

Penn State Electro-Optic Center Aircraft Search Patterns

An effective search pattern must be matched to the range of the on-board sensor, the geometry/obscurations in the terrain, and the required search area. In this case the search area was large, approximately 100 km in diameter. Search patterns could be "figure 8s" or "race-track patterns" that move the center after completion of the pattern, but with some overlap to prevent overlooking any one area. A race-track pattern with long straight stretches can cover a lot of ground in a given time period, but it provides only one basic "look angle" at a section of ground. A figure 8 pattern covers much less ground in a given time interval, but looks at the same ground patch from a variety of angles. Because rugged terrain may prevent an aircraft from finding a person obscured by terrain or foliage in one direction, "redundant looks," viewing at the same ground from different angles, are desired. The number of looks required is defined by the steepness of the terrain, and the flight altitude.

The hikers had already covered a tremendous area. Normally, it would be advantageous to start from close to the last known location, and then sweep radially outward. Often, the highest probability for the hiker's current location is closer to the last known location. This would be difficult in the case of the hikers, since thousands of sweeps would be required to cover the large area of interest, and the hikers may have bedded down nearby, waiting for others to find them. The extra overhead of conducting a radially circular sweep likely was not justified.

It would be very advantageous to also use the larger MWIR sensor in the manned aircraft, and dispatch it to any sites that the video observers found a thermal signature that they could not verify if man or animal, and use it to positively identify the target.