

Boat	Speed	RPM's	Fuel Used	Range
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**Many thanks for the reintroduction of this guide by Mr. Jim Emery, USCG Auxiliary (D5-North, Flotilla 74) and Mr. Jim Shea, USCG Auxiliary (D7, Flotilla 69). Working with their partners and SAR School, the Coxswain SAR Guide was updated and brought out of retirement.**

**United States  
Coast Guard**



**1<sup>st</sup> Edition:** Updated Time/Speed/Distance Table Jan 07

PROVIDED BY:

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### References:

**COMDTINST M5000.3B UNITED STATES COAST GUARD  
REGULATIONS 1992**

**COMDTINST M16114.5C BOAT CREW SEAMANSHIP MANUAL**

**COMDTINST M16114.32A U.S. COAST GUARD BOAT  
OPERATIONS AND TRAINING (BOAT) MANUAL, VOLUME I**

**COMDTINST M16114.33 U.S. COAST GUARD BOAT  
OPERATIONS AND TRAINING (BOAT) MANUAL, VOLUME II**

**COMDTINST M16130.2D U.S. COAST GUARD ADDENDUM TO  
THE UNITED STATES NATIONAL SEARCH AND RESCUE  
SUPPLEMENT (NSS) TO THE INTERNATIONAL AERONAUTICAL  
AND MARITIME SEARCH AND RESCUE MANUAL (IAMSAR)**

## Handling Private Property

Private property which becomes the possession of the SAR system should be safeguarded, inventoried, then returned to its rightful owner, and a receipt obtained.

Trespassing is an entry without right onto land or property that belongs to another. Trespassing by SAR personnel is excused or justified if it is necessary to save life or property.

## Towing

When towing any vessel, ensure:

- Everyone is wearing a PFD,
- You pass all tow lines,
- You tend all tow lines,
- You have a sharp knife ready,
- You tow alongside for only short distances and in calm water,
- You adjust the tow so that it rides the second or third wave aft of the towing vessel's wake. Heavy boats will require longer tow lines,
- You use chafing gear on the tow line,
- You occasionally let out a few feet of tow line on extended tows to reduce chaffing from the taff rail or tow bitt in one spot of the tow line.
- You use heaving lines,
- You avoid sudden bursts of speed,
- You slow down gradually, especially on heavy tows,
- You avoid placing your vessel in a position where the wind or current will cause you to drift over the tow line,
- You avoid passing lines to vessels with too much way on,
- You advise the operator of your plans or procedures before taking action, and
- You remember **haste makes waste**. Think out your moves prior to executing them.

## Debrief the Survivors

Make sure you've accounted for everyone before leaving the scene. If there's someone missing, question the survivors to see if they can give you any leads to the search. Have a member of your crew take notes so you'll be able to recount the incident at a later time. If the survivors were in the water for any length of time, have them describe in detail their emergency and survival procedures. This information might be helpful in later SAR cases.

Once the survivors are cared for, then and only then can you shift your attention to any property in danger. Again there are a few things that you must consider before taking action:

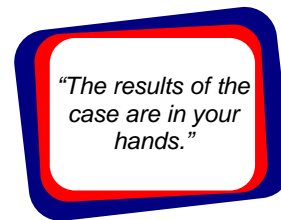
- *Are you in danger of losing the property? Can the damage be repaired by the crew?*
- *Can the property be towed? What is the best method of towing for this property, alongside or astern?*
- *If you decide to tow the vessel, maintain communications with the people aboard the boat that you're towing. Stay informed of their needs. They may have needed a tow in the beginning, but after you take them in tow, they may need a pump. Keep the operator informed of your intentions.*

Always keep in mind that people are far more important than property. If a survivor needs medical attention, you must forget about towing and get the victim ashore as quickly and safely as possible. Keep your station informed of your intentions. Let them know where you are and where you will moor. Keep them informed of any changes.

After you've brought the survivors and the property back safely, then board the boat and complete the procedures prescribed by your station or sector. Make sure you retrieve all of the gear that you may have loaned the operator. When all these actions have been completed, the SMC may consider the case closed.

