



Electronic Detection  
&  
Search Patterns



# Lifaboats



# How can we help ourselves?

- Wear a lifejacket and correct PPE with reflective clothing. Ensure you carry a whistle or VHF radio.
- Carry a means of creating light / (torch or Flare)
- Unless confident that you can make land drift with the tide. Save your energy, internal warmth. SAR co-ordinators will use tidal calculations to determine your position.
- If carried activate the Electronic Locating Beacon (PLB) or Locating Device (AIS).
- Stay positive!





Lifeboats



PLB Beacon or  
AIS Device?



If more than 1 activate  
then switch off.



COSPAS-SARSAT System





# PERSONAL

MUST HAVE A CLEAR VIEW OF THE SKY

In a man overboard situation, this device alerts other people on your boat, as well as water users within a 5-mile radius

AIS

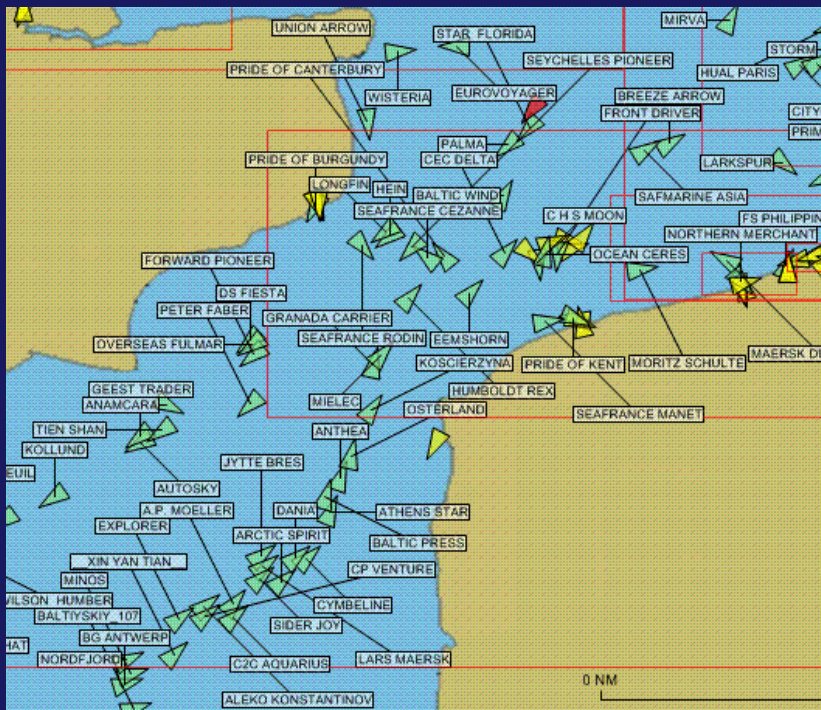


Range of up to 5 nautical miles  
Broadcast may not be picked up by coastguard





Lifeboats

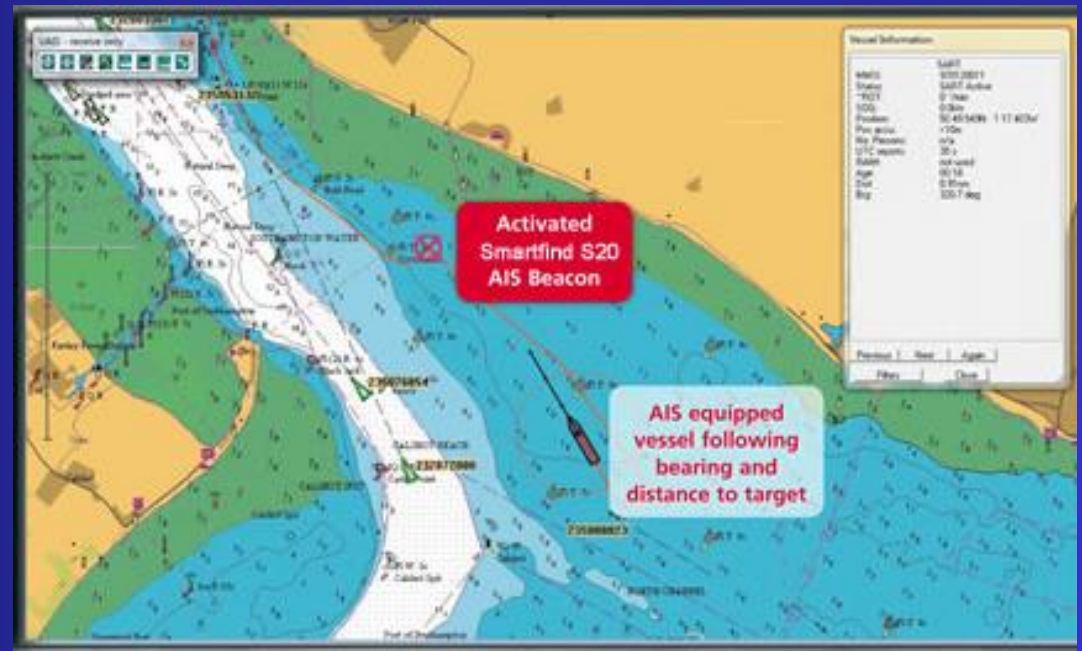


MMSI number which starts 972

Not Monitored

2013 New Symbol

2015 DSC / Audible Alert





# The Future



- New device with combined AIS and PLB will appear on the market in the USA in 2017
- Auto activated.
- There is no plan for legislation of this product in Europe in the near future
- Iridium may be joining the GMDSS network as soon as 2017 offer two way comms

# STAY SAFE ON THE WATER BY CHOOSING THE RIGHT WAY TO CALL FOR HELP. **HERE IS A SELECTION FOR YOU TO CONSIDER:**

## **EPIRB** Emergency Position Indicating Radio Beacon

Personal or vessel	<b>VESSEL</b>
GMDSS approved	<b>YES</b>
Single or multiple point	<b>SINGLE</b> The distress signals are passed to the relevant maritime rescue coordination centre, which will launch the correct search and rescue services.
Range	<b>NO RANGE LIMITATION</b> (frequency 406 MHz and 121.5 MHz)



### THINGS TO CONSIDER

- recognised emergency signal
- can be float free and automatic activation
- must be registered
- always choose a GPS-enabled EPIRB.

## **PLB** Personal Locator Beacon

Personal or vessel	<b>PERSONAL</b>
GMDSS approved	<b>YES</b>
Single or multiple point	<b>SINGLE</b>
Range	<b>NO RANGE LIMITATION</b> (frequency 406 MHz and 121.5 MHz)



### THINGS TO CONSIDER

- recognised emergency signal
- cannot be activated if you're unconscious
- must be registered
- should always be on your person.

## **AIS** Automatic Identification System

Personal or vessel	<b>PERSONAL</b>
GMDSS approved	<b>NO</b>
Single or multiple point	<b>MULTIPLE</b> Communicates by electronically exchanging data with ships or AIS base stations.
Range	<b>&gt; 5 MILES IN OPEN WATER</b>



### THINGS TO CONSIDER

- not a recognised way of calling for help
- can be automatically activated – will work if unconscious
- don't need to register
- in a man overboard situation, this device automatically alerts other people on your boat as well as water users within a 5-mile radius
- poor range if affected by obstacles
- should always be on your person.

