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CHAPTER NINE

SEARCH TACTICS

9.0 GENERAL

This Chapter discusses a variety of search tasks that appear to be quite different. There are, however, some general principles that apply equally well to most types of search tasks, and it is worthwhile to consider these at the outset. First, the team leader must assure that his team is actually performing the task that was assigned to them. There have been instances in the past where a team spent six hours searching the wrong area; perhaps the east side of a ridge instead the west side of that same ridge. The best cure for this is, of course, to pay close attention during your briefing and to carefully consult the assignment section of your Vehicle Clearance Form or Task Assignment Form when in doubt, or even when not in doubt. Second, your team should have a good idea of their search objective, and you must ensure proper searching in your assigned area. Not only should your team have a description of the person or plane, but they should know the type of clues for which they are to search. For example: trees with their tops clipped off when on a downed plane search; tracks, trash, or evidence of a bivouac site when looking for a lost person. Searching for these things thoroughly means looking in the correct manner, for example turning around and looking backwards occasionally on a line search; it also means giving each part of the search area equal attention, with special attention in those places where clues might be especially evident (e.g. checking stream beds and swampy areas for tracks, or stopping at country stores in an interrogation search). There is a tendency among most searchers to search the easy areas thoroughly and to skimp when the team comes to more difficult conditions. Teams must be on the alert for this constantly. In a large line search with untrained searchers, it is not unknown for three or four search lines to search the same area and go right past the victim, merely because he is in a large clump of brush. An area that has been searched badly is an area that must be searched again. Third, the area your team searched must be accurately recorded in a manner that is meaningful to the Mission Staff; this assumes particular importance in the later stages of lost person search. An accurate drawing on a map is probably the best for lost person searches, but this is often difficult unless your search area is bounded by natural boundaries that are easy to identify on a map. For line searches, an alternative is to mark the area with paper or plastic tape, as described in the line search section. A search team that does an excellent job of searching but cannot accurately tell what area they searched isn't much more use to the mission than a bad search team. Fourth and final is the proper reporting of information. Anything which might be a clue should be reported to the Mission Base. Do not evaluate the item yourself as being important or unimportant--that is the Mission Coordinator's job. You should take care to separate the objective and subjective parts of your report. For instance: "We found an area next to the stream where the grass is matted down and branches are broken off some bushes." (Objective). "It looks like someone spent the night here last night." (Subjective). Unless you have some way of knowing that someone did indeed spend the night there, and of knowing that it was the person you are looking for, DON'T say "We just found where he spent the night last night!"

To sum up, we have identified four important principles that apply in general to search tasks:

(1) Perform the task assigned to you.
(2) Search properly, and search for the right things.
(3) Record accurately your search area.
(4) Report properly anything that might be a clue.

As a team leader these items, along with the safety of your team, are your responsibility. The Mission Staff and the victim depend on you to do your job well.

9.1 LOST PERSON SEARCH TACTICS--GENERAL

A general understanding of lost person search strategy will aid in the understanding of lost person search tactics. The initial step in any search is the gathering of important information, and part of this process in a lost person search is termed a "hasty search". This refers more to the duration of the search task than to any particular tactic; a hasty search is usually conducted by law enforcement agencies before any search and rescue organizations are called in. A hasty search includes a quick check to see if the person is really lost, for example by checking obvious places such as friends' homes, hospitals, and other law enforcement agencies. A quick check for clues may be made at the last reported location of the person, a parked car, or other obvious place. Often the initial actions of a Quick Response Team (QRT) during a search may be considered a continuation of the hasty search, even though the team may be employing various search tactics.

The first priority after the hasty search is to limit the area to be searched by containment. The usual procedure is to calculate the maximum distance the victim may have traveled in the time since lost, and to surround this area in such a way as to prevent the victim from leaving the area unknown to the search effort, and thus expanding the area to be searched. Often, features such as wide rivers and lakes, and distinct roads and trails, may be used for containment. Other times, it is necessary to have road or foot patrols regularly traverse the perimeter of the area. Sometimes, in heavily wooded areas, string with markers pointed towards base camp may be used with success.