## Disclaimer:

All information found in this guide is subject to change or update. It is the Coxswain's responsibility to ensure compliance with the most current guidance and regulations found in the applicable Coast Guard Instruction. This guide is not a substitute for good headwork and situational awareness. The ultimate responsibility for the safety of the passengers and crew rests with the coxswain.



## Introduction

In accordance with Coast Guard Regulations, COMDTINST M5000.3 (series), the coxswain shall be responsible for, in order of precedence:

1. The safety and conduct of passengers and crew;
2. The safe operation and navigation of the boat assigned; and
3. The completion of the sortie or mission(s) assigned or undertaken pursuant to Coast Guard policy and regulations.

The SAR Mission Coordinator (SMC) has several tools available to help develop the optimum Search Action Plan (SAP). Computer based tools along with an extensive search planning protocol help guide the SMC through the planning stage of the case. Yet, the SMC's best laid plan, based upon the most accurate datum calculations and using the best resources available, will likely fail to locate and rescue the survivors if the coxswain does not apply the best practices to the case.

Although experience is the best teacher, sometimes we don't have all the experience we need. This guide has one purpose – to help coxswains conduct the best searches. The results of the case are in your hands.

## Risk Management

In order to understand the risk assessment and management process, it is necessary to define safety. One definition is “the identification and control of risk.” Risk management identifies and controls risk, according to a set of predetermined parameters. It is one tool for maintaining an acceptable level of safety. The parameters and the acceptable limits vary with the type of operation; rescue operations, buoy tending, ice breaking, law enforcement, etc. Controlling risk means we eliminate or reduce hazards that can lead to mishaps. **Remember, risk management is the responsibility of everyone involved!**

The risk assessment and management program assumes:

- Every event/evolution has some degree of risk;
- All of the risks will never be known;
- Every event/evolution requires balancing risk by applying adequate control; and
- Resources available to identify and manage risks are limited.

The goal is to control or eliminate all unacceptable risk in each event/evolution. Follow these steps to manage risk:

1. Define The Mission – T.O.W., MEDEVAC, Flare, OVDU, etc.
2. Identify Hazards – Use the PEACE model.
3. Assess Risks – Use the GAR model.
4. Identify Options – Use the STAAR model.
5. Evaluate Risk vs. Gain – Never accept high risk for low gain!
6. Execute The Mission – Keep evaluating.
7. Monitor The Situation – Risk management is a continuous process.

*Note: Refer to Chapter 1 of the Coast Guard Addendum for a detailed description of the PEACE, GAR, and STAAR models and how to use them.*

information is provided by Coast Guard Flight Surgeons, but may also be from hospitals contacted by the shipping agent or international organizations such as the International Radio Medical Center (CIRM), located in Rome, Italy.

Medical Evacuation (MEDEVAC) – Always think HIGH-RISK when considering a MEDEVAC mission. A Flight Surgeon must be consulted prior to performing the mission. The Flight Surgeon may recommend a MEDEVAC. However, it is not an order. The final decision on performing a MEDEVAC always rests with you, the coxswain on scene.

If you take survivors on your boat, never leave them alone, and **ensure they are properly put into a lifejacket**. People who are saved are sometimes panic stricken, thinking irrationally or in a state of shock. If left alone, survivors might do something that would threaten the safety of your boat, your crew, and their lives. Make them comfortable and keep a member of your crew with them. Remember to handle all survivors with care. Rough handling while trying to get them aboard your boat could make a serious injury fatal.

Treat all survivors for shock, whether they show the symptoms or not. This will make them more comfortable. If any of the survivors have been seriously injured, you should consider a MEDEVAC by helicopter or call to have an ambulance awaiting your arrival.

results of their actions complicated the case. If, for instance, you feel that a larger SRU is required for towing, or that more pumps are required, or that you will need a medical evacuation, you must tell your station that this is so. Don't try to do it all yourself if you feel that you could use some help. If you feel the case is within your capabilities, then the following information should be considered.