## **VHF/DSC** Very High Frequency/ Digital Selective Calling

Personal or vessel	<b>VESSEL</b>
GMDSS approved	<b>YES</b>
Single or multiple point	<b>MULTIPLE</b>
Range	<b>&gt; 12 NAUTICAL MILES</b>

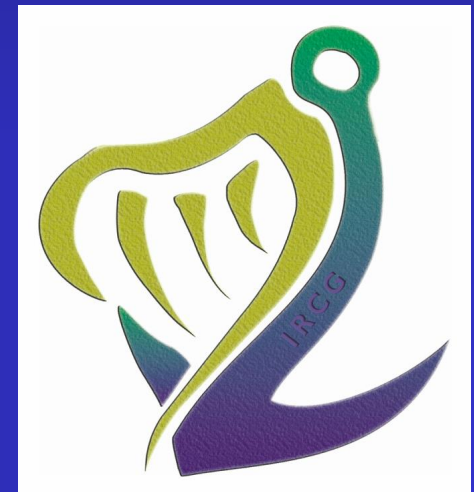


### THINGS TO CONSIDER

- a DSC distress alert is a recognised emergency signal
- must have licence and MMSI number
- send a distress alert followed by a mayday voice call on Channel 16
- communicates distress message to all vessels and shore stations in range.

# What happens now!?

## Search & Rescue Co ordination



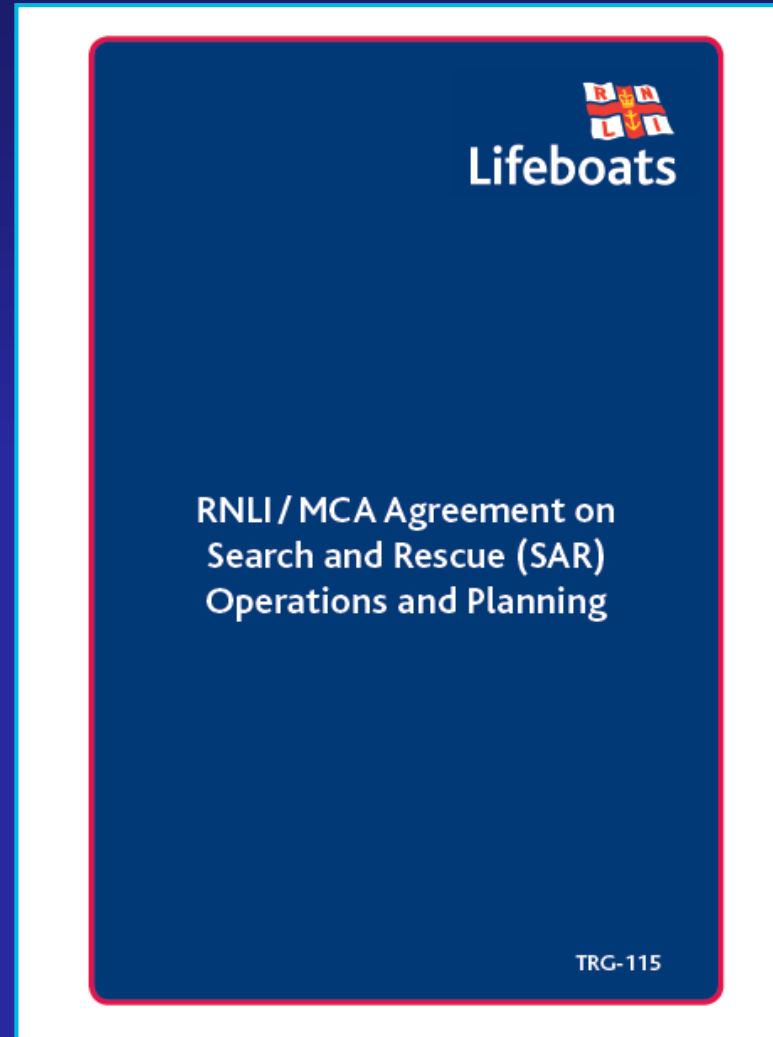
# SAR MISSION CO ORDINATOR (SMC)



