POLICE DEPARTMENT
Western Australia

SEARCH TECHNIQUES

With Compliments of
The Commissioner of Police
Western Australia

71743/11/77—10M

POLICE DEPARTMENT

WESTERN AUSTRALIA

IN-SERVICE TRAINING

SEARCH TECHNIQUES

PREPARED BY

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CONTENTS

THE PRINCIPLES OF SEARCH OPERATIONS

Introduction

1. In many countries throughout the world search and rescue training is concentrated on one, or perhaps two particular types of operations. This is possible because the physiographic structure and climatic conditions are similar throughout the country, which makes their search and rescue tasks similar.

2. The widely differing terrain and climatic conditions in Australia makes this impossible. Instead, search and rescue training must include instruction on all types of searches applicable to the wide variety of conditions which exist in this country.

3. Regardless of the type of search to be conducted, be it a mountain search or a desert search, there are standard principles which must be applied in order to achieve maximum efficiency.

Principles of Search Operations

4. Reports on search and rescue operations prove conclusively that the degree of efficiency achieved is directly related to adequate pre-planning, effective liaison and the adherence to sound and proven principles. These principles are covered in the following paragraphs.

5. Control. The Police are responsible for land search and rescue operations. The responsibility or organising and controlling search parties is usually vested with the officer-in-charge of the Police District concerned.

6. Although the overall control never leaves the police, field search control may however be delegated to some other person. An example of this could well be in a mountain search where field control could be delegated to an executive officer of a mountain climbing club or someone equally experienced.

7. The most important point regarding control is that everyone taking part in the search operation must be made fully aware of who is controlling the operation. Case studies show time and again that where search operations have been unsuccessful it was due to either lack of control or that there was some doubt amongst the various organisations taking part as to who was controlling the operation.

8. Information. Information is an essential requirement in any operational situation. For search operations, information may be broadly classified as pre-search information and search operational information.

...../2

(a) Pre-Search information. As much information as possible must be obtained prior to initiating a search operation. This information should include the following:-

(i) Relevant information regarding the missing or isolated person/s.

(ii) Weather conditions:-

(1) At the time the person was reported missing.

(2) Present weather conditions.

(3) Forecast weather conditions.

(iii) Information regarding the area to be searched.

(iv) Manpower and resources available.

(b) Search operational information. Based on the pre-search information, a preliminary assessment of the search task can be made. Once the search operation has commenced, reliable and accurate information is required from the search parties operating. Various methods may be used to obtain this information; search parties may be instructed to send reports at specified times or they may be required to report only when they have significant information to pass on. Regardless of the method decided upon by the controller, it is vital that all search party leaders are briefed in detail on the particular method and their responsibility for forwarding search operational information.

9. Communications. An efficient communication system is essential for control and for the passage of information. Wherever possible, radio communications should be used, however, depending on the type of radio set, their capability may be seriously affected by terrain and poor weather conditions. Therefore, alternative means of communication should always be provided.

10. Mobility. Mobility is an important principle with search operations. Search headquarters must have the facilities to move quickly to the search area and commence operations. Mobility is also essential in conducting reconnaissance searches.

11. Flexibility. The search controllers plan must be flexible. As new information is revealed it may be necessary to concentrate the search operations in a different part of the search area or even to an entirely new search area. Not only should the overall plan be flexible but equally as important, search party members must fully realise the difficult and demanding nature of search operations and the need for flexibility.

12. Trained and Disciplined Personnel. Ideally, the best persons to use in search operations are those who have been trained in bushcraft, search techniques and rescue skills. Unfortunately the number of persons trained in these areas and available are limited, and therefore it will be necessary to supplement search parties with volunteer untrained personnel. In this case, the following points are important:-

(a) Never send poorly led search parties into the field. Limit the number of search parties to the number of COMPETENT LEADERS.

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(b) Assess the physical fitness of all members and allocate tasks accordingly. Hard tasks to the fit; medium tasks to the average; base duty and easy tasks to the unfit.

(c) Ensure that members of search parties are prepared to accept orders and advice from their leader. Remember that the object of the operation is to save life, and therefore there is no place for a person who will not work in the team.

Summary

13. The principles detailed above apply equally well to all types of searches. They do not in any way reduce the importance and the need for a carefully produced plan, which of course is vital. However, past experiences have proved that these principles are sound and are essential in achieving the aim of any search operation - TO LOCATE AND SAVE THE LIFE OF A MISSING PERSON OR PERSONS.

Search Statistics

14. Attached as Annex A is a paper giving general search statistics.

GENERAL SEARCH STATISTICS

Introduction

1. The following information has been condensed from a survey conducted at the Los Angeles County Sheriff's Department, Montrose, USA. Included in the survey was the study of 380 search case histories during the period 1964 to 1971. Additional information from the survey report is included in the book "Mountain Search for the Lost Victim" by Dennis E. Kelley.

The Victim

2. The survey report gives the following description as being the typical lost person from the 380 case histories studied:-

> The lost victim is male, 14 years of age and was last seen or heard from at approximately 0900 hours Sunday morning during the month of December. The victim will be missing for nearly 12 hours before someone will request help from the authorities. A little more than two hours later a team will arrive at the search area and commence search operations. Three hours later the significant clue will be found. The total time that the victim was missing will be over 18 hours. The apparent reason the victim became lost was that he became disoriented. More often than not, the real reason can be traced to poor adult supervision.

3. To assist searchers in predicting victim behaviour it is necessary to study the missing victim and his situations. Fig. 1 illustrates the statistics based on 380 case studies. It is interesting to note that there is a 95.9% chance of finding the victim alive. This should encourage worried parents etc., calling for help.

Analysis of Statistics

4. Listed below in the following paragraphs are explanatory notes on the statistics shown in Fig. 1.

5. Never found. There is a 0.4% chance of not finding the victim at all, dead or alive. This may sound surprising, yet a number of both children and adults disappear without a trace and are still in police files.

6. Lost. There is a 35.8% chance that the victim is lost. The motivation of the victim when lost is highly controversial. There is a belief that the lost person tends to become semi-conscious and operate in semi-hallucinary mode. Many rescued victims relate their experience when lost as clouded with visions, hallucinations and dreams. The main reasons for becoming lost are:-

Reason	%
Disoriented	35.8
* Poor adult judgement	19.9
* Poor adult supervision	19.7
Darkness	11.0
Hunting	5.5
Underestimated distance	2.2
Misguided by bypassers	1.6
Fog	1.6
Snow	1.1
Fishing	1.1
Emotional disturbance	.5

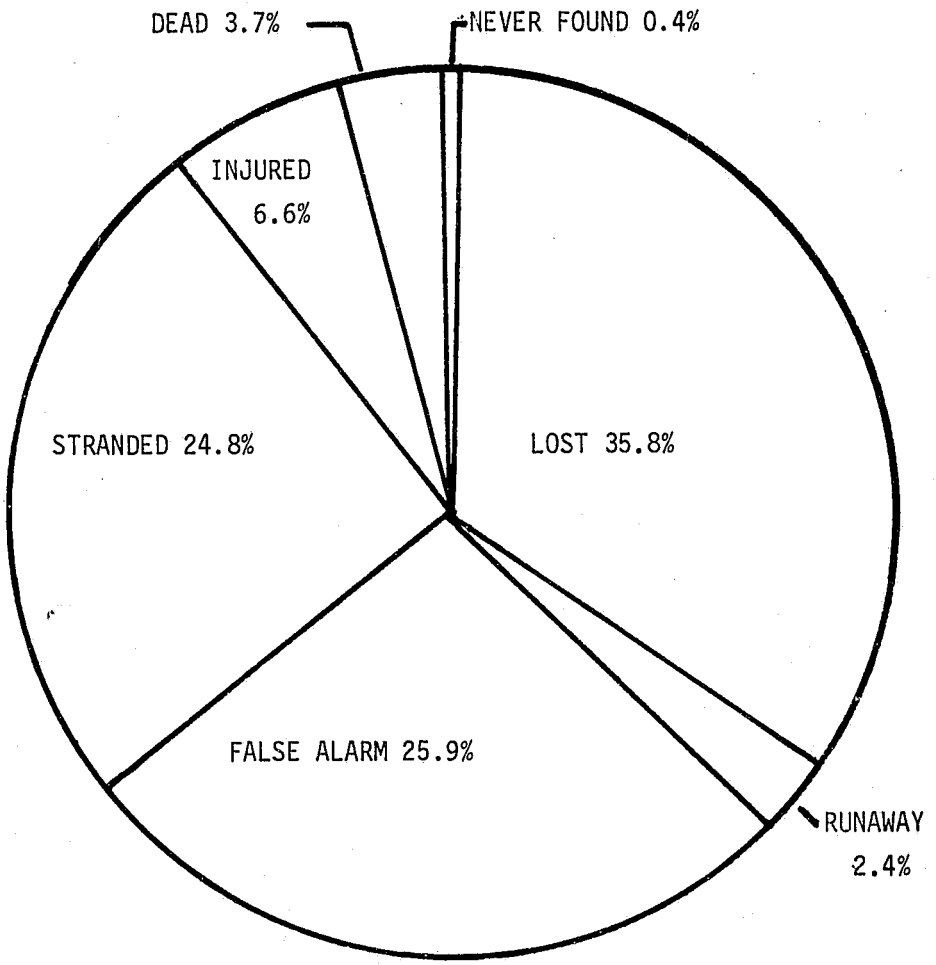


FIG. 1 VICTIM STATISTICS (Based on 380 case histories)

* Poor adult judgement means that a parent or adult leader made a decision which jeopardised a child's safety and welfare. Poor adult supervision reflects the lack of adult guidance resulting in a situation jeopardising a child's safety and welfare.

7. Runaway. This includes all of those who are unwilling to be found and resist detection. The runaway child, for example can be an illusive quarry. Also included are delinquent children, senile adults and the emotionally ill and accounts for 2.4% of all missing persons. Emotional disturbance is, of course, a factor where the majority of runaways are concerned.

8. False Alarms. Statistically, there is a 25.9% chance that, before the formal search (defined as the arrival at the search area of organised search teams) can be started, it will be established that the victim is not really missing. This fact substantiates the importance of establishing the need for a search as accurately as possible and immediately initiating the search once the need is definitely established.

9. The main reasons for false alarms are listed below. Note that safety checks and the victim extricating himself lead the list. A safety check is a search for a potential missing person e.g., a search for possible additional passengers in a vehicle smash situation.

Reason	%
Safety check	31.1
Self extrication	25.5
Erroneous request for help	8.7
Underestimated distance	8.1
Abandoned vehicle	6.8
Erroneous observation	6.8
Emotional disturbance	4.4
Darkness	3.7
Riderless horse	1.2
Blood stained clothes	.6
Other	.6

10. Stranded. A person stranded is defined as being in a helpless position and the chances of this happening are 24.8%. The main reasons for being stranded are:-

Reason	%
Darkness	24.5
Poor adult judgement	22.2
Snow	21.5
Underestimated distance	11.4
Steep terrain	6.6
Mud slide	4.8
Vehicle problems	3.0
Disoriented	1.8
Hunting	1.2
Flood	1.2
Avalanche	.6
Drugs	.6
Fog	.6

11. Injured. There is a 6.6% chance that the victim has suffered some kind of non fatal accident. A medical history of the victim and a knowledge of the search are helpful in predicting the possibility of this situation. It should be understood that many of these accidents, if unattended, can be fatal. However, quick response by search teams can prevent this. The most common causes of accidents are:-

Reason	%
Exposure	35.7
Fall	17.8
Flood	11.1
Poor adult judgement	11.1
Poor adult supervision	8.9
Snow	4.4
Darkness	4.4
Emotional disturbance	2.2
Rockfall	2.2
Fatigue	2.2

12. Dead. There is a 3.7% chance of finding the victim dead. Many factors can contribute to the death of the lost victim. These conditions can be sufficiently generalised so that searchers can predict the time frame for survival;that is, the probable average period of time for finding and rescuing the victim before death occurs. Within this time frame for survival, the searcher must apply all required resources to assure a reasonable change of success.

