

SAR Field Search Methods

Search Techniques Used by Trained Teams in the Field

When search teams go into the field, they are usually assigned a search area and a search technique they are expected to use. As a trained searcher, you need to understand these techniques, their purpose and some key considerations when you are assigned to different types of search teams.

This article will briefly describe the most common techniques used by land search teams in the field and what purpose they serve to the overall search effort. As with most search and rescue techniques, there is no substitute for field work and practical experience working with trained teams.

Note: This article does NOT discuss water searches or urban/disaster search techniques.

Search Terms to Understand

Search Area - When search teams begin looking for a person (search subject), they often draw lines on a map to divide the world into search areas. These areas will then get labeled, such as A, B, C, D, etc. or 1, 2, 3, 4, etc. When teams are sent into the field to look for the person, they are assigned a search area and given a map of that area. It is up to the search team to complete their assignment, return to base and report their findings.

Point Last Seen (PLS) - This is the point on the map where the person was last spotted by a witness with a positive identification. It might be a trailhead, hunting camp, boat dock, parking lot, etc. If you know for certain the person was seen standing at by their car in the parking lot just two hours ago, then you have a place to begin your search. You also know about how far the person might be able to travel in two hours, which helps limit your search area.

Last Known Position (LKP) - During a search, clues will turn up about the person. Occasionally, the clue will be solid enough to be reasonably certain the search subject

left it. For example, if the person is hiking a trail and searchers have a good unique shoe print, a tracker can often find the same print along the trail, at a stream bed, etc. and know beyond a shadow of a doubt that the person left the clue. Since the LKP is more recent than the PLS, you basically have a new starting point for your search. Knowing just these two points allows you to determine, general direction of travel, approximate speed of travel, etc.

Probability of Detection (POD or PoD) - POD is the likelihood of finding the search subject in a given search area with the technique used. Different search methods typically yield different PODs.

For example, imagine someone lost a silver dollar coin in a child's sandbox. When you begin looking for it, you simply shuffled the sand around hoping it would turn up. Your probability of detection for this hasty search might be 25%. In other words, 25% of the time, this hasty search would have turned up the lost coin. But it didn't. So, you begin digging a little deeper, looking a little harder, etc., but still with no definite technique. When you finish, you might begin asking the person if they were sure they lost it in the sandbox. Now, you're 50% sure it isn't in the box. So, you search a third time. But, this time you approach the search with a more structured approach. You draw some large blocks in the sand and run your fingers through each "grid" looking for the coin. When you've searched the entire sandbox you declare, I'm 75% sure the coin isn't in there. Finally, you divide each large block in the sand, into smaller blocks and search each block by screening the sand through a wire mesh. Sure enough, you discover the coin. It was in there all along.

Each of the above search techniques carries with it a "probability of detection". The more thorough the search technique, the higher the POD. However, the more thorough the search technique, the longer it will take you to complete the search of the same area. Managing a search is usually a balancing act between POD and search time in the field.

Also, as you might guess, POD for a given search area becomes cumulative. So, searching the sandbox twice quickly is usually more effective (higher POD) than searching it once very slowly.

Types of Land Field Searches

Bastard Search

In the search and rescue community, a "bastard" search refers to looking in all the obvious places and assuming the person wasn't really lost to begin with (or found his own way out and simply went home). The name originates from what the searchers typically call the person after they've spent hours and hours crawling through the woods, only to find the "victim" at home watching baseball and eating chips.

For example, a teenager goes out hunting for the day and doesn't return by dark. His family calls out search and rescue who spends the entire night searching the woods for him. Then, in the wee hours of the morning, the boy shows up at home alive and well. In reality, the hunting story was fabricated so he could get out of doing chores and spend the day with his girlfriend.

So, by assigning a team to quickly search the likely places the person would go, you can often eliminate a search before it really begins. And, while the name might not be the most flattering, it is a search result that SAR teams don't mind, because it means the victim is safe and sound.

Some key considerations if you are assigned to a bastard search are intelligence and speed. You need to get the latest information about what the person's plans were, what they planned to do later in the day, where they are staying, who their friends are in the local area, who they might have met recently, etc. You also need to move quickly. Using vehicles and radios to communicate quickly with the command post is paramount because it allows search planners to quickly rule out obvious areas. As always, you should be alert for clues, both discovered clues and comments from people who know the person. For example, if you go to the person's tent to check on them, you might chat a minute with the people in the tent next door, only to discover the lost person had an argument with their parents earlier that day. This changes the dynamics of the search effort considerably.

