SEARCHPATTERNS

NEEDLE IN A HAYSTACK?

Paul Glatzel looks into what to do if you find yourself part of a real search and rescue.

Whilst a good number of RIBs undertake no more arduous a passage than a trip to the beach in fine weather, there are plenty more that undertake some challenging passages or ferry divers far and wide to dive sites.

It is these RIBs that are far more likely to be in the more remote locations or out in the rougher weather when the call goes out for help and are the closest or perhaps the only asset available to assist. This article looks at one particular aspect of becoming part of an incident - the search part of it.

Firstly though, imagine you are out there when the call comes out for assistance to find a missing person. It may be a diver, a swimmer lost from a beach, or a person overboard from a craft (perhaps it's even someone from your RIB). The natural reaction is to dive in and volunteer assistance whilst zooming off to the 'Last Known Position' ('LKP'). Stop though and think. As skipper ask yourself some questions. Are you really needed? You may be a fair distance away and of no real use by the time you arrive, as by then there may be plenty of craft already 'on scene', and your racing at breakneck speed in challenging conditions could increase the chances of you becoming another incident. Secondly, are you capable - is your craft capable of assisting, getting safely to the location and are your crew capable of assisting? With an experienced crew in a good craft you could be of great assistance; a less capable craft with a crew that will need plenty of direction and 'management' may be more hindrance than use. In short your first thought must be for the safety of your own crew and craft; the Coastguard will not thank you for over estimating your capability, and possibly putting even more people in danger and so making their job and that of the RNLI even more challenging.

So if you do hear of an incident what do you do? Firstly, ease up and listen, note the salient details of the incident (lat and long,

> **TIP**
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> Take the time before heading toward the casualty to enter the lat and long as a waypoint and 'goto' that point, also plot the casualty's position on a chart. Does the position correlate with the description of where the casualty is? Often the stress of an incident causes the casualty to misread their position.

description of location, persons involved, name(s) of craft etc). Keep quiet, let the Coastguard do their job and establish control of the incident. If there is a request for assistance or if you can be of use, then contact the Coastguard on 16 and discuss how you can assist. If there are lots of initial comms then perhaps begin to proceed towards the casualty and contact the Coastguard when it seems convenient (for them!) to do so.

> **TIP**
>
> Keep a Chinagraph pencil attached to the helm. You can then write straight onto the console when there's anything worth noting.

Before you commence a search you need to know where to start (your 'datum') and what area you are going to need to cover with

your search. It's all to easy to assume you just head for the LKP and then search from there - but when was the casualty there and where are they likely to be at the time you arrive on scene and commence the search?

Take an example. A report states a person is lost overboard a mile south of Anvil Point, the alarm is raised but it's now 30 minutes since the person entered the water and the tide is running at about 3 knots. In the 30 minutes since the incident the casualty will have moved a mile and a half in the direction of the tide. Clearly executing a search based around this estimated position might make far more sense than basing it around the LKP.

TIP

Don't miss or ignore the simple answer though. An estimated position is great, but if the casualty is drifting through moorings then they may be hanging onto one of them or perhaps even have climbed onto a craft.

SO HOW DO THE PROFESSIONALS DO IT?

TAKING THE EXAMPLE OF AN INCIDENT IN OPEN WATER, AS THE REPORT COMES IN CERTAIN KEY FACTS WILL BE NOTED:

The 'quality' of the report. A report from a mobile Coastguard unit is likely to be more accurate than one from a granny on a cliff.

The LKP and the time the casualty was there.

The nature of the casualty - a person in the water will be affected differently than a small inflatable which is likely to be far more wind affected.

From this data the LKP is plotted. The effect of the tide is added in to give an estimate of where the casualty is now. The effect of the wind ('leeway') is then added in with the likely drift calculated from a table which gives a value for each type of casualty which is multiplied by the wind speed to give the estimated drift in an hour. (For example given a 20 knot wind a surfboard in the water might have a leeway of 0.4 knots whereas a large but light displacement cruiser might experience 1.5 Knots of leeway.