The first phase of major search effort is termed scratch searching after the primary tactic employed. During this phase, efforts are directed at finding a victim who is still alive and very well may be moving around. Small, fast Field Teams are sent out to search high probability areas. The team may be assigned to do a scratch search, that is, to search a point or a linear feature such as a trail, ridge, or stream. The team might also be assigned to do a sweep search, that is, a loose line search of a small area; or, the team might be assigned to do a combination of the two. During this stage, a tactic known as survey searching is also utilized. This refers to the search of a large area from a single vantage point, for example, visual scanning from a firetower. Attraction may also be employed (e.g. building a large fire on a prominent ridge at night to attract the lost person).

If scratch searching fails, or if there are enough searchers to allow use of them in the next phase without pulling out the scratch search teams, the saturation searching phase is instituted. During this phase, the entire search area is methodically searched by large line search teams. As each small area is searched, it is marked in the field and on a map at Base Camp, so that the extent of the search may be accurately judged. Saturation search usually takes such time and effort that it is usually reserved for situations in which scratch searching seems not to be productive of clues.

If at any time a good clue is found, the Mission Coordinator will seriously consider the employment of trackers, either dogs or human man-trackers. Dogs will have trained handlers and will usually require little assistance, but trackers will usually ask for two searchers (preferably with some tracking knowledge) as assistants. Thus, tracking may be considered a type of search task.

Search dogs, as contrasted to tracking dogs, do not follow a scent on the ground. They are trained to follow airborne scent; any person in the search area will be found by these dogs. Unlike tracking dogs, they do not need a "key" or characteristic scent article for the victim.

Searchers in lost person searches will be looking for the same type of things, no matter what type of task they have been assigned. Any type of clue may be useful as a starting point for a tracker, or may serve to cut the search area down dramatically by providing a more recent location for the victim. Clues may include (but are not limited to) distinctive footprints, trash, a track when found in a fairly remote area, evidence of an overnight stay by someone, items of clothing, threads of clothing caught in a piece of barbed wire, or movement or lights seen on a distant hill. Searchers must take care to look backwards as well as forwards, and to

pay careful attention to areas that may be especially conducive to clues, such as a muddy spot on a trail. Usually, search teams will alternate calling the name of the lost person with periods of silence and listening. All clues should be marked with flagging: the standard is to place three separate flags next to each other in the vicinity of the clue for future reference. The flags are usually placed at eye level on a tree limb. As each clue is found by a searcher, the assigned Field Team Leader (FTL) makes a preliminary evaluation whether or not the clue may apply to the current search. For instance, a rusty beer can which has been in place for at least several weeks is not worthy of being considered a clue in the real sense. Only those clues which bear upon the present search are tagged and reported. Obviously, this puts the burden of this evaluation on the shoulders of the team leader. Team leaders should carefully consider the consequences of disregarding a real clue, and should make decisions accordingly. When in doubt, mark and report a clue. When a clue is found, the FTL must make sure that his team does not destroy tracks that may lead to and from the clue. If an obvious track leads from the clue, this fact must be mentioned in the report.

9.2 HASTY SEARCH

A hasty search, if carried out by a QRT, must be planned "on the spot", and usually the initial instructions are given by the Mission Coordinator, with the Quick Response Leader consulting with the MC and modifying the initial assignment based on new information. Since the type of tactics to be employed are chosen by the MC from among the other types of search tactics, no one tactic can be singled out as being a "hasty search tactic". However, one type of tactic mostly used for hasty searches, the expanding square (or expanding circle) will be described. The expanding square search is used to search an area around a point for clues; for instance, the point might be the victim's car or truck parked along a backwoods road. Searchers form a loose line and pivot around the point. As they reach their initial position, they move out and search in a circle surrounding the circle initially searched: (see figure 9-1)