13. The reasons for death are listed below. Note the small percentage of deaths that could be saved by improved search techniques.

Reason	%
Vehicle over cliff	26.7
Fall	14.3
Suicide	14.3
Airplane crash	14.3
Exposure	6.1
Poor adult supervision	6.1
Drowned	6.1
Flood	6.1
Fatal gunshot wound	6.1

Helicopter Effectiveness

14. An analysis of helicopter effectiveness was performed on the 1964-1971 Montrose searches.

15. The effectiveness was 47%. This was calculated on the fact that helicopters found or supported a find in 55 searches out of a total of 117 searches in which they were used.

SEARCH INFORMATION

Introduction

1. In any operation the degree of success will depend considerably on the availability and utilisation of accurate, up to date and relevant information. This will be particularly so in search operations, where so often the time factor is critical and hence urgency is a keynote.

2. The search operation may present special problems in that there will be an essential conflict between the urgency posed by the particular situation and the initial delay imposed by the need to gather and evaluate as much information as possible. An understanding of the information process must therefore be a major qualification for the Search Controller.

The Information Process

3. As in any other operation, the process of handling search information will divide into four stages:-

(a) Collection. Information of itself does not come readily to hand. It must be sought out, often from the most unlikely sources. It may sometimes be necessary to set up special information seeking agencies. Whether the information be readily available or whether obtaining it be a long and difficult process, as much as possible should be obtained in the shortest possible time.

(b) Collation. Once a quantity of information has been assembled it will be necessary to sort it out into the various categories relevant to the problem. Where possible information should be displayed in such a way that it is readily available to the Search Controller; if he is obliged to leaf through large numbers of sheets of paper, maps, etc., the task of evaluating the information, and making decisions based upon that information is made much more difficult.

(c) Evaluation. In any mass of information there will be some relevant and some irrelevant, some reliable and some not, some recent and some out of date. It will be necessary for the Search Controller to evaluate the information presented to him, to separate the wheat from the chaff, and to make decisions based upon the situation as it appears.

(d) Dissemination. The Search Controller will not be working alone. It will always be necessary for him to pass on such information as is necessary to search parties, to higher headquarters, to the family of the victim, to the press, etc. Such information must be accurate and relevant if confidence in the Search Controller is to be maintained.

Search Information Phases

4. The information process as applied to search operations may be divided into four phases:-

(a) Pre-Search. (Collection; Collation; Evaulation). In the period between the raising of an alarm regarding a missing person(s) and the actual mounting of a search, as much relevant information as possible must be acquired and evaluated. The result of such evaluation may well be to reinforce a sense of urgency in the light of such factors as the victim's physical or psychological condition, weather conditions, etc.; equally well, as information comes to hand it may become evident that the alarm has been raised prematurely and that the search should be delayed or even cancelled altogether.

(b) Briefing. (Dissemination). The decision to mount a search having been made, and search parties being ready to commence operations, the Search Controller must then brief each party leader thoroughly. The information given must be complete, and be presented in an orderly and logical fashion. All details regarding the victim, the area to be covered, the search pattern to be followed, command and communications, special instructions, etc. must be clearly and fully understood. The omission of a single item of information in briefing may well lead to an unsuccessful search conclusion, as may lack of appreciation of the relative importance of the various information details.

(c) Search Operations. (Collection; Evaluation). During operations all members of search parties must constantly and consciously seek further relevant information. This may come in the form of physical clues, by word of mouth from persons in the area, by interpretation of topographical factors in the light of experience, etc. All such information must be carefully evaluated and passed to other party members and if necessary back to search headquarters. Information acquired during search will often dictate the future course of operations.

(d) De-Briefing. (Collection; Collation; Evaluation; Dissemination). As search parties return to field search headquarters, party leaders and/or members must be de-briefed. Care must be taken to ensure that all relevant information is gathered and re-evaluated in the light of the overall picture as it develops, and is then passed on to those parties still in the field or about to set out.

5. When a search extends over a considerable time-frame, phases (b), (c) and (d) will operate as a cycle. As search parties return for de-briefing, the information obtained will be evaluated and built into the briefing of the next parties to be sent out. This cycle will continue until end of search.

Information Gathering Aspects

6. Four main aspects of information gathering are to be considered. These are:-

(a) Type of information required.

(b) Availability of the information.

(c) Techniques of acquiring information.

(d) Evaluation of the information acquired.

7. Type of Information. The information required, particularly in the pre-search phase, will fall broadly into four categories:-

(a) Victim. As much information as possible regarding the missing person(s) should be obtained. It should include personal details, physical features, state of health, dress, method of transport, time of going missing, etc. Such information may well dictate the urgency of search; conversely, a history of 'going missing' may suggest a policy of 'wait and see'.

(b) Weather. The weather affecting the area of search will be of vital importance, in that it dictates the victim's time-frame for survival, and will also have a major bearing on the search operations themselves. Full weather details together with available predictions should be obtained, and these related to local knowledge and experience.

(c) Area of Search. Successful search operations will depend to a large extent upon accurate fore-knowledge of the area to be covered. Before patterns of search can be decided it will be necessary to know the general topography of the area, details of particular problems or hazards, type of ground cover, location of check points, etc.

(d) Resources. The pattern of operations will be confined and dictated by the resources available to the Search Controller. These will fall naturally into two groups; manpower and facilities.

(i) Manpower. Numbers available, range of experience, local knowledge, times available, standard of training, etc.

(ii) Resources. Vehicles, helicopters, radios, maps, protective clothing, special equipment, etc.

The Search Controller must marshal his resources before allocating tasks and areas, and the success of the operation may well depend upon his skill in this regard.

8. Availability of Information. Having laid down the type of information required, there are two factors to consider. First, where may such information be obtained; and second, 'how much is enough?' The sources of information will naturally be related to the type of information required, as follows:-

(a) Victim. Family, friends, school, employers, family doctor, last contacts, etc.

(b) Weather. Bureau of Meterology, local knowledge, local records, experience and training.

(c) Area. Army survey maps, local maps, sketches, local knowledge, aerial photographs, reconnaissance, etc.

(d) Resources. Police, Emergency Services, Scouts and Guides, clubs, bushwalkers, Armed Services, private aviation, etc.

9. The Search Controller will always be faced with the problem of deciding when he has enough information on which to base his decisions. If the vailability of information is such that details are slow in forthcoming, he may let a sense of urgency over-ride his better judgement; on the other hand there will never be "total' information, and extended delay in commencing search operations may well cost the victim his life.

10. Techniques of Acquiring Information. While certain information will be fairly readily available, such as weather forecasts, lists of resources, etc., much of the information required by the Search Controller and by members of search parties will have to be elicited from people who are emotionally involved, or inexperienced in reporting, or even purely disinterested spectators. It will therefore be necessary for the information-gatherer to probe for the details he may require, and he must at all times be able to separate the wheat from the chaff and if necessary re-direct his line of questioning.

11. Before attempting to interview persons who may have relevant information the interviewer should, if he has time, arrange his questions to follow a logical pattern in order to produce logically developed information. However, he must always be ready to adjust his approach in the light of answers as they are given. Certain problems may face the interviewed, including:-

(a) Emotional involvement. This can affect information gathering in two ways. The person interviewed may be closely related to the victim, and is hence to a degree incapable of objective answers; or the interviewer himself may be affected, e.g. when the victimis a very young child and the interviewer has children of similar age. In any case the interviewer must be alert to the problem and take it into account when carrying out the questioning process. At all costs the interviewer must avoid further upsetting close family members of the victim.

(b) Lack of Awareness. Often the non-involved person is not aware that he has information relevant to the enquiries the interviewer is making. Only patient questioning can elicit the required detail, which can then be set in the overall context to fill in a pattern.

(c) Resentment. While not necessarily common, sometimes there is resentment on the part of the person being interviewed. When faced with an attitude of 'it's nothing to do with me, leave me out of it', the interviewer must by force of personality reduce the resentment and attempt to get the other 'on side' if he is to acquire the information he seeks.

(d) Language. An increasing proportion of the Australian population does not have English as a mother tongue. This presents problems for the interviewer seeking information. It may be necessary to use an interpreter, either from the search party or from the family of the person being interviewed. (Children in the family can be very useful in this respect). This particular problem becomes more acute if the person is also emotionally involved, as in times of stress it becomes more difficult for people to converse in a language not their own.

(e) Arrogance. The interviewer must beware also of the subject who 'knows it all'. Such a person, secure in his belief in his own infallibility, may at times unwittingly withhold the very detail that could be important to the interviewer; upon occasion he may even deliberately mislead the interviewer in a misguided attempt to convince of his own knowledge, skill or ability. Such a subject must be very carefully handled indeed, and the interviewer must not let his natural resentment of such an attitude prevent him from attempting to gain the information he seeks.

12. For the interviewer, no matter whom he questions, there is one over-riding rule: Information must be written down. There will be occasions when the subject himself may set down the information (perhaps in the form of a report), but as a general rule the interviewer will ask the questions and set the answers down himself. Written summaries of the information enable better evaluation of the material and ensure that vital facts are neither forgotten nor overlooked.

13. Evaluation of Information. When information has been collected the Search Controller must then evaluate it in terms of its relevance, reliability, and relationship.

(a) Relevance. Each piece of information must be examined to see whether it is relevant to the problem facing the searchers. In any programme of information-gathering it is inevitable that a certain proportion of the information will have no real bearing on the task in hand, and may therefore be discarded. The Search Controller must however be careful in his selection of information in this regard, as an oversight could cost the victim dear.

(b) Reliability. The Search Controller must reassure himself that relevant information is in fact reliable; i.e. is both accurate and up-to-date. Unreliable information may lead to wrong decisions, and such decisions at an early stage of a search can lead to an unnecessary prolongation of the search and possible increased suffering by the victim.

(c) Relationship. Having selected the relevant information, and satisfied himself as to its reliability, the Search Controller must then relate each piece of information to the needs imposed by the search. For example, while search parties must have all relevant information, it would be foolish for them to be burdened with the full range of information available, much of which may not relate to their own particular task.

14. When evaluating information, the Search Controller must endeavour to develop a 'detective instinct', so that the information may be evaluated not merely on its own merits but also in relation to the personality of the victim himself. In this way it may be possible to predict the victim's movements subsequent to his becoming lost or to narrow the area of probability when allocating search areas or patterns.

Briefing

15. Particular care must be taken by the Search Controller when preparing and delivering briefings. Poor briefing, in terms of technique or information included, can be a prime cause of search failure. Good organisation, adequate information, excellent communications and experienced search parties can all be to no avail if the quality of the briefing is not up to the requirement.

16. Information to be covered in the briefing should include the following:-

(a) Background to and purpose of operation.

(b) General information regarding the search area to be covered.

(c) Full information regarding the missing victim/party and the circumstances under which he/they went missing.

(d) Specific details regarding the pattern of search, action required, additional information to be sought, action on locating victim, etc.

(e) Control personnel and arrangements.

(f) Communication arrangements.

(g) Action to be taken in event of injury, etc.

