever possible.
- Make sure the patient can easily identify you and knows your name.
- You should not take part in the carrying of the stretcher.
- Involving the patient in conversation may take their mind off the situation and any pain or discomfort.

- If you need to leave the patient at any time, say where you are going and when you intend to return. If you are likely to be away for a while, have someone else stand in for you.

### **Preparation for Stretcher Loading**

To be supervised by Stretcher Leader and Nominated Field First Aider.

- Those who are not directly involved with the first aid or stretcher loading should be moved away or given other tasks.
- Ensure all first aid requirements have been completed.
- Attend to the patient's toilet requirements. (It is important to respect the patient's privacy and dignity.) A person in pain or discomfort may not be aware of toilet needs and the pain will make urination difficult.
- If the patient's clothing is wet and the carry is likely to take some time, it is advisable to change the patient into dry clothing. Use the patient's gear first. Quite a lot of warm clothing, sleeping bags etc may be required to maintain body warmth. Cut patient's clothing (along the seams) to remove it if injuries dictate.
- Ensure the patient's circulation is not restricted by tight clothing, belts or bandages.
- Ensure the patient will not be caused discomfort or further injury by articles in pockets, zips, domes etc. - Remove if necessary. This is critical if the patient is unconscious.
- Ensure the stretcher is well padded with blankets or sleeping bags and the straps are correctly positioned.
- Regularly check the patient's extremities for signs of loss of circulation due to constrictions.

### **Loading**

- To be supervised by the Stretcher Leader and Nominated Field First Aider.
- Brief the team on what is required and how it is to be achieved. It may be necessary to discuss the best methods first.
- Every care must be taken and the patient's injuries considered.
- If necessary, rehearse manoeuvres on a team member of the same size as the patient until the move is perfected.
- If the patient is unconscious, load in the recovery position.
- If the patient has suspected back or neck injuries, it is essential that they are handled extremely carefully. The head, neck or back must NOT be allowed to rotate or bend. The head and body must be padded and secured against possible movement once on the stretcher.

- Log roll the patient on to a blanket or sleeping bag if possible and then lift on to the stretcher by lifting the rolled edges of the blanket or bag.
- Make sure the patient's head is well supported while lifting.
- Support above and below any injury sites with extra pairs of hands. Injuries may be worsened if moved or jarred. eg. blood vessels may be severed or crushed or bleeding may restart.
- Pad between the patient's knees and ankles to prevent chafing.
- Pad between the patient and the stretcher to prevent movement, taking special care to prevent aggravation to injured areas.
- Adjust the foot board of the stretcher to give the best support.
- Make sure the patient is warm but does not overheat.
- Tighten straps firmly.
- Protect the patient from falling debris and the sun, and provide protection for the patient's eyes (sunglasses, hat etc).
- Cover with a parka or flysheet if raining.

### Handling Commands

The commands must be positive, loud and clear and should be preceded by a warning of a command where possible.

eg. ..	“Prepare to lift...	Lift”
	“Prepare to move forward...	Move”
	“Prepare to turn left/right...	Turn”
.....	“Prepare to stop...	Stop”
	“Prepare to lower...	Lower”

The stretcher bearers must be told clearly what is expected of them, especially when negotiating difficult obstacles etc. They must also be prevented from going faster than necessary.

### **Different Methods**

1. Teams of 6 or 8 people carry the stretcher for approximately 10 minute intervals and then stop to change teams.
  - The patient should be checked during the changeover period.
  - This is the most suitable method to use on narrow tracks and when regular checks on the patient are required.
  - The Stretcher Leader calls out when it is time to change teams and decides which team to take over.
2. A team of 6 or 8 people start off with the stretcher.
  - Every few minutes, one pair of bearers is replaced by a fresh pair while the stretcher is still in motion.
  - The fresh pairs follow behind the stretcher ready to take over and the pair who have just been replaced go to the rear of the line. The Stretcher Leader calls out for a replacement pair when required eg. "Change front pair."
  - This method is ideal for fast evacuation on wide tracks and where regular checks on the patient are not necessary.
3. The Stretcher Bearers stand still in pairs and pass the stretcher along the line in between them.
  - Those who have passed the stretcher along go forward outside the working pairs to the front of the line ready to receive the stretcher again.
  - This method is ideal for steep or uneven ground, across fences, rivers, obstacles or any area where insecure footing makes it dangerous to walk with the stretcher.