Expanding Circle Search

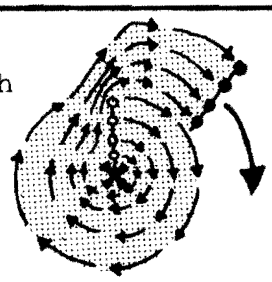


Figure 9-1

This search tactic is only useful for small search areas, as it quickly becomes cumbersome as the circumference of the circle increases. A variation of this known as "cutting for tracks" involves searching in a wide circle around a clue, and checking for tracks crossing the circle. The principle of "cutting for sign (tracks)" also may apply to other types of search tactics. For example, a <u>scratch search</u> (see below) may be sent <u>across</u> the victim's probable line of travel, rather than <u>along</u> it.

9.3 SCRATCH SEARCH

A scratch search is usually carried out by a small, quick Field Team; it is a search of a point or a linear feature. If a point is to be searched, an expanding square or circle is usually appropriate. (See section 9-2) The team does not mark search area boundaries, but marks the center of the small swathe they have searched. Of course, if the linear feature is a well-defined feature (e.g. a trail) that is marked on the map and easily followed in the field, there is no need to put up flags. However, if there is any chance that a second Field Team might have difficulty following in your team's footsteps, put up an occasional flag, especially at places (e.g. forks in a stream, a wide ridgeline) that may be confusing. The usual procedure for a scratch search is to have one searcher (quite often the FTL) guide on the center of the feature, and to have the other searchers just within visual distance on either side of the feature. The FTL should continually monitor the team's progress on a map, so he can instantly locate a clue, trail, etc. accurately on the map.

9.4 SURVEY SEARCH

Survey searching generally refers to the visual scanning of an area from a vantage point. Survey searching may be effective during the day or at night. Considerable perserverance and stamina are required, as long hours of watching may be necessary; however, the occasional joy of sighting an obvious distress signal makes the eyestrain headaches of little consequence.

Day survey search is relatively more simple than night search, but searchers should generally wear sunglasses or goggles, and trade off shifts. A regular routine of scanning should be adopted. In general binoculars or similar devices should be used only to investigate suspicious areas, rather than for continual scanning.

Night survey search requires a basic knowledge of eye physiology. A simplified account follows. The human eye contains two types of light sensors, rods for black and white (night) vision, and cones, for color (day) vision. Vision is created by the breakdown of a substance known as rhodopsin or visual purple by incoming light. This substance is gradually recombined; strong light may break it down a great deal, resulting in temporary blindness.

In bright light, most of the rods (black and white vision) are "washed out" and ineffective; the cones provide us with our visual ability. It takes a while for the rods to build up rhodopsin and become effective; thus the requirement for "dark adaptation" when entering a dark room from bright sunlight. Dark adaptation takes roughly twenty minutes. Obviously, using a flashlight to read a map, etc. will ruin night vision; however, rods are quite insensitive to red light, so red filters on flashlights are quite appropriate; these lights may then be used with minimal destruction of night visual ability.

The fovea, or optic pit, is the most "accurate" part of our eyes; this is the area at the center of our visual field, where vision is clearest. However, this area is devoid of rods. Therefore, night vision is better toward the edges of the visual field. Staring at an object at night may actually cause it to 'disappear'.

When straining to see in very dark conditions, the eyes exhibit a motion known as involuntary nystagmus; that is, the eyes "twitch" back and forth slightly without the searcher's awareness. This phenomenon is the primary reason constant red lights have been replaced with blinking ones on aerial obstructions.

See Chapter Fourteen of May's Mountain Search and Rescue Techniques for a more detailed treatment of night searching.