## Rescue Planning

During most cases, the actual rescue of survivors is the easiest part of the mission. SRU's are normally able to recover the survivors without any problems. Sometimes, however, the SRU is unable to perform the rescue themselves, and rescue planning becomes essential. Examples of when an SRU might not be able to perform the rescue include:

- Too many survivors for one SRU to carry;
- Weather conditions exceed the capabilities of the SRU;
- Locating the survivors by a fixed wing aircraft; and
- The distance from shore exceeds the capabilities of the SRU.

When the SRU cannot perform the rescue, the SMC must develop an effective rescue plan. Rescue planning includes the following elements:

- Evaluating the survivability of the incident;
- Evaluating the environment;
- Selecting the rescue method;
- Selecting the rescue facilities; and
- Developing the optimum and attainable rescue plan.

Chapter 6 of the National SAR Supplement (NSS) provides a detailed discussion on the elements of rescue planning. Chapter 4 of the Coast Guard Addendum to the NSS provides policy on providing distress and non-distress assistance, general salvage (other than towing), firefighting activities and navigational assistance.

Medical Communication (MEDICO) – A MEDICO consists of providing emergency medical advice to the crew of a ship at sea. This is normally accomplished by radio or satellite telephone. MEDICO is an international term and can be used with foreign flagged vessels. Under normal circumstances, the medical

## Briefing

Whenever possible, the Coxswain should brief the crew of the SRU prior to departing. However, the urgency of the call may require a briefing while en route. Before you launch, or while en route, make sure you obtain the following information:

1. Nature of distress;
2. Last known position;
3. Description of the search object;
4. Number of people on board (or involved);
5. Specific tasking from the SMC; and
6. On scene and forecast weather.

Gather as much information as possible before launching, so you'll be sure to select the right resources and bring any additional equipment needed, such as a dewatering pump, stokes liter, hand-held radio, extra life jackets, etc.

## En Route

Preparations – SRU Crewmembers should make every effort to prepare for the search prior to arrival in the search area. Preparations include briefing and assigning lookouts and establishing a relief/rotation schedule if appropriate. Charts of the area should be prepared for use, with the search area boundaries, search pattern, and turning points plotted. Homing, monitoring, and on scene radio frequencies should be tuned. Depending upon the resource used and the weather conditions, equipment necessary to perform the rescue should also be prepared for immediate use.

Searching En Route – There is always a possibility that the search object is outside the assigned search area, therefore, searching while en route to the assigned search area is one way the SRU can increase the search area size. By posting lookouts while en route to and from the search area, effective trackline searching can be accomplished and the results should be passed to SMC through the On Scene Coordinator (OSC).

Checking In – Check in with the SMC or OSC 15-minutes before arriving on scene to report your status and limitations, and to obtain a search update or any additional instructions/tasking.

## On Scene

Datum Marker Buoy (DMB) – When necessary, the SMC will instruct one of the SRU's to deploy a DMB to measure Total Water Current (TWC). If tasked to deploy a DMB, make sure you record and report the time and position where it was inserted, the beacon frequency for a radio DMB, or the serial number for a Self-Locating DMB. You will typically use a fender or life ring with a strobe light as your DMB.

Search Action Plan (SAP) – You should make every effort to follow the SAP. When the SAP needs to be modified, report the problem to the SMC along with recommendations to correct the problem. Situations requiring a SAP to be modified include hazards to navigation in the search area; insufficient water depth; inappropriate track spacing based upon prevailing weather conditions; and the position of the sun in relation to the lookouts. Anytime the SAP doesn't make

sense on scene, report it to the SMC along with your recommendations.

Search Pattern Summary – You may be tasked with completing a search using a search pattern summary printed from the SAR Tools software. Like the SAP, if the search pattern doesn't make sense on scene, report it to the SMC along with your recommendations.

Reporting The Weather – On scene weather affects both sweep width and track spacing. You should report on scene weather to the SMC as you start your search and report any weather changes as your search progresses.

Navigation – Make every effort to remain on track during your search. Subsequent searches assume you searched as planned.