### **Steep Areas**

Wherever steep areas are encountered or where control of the stretcher could be lost, use a rope belay to take the weight of the stretcher.

### **Stretcher Orientation**

- Normally, carry with the patient's feet first, unless going uphill.
- Unless injuries or shock dictate otherwise, keep the patient's head level with or raised slightly above the feet.
- Ask the conscious patient which way is most comfortable.

### **Advance Party**

It is often necessary to have an advance party locating the best route and preparing the path for the stretcher party by clearing obstructing vegetation. Keep vegetation destruction to a minimum.

## **Section 13: Debriefing**

A debrief after an operation is essential as it allows everyone to learn from what occurred during the operation. Often there are two debriefs; a general debrief and a more in-depth one for the IMT, Advisers, senior SAR and Police personnel. A general debrief is for Team Leaders, Rescue Controllers, IMT, Advisers and Police. Often Team Members are also invited to attend.

Searches are often debriefed as soon as they are completed, ie on the same day. However, a debrief is required within 21 days of the conclusion of the operation.

### **Purposes of the Debrief**

- To help those involved build up an overall picture of the search.
- To learn from any mistakes made.
- To recommend any improvements for future searches.
- To determine suitability of equipment.

It is also a good opportunity for those involved to learn what happened at the ICP and to other teams in the field during the search.

### **Topics discussed include**

- The callout
- Search phase
- Rescue phase
- Logistics, transport etc.
- Communications
- General

Those invited to take part should make every effort to attend, as the debrief is an important part of any SAR operation.

## **Section 14. Miscellaneous**

### **Stress**

The stress of a SAR operation, including the shock of finding a dead body (or even a badly injured person) can be very traumatic and affects different people in different ways. Signs may be immediate, or occur several days later, and personnel involved need to be followed up.

Team Leaders should report to the Operations Manager or Incident Controller any concern they may have about any team member who seems distressed as a result of such an experience, or if they themselves feel distressed. It is important for everyone to be aware that counselling is readily available through the Police Psychological Service and/or Victim Support for anyone who is unduly distressed by what they experience.

Remaining at Base for the debrief provides a good opportunity to talk about your experiences and to unwind.

Stress during searches, particularly long searches, is common and the Planning/Intelligence Managers, Operations Managers, Team Leaders and others involved should watch for the signs among all personnel. Common signs are:

- Frustration, argumentative over tasks
- Withdrawn
- Silent and/or distressed
- Lacking motivation

Action should be taken to quickly remove the person from further involvement and:

- Debrief thoroughly
- Provide counselling and ongoing help if required

The Police can arrange victim support groups or professional counselling etc. as required.

## **Callout Procedures**

SAR is now generally organised through dedicated SAR organisations around the country. Although a few areas still operate using the club callout system. In the event of an operation the Adviser who has been rung by the police will ring the Callout Officer or Club Contact who will then callout the members of the SAR team. A variety of methods are used to call people out, including Pager, texting, phone tree, etc.

The role of Callout Officer or Club Contact is a very important one as the link between Adviser and the SAR organisation and/or club. A minimum of three contacts is required per group/club. All correspondence regarding your contact details, including changes, must be sent to the person in the organisation who is maintaining the callout list. It is preferable, but not essential, that the position is held by someone with an interest in SAR.