# Origins of the Check Cards



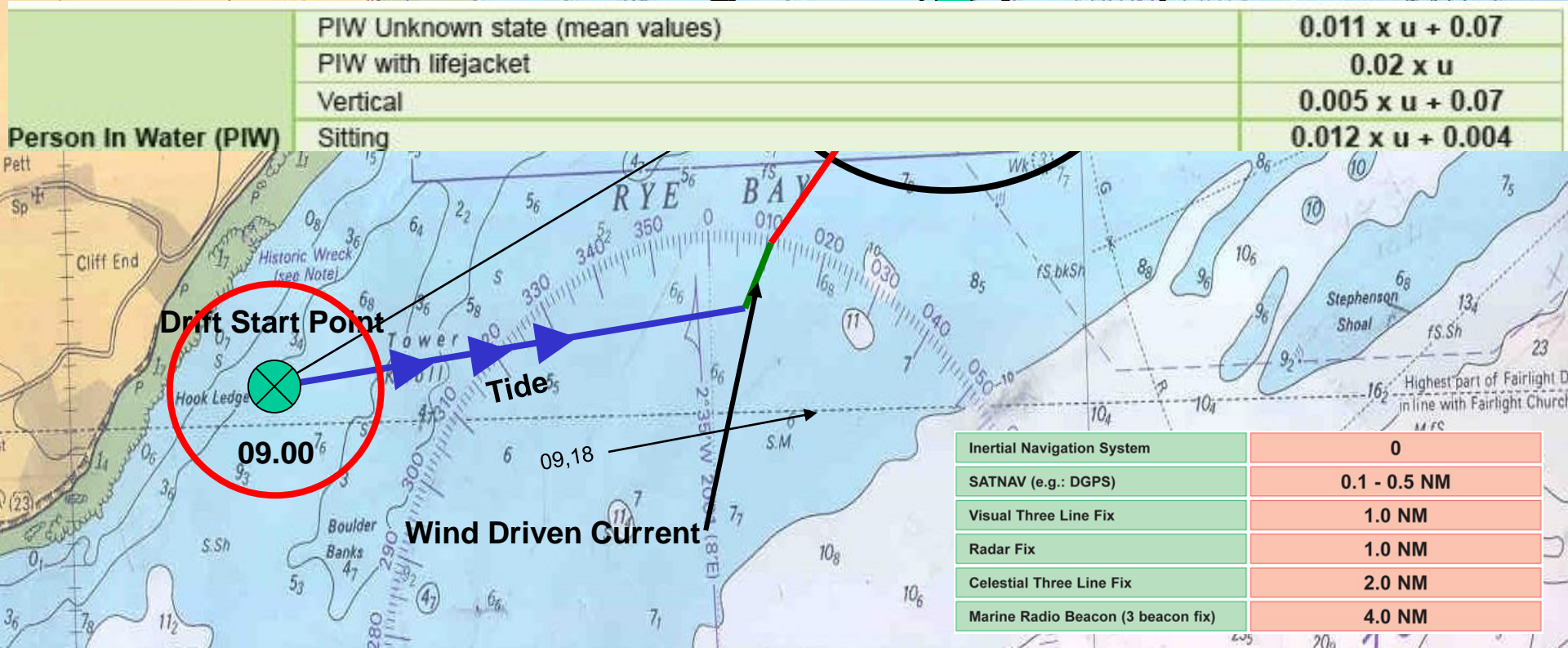
June 2013





-2 067° 2.0 1.0  
 -1 080° 2.1 1.0  
 HW 150° 0.8 0.4  
 +1 160° 1.0 0.5  
 +2 173° 1.3 0.7

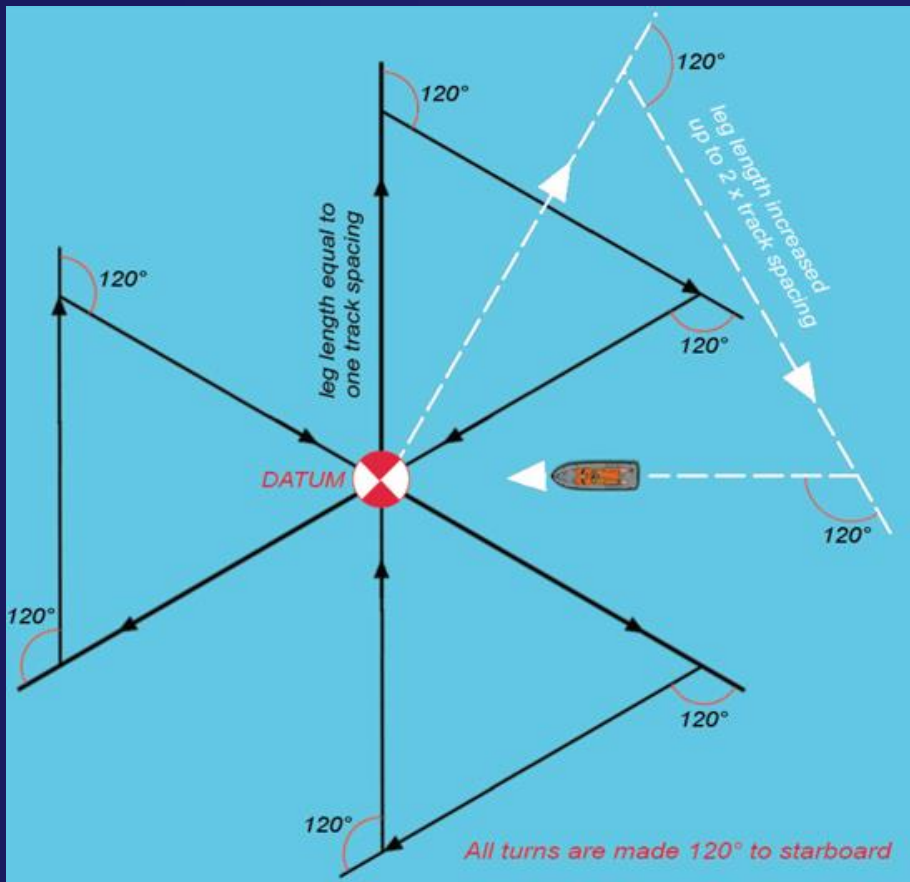
Type of Target	u = mean wind speed (kts)
PIW Unknown state (mean values)	$0.011 \times u + 0.07$
PIW with lifejacket	$0.02 \times u$
Vertical	$0.005 \times u + 0.07$
Person In Water (PIW)	$0.012 \times u + 0.004$
Vertical	$0.012 \times u + 0.004$
Sitting	$0.014 \times u + 0.1$
Scuba suit, face up	$0.007 \times u + 0.08$
Decapitated, face down	$0.015 \times u + 0.08$
No ballast pockets, general (mean values)	$0.042 \times u + 0.03$
No ballast pockets, no canopy, no drogue	$0.057 \times u + 0.21$
No ballast pockets, no canopy, with drogue	$0.044 \times u + 0.2$
No ballast pockets, with canopy, no drogue	$0.037 \times u + 0.1$
No ballast pockets, with canopy, with drogue	$0.03 \times u$
Shallow ballast pockets, with canopy (mean values)	$0.029 \times u + 0.004$
Shallow ballast pockets, with canopy, no drogue	$0.032 \times u + 0.02$
Shallow ballast pockets, with canopy, with drogue	$0.025 \times u + 0.14$
Shallow ballast pockets, with canopy, capsized	$0.017 \times u + 0.1$
Deep ballast pockets, with canopy, unknown capacity and loading (mean values)	$0.03 \times u + 0.015$
4.6 man deep ballast pockets, with canopy, loading and drogue unknown, general (mean values)	$0.029 \times u + 0.04$
4.6 man deep ballast pockets, with canopy, no drogue, loading unknown	$0.038 \times u + 0.04$
4.6 man deep ballast pockets, with canopy, no drogue, light loading	$0.038 \times u + 0.04$
4.6 man deep ballast pockets, with canopy, no drogue, heavy loading	$0.036 \times u + 0.03$
4.6 man deep ballast pockets, with canopy, with drogue, loading unknown	$0.018 \times u + 0.03$
4.6 man deep ballast pockets, with canopy, with drogue, light loading	$0.016 \times u + 0.05$
4.6 man deep ballast pockets, with canopy, with drogue, heavy loading	$0.021 \times u$
15-25 man deep ballast pockets, with canopy, loading and drogue unknown, general (mean values)	$0.036 \times u - 0.085$
15-25 man deep ballast pockets, with canopy, no drogue, light loading	$0.039 \times u - 0.06$
15-25 man deep ballast pockets, with canopy, no drogue, heavy loading	$0.021 \times u + 0.07$
Deep ballast pockets, with canopy, capsized	$0.009 \times u$
Deep ballast pockets, with canopy, swamped	$0.01 \times u - 0.04$
Aviation Life Rafts	$0.037 \times u + 0.11$
4-6 person, no ballast pockets, with canopy, no drogue	$0.037 \times u + 0.11$
Sea Kayak, with person, with aft deck	$0.011 \times u + 0.24$
Personal Water Craft	$0.015 \times u + 0.17$
Home made wooden raft, with sail	$0.019 \times u + 0.17$
Surfboard, with person	$0.02 \times u$
Windsurfer, with person, with mast and sail in the water	$0.023 \times u + 0.1$
Sailing Vessels	$0.03 \times u$
Mono hull, full keel, deep draft, heavy displacement	$0.04 \times u$
Mono hull, fin keel, shoal draft	$0.04 \times u$