9.5 SWEEP SEARCH

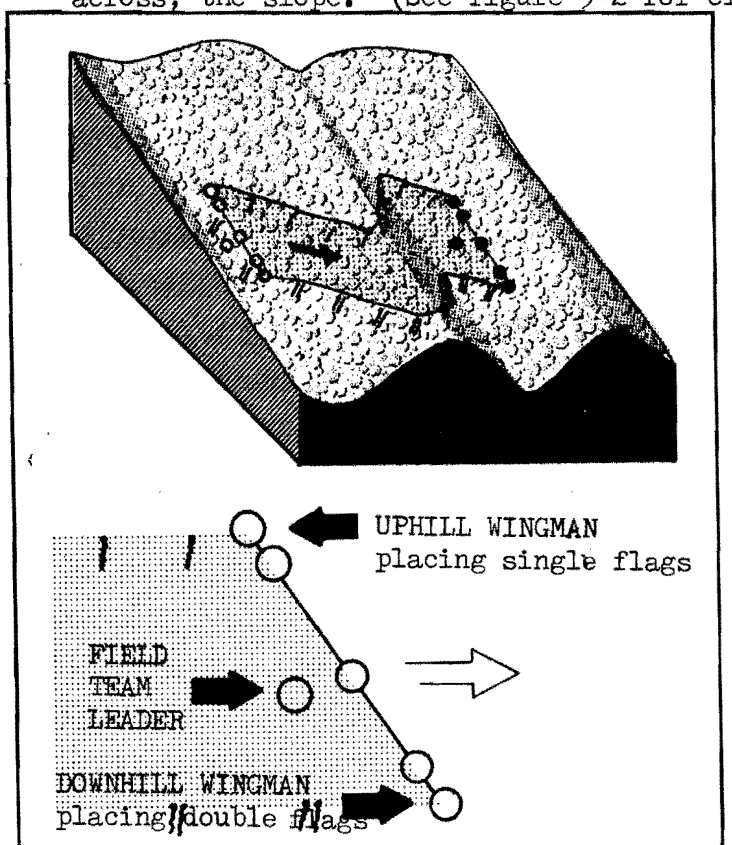
A sweep search is a saturation search of a small area by a small team. The search is wide-spaced (often beyond visible range, but within hearing range) as it is a quick search for obvious clues or a responsive victim. If the area does not have clearly defined natural boundaries that may be indicated on the map, the boundaries should be flagged with double flags, as with a line search. A Field Team will most often be assigned to do either a sweep search of a small area or along a particular section of a linear feature where more concentrated search than that of a single scratch search is desired. The beginning and end of the sweep should be marked along the linear feature with double flags, as should the boundaries of the area. It has been found by experiment that several wide-spaced searches are more efficient than a single close-spaced search. In wide-spread searches, searchers can not cover every square foot of terrain, nor should they.

9.6 LINE SEARCH

A line search is a saturation search of a large area by a large team. The team is lined up with all searchers equally spaced (see below for information about spacing) with the exception of the FTL, who stays out of the line, and two wingmen, who stay next to the end searchers. The FTL is responsible for line straightness and spacing, and the wingmen are responsible for marking the boundaries of the search sweep with flagging. The wingmen do no searching; they will have their hands full with the flagging. There are two primary methods for line searching an assigned

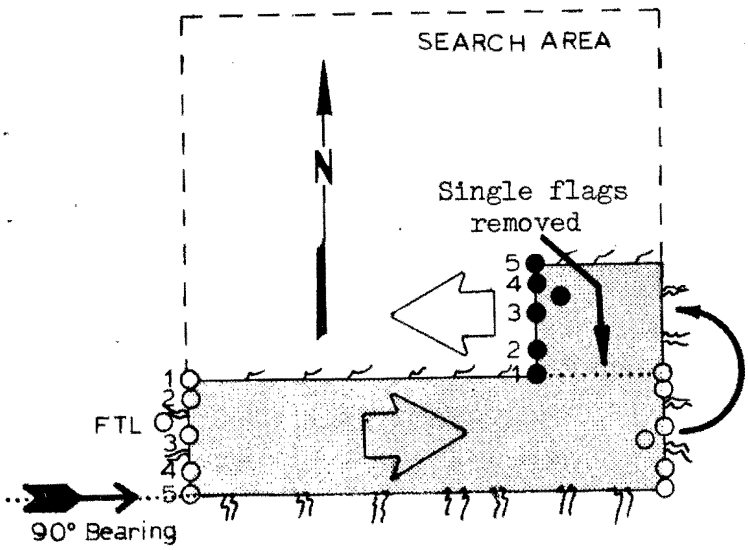
area: contour search and grid search.