Visual Distress Signals (VDS) – A distressed vessel has a limited number of VDS's, if any at all, and experienced mariners usually do not activate these signals until they actually see or hear an SRU. You should consider the use of audible signals such as an air horn or whistle when searching to encourage the distressed vessel to use its VDS's while the SRU is in the area. Pyrotechnic devices may be used to make the SRU's presence known to the distressed vessel. However, any signal used, whether visual or audible, must not be mistaken by other SRU's as a distress signal.

## Sightings and Identification

While searching, you may encounter objects that need to be investigated. If you need to divert and leave the search pattern, do so only after recording or marking the position and progress in the search pattern to which you are assigned. Once sighting identification is complete, and the results are negative, return to the position recorded and continue the search. Notify SMC how much time is spent evaluating sightings.

## Completing the Mission

The SAR System is activated in the awareness stage, upon first notification of an actual or potential SAR incident. The report may come directly from the distress party, a third party, or from an electronic signal, such as an Emergency Position Indicating Radio Beacon (EPIRB).

The SAR System is deactivated or shut down under one of the following situations:

- Case Closed – The distressed person or craft is located and necessary assistance is rendered;
- False Alarm – The person or craft reported to be in distress has been determined not to be in distress and does not need further assistance; and
- Active Search Suspended (ACTSUS) – Suspending the search after exhausting all possible hope for locating survivors with the information known.

In many cases, only the SAR Coordinator (SC) is authorized to suspend a search. However, depending upon the type of case, the SMC might have the authority. Consult your District SAR Plan for further guidance.

For the purpose of this guide, let's say you find the search object. What are the most important things you must do? The single most important thing is to notify your station, the OSC and other SRU's that you've found the search object and the position where you found it.

Once you've found the search object and reported it, stop for a moment and think the case through. A very important question at this time is – can you, with the personnel and equipment that you have with you, complete this mission successfully? On a number of cases, coxswains have thought they could but actually couldn't. The

## Expanding Square, Single Unit (SS)

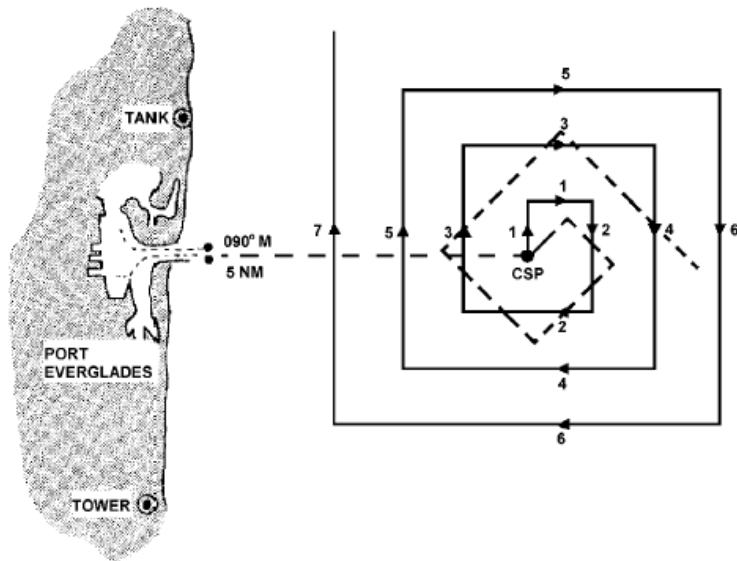
Designation: *Sierra Sierra (SS)*

Used when

- The search area is small,
- The location of the search object is known within relatively close limits, but some doubt exists about the distress position, and
- A concentrated search is desired.

Description:

The SRU goes to the best known location of the search object. This becomes the center (datum) of the search area. Datum should be marked with a buoy, life ring, strobe light, etc. The first leg will begin from datum in the direction of drift for one track space (S). If there is no drift, the first leg will be true north, 000°T; the second leg is 090°T, the next is 180°T and so on. All course changes are 90° to the right. Search leg length is increased by one track space on every other leg. Multiply your track space (S) by the numbers shown in the search pattern below to determine leg length. A second search is performed by rotating the search pattern 45° to the right.