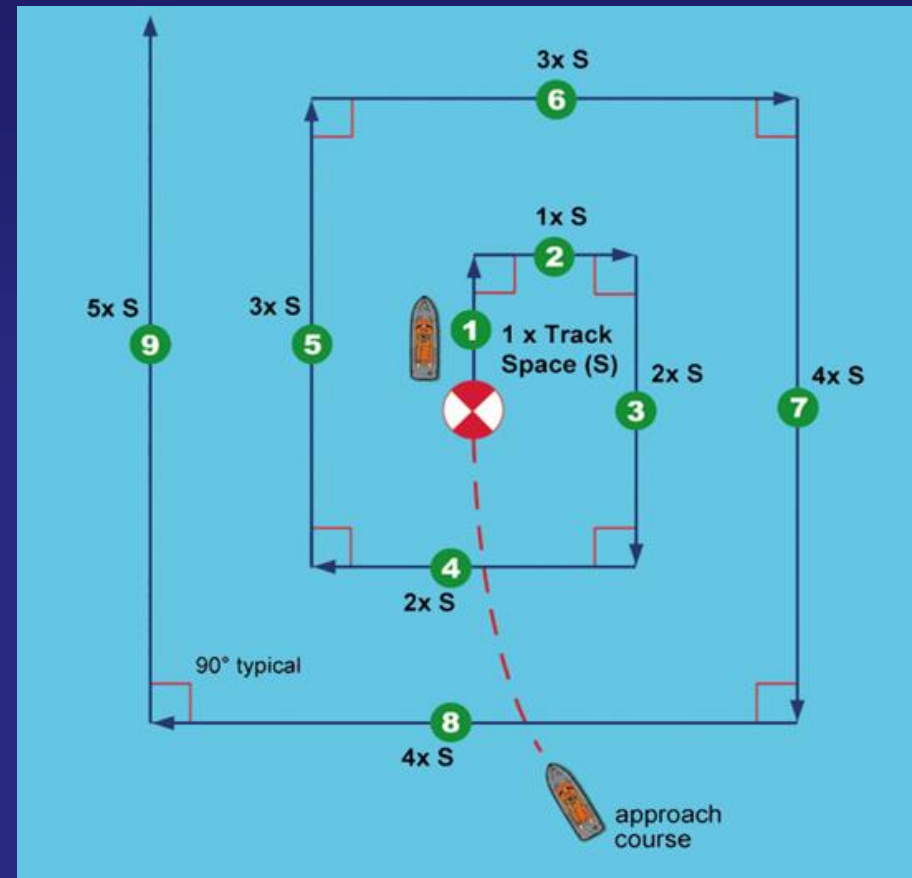
PIW Unknown state (mean values)	$0.011 \times u + 0.07$
PIW with lifejacket	$0.02 \times u$
Vertical	$0.005 \times u + 0.07$
Person In Water (PIW)	$0.012 \times u + 0.004$
Sitting	$0.012 \times u + 0.004$

Inertial Navigation System	0
SATNAV (e.g.: DGPS)	0.1 - 0.5 NM
Visual Three Line Fix	1.0 NM
Radar Fix	1.0 NM
Celestial Three Line Fix	2.0 NM
Marine Radio Beacon (3 beacon fix)	4.0 NM