(h) Any other relevant details.

17. Briefing Procedures. In order to ensure efficient briefing of search teams, the following points should be noted:-

(a) Party leaders must be provided with a written brief, as well as such maps, photographs, etc. as are available.

(b) The Search Controller should insist on silence during his briefing; questions will be handled at the end of each section of the briefing.

(c) The Search Controller should give a general oral cover of the information covered in the written brief and issue general instructions. Then each party should receive its specific tasks in turn, and have the opportunity to ask questions

(d) No party should set out until they clearly understand the tasks allocated to them. It is far better to use a little time for questions than to waste a lot of time on a fruitless search operation.

SEARCH TECHNIQUES

Introduction

1. When in the light of information available it becomes obvious that a search is required, the Controller and his team will need to make two major decisions, both of which will influence the techniques employed by search parties in the field. They are :-

(a) The type of search needed.

(b) The overall strategy. The search plan.

Types of Search

2. Many factors including the current situation and local conditions will need to be considered but broadly the types of searches can be classified as follows:-

(a) Type A. All out immediate search. Defined as a 24-hour per day immediate rescue type search using all available resources for the following situations:-

(i) One or more children missing.

(ii) Victim with medical history missing.

(iii) Extreme or hazardous weather conditions.

(b) Type B. Normal but immediate search. Defined as a 24-hour per day search using local resources only for the following situation:-

(i) Overdue or missing adult alone.

(c) Type C. Normal but convenient search. Defined as a day time local search team effort for the following situation:-

(i) Two or more overdue or missing adults.

Search Strategy: The Plan

3. No hard and fast lines can be laid down for search strategy, depending as it does on so many variable factors which may be present in a particular situation, e.g. type of terrain, number of leaders or men with local knowledge available, number of effective search personnel available, location of search area, possible earliest time for commencement, etc. etc.

A study of case histories of a large number of actual searches however reveals, in most cases, a common pattern of progression through three distinct phases. They are:-

(a) The Reconnaissance Phase.

(b) The General Search Phase.

(c) The Contact.

The techniques required for each of the above phases will be discussed in detail. It is emphasised that although a search will usually progress through the phases in order as listed, it may commence or end with any one of them and the techniques mentioned may need to be modified to meet local conditions.

The Reconnaissance Phase

4. The prime reason for reconnaissance is to narrow down the search area and to speedily pass back significant information which may have a bearing on the future search plan. Reconnaissance parties may also be lucky enough to find the missing party quickly and thus save a great deal of time and effort necessitated by a full-scale search.

5. Composition of Reconnaissance Parties. Since they must travel light and fast, reconnaissance parties should be kept small; ideally 4 to 6 men. It is almost essential that the leader or at least one member of the party should have a good knowledge of the task area and that all members are fit and competent for the task. In the event that it becomes necessary to divide the party for separate tasks such as investigation of particular hazards or carrying information back to Search Headquarters, it should be remembered that two is the minimum number for safety in any sort of hazardous condition and although speed is essential the leader remains responsible for the safety of his party.

6. The Task of Reconnaissance Parties. The area to be covered by reconnaissance will probably be based on the area of POSSIBILITY i.e. the maximum distance, in any direction, the missing party could have travelled in the time elapsed since the last definite sighting. This area may be further limited by the existence of natural barriers such as large streams, cliffs, etc. The actual physical method employed to cover the parties allotted task area will probably be decided by the party leader in consultation with his team. A typical briefing would probably include the following:-

(a) Check all local hazards that might have trapped or caused injury to the missing party such as:-

(i) Waterfalls, cliffs, caves etc.

(ii) Huts, caravans, cars, buildings etc.

(b) Check tracks, routes, sandbars etc. for clues in the way of footprints, discarded items of clothing and equipment.

(c) Question any persons found in the search area and brief them as to the situation. Record their names and addresses, car registration numbers and any other relevant details.

(d) Clearly mark or rope off any clues found and record time and name of member who found them.

7. From the above requirements it can be seen that the briefing of the reconnaissance parties must be as complete as possible especially with regard to the missing party. Details of clothing, equipment or items carried, type of footwear etc. all of which, if discarded, will supply vital clues, should be included. So often the importance of clues is only realised long after they have been dismissed as irrelevant and, of course, are at this stage irretrievably lost.

8. Information Required. As quick results are required, information regarding clues and indications found should be sent back to Search Headquarters by the quickest possible means. It is also equally important that a NO TRACE report be made as this may enable areas to be eliminated with consequent saving of time and manpower.

9. Written Briefing. If at all possible a written briefing or handout should be provided for reconnaissance party leaders: or alternatively, leaders should make comprehensive notes. A map or sketch plan of the area or a copy of the same may also be needed.

The General Search Phase

10. When as a result of reconnaissance and/or definite information received, the Controller and his team are able to define the area of PROBABILITY, they may decide to cover this area with a "General Search". This implies a general coverage of the whole area and may be organised under the following heading:-

11. Search Area Segmentation. The actual practice would appear to be to break the search area up into search task blocks according to the number of search teams available and the nature of the terrain, the areas being kept reasonably small for efficient coverage by one team in a reasonable time. As a rough guide on General Search, a 4 to 6 man team could in average rough bush country, be expected to cover 3 to 4 square miles in one day. If the segmentation of the search area results in more search task blocks than teams available, it may be better to allocate an order of priority rather than enlarge the search task blocks. Lower priority blocks could be covered later or possibly as new teams arrive. To ensure complete coverage, the boundaries of the search task blocks may be defined by natural features such as ridges, streams, tracks, bush edge, snow line etc. Undefined mutual boundaries between blocks would need to be mutually defined and marked by the parties concerned.

12. Composition of Teams for General Search. Recorded experience indicates the need, as in the case of reconnaissance, to keep parties small (4 to 6 men) and as far as possible, comprised of men of equal fitness, thus enabling the allocation of tasks according to the fitness of the whole team. It has been suggested that more than 14 search teams operating simultaneously will produce problems in overall control.

13. Method of Search. Having been allocated their search task block, the team concerned will probably decide how to carry out their own search of the area; possibly a reconnaissance round the boundaries (boxing the area) followed by a general systematic coverage. The term 'General Search' implies not an examination of every square yard of the area but rather a general check for signs or indications of the missing party. A check of such items as camp sites and possible shelter areas such as logs, caves, rocks, etc. could produce results. A special check of any natural hazards is necessary with special emphasis on those which might trap or cause injury to the missing party. Close investigation of anything unusual, even smells, is needed. It is suggested that party members would do well to constantly think of what they would do if lost in the area themselves.

For areas of greater PROBABILITY than others a modified form of General Search may be employed using the same strength in parties but designating much smaller task areas resulting in a closer coverage of the areas involved.

14. Final Reports. After consultation with his team members, the party leader will need to make his report to the Search Controller on the result of the search in his area. Absolute and complete frankness and honesty is essential especially if there is any doubt about a particular part or area. This must be mentioned as it may well be that the Controller will eliminate the area on the basis of the report.

The Contact Search Phase

15. Contact search means that each member of the search team is in visual contact with the man adjacent to him. It would probably be used when a relatively small area of high PROBABILITY has eventually been defined or alternatively to search for further clues in an area where the missing party was known to have been located. Contact search technique may also be used in the initial stage when the AREA of PROBABILITY is small, e.g. a child missing in a pine plantation or small patch of bush.

16. Composition of Parties in Contact Search. As the grouping is much closer, teams can be larger. It is generally though that 8 - 12 men (two combined General Search teams) is the maximum that can be effectively controller in rough country. It is, however, on record that a successful contact search was carried out by over 200 men in one combined team co-ordinated by 15 leaders in medium to rough bush country. Generally the maximum size of the team relates directly to the type of terrain involved.

17. Method. Contact search must be orderly and methodical with base lines and boundaries clearly established. Every member should be in visual contact with his adjacent member and every bit of the ground must be seen. The leader usually controls his team from the centre, or if he has a reliable deputy he may take one extremity and his deputy the other. Visual identification of the leader and his deputy in some way, e.g. coloured hard hats is a help in keeping order, especially when several teams are searching adjacent areas with mutual boundaries.

18. Formations for Contact Search. Although variations will probably be needed to suit local conditions, there appear to be two basic formations. They are :-

(a) Parallel Sweep Search - employed where sufficient searchers are available to cover the entire search area in one pass (See Fig. 1).

(b) Creeping Line Ahead Search - employed where there are not sufficient searchers to implement the Parallel Sweep Method (See Fig. 2).

19. Areas and Boundaries. Contact searches are slow, tedious and exhausting work, so areas must be kept small. As a rough guide, it has been found that 8 - 12 men can cover only one-quarter square mile of rough bush/mountain country in one day. Boundaries of search areas must be very carefully delineated, preferably by natural features such as rivers or roads and tracks. In the case of a Creeping Line Ahead technique, physical marking will be necessary by party members on the extremities. Searchers tasks will be made easier if contact search patterns follow the contours of the terrain.

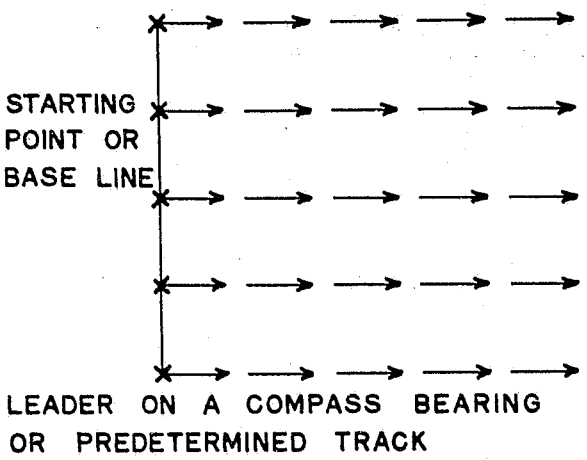


FIG. 1 PARALLEL SWEEP SEARCH

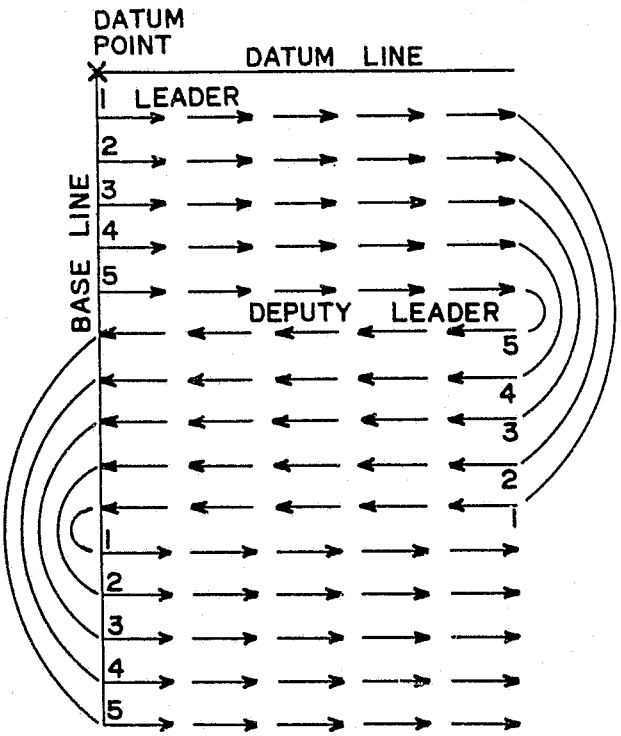


FIG. 2 CREEPING LINE AHEAD

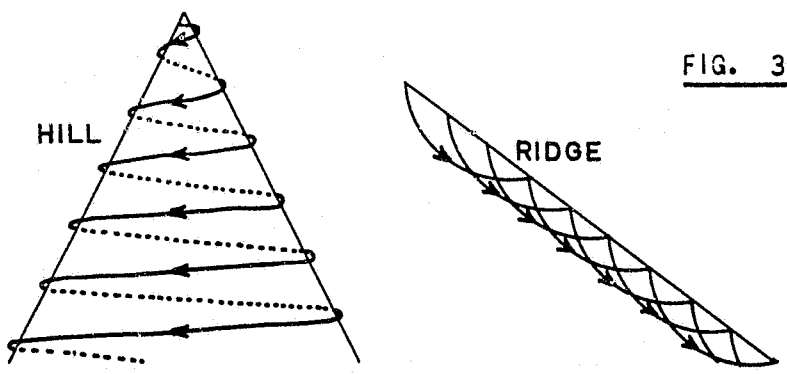


FIG. 3 CONTOUR SEARCH

SEARCH TECHNIQUES - GENERAL NOTES

General

1. The purpose of these notes is to provide general information on search methods and techniques.

Night Searches

2. Before deciding to search at night, the Search Controller will need to weigh the possibilities of success against the risk to his search teams. Night search is not a task for inexperienced searchers. Some advantages and disadvantages are :-

(a) Advantages

(i) Tracks and signs show up much better at night when illuminated by a flashlight.