Aural Searches – Surface SRU's should make every effort to reduce background noises, and occasionally stop the engines to permit faint calls for help to be heard. If possible, lookouts should be posted away from the engines and radios.

Reports – Situation Reports (SITREP's) (normally over the radio) should be sent to the SMC upon arrival on scene and whenever important information needs to be passed.

Lookouts – Effective scanning by lookouts, is accomplished with a series of short, regularly space eye movements that bring successive areas of the water into the central visual field. Each movement should not exceed 10 degrees. Each area should be observed for at least two seconds, plus time to refocus if necessary.

## First SRU On Scene

Without specific tasking from the SMC, you should report on scene weather conditions to the SMC and prepare for your initial search. Refer to the following table for initial track spacing:

Initial Track Spacing (NM)		
Search Object	Good Conditions Winds < 15 Knots Seas < 3 Feet	Poor Conditions Winds ≥ 15 Knots Seas ≥ 3 Feet
PIW	0.1	0.1
Vessels < 15 Feet	0.5	0.2
Vessels ≥ 15 Feet	1.0	0.5

## Timing Chart:

This chart shows the time required to run each of the first two legs of an Expanding Square (SS) search pattern and each leg of a Sector Search (VS) at different speeds according to the initial track spacing.

To calculate the time required to complete one sector search (VS), multiply the leg time by nine.

Speed / Time Table in Minutes : Seconds

Track Spacing	6 Kts	7 Kts	8 Kts	9 Kts	10 Kts	11 Kts	12 Kts
0.1	01:00	00:51	00:45	00:40	00:36	00:33	00:30
0.2	02:00	01:43	01:30	01:20	01:12	01:05	01:00
0.3	03:00	02:34	02:15	02:00	01:48	01:38	01:30
0.4	04:00	03:26	03:00	02:40	02:24	02:11	02:00
0.5	05:00	04:17	03:45	03:20	03:00	02:44	02:30
0.6	06:00	05:09	04:30	04:00	03:36	03:16	03:00
0.7	07:00	06:00	05:15	04:40	04:12	03:49	03:30
0.8	08:00	06:51	06:00	05:20	04:48	04:22	04:00
0.9	09:00	07:43	06:45	06:00	05:24	04:55	04:30
1.0	10:00	08:34	07:30	06:40	06:00	05:27	05:00

## Sector, Single Unit (VS)

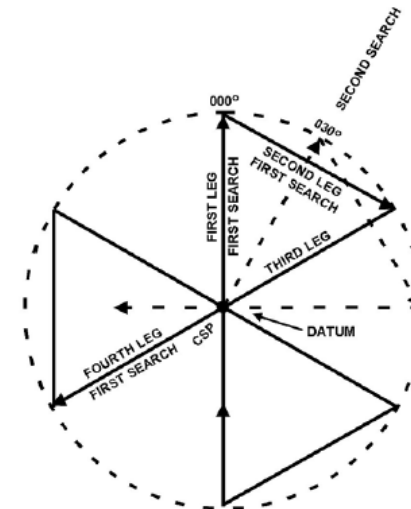
Designation: *Victor Sierra*

Used when:

- The search area is small,
- The location of the search object is well known, and
- A concentrated search is desired.

Description:

The SRU goes to the best known location of the search object. This becomes the center (datum) of the search area. Datum should be marked with a buoy, life ring, strobe light, etc. The first leg will begin from datum in the direction of drift for one track space (S). If there is no drift, the first leg will be true north, 000°T, the second leg is 120°T, the next is 240°T and so on. On the 3<sup>rd</sup>, 6<sup>th</sup>, and 9<sup>th</sup> legs, steer on your marker, once passed, return to your base course. All course changes are 120° to the right and the length of all legs are equal to one S. A second search (with the same SRU – VS) is performed by rotating the search pattern 30° to the right beginning at datum. A second search (with a second SRU – VM) is performed by rotating the search pattern 90° to the left beginning at datum.