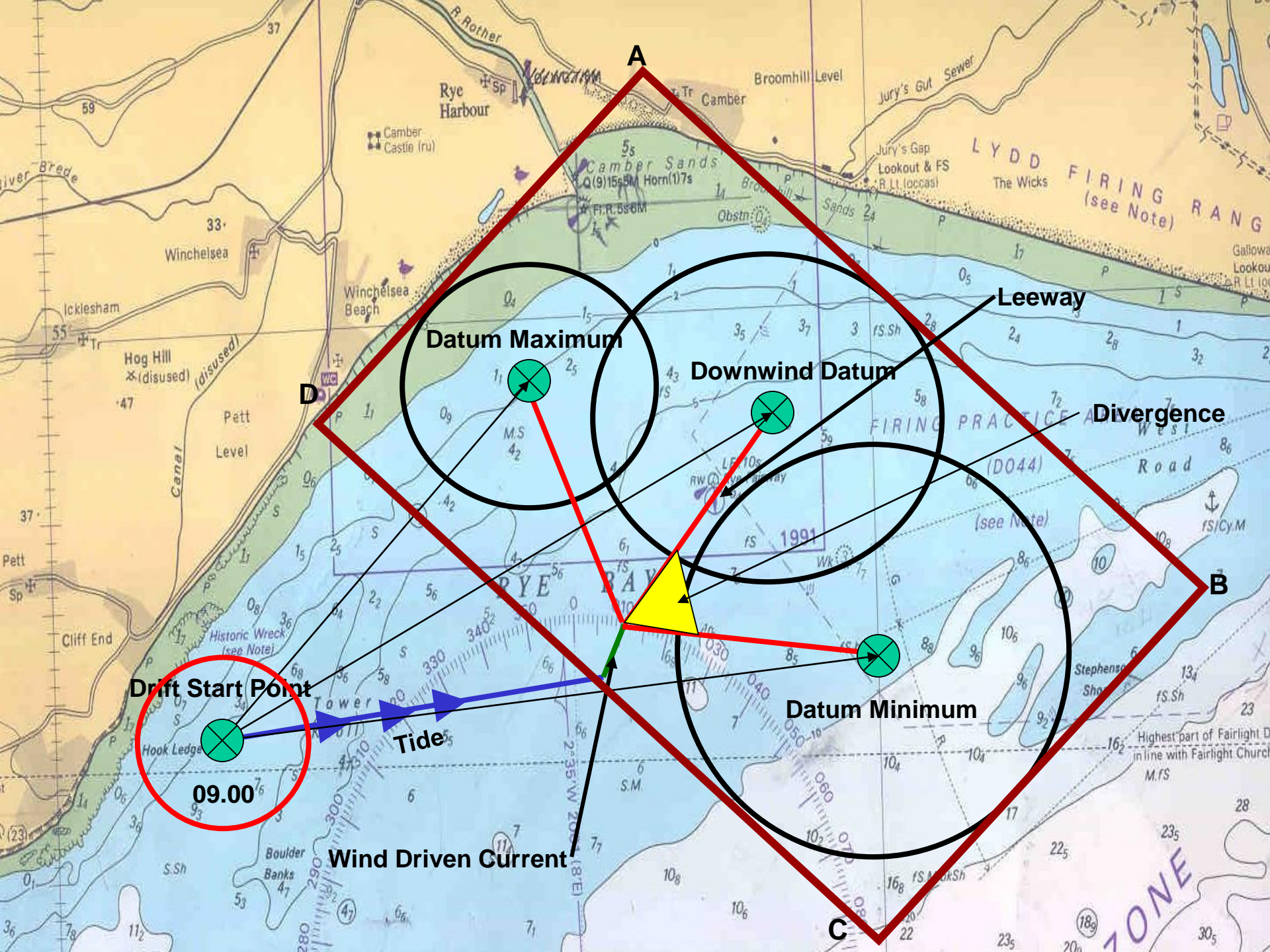
# Datum Searches



Sector



Expanding Square



A

B

C

D

Datum Maximum

Downwind Datum

Datum Minimum

Leeway

Divergence

Drift Start Point

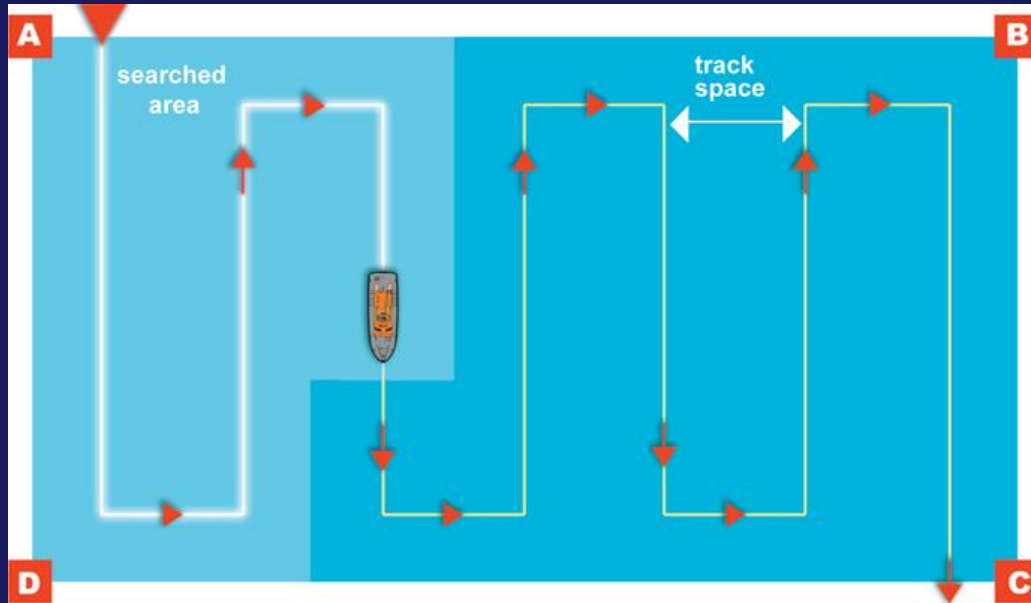
09.00

Tide

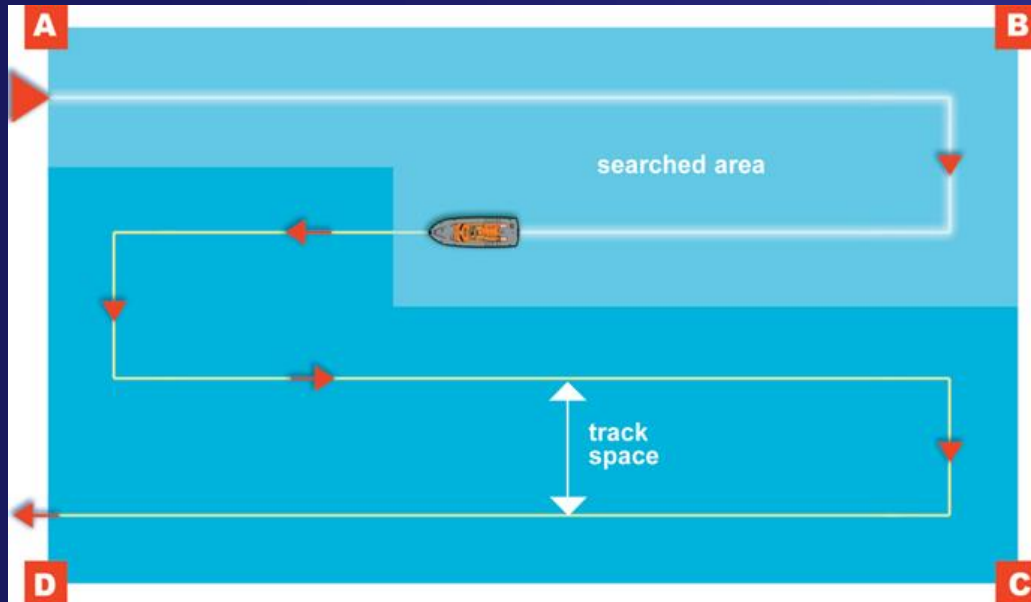
Wind Driven Current



# Area Searches



Creeping Line Ahead



Parallel Track

# What can we do – MOB / Casualty Vessel?

- Call for help early. Wear PPE.
- If required activate electronic devices.
- If anchored, place something in the water (lifejacket / perry buoy with line attached). Notify SMC (CG).
- If not able to support SAR drift – provide updated LKP & radar target.
- Conserve power. Look after yourself and the rest of the crew. Maintain morale!
- Provide as much detail as possible – description, wearing, experience, weather conditions on scene.



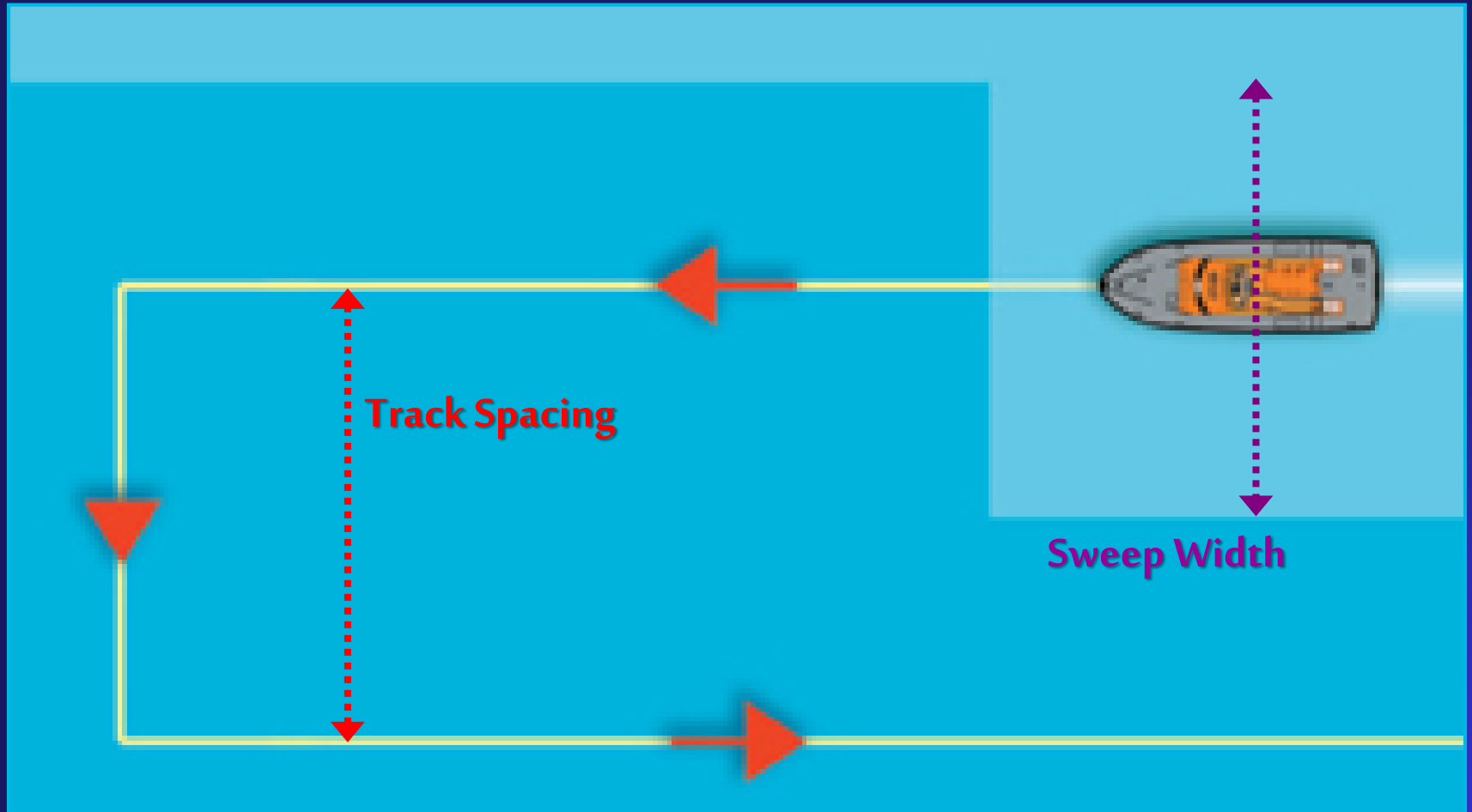
# How can I support the SAR teams?