## **Responsibilities of Callout Officer/Club Contact**

### **Non-Operational**

- To keep an up to date list of all the SAR team members including:
  - Home, work and other contact numbers, cell phone, pager, etc.
  - Residential (and work) address
  - Training Records, including abilities and experience
  - Fitness levels
- To make sure all the other Callout Officers or Club Contacts have an up to date list.
- To inform the SAR Adviser of the names and phone numbers of the Callout Officer and Club phone contacts and notify him or her immediately of any changes. (A minimum of three contacts is required)
- To inform all SAR team members of any coming events and encourage their involvement. Collect names and contact numbers and pass them on to the Adviser as soon as possible. (It is essential that each person is phoned individually. Newsletters alone are not sufficient to pass on the information.)
- To keep other SAR members informed of SAR activities through meetings or newsletter articles.

### **Operational - Search Callouts**

In the event of a search, you will be phoned by a SAR Adviser or the Logistics Manager and asked to supply personnel. You should observe the following procedure:

- Write down the number of people required and if any special skills or equipment are needed.

- Write down a contact number of the person who phones you and any other numbers you are given.
- Write down details of the staging/assembly point and time.
- Phone the required number of appropriately skilled people from your list. If time is short, phone other contacts and ask them to help you. Start with the most competent people and those who are most likely to be available. Tell them all the necessary information and give them a number where you can be contacted.
- Unless specifically requested, never call people who have no SAR training or experience or anyone you know to be incompetent.

**Important - when phoning:**

- Ensure that you try to contact everyone you are requested to.
- Introduce yourself and say what organisation you represent.
- Be courteous.
- Give clear instructions; allow time for the person at the other end to write down all details.
- Allow time for the person to ask any questions.
- If you do not have an answer to any question, say so. Do not make any assumptions or try to give your own interpretation of the situation.
- If you get an answer-phone, give brief details of the search, your contact details and the date and time of the message.
- Keep a note of who you contact and who you have to try again, answer-phone messages etc.
- Unless otherwise specified, all personnel should be fully equipped for 2 days.
- Once you have been through the list, get back to the Adviser who called you and give them details of who you were able to contact.
- Each alternate time you do a phone call-out, start from the other end of the list.
- Keep a log of events.
- If you intend to take part in the search, make sure you arrange for another person who can call out more people if required.

## **General**

### **Wages claims**

Government Departments are required to pay employees while they are engaged in a search. The Department may require a letter from the Police to back the claim. Many private employers will pay employees for reasonable time off while they are involved in a search. If this is not the case, or you are self-employed, you may claim lost wages from the Police. (This does not apply to a SAREX.)

### **Equipment claims**

Compensation is normally available from the Police for the insurance excess on your equipment lost or damaged in the course of a search (but not a SAREX). You make a claim on your individual insurance policy first.

### **Making a claim**

In the first instance, see the Incident Controller at the ICP before you leave and they will arrange the appropriate forms. To make a claim after the event, contact the controlling Police Station.

### **Insurance**

You are advised to check that your insurance policies are not adversely affected by your involvement in a search or SAREX, especially with regard to transport in off-road vehicles and non-scheduled aircraft flights. (The latter may be covered by a gentleman's agreement with the Insurance Council.)

### **Accidents**

It is important that all accidents and/or incidents that occur during the course of a search or SAREX are reported to the IMT and are documented on your return from the field.

In the event of a possible ACC claim, and especially for the payment of the first week of an injury, the Police must be informed and they will clarify their requirements should you need to make an ACC claim.