One last point about a bastard search is to leave a note. If the person isn't home, then leave a note on the door telling them they are the subject of a Lost Person Search and to please call 555-1234 if they discover this note.

Containment

When a search team first arrives on the scene, they usually know the "point last seen" of the victim. It might be a trail head, a camp ground or someone's front yard, but they do have a place to start. In theory, you can determine the maximum area you

need to search by starting at that point, determining how fast the person is traveling (say 2 miles per hour), and how long it's been since you last saw him there. So, what you end up with is a circle with the point last seen in the center because you don't know for sure which direction the person went or if they continued moving in that direction or not.

So, it is easy to see how the potential search area can get very large in a short time. So, the best search teams make containment of the victim the first, high priority, because it immediately limits how far the person can travel without being discovered.

Containment is a simple job nearly anyone can do, regardless of physical conditioning. For example, you might have two or three people positioned along on a long straight road. If the search subject crosses the road, they'll spot him. Bridges, wide creeks and open fields often offer the same confinement ability with a minimum of manpower.

By confining the search subject, even if you only have the manpower to confine them on one or two sides, you immediately limit the area which needs to be searched. Again, confinement is an area of search which is usually very well suited to people who want to help but otherwise cannot due to some physical disability or age.

The containment team doesn't really have a POD, since you are basically waiting for the search subject to run into you. However, unlike the other teams, you need to be 100% certain that the lost person doesn't get past you without being spotted. And, while this team will likely experience many hours of boredom while waiting, it is important they stay focused.

People assigned to the confinement team are sometimes given secondary tasks such as radio relay, first aid station, food/water resupply, etc. for teams which are deeper into the field. If you are assigned to a confinement team, you might suggest other duties you could perform while stationed there.

The Key considerations on this type of team are to make sure the person doesn't get past you, and report in regularly (via radio or messenger) that the lost person hasn't been spotted.

Hasty Search

A Hasty Team search will usually consist of ten to twelve highly trained searchers. This team will be dropped into a virgin search area and will quickly spread out in

pairs looking for clues or the lost person in obvious places. The goal of a hasty team is to move quickly through the search area, almost at a slow jog to check cliffs, wells, tangle hazards, caves, ditches, etc. where a person might be injured or might have stopped to rest. If a lost person is conscious, even if they are injured and unable to move, the hasty team should detect them as they pass through the area. The members of a hasty team are not directed to move along a certain path or in a given direction. They are usually given free reign over how they move through the territory. They might spend a few minutes checking an old barn, but move at almost a run across an open field. The idea is to cover the ground. This is why it is so important to use trained searchers, because they are usually much more in tune with what clues to look for and how to quickly spot footprints, broken branches (tracking signs), etc.

The purpose of the hasty team is to bring a rapid end to a search. By putting a well trained team into a high probability area, the search leaders are hoping to find the victim with a quick pass. If the person is truly just wandering around in the woods, then the hasty team will find them and bring the search to an end.

The expected probability of detection for a hasty team may vary somewhat based on the skill level of the team members and the ruggedness of the search area. However, for a well trained team, search leaders might expect a probability of detection of 30-40% for a hasty team. Meaning, if the hasty team comes back empty, then there is a 30-40% chance that the victim isn't there. However, it may be a 70% chance that a conscious and uninjured victim isn't there.

The key considerations for a hasty team include moving quickly, searching all likely places while looking for clues and signs and communicating with other team members. In a hasty team search, it is very easy to get separated from the rest of your team, so communication is vital. We usually paired up hasty team members so they could support each other in the field. They didn't have to stay side-by-side, but at least within sight of each other and in constant contact.

Grid Search

A Grid search is what the public usually thinks of when they think of a lost person search. They picture a long line of people marching like soldiers across an open field. Because of the manpower involved, this is usually the search method of last resort. Trained grid searchers are taught to move slowly and deliberately through an area in a straight line. It is important for each searcher to maintain their spacing with the person on each side. It is also important NOT to take the path of least resistance, such as walking around a large patch of thorns. Unfortunately, that's where lost people

(especially children) usually get caught if they wander around in the dark. Grid searchers rarely find the victim; however, they almost always find any and all clues which might be in the area, assuming the searchers are reminded to be clue conscious. Typically, the grid search team leader and radio operator will try to locate themselves in the center of the line. This way, they can quickly communicate and provide guidance to anyone up and down the line. When a large number of searchers are involved, it may be necessary to use "squad leaders" up and down the line as well.