- If sail go to power.
- Make your way to Last Know Position (LKP) or Commence Search position (CSP) at best safe speed.
- Following direction from SMC or OSC. Support other SAR assets as directed. If unable due to vessel capability, personnel or equipment say so.
- If capable (personnel / equipment ) start a expanding square search
- If not clear on what is required ask!
- Appreciate that you form a larger SAR activity and you may not be aware of all other SAR assets.
- Understand & appreciate the changes of success.



79% P.O.D

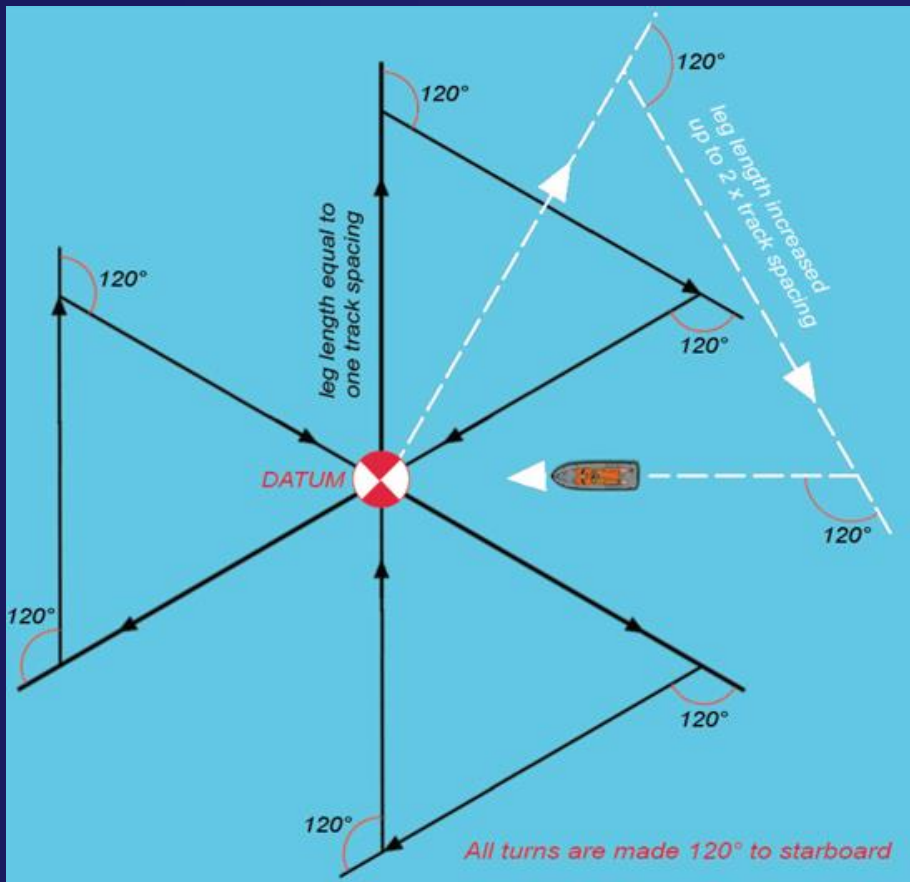
# Track Spacing



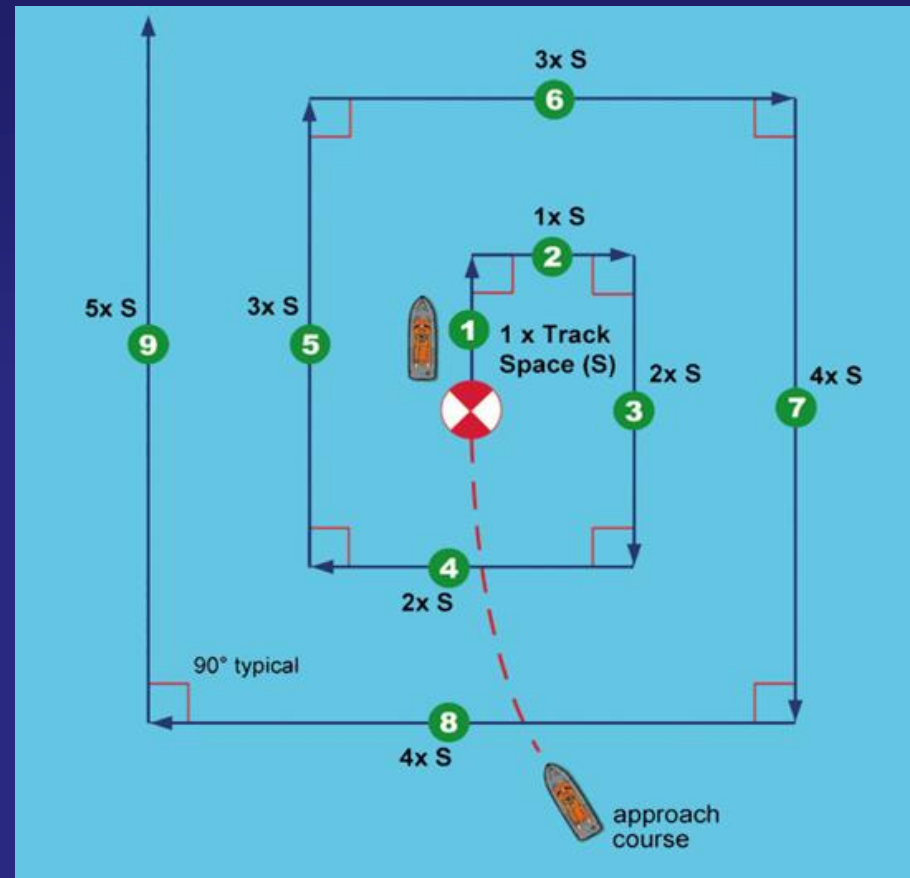
If track spacing is the same as sweep width