(ii) The missing person will probably be immobile at night and see the searchers lights.

(iii) The human voice carried further at night.

(b) Disadvantages

(i) Possible risk to searchers.

(ii) Excessive strain on eyesight.

(iii) Possible accidental destruction of vital signs.

3. A possible compromise would be to patrol all available tracks with vehicles during the night, or form a reconnaissance by well trained and experienced search parties.

Water Searching

4. This is a task for the experts and since this type of search implies that the missing person is dead it may well be left to experienced persons. It is worth noting that it is difficult to locate a body in a small water hole by probing with sticks etc. As an improvisation, a bundle or barbed wire at the end of a rope has been found effective, although the only sure method is to get in and search by contact. Location of the missing person, even if dead, is the main object.

Searching from Vehicles

5. Quick reconnaissance may call for the use of vehicles, e.g. four wheel drive vehicles, trail bikes etc. These have the advantages of quick coverage and they are visible and audible to the missing person. It must be remembered that the driver of the vehicle will concentrate on driving and have little time for actual visual searching and that engine noise may oblitorate calls for help. Horses have proved satisfactory for reconnaissance.

Dogs

6. If they are available and are to be used, they must be introduced very early in the operation. The newer the scent, the more easily a dog will follow it. Dogs have followed a seven day old track but this is rare; normally dogs are ineffective on a track over 48 hours old. All trained tracking dogs can reasonably be expected to follow overnight tracks.

7. There are two distinct types of dogs which may be used. They are :-

(a) Search Dogs. These freely cover the whole area in groups of up to seven.

(b) Tracker Dogs. These operate singly, with a dog handler, and follow individual scents.

8. Trained tracker dogs do not require the classical article of clothing to enable them to follow a track, but if available it is an asset. In this regard personal possessions, clothes etc., belonging to the missing person should be carefully placed in a clean carton or bag, using a stick or pair of pliers, and then sealed until required.

9. The following factors adversely limit the effectiveness of dogs :-

(a) Temperature. High temperature will quickly reduce the scent due to evaporation.

(b) Wind. A strong wind rapidly disperses the scent.

(c) Rain. Heavy rain will wash the scent away.

(d) Ground Surface. Dry bare ground adversely affects tracking, e.g. rock, chalk, paths or roads where there is little vegetation.

(e) Manure. Heavily manured land affects the scent.

(f) Crowds. Streets and towns where the track has been crossed and confused by other and fresher tracks.

(g) Water. The worst enemy of the tracking dogs is water, particularly running water. Dogs have been known to follow a track across shallow swamp water but this is unusual.

10. The Searchers

The safety and welfare of searchers is of paramount importance. This is the responsibility of the Search Controller and Party Leaders. A record of the names, addresses and phone numbers of all members of search parties should be kept at headquarters. Individual members should be capable of the task set in terms of physical fitness, clothing, equipment etc. It should always be remembered that searchers' efficiency drops very rapidly as they become over-tired. Generally, tasks should be allotted according to the capability of teams.

11. Support Teams

If at all practicable, it is a good policy to retain a support team of searchers at base. They can be used to fill in gaps in the search pattern, to implement a close search in a particular area, if needed, or to help with evacuation on location of the missing party.

CONTROL OF SEARCH OPERATIONS

Introduction

1. In conducting a search for lost persons it is important that the search be properly organised and well controlled. Time spent in assessing the situation (pre-search information) and organising the search will never be wasted. In fact it is true to say that a search should not be launched, before all the facts have been assessed. A hastily mounted and poorly organised operation may not only fail to find the missing person/s but may also unnecessarily endanger the searchers.

Responsibility

2. All organisations which may be involved in a search operation must realise that the overall authority and control rests with the police.

3. The senior police officer (Search Controller) whilst retaining control over the whole operation, may delegate authority for field search operations to another person; however this would depend on local circumstances. If a Field Search Controller is appointed, it must be clearly understood by everyone that he alone is responsible for the conduct of the search.

Organisation

4. In order to achieve effective control it may be necessary to set up all, or some of the headquarters listed below. The number will depend on the location, size and scale of the search and other local conditions. A complete organisational chart is shown in Annex A.

5. Field Search Headquarters. This should be established by the Field Search Controller in or near the search area, as it is from here that Search Parties will be briefed and controlled during the operation. Factors to be considered in the choice of location are access, accommodation, communications, range of visibility etc.

6. Normally a Field Search Headquarters can control up to six Search Parties and tasks. When more have to be used, or because of communication problems due to difficult terrain, the Field Search Controller may have to set up Sub-Headquarters to ensure efficient control.

7. Support Base. This is not part of, but an essential adjunct to Field Search Headquarters to ensure that operations in the field receive adequate manpower, administrative and logistic support. It is an area where all resources can be marshalled, organised and brought to a state of readiness against the Field Search Controllers requirements. As there will of necessity be considerable movement of personnel, vehicles and equipment it should not be located in the search area, but should be as close as possible to Field Search Headquarters. Good communications are, of course, essential.

8. Main Search Headquarters. This is set up by the Search Controller (Senior Police Officer) who is responsible for co-ordinating the overall search effort. It will normally be at an existing Police Station or Police District Headquarters whichever is appropriate.

9. The role of this headquarters is to provide effective back-up support to Field Operations.

10. As has already been stated, when a person has been reported missing, a great deal of careful investigation must be undertaken before a decision is made to mount a search.

11. In these preliminary stages there is the very real danger that rumours and false information may produce an over-reaction from the public. Organisations and individual volunteers may rush off into the search area with the best will in the world, but by doing so, greatly reduce the chances of success.

12. It should be remembered that the use of the minimum number of parties, consistent with effectiveness and safety, is most likely to lead to success.

13. When the Search Controller has made the decision to mount a search, and a Field Search Headquarters and Support Base have been deployed to the search area, there are positive actions he can, and should initiate. The following could apply:-

(a) Set up road blocks to restrict unauthorised movement into the search area.

(b) Keep the public informed by regular press releases to the media, and set up an Information Centre to answer enquiries from the individual.

(c) Alert the organisations and individuals whose assistance may be required in the search. A pre-planned call-up procedure should achieve this, but it is good Public Relations not only to alert those likely to be involved, but to inform those whose assistance is not required at this stage of the situation.

(d) Despatch to the Support Base resources in manpower and equipment, as and when the Field Search Controller requests them.

14. Assembly Area. If the distance between the Search Area and Main Search Headquarters is considerable, the Search Controller may set up an Assembly Area nearby, to ensure that those resources going forward to the Support Base are properly equipped.

Communications

15. Sound communications, involving not only the use of telephones and radio, but as many alternative systems as possible, must be pre-planned and implemented. Basic requirements are:-

(a) From Field Search Headquarters to Search Parties and Sub-Headquarters if necessary.

(b) From Field Search Headquarters to Support Base.

(c) From Field Search Headquarters and Support Base to Main Search Headquarters.

(d) From Main Search Headquarters to Assembly Area (if set up).

Search Operations - Requirements, Staff and Duties

16. During operations all headquarters must be run on methodical and systematic lines. In principle the staffs should be kept to a minimum and the procedures simple and easily understood. The succeeding paragraphs deal only with the main requirements, the Controllers responsibilities and the staff duties which have to be carried out at the various headquarters.

17. Field Search Headquarters. Wherever practicable a house or hut should be used. The convenience achieved by using a building, warrants going a short distance out of the way. The briefing of search parties, communications arrangements, necessary stores and equipment, all make working space important. Suitable lighting for nightwork is essential.

18. The responsibilities, duties and procedures of the staff are as follows:-

(a) Field Search Controller. He is responsible for:-

(i) Where and how to search.

(ii) By what type of search technique

(iii) Number of Parties to be used; their composition and equipment.

(iv) Briefing and de-briefing Search Parties.

(v) Safety of all field personnel.

(vi) Keeping the Search Controller and Support Base informed of field requirements, and by sitrep, on progress and forward planning.

(b) Procedures and Aids. If the headquarters is to function efficiently, procedures must be laid down and adhered to. The more important ones are :-

(i) A log must be maintained, giving brief details of all actions in chronological sequence. An example of a Civil Defence Working Log is attached as Annex B.

(ii) A search map with all task areas marked should be set up. On this will be plotted the changing operational situation, areas covered, clues, finds, etc. Maps for issue to Search Parties must also be available.

(iii) A filing system for IN and OUT messages, search tasks, weather forecasts and sitreps should be maintained.

(iv) A simple Resources Board showing resources deployed in the field, those available at Support Base and those coming in (Main Search Headquarters) could be of value. An example of a Civil Defence Resources Board is attached as Annex C.

(c) Staff. Within the principle of staffs being kept to a minimum, the procedures listed above should be adequately handled by a deputy controller and clerk. Communications operators as required must be added to this number.

19. Support Base. This should be sited close to, or may even be alongside Field Search Headquarters, if the latter is located outside the search area. Ideally it should have buildings to accommodate Headquarters, Stores and Welfare facilities, hard standing for vehicles and working space. It is the point of entry into and exit from the search area, and as such has a vital role to play.

20. It should be clearly understood that it is NOT a rallying point for all those who may wish to help; this can only lead to chaos. Its role is entirely operations, and should only hold such manpower and equipment resources as the Field Search Controller requires.

21. The responsibilities and staff duties are as follows :-

(a) Officer in Charge. He is responsible for :-

(i) Maintaining close contact with Field Search Headquarters and Main Search Headquarters at all times.

(ii) Controlling movement in and out of the search area.

(iii) Recording the names and addresses of all those taking part in the search, as well as details of Search Parties.

(iv) Recording the issue and return of all equipment.

(v) Welfare, including food and water, clothing, rest areas etc. for all personnel in the field.

(vi) First Aid and Sick Bay facilities.

(vii) Despatching fully equipped Search Parties and resources to Field Search Controller as required by him.

(b) Procedures and Aids. Operations at the Support Base will be complex, and to ensure its smooth and efficient running, the following will be necessary :-

(i) Base headquarters procedures will require maintenance of the same sort of logs, plots and message filing systems as at Field Search Headquarters para 18(b). A copying machine could be useful for extra copies of maps etc.

(ii) The maintenance of a Resources Board is of particular importance.