Contour search is most commonly used with irregular search areas and in mountainous or hilly terrain. To use this method, the team is lined up along one boundary of the search area. For the purpose of discussion, we will assume the search area to be a square area on a mountainside, with pre-established boundaries. Adaptation to a different shape or topography is usually fairly simple. To return to the example, we have our team lined up and down one of the boundaries, with one wingman on a corner. The team is lined up so as to be up and down, rather than across, the slope. (See figure 9-2 for clarification). The team works its way across the slope, with the downhill wingman placing double flags (this is the search area boundary) and the uphill wingman placing single flags. (See figure 9-3). When the team reaches the opposite side of the area, the team pivots and searches the next higher swathe. This puts the old top wingman in the bottom wingman position, where he can take up the flags he placed on the earlier sweep. When the team pivots, the wingmen put double flags at the end of the sweep to mark the boundary. This continues until the entire area has been searched. On the last sweep, the uphill wingman places double flags. Thus all of the single flags are taken up by the wingman having placed them, and the entire search area is outlined with double flags. Should the search task be interrupted for any reason, it is a fairly simple matter to pick up where the task was stopped. This is called a contour search because the team works its way across the hillside, rather than up and down. When the bottom boundary is irregular, the team can "contour" across the hillside, staying at the same elevation.



Note that only a few searchers are shown for purposes of clarity. Most line search teams consist of 10-15 searchers.

There are two primary problems that are encountered with this type of search: first, the team always tends to compress downhill; the FTL must constantly work against this. The second problem is managing the pivots between sweeps. There are two main methods for accomplishing this manuver. The team may either pivot around the end wingman, or may file past the stationary wingman and reform in reverse order on the other side. The problem of pivoting grows larger with the size of the Field Team, as does management in general. For this reason, a line search team usually consists of ten to fifteen searchers, rarely more.



When the terrain is level enough so that contour searching will not result in a significant saving of energy for the searchers, or when there are few available landmarks for search area boundaries, a slightly different saturation search technique, known as grid search, may be employed. This method uses azimuths (bear-

ings determined by compass) as the search area boundaries and for the guidance of wingmen. Otherwise, the procedure is the same as for contour search.

The spacing between searchers is determined by the visibility within the search area. If your area consists of two or more distinct sections with different types and densities of brush, it may be profitable to search each sub-area separately with a different spacing. If only one or two small sections are more brushy than the rest, it will probably be best to deal with these as you come to them by stopping the search line and running a mini-search through the brush, then re-forming the line where it stopped. When setting a spacing, you should be guided by your briefing at Base Camp. If this is a line search early in the mission, you will probably be asked to use wide spacing; that is, to have your searchers just within visual range, or perhaps beyond. This represents the most efficient use of manpower when you must search a large area quickly for a victim or obvious clues. In later stages of the search, it may be necessary to resort to close spacing, where all of the ground between each searcher can be scanned by one or possible two searchers. Usually, the FTL will merely be given a search area, a group of searchers, and will be told to use wide spacing or close spacing. The rest of the decisions are left up to the FTL; it is his responsibility to see that the entire assigned search area is searched with the assigned degree of thoroughness, is properly marked, and all clues are properly marked and recorded.