then the Probability of Detection is 79%

# Datum Searches

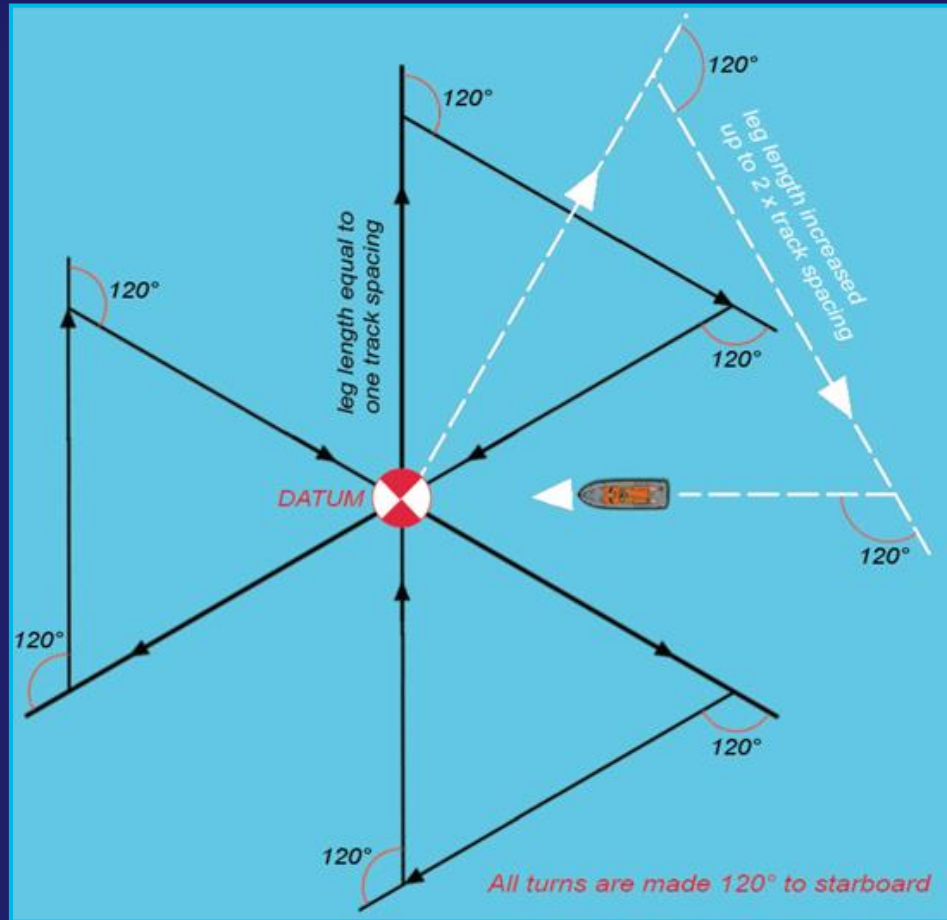


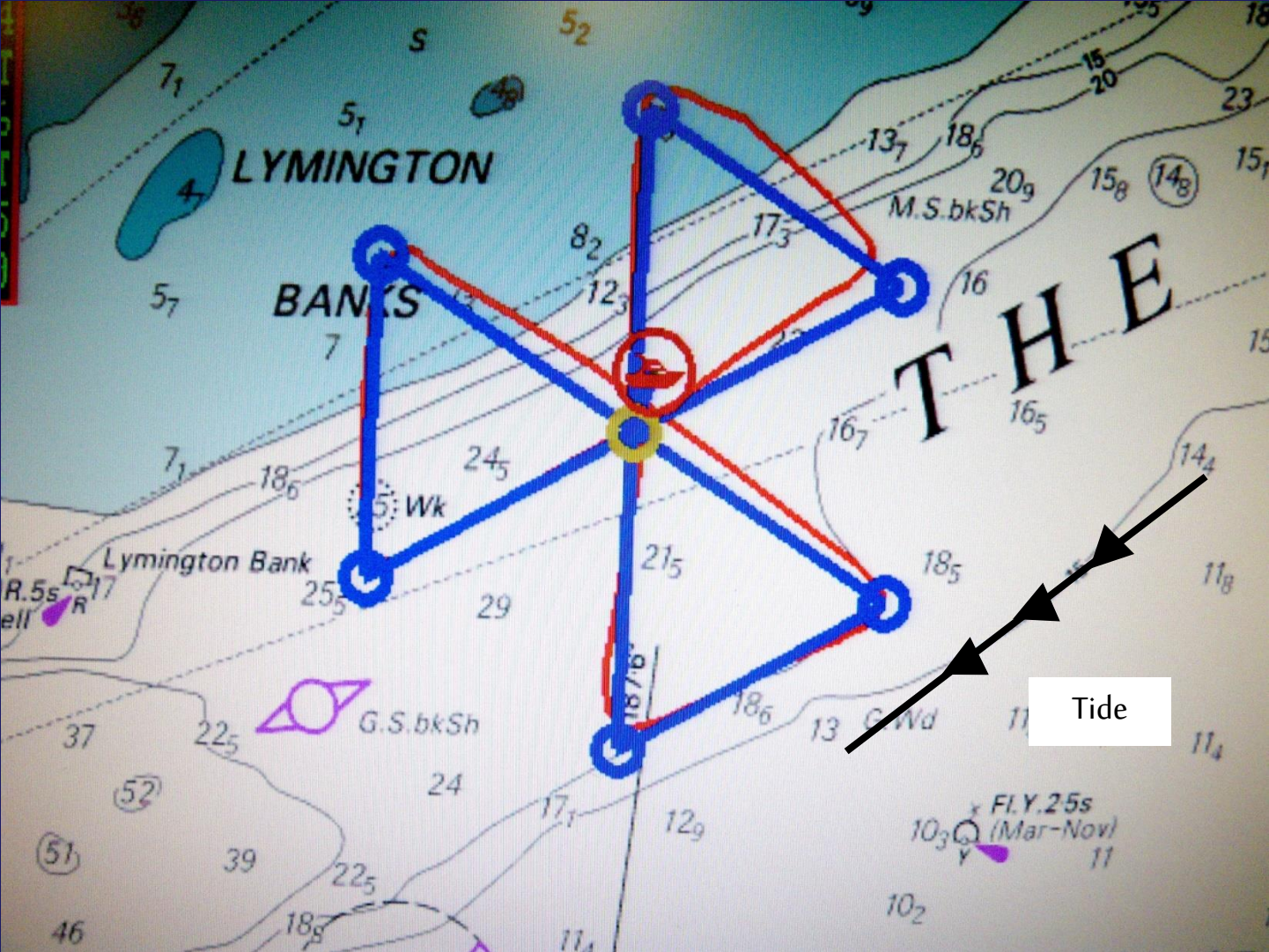
Sector



Expanding Square

# Sector Search





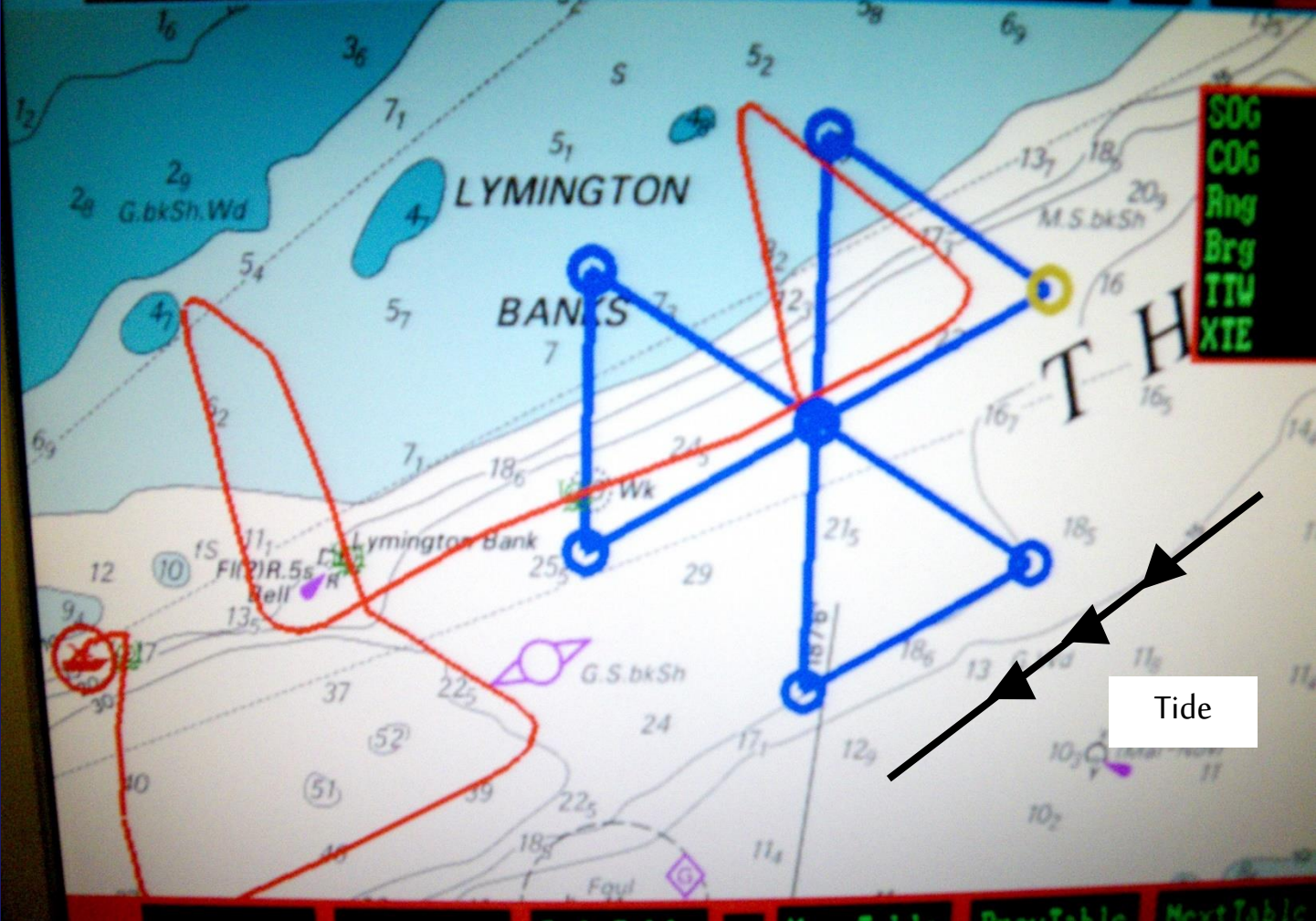