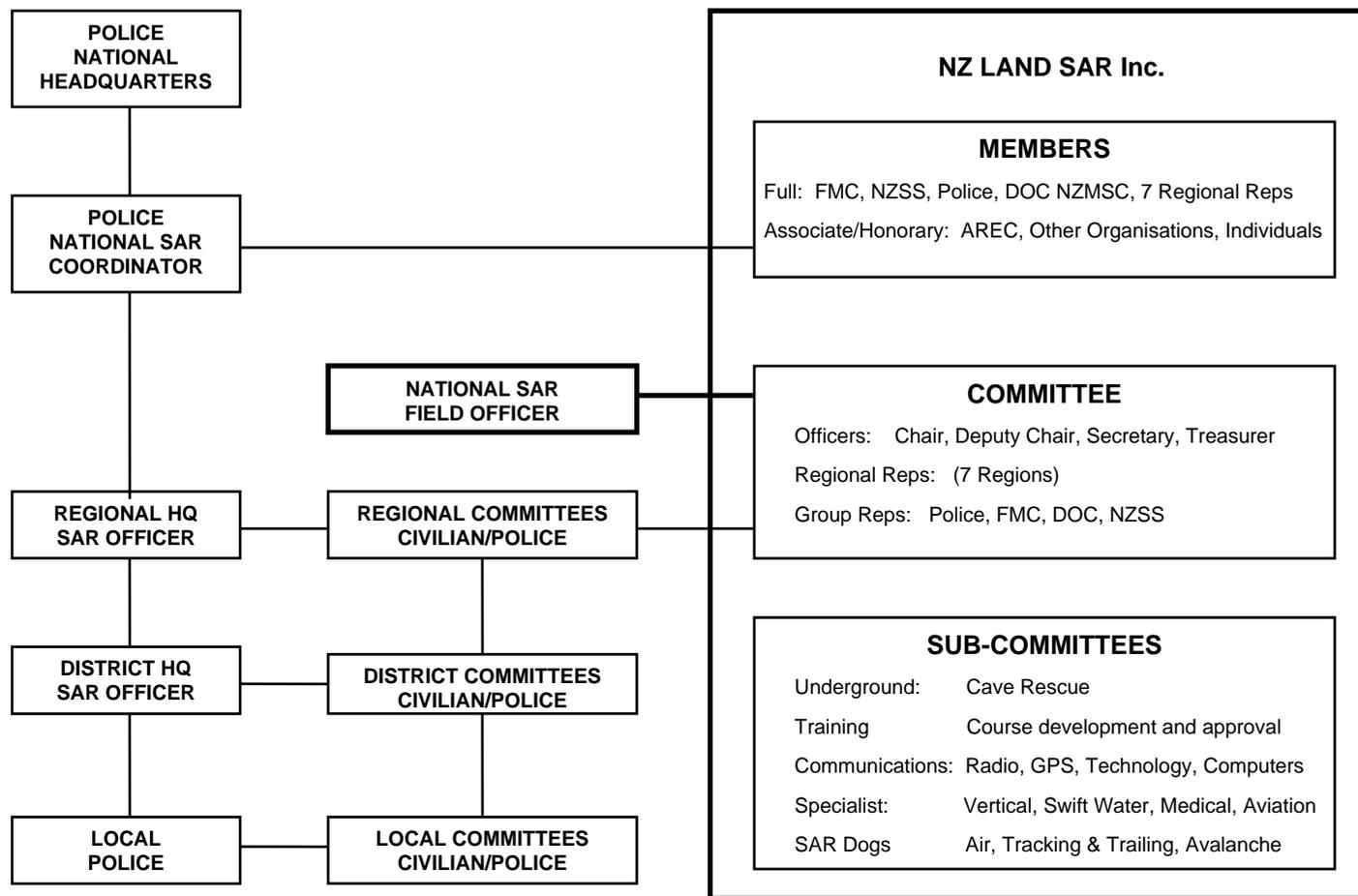


Fig. 14.1 NZ Land SAR Inc. structure





## Recommended Reading:

Land Search & Rescue	Federated Mountain Clubs of NZ
Bushcraft Manual	NZ Mountain Safety Council Inc.
Outdoor First Aid Manual	NZ Mountain Safety Council Inc.
Hypothermia Manual	NZ Mountain Safety Council Inc.
Mountain-craft Manual	NZ Mountain Safety Council Inc.
Managing Risks in Outdoor Activities	.
Radio Communications	NZ Mountain Safety Council Inc

Books available from Search and Rescue Institute of NZ (SARINZ). - Agent for  
Emergency Response Institute - USA:

- Search is an Emergency: A handbook for managing search operations
- Behaviour of Lost Persons in Wilderness Areas by William Syrotuck
- Ab Taylor's Tracking Book by Ab Taylor

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