When moving the search line along the sweep, a set of standard calls is used to facilitate control of the line. When the line is ready to go, the FTL calls "FORWARD!", the command is echoed by the searchers up and down the line, and the line moves forward. If, for any reason, a searcher wants the line to stop, he merely calls "STOP!". Any searcher may call "STOP!", but only the FTL may call "FORWARD". Once the line has stopped, the FTL ascertains the cause for the stop (usually a possible clue for inspection) and, when he is ready for the line to continue, calls "READY RIGHT?". This command is echoed, searcher by searcher, down to the right wingman. If he is ready to proceed, he calls "RIGHT READY!" and this call is passed, searcher by searcher, back to the FTL. If, for any reason, a searcher on the right is not ready, he merely does not pass on the call. In a few minutes, the FTL will start the sequence again. The same procedure, with the calls "READY LEFT?" and "LEFT READY!" is followed for the left side of the line. The FTL may then move the line forward.

9.7 CONTAINMENT

Containment tasks may involve foot or vehicle patrols, depending on whether or not roads are available as boundaries. The purpose of containment is to keep the search area from expanding, and this is done by continually patroling the boundaries of the area in such a way as to make sure that the victim will not cross the boundaries without being picked up, or at least his passage being noted. The Mission Coordinator's evaluation of the victim's mental condition will affect the type of containment that must be done; a seasoned hunter will not cross a road and continue back into the wilderness; a small child or mentally unstable person might do so. Containment patrols will be checking for the victim himself walking down a road or trail, and will be looking for evidence that he may have crossed or entered the road or trail. Leaving notes giving directions to Base Camp may prove useful, as may staying at a prominent trail junction in the midst of a wild area (a camp-in). If few roads or trails are to be found, long strings with arrows pointing to base camp on them may be used for containment. The exact type of containment will be determined by the Mission Coordinator or Operations Officer, and the team leader will be given specific instructions by the Mission Staff officer who briefs him.

9.8 MAN-TRACKING

Man-tracking is a task requiring special skills, and any member who will be acting as a tracker will receive special training in the tactics to be used. When accompanying a tracker on a tracking task, the important thing to remember is to not

mess up the tracks. Unless instructed otherwise, you should follow in the tracker's footsteps (literally), and be careful not to touch the tracks he has marked. The tracker will usually brief you in detail as to what he expects.

Should you come across a track during the course of some other type of task, do your best to protect it from your team and others in the area. Report any distinct tracks to Base Camp immediately, if in a relatively untraveled area.

9.9 TRACKING DOGS

Tracking dogs rely on ground scent to follow the track of a lost individual. Usually, a "key" or uncontaminated item of the victim's clothing is required, in order to allow the dog to follow the proper track. Scent tracks may be destroyed by dry heat, rain, or other tracks. The effectiveness of tracking dogs varies widely with training and search conditions. In general, the use of tracking dogs requires a "hold" on all other search operations, so as not to destroy the track.

9.10 SEARCH DOGS

Search dogs, as contrasted to tracking dogs, sense airborne scent. Although they may be able to "key" on a particular scent, most search dogs will find <u>any</u> person in the search area. Search dogs are usually used in a type of very wide grid-type search, with search paths perpendicular to the prevailing wind. Any dog finding a scent "cone" (see figure 9-4) will follow it to the source.

According to the American Rescue Dog Association (ARDA), only German Shepherds are suited for this type of work, and considerable care must be exercised in the selection and training of a candidate puppy. Search dogs have two main advantages over tracking dogs:

(1) Other search tactics may be used at the same time, with little or no decrease in efficiency, and

(2) Search dogs have an extremely high find rate, compared to tracking dogs.

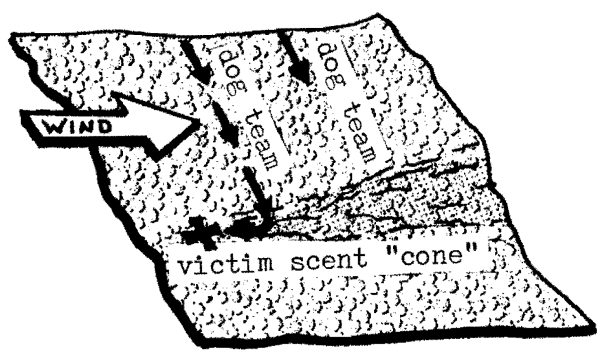


Figure 9-4 Search Dog Use

9.11 DOWNED PLANE SEARCH TACTICS--GENERAL

Search on the ground for downed aircraft can be divided into two main classifications: large area search and close-in search. Ground search of a large area usually involves the simultaneous use of three distinct ground search tactics: interrogation, visual, and electronic. The team usually drives through the assigned area in a search pattern, scanning the visible terrain for signs of an aircraft crash, monitoring for Emergency Locator Transmitter (ELT) signals with a directional receiver, and stops at appropriate houses, stores, etc. and requests verbal information from the residents (interrogation).