This then gives the 'datum' for the search. The final piece in the jigsaw is to define the area to be searched (after all the two places where there is rarely a chance of finding the casualty is the LKP and your newly calculated estimated position - that would be too easy!)

A circle is drawn around the datum with a diameter of typically about 6 miles (thus accounting for the likely errors inherent in the initial position and subsequent calculations) which is then box this off - now you have your search area.

The Coastguard uses its state of the art SARIS system to automate the above calculations helping to improve the prediction of where the casualty is likely to be.

WHEN SEARCHING IN OPEN WATER, THERE ARE A VARIETY OF PATTERNS THAT CAN BE USED TO COVER THE SEARCH AREA.

The Expanding box search is now taught as the preferred method on RYA Advanced Courses. A simple search quickly covers the inner part of the search area but takes a while to provide any coverage of the outer areas of the search area.

Sector search: The shape of this search pattern resembles that of helicopter rotor blades and is more complex than an expanding box search but starts to effectively cover the outer boundaries of the search area more quickly. There remain some areas of the search area not covered at all for some time though. The complexity of this pattern means it's only likely to work with a crew that have practiced it.

If the area to be searched is rectangular there are two options:

Creeping line search: This search pattern starts at one end of the rectangle and moves along the area. Coverage of one end of the area is clearly good but it will take a while to provide any coverage at the other end of the area. It's therefore a logical pattern to execute if the probability of finding the casualty at one end of the rectangle is greater.

Parallel line search: This pattern covers the area lengthways so gives reasonable coverage of the area throughout its length quickly. It may work well as the pattern to execute where a casualty is lost from a beach.

Where there are multiple craft undertaking the search, they can either be tasked to cover individual areas or can work alongside each other to cover a larger area together. The simplest pattern to execute this way is to have the craft running in parallel, matching their speeds and keeping a distance apart where the maximum distance at which they could spot the casualty overlaps with the adjacent craft - thus ensuring a casualty is unlikely to be missed between the craft.

As touched on previously, one scenario could be that a person has been lost overboard from your craft. Regular checking of the crew by the ▶
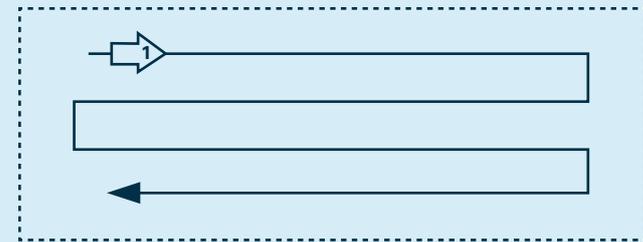
Calculating the new datum: Predicting the new position using tidal and leeway vectors gives the datum
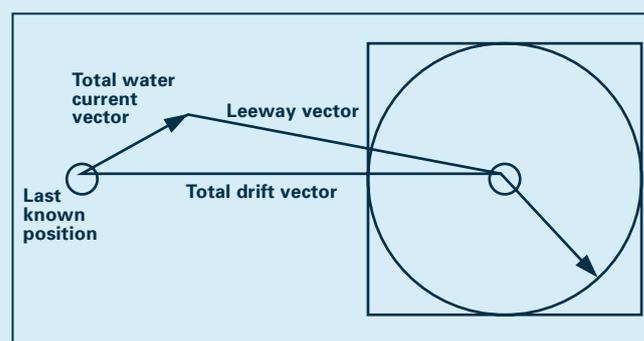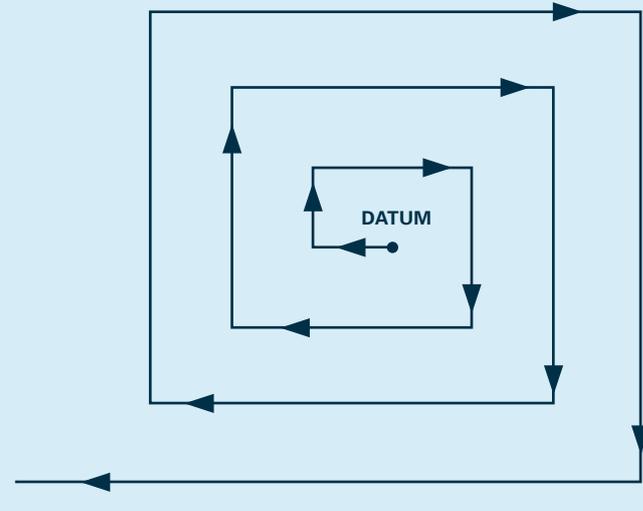