(iii) Records of issues and return of stores and equipment.

(iv) Records of all personnel taking part in the search.

(v) Reliable communications between the forward and rear areas.

(c) Staff. It is difficult to be precise as to the staff needed to fulfil the above functions, but obviously the Officer in Charge must be an experienced organiser and have appropriate trained staff to back him up.

22. Main Search Headquarters. This will be located in an existing Police Headquarters and the senior police officer in charge will become the Search Controller. His responsibilities are as follows :-

(i) Control and co-ordination of the overall search operation.

(ii) Deployment of Field Search Headquarters and Support Base.

(iii) Alerting all organisations who may be required to assist, including the armed services. Good liaison and pre-planning will make this more effective.

(iv) Forward planning to obtain a short notice useful aids and equipment which may be needed in the search. These could include trackers and dogs, horsemen, divers etc. as specialised manpower; and flares, beacons, compasses, sirens, rattles etc. as useful equipment.

(v) Organise transport as necessary.

(vi) Alert Medical, First Aid and Ambulance Services.

(vii) A comprehensive communications plan to cover the whole operation.

(viii) Deploy manpower and equipment, as requested by the Field Search Controller, to the Support Base.

(ix) Public Relations with Media and setting up an information Centre.

(x) Setting up an Assembly Area (if necessary).

23. To enable the Search Controller to meet his responsibilities, Main Search Headquarters could be organised as follows:-

(a) Controller's Conference Room. A room at the disposal of the Controller where he may receive and consult representatives of the Services and other Headquarters.

(b) Operations Room. This may be described as the "nerve centre" of a Headquarters. In this room information of an operational nature is received, collated and displayed, and orders issued for the deployment of Services. In fact, all major problems concerning operations will be decided here, and consequently a room of adequate size should be provided to accommodate the Operations Staff. An Operations Room should have a large scale map covering the whole of its area as well as smaller maps of the Search Area. On the maps will be plotted information as it arrives. It will also require a Resources Board and message files and log.

(c) Administration Room. The Administrative Staff is responsible to the Controller for personnel, supply, maintenance, accommodation and finance matters.

(d) Signal Centre. To accommodate communications equipment and to provide facilities for the reception, despatch, filing and logging of messages. It is desirable there should be separate rooms or divisions for radio, telephone and maintenance. The master register for incoming and outgoing messages is maintained in this section.

(e) Messenger's Room. For the use of despatch riders and messengers belonging to or visiting the Headquarters.

(f) Liaison Room. To ensure that Services and Supporting Bodies are kept up to date with the developing situation, a Liaison Room should be provided under a Staff Officer (Liaison). The information displayed in this room will be similar to that of the Operations Room.

(g) Services and Supporting Bodies. In larger Headquarters it may be desirable to provide accommodation for such Service and Supporting Body where such personnel may carry out their own portion of the operation. In smaller Headquarters only a Liaison Room may be provided.

(h) Additional Accommodation. Dining Room, kitchen, washrooms and sleeping accommodation may be provided, as well as parking areas, furniture etc.

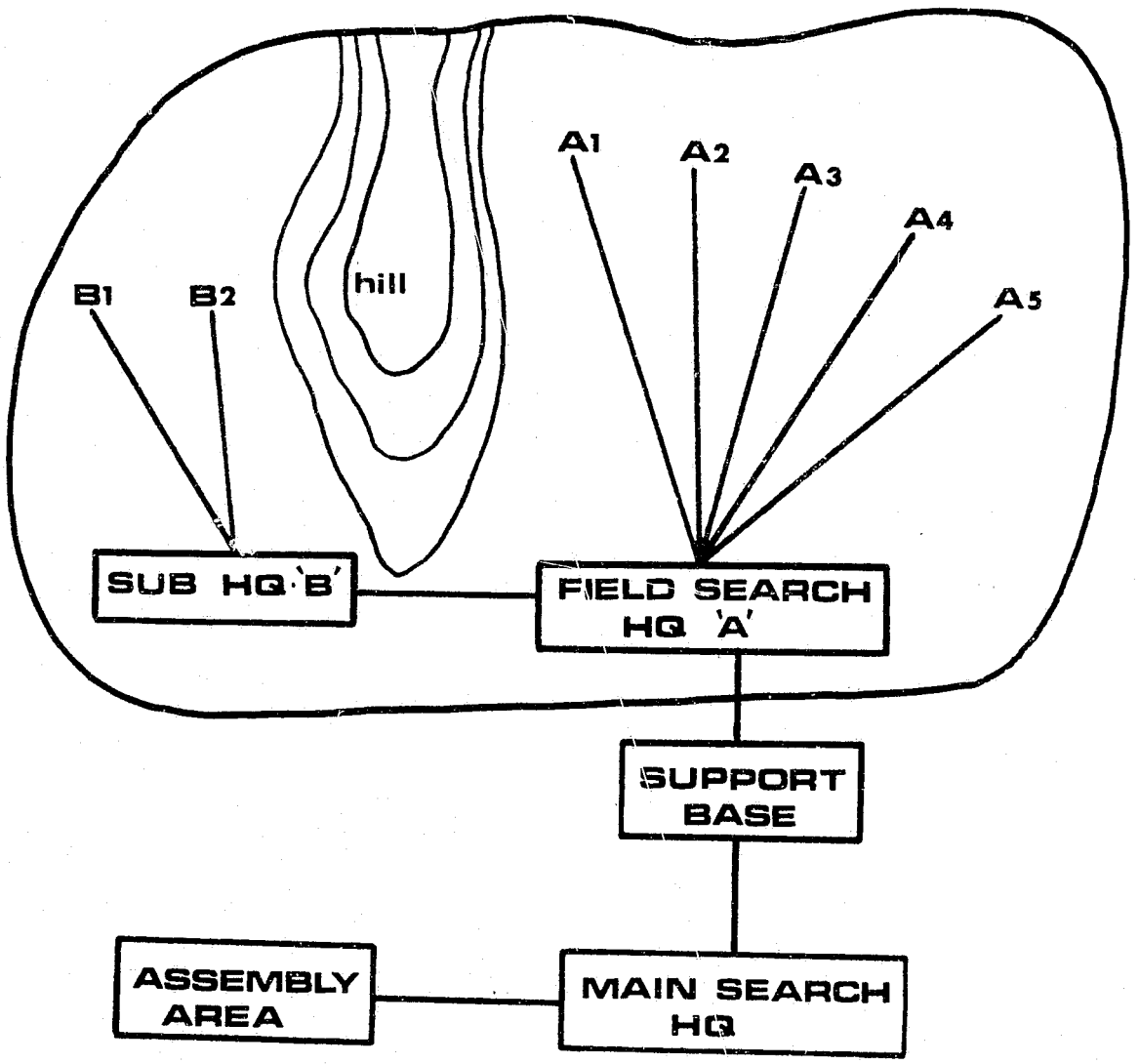
(i) Information Centre. Wherever a Search Headquarters is established there will inevitably be numerous people arriving to seek information and make enquiries. To cope with these enquiries it will be expedient to establish an Information Centre, clearly marked but some distance from the Headquarters to which such visitors would be directed, thus ensuring that other departments are free to undertake their own duties. The information centre will be run by the Public Relations Officer (PRO) who is also responsible to the Search Controller for briefing the Media as to the situation in the field.

Summary

24. The success of a search will largely depend on good planning and adequate control in the field. This is based on the Field Search Controller having a free hand to deal with field operations, at the same time receiving maximum support from the Search Controller through the Support Base.

25. Under no circumstances should unofficial search parties be allowed in the search area, and any person disobeying instructions should be withdrawn immediately.

SEARCH ORGANISATION



RESOURCES BOARD

RESOURCE	AVAIL. FOR DEPLOYMENT	RESTING	REINFORCEMENT DETAILS	DEPLOYMENT DETAILS	TOTAL DEPLOYED

WORKING LOG

SERIAL	DATE/TIME	EVENT	ACTION TAKEN

HELICOPTERS - GENERAL INFORMATION AND SAFETY PRECAUTIONS

Introduction

1. The helicopter is an extremely versatile aircraft and as such is capable of performing a variety of roles in search and rescue operations including :-

(a) Casualty evacuation.

(b) Low level aerial searching.

(c) Resupply.

(d) Transporting search parties into and within the area of search operations.

2. The purpose of this precis is to provide :-

(a) General guidelines on the use of helicopters.

(b) Specific details applicable to the RAAF Iroquois helicopter.

(c) Safety precautions to be observed when working with helicopters.

Factors Affecting the Capability of Helicopters

3. The following factors limit the capability of helicopters :-

(a) Poor weather and turbulence. Poor weather conditions, apart from reducing visibility, may produce air turbulence which can seriously affect the handling of helicopters, thus limiting their capabilities.

(b) Temperature and altitude. High temperatures and altitudes lessen the "lift" which is produced by the helicopter rotors thereby reducing the maximum load which can be carried.

(c) Fuel requirements. At maximum speed, the helicopter "stay time" is very short due to fuel expenditure. It is therefore important that a refuelling point be established close to the area of operations.

Characteristics of the RAAF Iroquois (UH1D) Helicopter

4. The Iroquois, being the most common helicopter used by the RAAF, is the type most likely to be provided to assist in search and rescue operations. The characteristics and capabilities of this helicopter are listed below:-

(a) Maximum speed. 138 mph.

(b) Normal cruising speed. 120 mph.

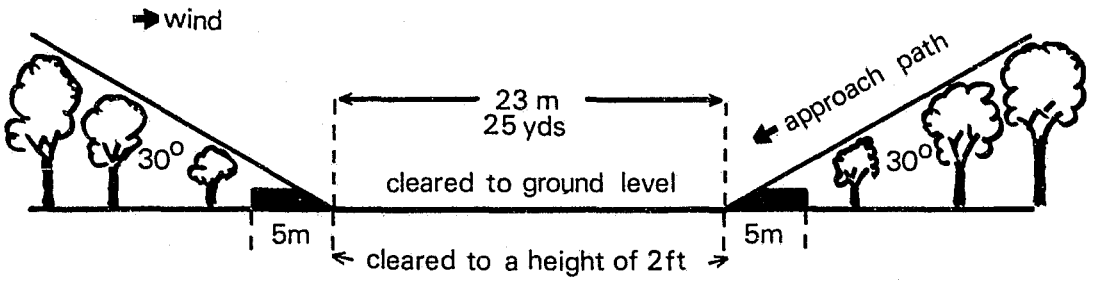
(c) Cruise endurance. 2 hours.

(d) Cruise range. 250 statute miles.

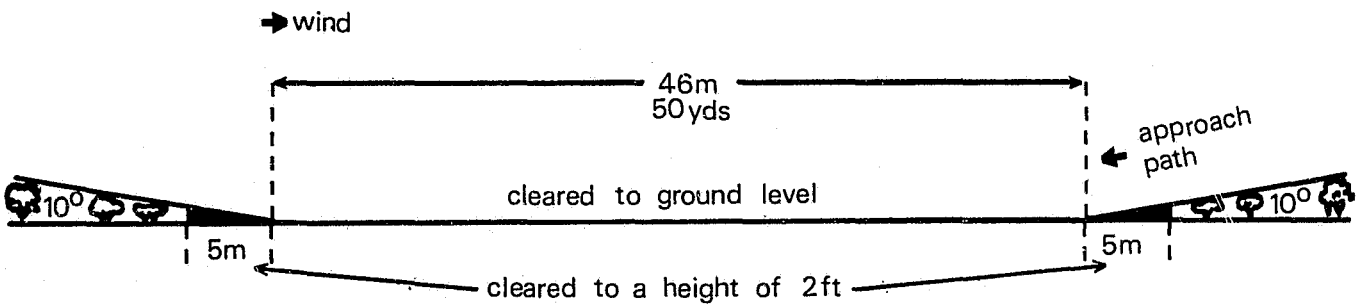
(e) Normal seating. 3 crew plus 9 passengers.