Once the approximate location of the crash site has been determined by observation from an aircraft, by an ELT signal, or by visual sighting by a team, the job of actually getting to the crash site remains, and if the site is far away from roads, can be quite difficult. Often special ground search tactics (locale search) are necessary to come upon the actual crash site, even though the general area has been indicated.

9.12 INTERROGATION SEARCH

Interrogation search is the questioning of people throughout an assigned area,

in regards to unusual occurences which may relate to the search. It is usually carried out in conjunction with visual and often with electronic search. The search is usually conducted with the use of a vehicle and a small team; the team travels through the area, stopping at selected locations and questioning the people there.

Several important principles apply to interrogation search:

(1) Identify yourself. Don't get yourself shot. At night, shine a light on yourself; wear your ASRC patch (or your CAP uniform) to reassure your informant.
(2) Beware of animals.
(3) Close any gates you open; letting cattle escape is bad public relations.
(4) Do not volunteer information. It is difficult to sort out the unrelated leads and hoaxes from true leads. Comparing lead information with known facts is the primary method of selecting good leads; giving out information to informants destroys the effectiveness of this selection process.
(5) Get details of the informant: name, address, phone number, etc. A CAP Form 106 (Ground Interrogation Report) is useful for this.

Normally the interrogation function is thought of as the process of asking questions to obtain information to be fed to the base. When a team finds an interrogation lead they often are not sure what to do following the lead except to continue to ask questions in the local area. Time and effort can be saved by utilizing search techniques employed by ground searching in the field and by aircraft.

When directed to interrogate in a given area the team leader has a number of decisions to make. Among these are: How often should the team stop and question people? How far off the given roads should the team proceed (MC's will almost always direct a search from road maps and will choose main or secondary roads that bound a given area.) And, what does the team do if a lead is found?

The number of stops should be determined by the likelihood of gaining information. Stores, taverns, gas stations, and quiet residential areas would make good stops. Choosing every quarter mile or every fifth house, is an arbitrary way of making the selection. It is sometimes necessary to make this kind of choice in a suburban area with a multitude of houses, however, the team should not be so set on finishing the assigned area that they fail to consider going back to question a potential lead.

When a lead is located the team reports to base the information and then must consider its next move, unless other orders come from Base Camp. If no such direction is given then the team leader should plot the lead on his (preferably topographic) map. It is then wise to interrogate on either side of the lead to see if verification can be obtained. Having obtained the direction of travel of the lead, it is possible to extend the line of flight and see where it might lead. The team may choose to proceed to the next closest point the flight path might cross a road, and proceed along that road from their present location to see if further information might be gained. This technique has been used in the past to find other leads and track the aircraft, resulting in a find.

If this method does not produce additional leads, an aircraft may then search the terrain between the roads that have been interrogated. If nothing is found the team may then employ an expanding square search pattern (see section 9.2), interrogating for additional information away from the initial lead. It is important that the lead be evaluated by the Mission Base before the above procedure is begun, as much time might be wasted using this method if the informant gave information that is not compatable with other teams' inputs, or with data the base has, that is not available to the team in the field. On the other hand, a good lead will often indicate more in the same area.

When a lead is located team members should not become so excited about it that they fail to obtain exact as possible information. For example, in a recent search, a team discovered a hot lead, but it wasn't until a second thought by the team leader sent the interrogator back to discover the person who gave the lead lived in another area and was visiting the house for Sunday dinner.

