

Search and Rescue Fundamentals

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- **Search and Rescue (SAR)** is defined as "the use of available resources to assist persons and property in potential or actual distress."
- **The SAR organization** is composed of the:
 - SAR Coordinator (SC)
 - SAR Mission Coordinator (SMC)
 - Rescue Coordination Center (RCC)
 - Rescue Sub-Center (RSC)
 - On Scene Coordinator (OSC)
 - SAR Units (SRUs)
- **List the eight major duties of the SAR Coordinator (SC).**

Major duties of the SAR Coordinator are to:

 - Identify all SRUs and SAR resources that may be used within the area.
 - Establish close liaison and agreements with other Services, agencies, and organizations having SAR potential and with SAR authorities of neighboring nations to ensure mutual cooperation and coordination.
 - Prepare and distribute a current comprehensive area SAR plan.
 - Establish RCCs to coordinate SAR resources within the region of responsibility and Rescue Sub-Centers (RSCs) for areas where RCCs cannot exercise direct and effective coordination.
 - Ensure that operations conform with the SAR plan and the National SAR Manual.
 - Conduct SAR, assigning SMC and SRUs until assistance is no longer necessary or rescue has been effected.
 - Suspend SAR cases when there is no longer a reasonable chance of success.
 - Report results to the parent operating command or agency.
- **State the position responsible for planning the SAR mission.**

While the SAR Coordinator retains overall responsibility, the SMC plans and operationally coordinates and controls SAR missions from the time assigned until conclusion, prosecuting each mission with resources available.
- **State the function of the Rescue Coordination Center (RCC).**

The SAR Coordinator
- **State the position which controls SRUs on scene.**

The On Scene Coordinator
- **State the required advanced notice the SRU should provide to the OSC prior to arrival on scene.**

15 minutes

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- **List the five response stages.**
 - Awareness
 - Initial Actions
 - Planning
 - Operations
 - Conclusion

- **List the four most important pieces of information obtained during the awareness stage.**
 - Type of incident and the nature of emergency
 - Location and time of the incident
 - Target description
 - Number and condition of the people involved

- **List the five SAR support components.**
 - Organization
 - Resources
 - Communications
 - Emergency Care
 - Documentation

- **List the three emergency phase classifications.**
 - Uncertainty
 - Alert
 - Distress

- **Define datum.**

Datum is defined as “the most probable location of the search object corrected for movement over time”.

- **State the best source of information on total water current.**

Data Marker Buoy (DMB)

- **State the forces involved in determining total water current.**
 - Sea Current
 - Wind Current
 - Reversing Tidal Current
 - Longshore Current
 - River Current
 - Lake Current
 - Surf & Rip Current

- **Define leeway.**

Leeway (LW) is the movement through the water caused by winds blowing against the exposed surfaces of the search object.

- **Define track spacing.**

The distance between two adjacent parallel search legs is known as track spacing.

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- **State the three correction factors you use to determine corrected sweep width.**
weather, fatigue, aircraft speed
- **State the correct formula for determining coverage factor.**
$$C = \frac{W \text{ (corrected sweep width)}}{S \text{ (track spacing)}}$$
- **State the items you should consider when selecting a search pattern.**
Accuracy of datum
Size and detectability of the search object
Size and shape of the search area
Time available for searching
Number and type of SRUs
En route and on scene weather
Navigational ability of the SRUs
Desired POD
- **Identify the meaning of search pattern letter designators.**

The **first letter** indicates search pattern type:

- Trackline (T)
- Parallel (P)
- Creeping Line (C)
- Expanding Square (S)
- Sector (V)
- Barrier (B)

The **second letter** indicates the number of SRUs in the same search area:

- Single-Unit (S)
- Multi-Unit (M)

The **third letter** indicates amplifying/supplementary information:

- Radar or Return Search (R)
- Coordinated (C)
- Loran (L)
- Aural (A)
- Non-Return Search (N)
- Drift Compensated (D)