Creeping line search: Starts at the most logical end of the search area
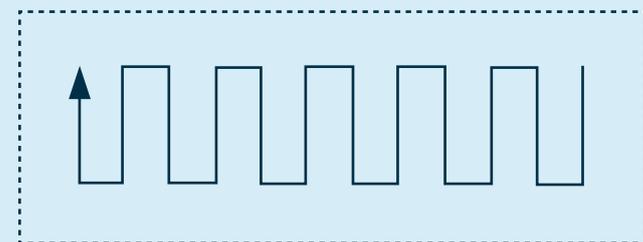
Parallel line search: Covers the length of the area more quickly

Expanding box search: The leg length is the detection range (D), every two legs the leg length increases by 'D'

TIP

Once you've commenced the search pattern, ignore the effect of tide as your craft will be affected in the same way as the casualty will continue to be.

skipper ensures he/she is rapidly aware of the departure (you do check that they are still there don't you?) and therefore should have a good idea how far behind the craft they could be. The first step should be to press the MOB button on the GPS to give a precise position for where you first realised they had gone over. Options available to find the casualty include:

• Retrace the line of your wake - if it is still visible
• Retrace your path by following the track on the GPS
• Starting at the point you noticed the loss of the person place an imaginary cone back along the route you took then execute a creeping line search within the cone. This is more efficient and quicker than a normal creeping line search with the distance searched away from the track of the boat increasing as you return further back along the track.

If you do ever become part of a search then do invest some time to think through what has occurred, appraise the situation and create a solution that best fits the particular scenario you are faced with. The search patterns referred to in this article are pretty straight forward but the conditions you face at the time you have to execute the search and the effect of stress/adrenaline will make executing the search effectively far tougher. Why not practice these search patterns by trying to find items using the various techniques. Doing this with your usual crew can be fun and can form the basis of some testing competitions.
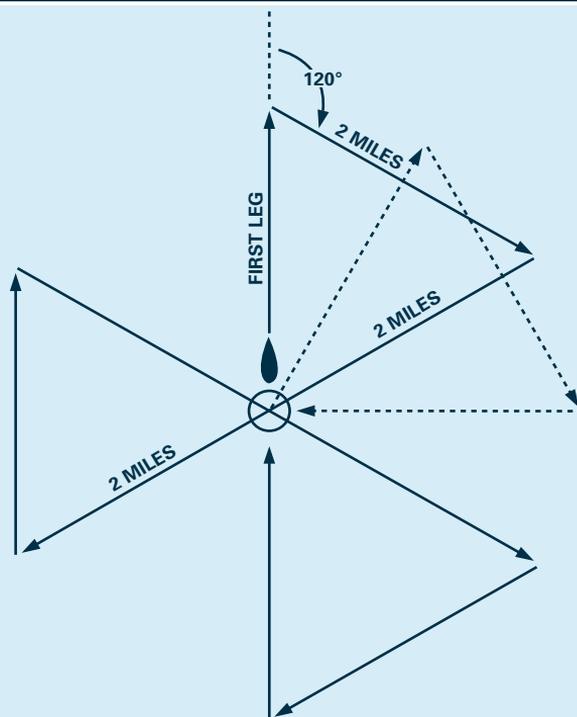
So in summary, think carefully before you get involved in a SAR situation, and then if you do, hopefully the practice that you have put in will help in effecting a rapid recovery of the casualty.

Paul**Glatzel**

Sector search: The sector search is more complex but rapidly gives reasonable coverage of a large search area"

120°
2 MILES
FIRST LEG
2 MILES
2 MILES

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