

The curves on the reverse side of this sheet are taken from the *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual, 1999*.

The “Ideal search conditions” curve is based on a mathematical model of how ships cruising on the ocean are detected visually from aircraft when the aircraft covers an area with perfectly straight, parallel, equally spaced tracks *relative to the moving ships*. This model was originally developed by B. O. Koopman during World War II. U. S. Coast Guard experiments during the 1980’s showed that this curve works remarkably well when coverage is computed from experimentally determined effective sweep width values **and** when search conditions are ideal. Ideal search conditions include clear, calm weather, very accurate navigation to assure the search tracks are straight, parallel and equally spaced relative to the (usually drifting) search object, and the effective sweep width is reasonably large. Any deviation from these ideal conditions is considered to be “poor search conditions.”

The “Poor search conditions” curve is also due to B. O. Koopman’s work during World War II. It is based on so-called “random” searching and is also known as the “exponential detection function.” Koopman’s definition of a “random” search is one where the searching effort is applied uniformly over some area but in a less orderly fashion than perfectly straight, parallel, equally spaced search tracks. In other words, the searcher tracks might be crooked (e.g., due to terrain or navigational difficulties) or increments of searching effort might be applied first to one part of an area and then to another, and then another, etc. in a “random” fashion that nevertheless places about the same amount of searching effort in any subset of the area as any other subset of equal size. Poor weather at sea, inability of search craft to maintain perfect parallel track search patterns, etc. will push PODs down to the “Poor search conditions” curve. On land, search conditions are usually difficult enough due to terrain, obstructions, vegetation and small effective sweep widths to justify using the “Poor search conditions” curve.

In general, on both land and sea, the “Poor search conditions” curve is the rule while the “Ideal search conditions” curve is the exception.

POD vs COVERAGE

Average probabilities of detection (POD) over an area for visual searches using parallel sweeps