Additionally, the team leader can conduct careful visual searches from high points, call in aircraft, and as a last resort employ a scratch search through a suspect area. The latter is a last resort due to the extensive time required. Any search on foot will consume great amounts of time and energy, and thus should not be used unless a high certainty exists that will justify this expenditure.

9.13 VISUAL SEARCH

As mentioned previously, visual search is often combined with interrogation search. Visual search is a survey search carried out from a vehicle. When driving along a road providing a good view of the surrounding area, the driver should slow so that riders may scan the terrain. Usually a rider should be assigned to one side or the other, and team members should alternate turns at scanning. Occasional stops at particularly good views are often warranted.

Possible visual clues include:

(1) Pieces of wreckage (large or small).
(2) Presence of smoke by sight or smell.
(3) Unusual sounds.
(4) Broken or disturbed trees or underbrush.
(5) Presence of scavengers (animals or birds).
(6) Fuel, oil, brake fluid, etc., by smell or sight.
(7) Decomposition odors.
(8) Signs of human passage or occupancy of an area.
(9) Landslides.
(10) Horsetails caused by the wind blowing loose snow or sand over an obstruction.
(11) Unexplained break in terrain contour or conditions.
(12) Personnel (especially those obviously dazed, wandering, or not dressed for the terrain).
(13) Blackened areas (even a single tree among green trees).
(14) Local discoloration of foliage.
(15) Signals. Remember that survivors may use many ways to signal possible rescuers depending on their training, physical condition, and signaling devices on hand. A vehicle (especially one in rough terrain) can be heard for many miles. Some other signals to be alert for include banging or thumping on metal or fabric, shouting, whistles, signal mirrors, flags, kites, etc. Be alert for anything that might be a clue.

Clues should be reported; often, an aircraft may be able to provide resolution of a possible sighting with ease. This should always be considered before striking out on foot.

9.14 ELECTRONIC SEARCH

Electronic search, also known as ELT search, is the use of radio receivers and directional antenna systems (known as direction-finding or DF equipment) to provide as to the location of the aircraft. Every aircraft has an Emergency Locator Transmitter (ELT) designed to start sounding a distinctive signal after a crash. Teams with ELT-DF capability may combine it with interrogation and visual search, to carry out triple-mode ground search tasks.

During vehicle travel, the ELT locator should be attached to an omni-directional antenna mounted on the vehicle. Failing this, an antenna may be held out a window, but this is much inferior to a good mobile antenna. One team member should continuously monitor the ELT locator, using earphones and <u>no squelch</u>. Often the signal is deep in the noise. Stops at high points may be productive; a directional antenna array may be used, and the ELT locator taken away from the vehicle.

If a signal is heard, a compass bearing should be taken on the signal direction. This should then be called in to the Mission Base. An interesting fact is that initial readings tend to be very accurate, more so than many subsequent ones. The team has two choices:

(1) The team may move a good distance (at least $\frac{1}{4}$ mile), take another bearing, and do so again. These three bearings should be carefully plotted onto a (topographic) map. If they intersect fairly closely, the team should then take the shortest route to this area.
(2) The team may go in the general direction of the first bearing, taking additional readings along the way. This process is, in general, more tedious than (1).

One problem often encountered is that of reflection from nearby mountains. A topographic map may aid in interpretation of bearings, by indicating possible reflec-

tions.

There are many references available with details of ELT search; see section 9.16.

9.15 LOCALE SEARCH

Locale search is concentrated ground search for an aircraft crash site. Many tactics may be appropriate, depending on the situation. ELT search may be continued into the field if indicated. If a bearing and distance is provided by an aircraft, a simple scratch search along the azimuth may work. If the site is not located within the distance indicated by the aircraft, an expanding square search may be indicated. If the team can make itself visible to aircraft, the aircraft may be able to direct the team right to the site. No matter what tactic is employed, the team must provide directions for additional teams; a trail marked by flagging is often appropriate.

9.16 REFERENCES

Acknowledgements

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