(f) Maximum lifting capacity. The load lifting capacity depends directly upon the dimensions of the Landing Point, the height of surrounding obstacles, the altitude, temperature and the fuel load. The maximum lifting capacity at sea level, with a full crew, 6 passengers and a full fuel load would be approximately 1,500 lbs.

(g) Special features. The Iroquois is equipped with winching facilities and can be fitted with 6 stretchers.



Requirement by day



Requirement by night

FIG.1 MINIMUM DIMENSIONS FOR AN IROQUOIS LANDING POINT

Landing Areas

5. Types. Within the Armed Services, specific terms are used to describe different landing areas. These are:-

(a) Landing Zone (LZ). A specific area containing a number of landing sites.

(b) Landing Sites (LS). An area containing more than one land point.

(c) Landing Point (LP). A point where one helicopter can land.

6. Where the landing site is required to contain more than one helicopter (Iroquois), the separation distance between landing points must be no less than 140 ft from centre to centre.

7. Dimesnions for an Iroquois Landing Point. The minimum dimensions for an Iroquois Landing Point are shown in fig. 1. In addition to the requirements shown in the diagram, the following points apply:-

(a) Ground surface. The surface must be able to support a fully laden helicopter and be free from holes, tree stumps and any loose items which could be blown up into the rotor blades. As a guide, the ground must be firm enough to enable a loaded vehicle (2 tons for an Iroquois) to stop and restart without sinking in.

(b) Slope. The slope of the ground must not exceed 7 degrees or 1 in 10.

(c) Markings. The centre of the Landing Point should be marked with a white "H". All markings must be firmly secured to the ground over their entire length.

(d) Wind indicators. Wind direction at Landing Sites may be indicated by any of the following methods:-

(i) White or coloured smoke from a smoke generator placed on the down wind side of the Landing Point. Note that if the wind is light and variable, smoke may obscure the Landing Point and be more of a hindrance than a help and should therefore be dispensed with. (See fig. 2 (a)).

(ii) A white or fluorescent "T" placed at the down wind edge of the Landing Point; The horizontal bar of the "T" must be positioned facing into the wind. (See fig. 2 (b)).

(iii) A windsock, the pole of which must not conflict with the clearances and approach gradients shown in fig. 1.

(iv) Radio contact with the ground party.

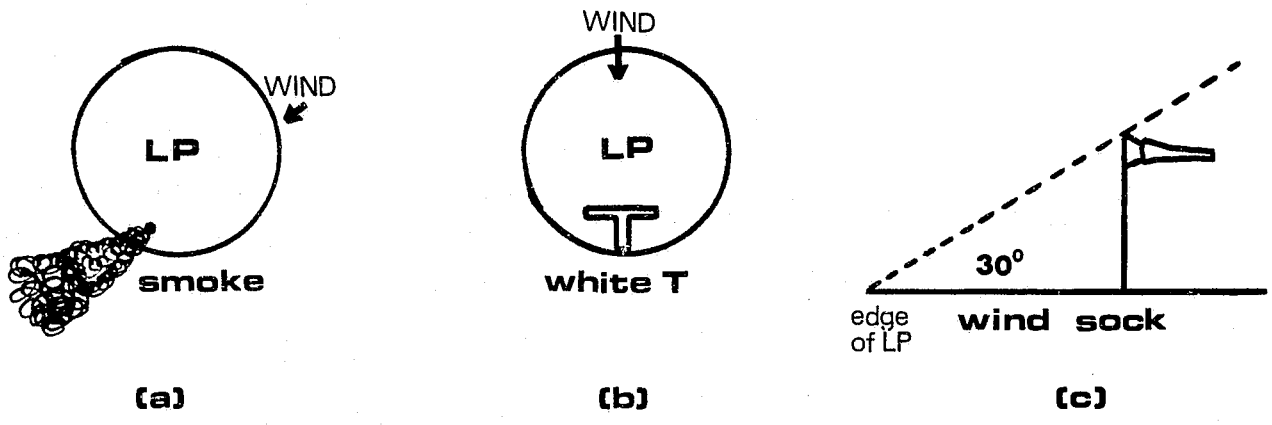


FIG. 2 WIND INDICATORS

8. Illuminating Landing Points at Night. An effective method of providing emergency lighting at the Landing Point is by using two vehicles. This method is shown in fig. 3 below.

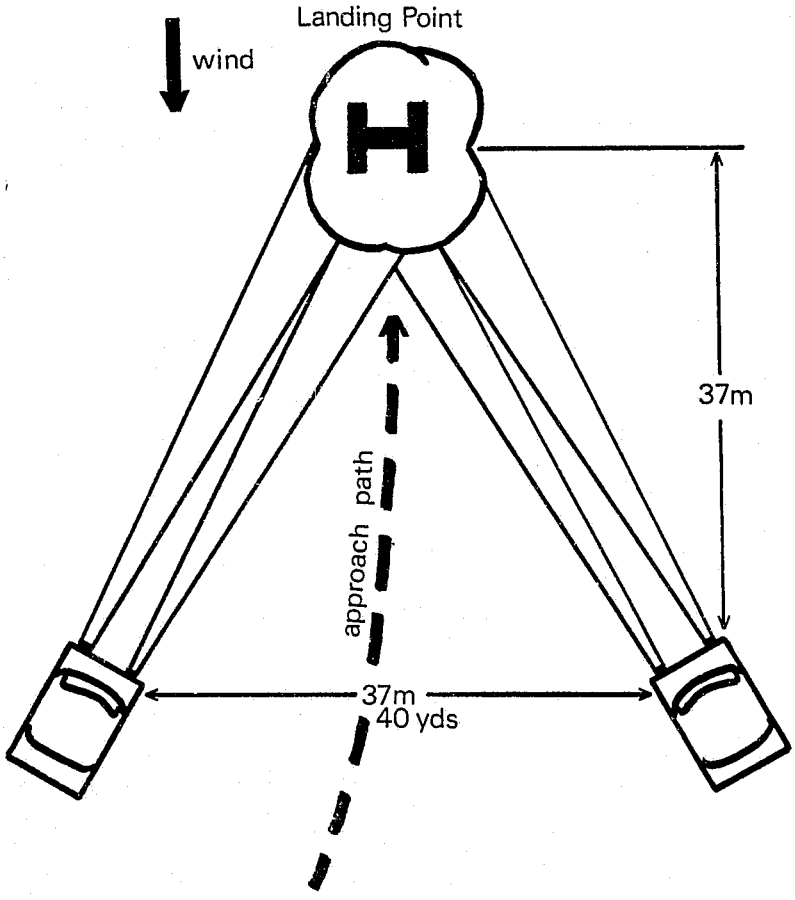
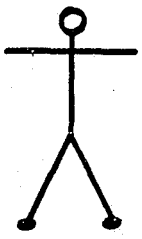


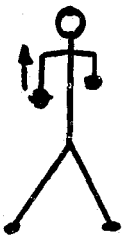
FIG.3 EMERGENCY LANDING POINT LIGHTING (USING TWO VEHICLES)

Marshalling

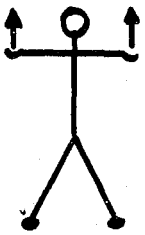
9. The helicopter pilot can be assisted in making his approach to a Landing Point by the use of marshalling signals by the ground party. One man only has to act as marshaller. The remainder of the party should keep well clear of the Landing Point. The marshaller must position himself where he can be clearly seen by both the pilot and the crewman, upwind of the Landing Point. Some marshalling signals are described in fig. 4 below.



HOVER Arms extended horizontally side-ways, palms downward.

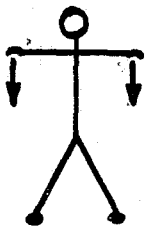


WINCH UP Left arm horizontal in front of body, fist clenched, right hand with palm turned upwards making upward motion.



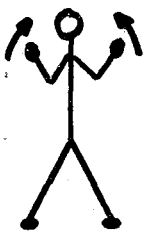
VERTICAL MOVEMENT UPWARDS Arms extended horizontally side-ways beckoning upwards, with palms turned up. Speed of movement indicates rate of ascent.

WINCH DOWN Left arm horizontal in front of body, fist clenched, right hand with palm turned downwards making downward motion.



VERTICAL MOVEMENT DOWNWARDS Arms extended horizontally side-ways beckoning downwards with palms turned down. Speed of movement indicates rate of descent.

HORIZONTAL MOVEMENT TO STARBOARD (RIGHT) Left arm extended horizontally side-ways in direction of movement and other arm swung in front of body in same direction in a repeating movement.



COME FORWARD Arms in front with palms facing Marshaller, beckoning helicopter forward.

HORIZONTAL MOVEMENT TO PORT (LEFT) Right arm extended horizontally side-ways in direction of movement and other arm swung in front of body in same direction in a repeating movement.

MOVE BACK Arms in front with palms facing away from the Marshaller beckoning helicopter away. Pushing movement.

LAND Arms crossed and extended downwards in front of the body.

FIG.4 MARSHALLING SIGNALS

FIG. 5 SINGLE LIFT

Iroquois Winching Methods

10. The two most common methods of winching; namely the Single Lift Method and the Double Lift are detailed in the following paragraphs.

11. Single Lift Method. (See fig. 5). This method is seldom used for survivors other than air crew, who are familiar with the use of the rescue strop. The helicopter is positioned into the wind directly above the survivor, who, of course, must be conscious and whose injuries do not prevent the use of this method. The rescue strop is lowered in the final stages of run-in and the winch operator places it in the hands of the survivor by directing the pilot in positioning the aircraft. The survivor places the strop over his head and adjusts it under his armpits, adjusts the toggle and signals the winch operator that he is ready for lifting by giving "thumbs up". He is then winched into the helicopter.

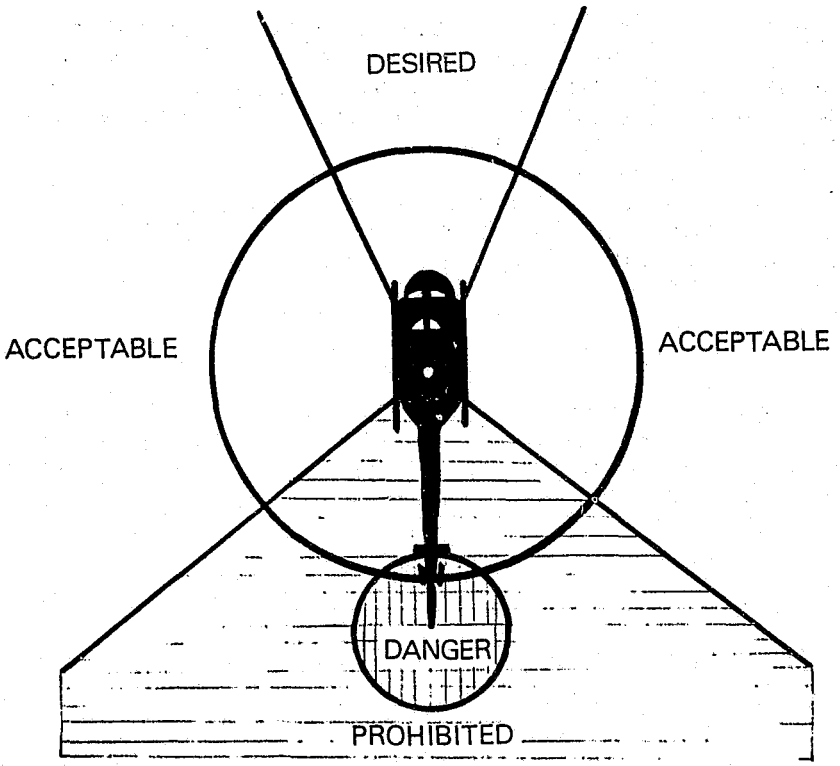
FIG. 6 DOUBLE LIFT

12. Double Lift (Normal Lift). (See fig. 6). This is the normal winching method used for picking up a casualty who is unable to help himself due to injuries, or is a person not familiar with the use of the rescue strop. The winchman is lowered and secures the survivor with the strop before both are winched up together into the helicopter. During the lift, the winchman is supporting the survivor to some extent by gripping him around the mid-section with his legs, at the same time supporting his head with his hands. On reaching the cabin door the winchman turns so that the survivors back is to the door, places his feet on the edge of the doorway and eases the survivor into the cabin with the assistance of the winch operator.