## Creeping Line, Single Unit (CS)

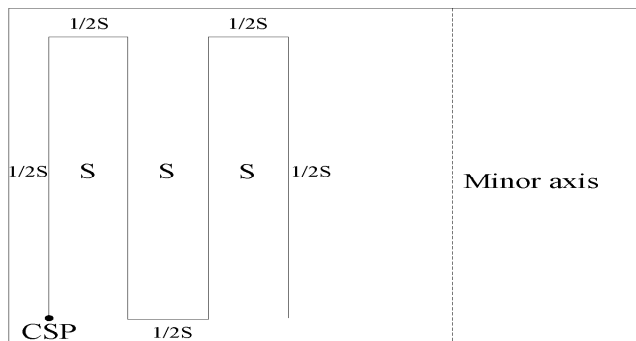
Designation: *Charlie Sierra*

Used when:

- The search area is large,
- The location of the search object is approximate, but there is a greater chance that the search object is at one end of the search area versus the other (i.e. debris was found on one end during a previous search), and
- Uniform coverage is desired.

Description:

The SRU searches parallel to the short side (minor axis) of the search area, moving over one track on the return. This process continues until the entire search area has been searched or the search object is located. The Commence Search Point (CSP) is located  $\frac{1}{2}$  track space (S) inside the search area in the specified corner.



## Search Patterns

Each search pattern has a specific use. Some are better suited for small, confined areas, while others are better suited to larger areas. Regardless of the type of search pattern selected, as a coxswain, you are expected to understand the SMC's SAP and be able to complete the assigned search. Once the SMC determines the search area, a systematic search for the object must be planned. The SMC will consider weather, search area size, search object size, numbers of SRU's available, search area location, and time limitations in deciding which pattern to use.

Search patterns are designated by letters. The first letter indicates the general pattern group:

T = Trackline      P = Parallel      C = Creeping Line  
V = Sector          S = Square

The second letter indicates the number of SRU's assigned to that pattern:

S = Single Unit      M = Multi-unit

The third letter indicates specialized patterns or instructions; the two most commonly used are:

R = Return          N = Non-return

## Trackline, Single Unit, Return (TSR)

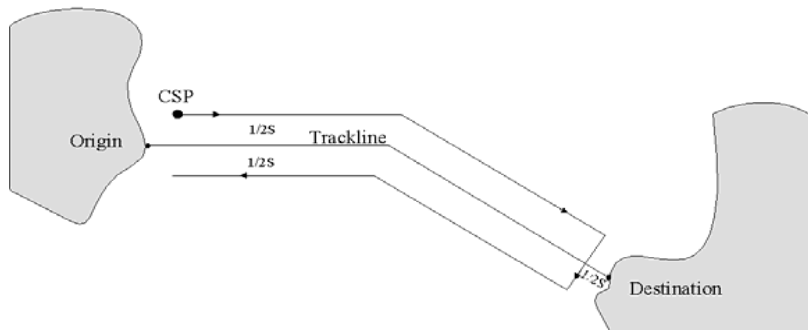
Designation: *Tango Sierra Romeo*

Used when:

- The intended route of the search object is known, and
- A rapid and reasonably thorough coverage of the missing craft's intended track and the area immediately adjacent, such as along a datum line (intended track corrected for drift) is desired.

Description:

Usually the first search effort in an overdue case since it's assumed that the search object is near track and either it will be easily seen or the survivors will signal. The SRU searches out  $\frac{1}{2}$  track space (S) in the direction of the intended track from the origin to the destination and ends  $\frac{1}{2}$  S on the other side of the origin.



## Parallel, Single Unit (PS)

Designation: *Papa Sierra*

Used when:

- The search area is large,
- The location of the search object is approximate, and
- Uniform coverage is desired.

Description:

The SRU searches parallel to the long side (major axis) of the search area, moving over one track on the return. This process continues until the entire search area has been searched or the search object is located. The Commence Search Point (CSP) is located  $\frac{1}{2}$  track space (S) inside the search area in the specified corner.