However, even with a grid search, there are some options available to search leaders which impact the probability of detection. For example, imagine you have one square mile to search. Using a grid search, you have to decide how many searchers to put in the search area. Assume you assigned 25 people to search that one square mile. Now, you have to decide on spacing. If you space out the searchers with 20 feet between them, this "line" will need to make eleven parallel passes through the area to cover it all and will take a total of 37 hours! That's 924 MAN HOURS and 37 actual search hours, if the searchers are moving at a slow, deliberate pace as they are trained to do.

Is that realistic? No.

(Note: As a rule of thumb, a trained grid search team requires about 3.5 hours to cover one mile.)

What happens then is you either allow the searchers to speed up (which negatively impacts POD) or you put even more searchers into that area. What if you put 100 searchers into that same one square mile search area, with 20 foot spacing? You'd still have 924 man hours, but you could complete the search in roughly 3 passes, with only 9.2 hours in the field. However, in both cases, your POD would be very high, maybe 95%.

As mentioned before, search leaders will often use this method as a last resort to gather every possible clue available. They will also use this method when searching for evidence in a criminal investigation, such as a gun, shell casings, personal effects, etc.

In very large searches which have attracted regional or national attention, grid searches are often used in low probability areas for the express purpose of giving people something to do. I have been involved in searches where 200-300 untrained citizens showed up "just to help". You must give them something to do or it becomes a public relations problem. So, we would pick an out-of-the-way search area and assign one or two trained searchers as leaders. This allowed the public to feel like they assisted and contributed, as well as getting those areas thoroughly searched.

Key considerations for this type of search team include keeping the proper spacing (don't spread out or bunch up), walk slowly and deliberately while watching for clues and try to stay in a line with the rest of the group.

Choke Point Search

Depending upon the lost person's skills and the terrain, some searches lend themselves to choke point searches. If your search area includes a large river with only a few bridges, then you have an excellent opportunity for a choke point search. Think of this as a roadblock rather than a search. A small team is assigned to cover the choke point, to ensure that if the lost person attempts to pass through that point, you can identify him.

Any places where you can identify a definite choke point, then you have an opportunity to apply this technique. Keep in mind however, that if you are searching for someone who is actively evading searchers, then choke points become much more difficult to define since the search subject may be willing to swim across rivers or climb or descend cliffs.

Like search containment, this type of search lends itself well to people with less mobility who can sit in an area and observe.

Track Trap Search

A track trap is a spot which will capture the fact that a person passed through the area. For example, if you walk along a beach, you leave footprints. Even if you "cover your tracks" there is still evidence that someone has passed through the area. There are many natural track traps, which include river and stream banks, trails with excessive mud or dust, thorn bush thickets and even sand pits.

However, in areas prone to lost person searches, like national parks, I understand it is not unheard of for SAR teams to build track traps along major trails to help in search efforts. They might bring in a few loads of sand and place it in low spots along the trail. This sand pit captures a record of anyone passing down the trail. Then, if a search develops, the trained trackers in the area can immediately go to these known track traps and compare the prints against a known print of the lost person.

One "trick" tracking teams will sometimes use in a search is to go out and "rake" the known track traps before the lost person has a chance to cross them. This quickly eliminates many of the false tracks that the team might later have to rule out. As an untrained searcher, your labor in this effort would certainly be appreciated.

In order to be involved in this type of search technique, it is customary to have some proficiency in man tracking and reading sign. However, you may find yourself attached to a team like this to act as a radio operator, driver, etc. and any assistance you can provide would be appreciated.

The key considerations for this type of team are speed of travel and the ability to identify track and sign.

Conclusion

As a search and rescue team member, it is important to remember why you are in the field. Your job is to find the lost person or to find clues related to the lost person. If your team is in the field and discovers a solid clue, then your team has assisted in the search by advancing the Last Known Position. By connecting the various clues and positions, it will often draw a line directly to where the lost person will eventually be found.

So, it is important when you are in the field, regardless of what duty you are assigned, to always remember to watch for clues and report anything you find. Each piece of the mystery gives a clearer picture of what happened and how the person might be found.