General Safety Precautions

13. Listed below are some general safety precautions to be observed when working near helicopters:-

(a) When operating with helicopters, the following danger zones must be remembered: rotor blades, tail rotor, exhaust and air intake. Fig. 7 shows the safety zones when approaching an Iroquois helicopter. Always obtain a "thumbs up" signal from the pilot before approaching a helicopter.



DO NOT APPROACH OR LEAVE THE AIRCRAFT

- WITHOUT THE PILOT'S KNOWLEDGE
- DURING START UP OR SHUT DOWN

FIG.7 IROQUOIS SAFETY ZONES

(b) Helicopters create 20-40 knot downdrafts when positioning above a Landing Point. Loose articles or light equipment must not be left lying in or around the area otherwise they could be picked up by the rotorwash causing injury to ground teams or damage to the aircraft.

(c) If external loads are to be hooked up to a helicopter, it is important that the person positioning the hook wears protective goggles. With the Iroquois helicopter, wait until the pilot has lowered the winch hook and touched the ground with it to discharge static electricity before touching the hook.

(d) When approaching a helicopter keep your head low. Should the aircraft land on sloping ground always approach and leave from the downhill side.

Information to be Supplied When Requesting Helicopter Assistance

14. When requesting helicopter assistance, in addition to the task and load, weather and topographical information should be supplied. Useful information would include:-

(a) Wind. A brief but accurate description should be given, for example very strong and gusty; no wind; strong and steady etc.

(b) Cloud. Indicate the percentage of visible sky covered by cloud which might be low enough to effect flying operations or describe the cloud cover in plain language. State whether most local hilltops are in cloud and whether valleys are clear of cloud and/or rain.

(c) Terrain. Include information on the nature of the Landing Point; whether rough or smooth. In difficult country, describe significant landmarks.

Conclusion

15. The information contained in this precis is to be used as a guide only. Should, at any time, differences arise between what the helicopter pilot requires and what is printed in this precis, then the pilots request should be taken and complied with.

SPECIAL RESCUE EQUIPMENT FOR USE WITH RAAF IROQUOIS HELICOPTERS

Introduction

1. The illustrations contained in this Annex show various items of rescue equipment designed for use on the RAAF Iroquois helicopter.

Rescue Sling

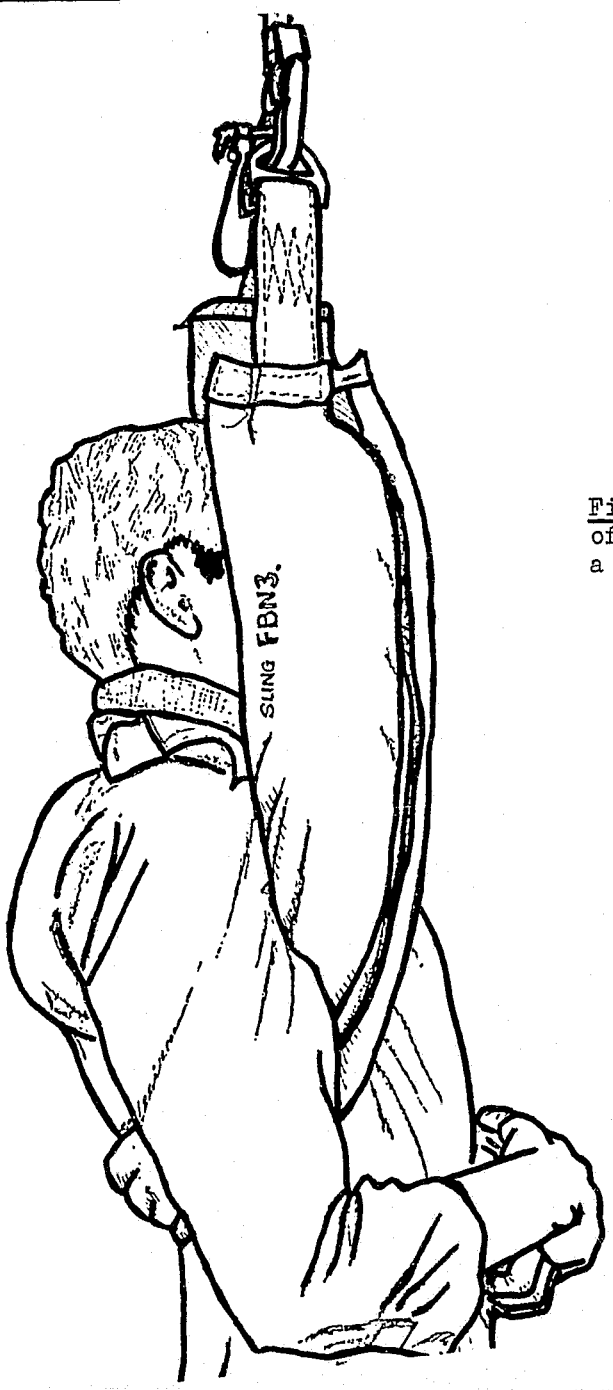


Figure 1. The correct method of wearing the Rescue Sling on a conscious survivor.

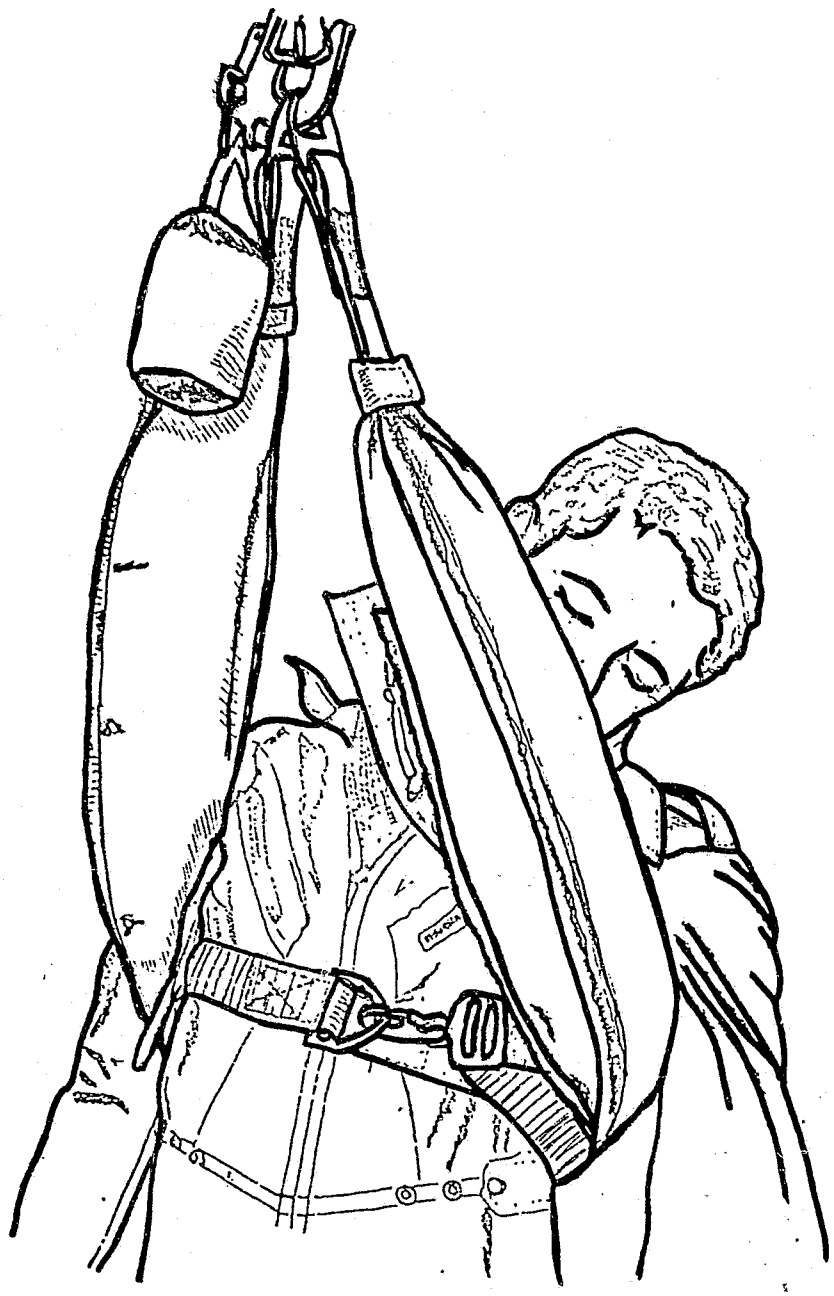


Figure 2. The correct method of attaching the Rescue Sling on a semi or unconscious survivor. (NOTE: Safety Strap fastened around the survivors chest).

Figure 3. The method used by the crewman in assisting the survivor into the Iroquois cabin.