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- **State the characteristics for each of the following search pattern types:**
 - A **Trackline (T)** search pattern is used when the only information available is the search target's known or projected trackline. This search pattern is usually the first search action since it is assumed that the target is near track and will be easily seen or will signal the SRU. Searching a datum line (intended trackline corrected for drift) should be evaluated as it can be a return or non-returning pattern. If a single-unit non-return (TSN) is conducted, the SRU searches down the trackline or datum line. For a single-unit return pattern (TSR), offset the search legs one-half track space (S) either side of the track/datum line.
 - A **Parallel (P)** search pattern should be used when the search area is large, there is equal probability of the target being anywhere in the search area, datum information is fair, and uniform coverage is desired throughout the area. The pattern may be used when the degree of detection may have an equal probability of being anywhere in the search area. The search legs are parallel to the search area's major axis (longest side oriented down the drift line). Commence Search Point (CSP) is located one-half track space inside the search area in the specified corner.
 - A **Creeping Line (C)** search pattern is used when the search area is large, uniform coverage is desired, datum information is fair, and there is more chance of the target being in one end of the search area than the other. The search legs are parallel to the search area's minor axis (shortest side of the search area or 90° off of the major axis).
 - An **Expanding Square (S)** search pattern is used when datum is established within close limits and uniform coverage is desired. The first leg is usually oriented downdrift (if it is not practical to search the first leg downdrift, then another first leg direction may be used). All turns are 90° to the right and a second search is performed by shifting the pattern 45° to the right.
 - A **Sector (V)** search pattern is used when datum is established with a high degree of confidence and the target is difficult to detect. The search unit passes through datum several times, each time increasing the chances of finding the target. The pattern resembles the spokes of a wheel, with the center of the wheel at datum. It is the only pattern with a circular area of coverage. The datum may be marked with a floating object such as a DMB. By marking the center of the search pattern, the SRU has a chance to check its navigation each time the SRU passes near the center of the search pattern. A 60° sector search is normally used which consists of nine equal legs, each leg having a length equal to the radius of the search area. The first leg is usually downdrift. Although the center of the search area is covered very well, the outer limits of the area are not covered as well.

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- **Select the radio transmission proword associated with distress, urgency, and safety.**

Type of Signal	Proceed by Proword...	Pronounce...	Meaning...
Distress	MAYDAY	same	conveys craft or person threatened by grave & imminent danger & requires immediate assistance
Urgency	PAN PAN	PAHN PAHN	a station has a very urgent transmission concerning the safety of a craft or person
Safety	SECURITE	SAY-CURE-A-TAY	a station is about to transmit a message concerning safety of navigation or give important meteorological warnings

- **List the three on scene SAR frequencies.**
282.8, 156.3, 123.1
- **Select the required time interval for SITREP submission.**
At least once daily
- **Select the assignment responsible for deployment of the Search Action Plan (SAP).**
SMC
- **State the type of ELTs/EPIRBs which use a coded ID.**
406

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- **State the correct initial response search pattern.**

WHEN search unit is ...	AND . . .	THEN search pattern is ...
Surface SRU	no other information	Expanding Square (SS)
	high degree of confidence in datum (e.g. debris found)	Sector (VS) or Expanding Square (SS)
Helicopter	no other information	Sector (VS) or Expanding Square (SS)
Other Aircraft	no other information	Sector (VS)
Note: A larger radius than 6 NM may be appropriate for aircraft during the initial search due to higher search speeds and turning radius.		

- **List the characteristics of the SRU best qualified to be an OSC.**
 - Long endurance
 - Excellent comms capability
 - Knowledgeable crew
 - Adequate staffing
- **State the information the OSC should pass to the SMC in the first SITREP.**
 - On scene weather conditions
- **Identify the proper use of the Maritime Assistance Request Broadcast.**
 - When specific alternate assistance is not requested or available, the mariner will be informed that a MARB can be made to determine if someone in the area can come to his or her assistance.
- **Identify the proper use of the term “safe haven”.**
 - A place that can accommodate and will accept the safe mooring of the vessel and has available a means of communication, normally a telephone.
- **Define “false alarm”.**
 - A False Alarm is a case where the subject reported to be in distress is confirmed not to be in distress and not to be in need of assistance.
- **Define “hoax”.**
 - A Hoax is a case where information is conveyed with the intent to deceive.
- **Define “Uncorrelated Distress Broadcast”.**
 - An Uncorrelated Distress Broadcast is a distress broadcast that does not include position and/or identification information sufficient to generate a reasonable search area.