Water Rescue Seat

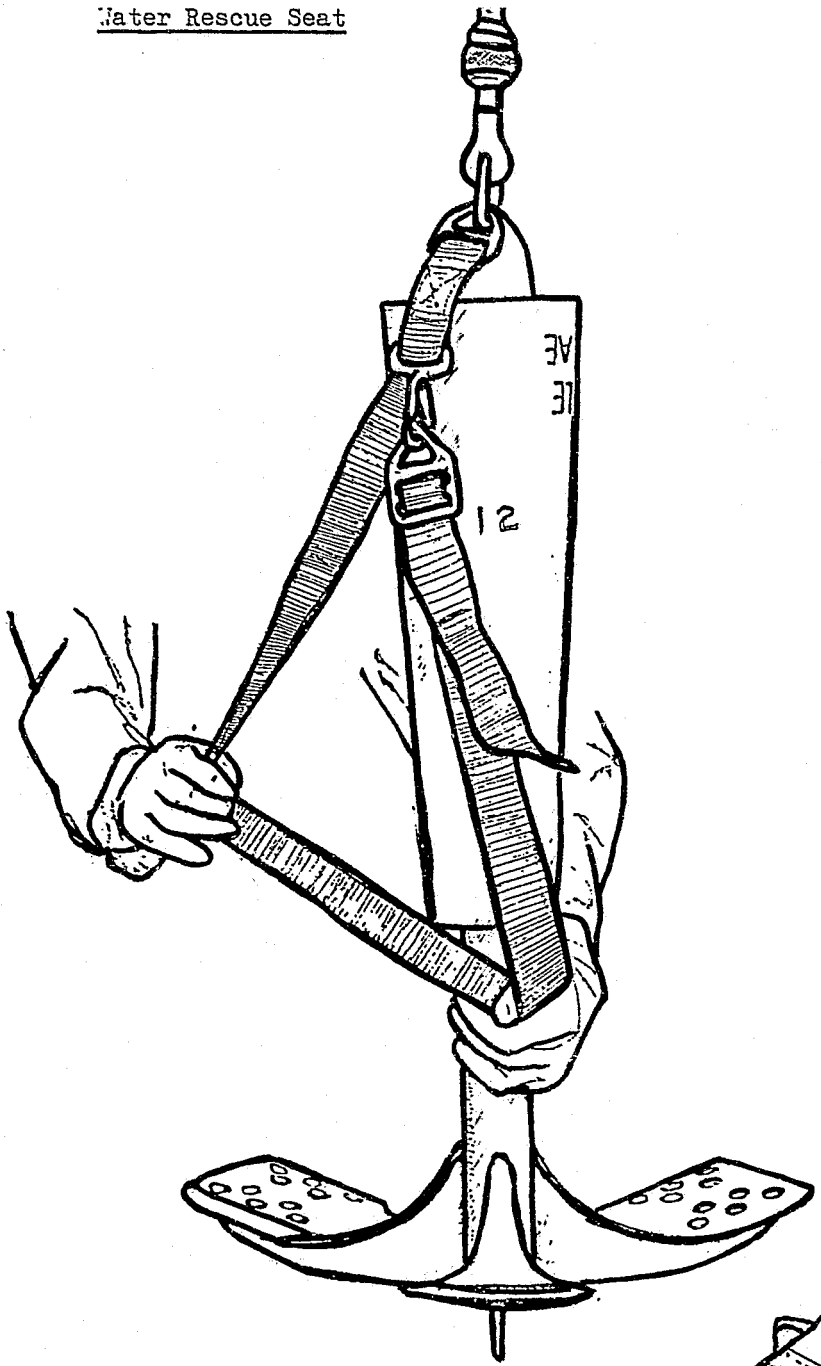


Figure 4. The Water Rescue Seat showing the safety strap.

Figure 5. A survivor correctly seated and strapped on the Water Rescue Seat.

Jungle Penetrator

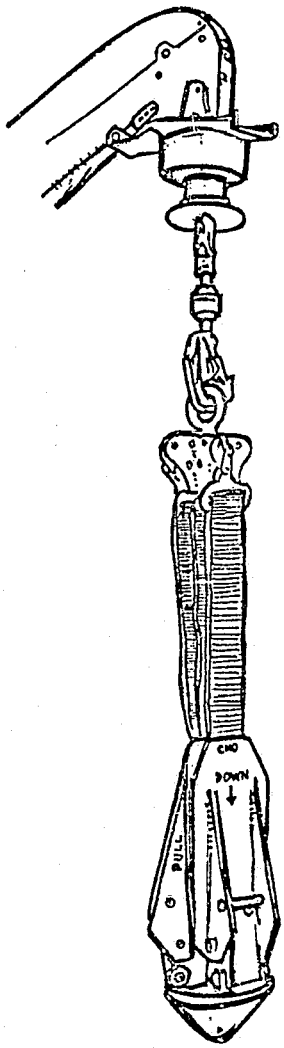


Figure 6. Jungle Penetrator in the folded position.

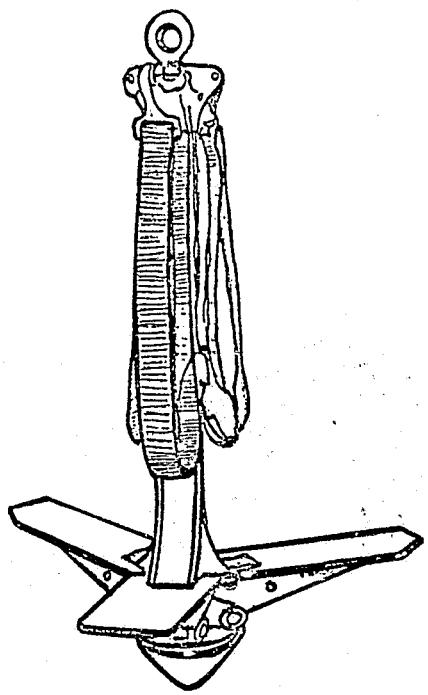


Figure 7. Jungle Penetrator unfolded ready for use.

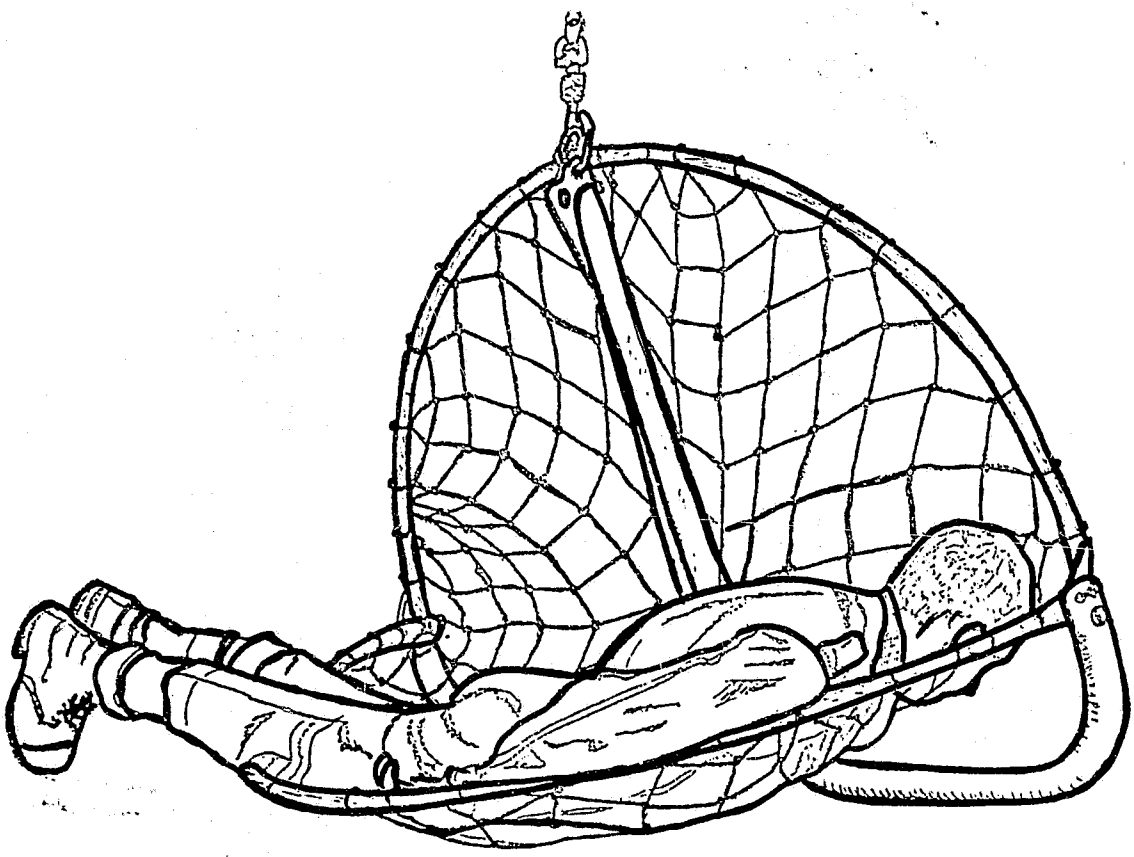


Figure 8. The Rescue Net shown with one side folded. This net is used for retrieving bodies and other objects from the sea.

Stokes Litter

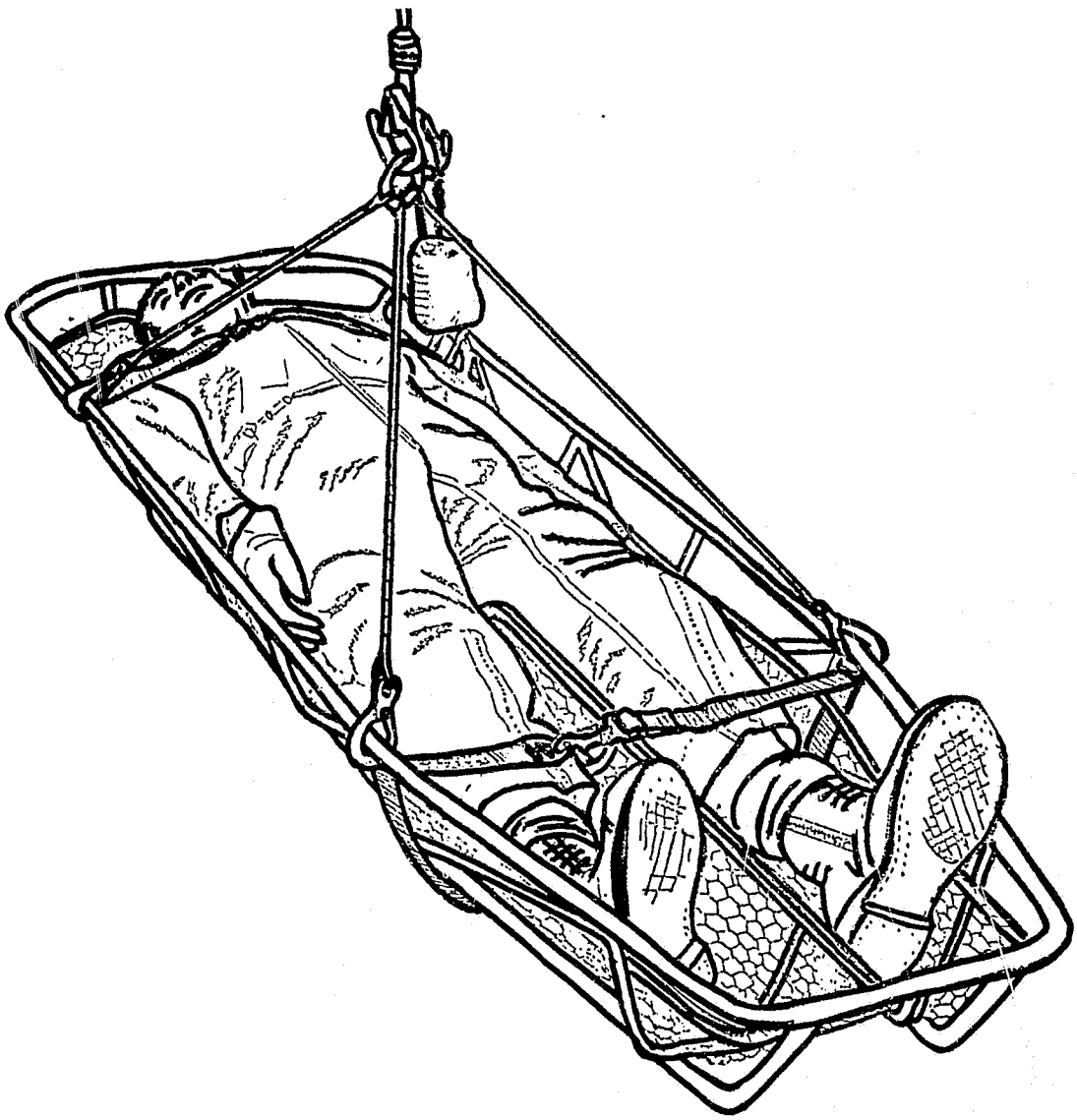


Figure 9. The Stokes Litter assembly showing casualty correctly strapped in and attached to the hoist cable hook.

END