Lat 50:42.990N

Lon 1:31.348W

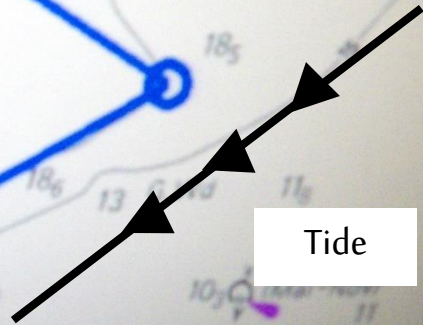
Time 03:51:57

M

1/8



SOG  
COG  
Rng  
Brg  
ITW  
XTE



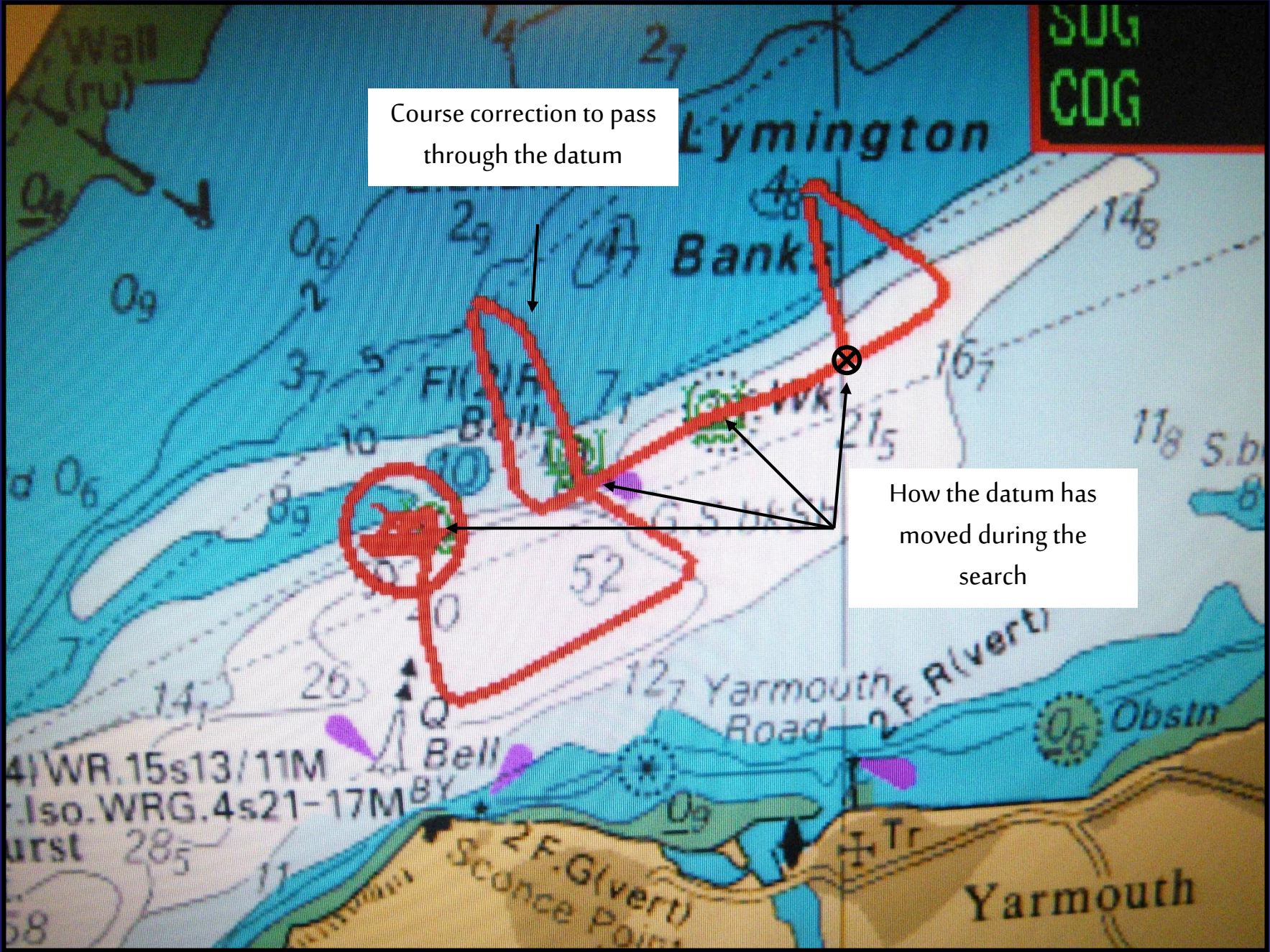
Tide



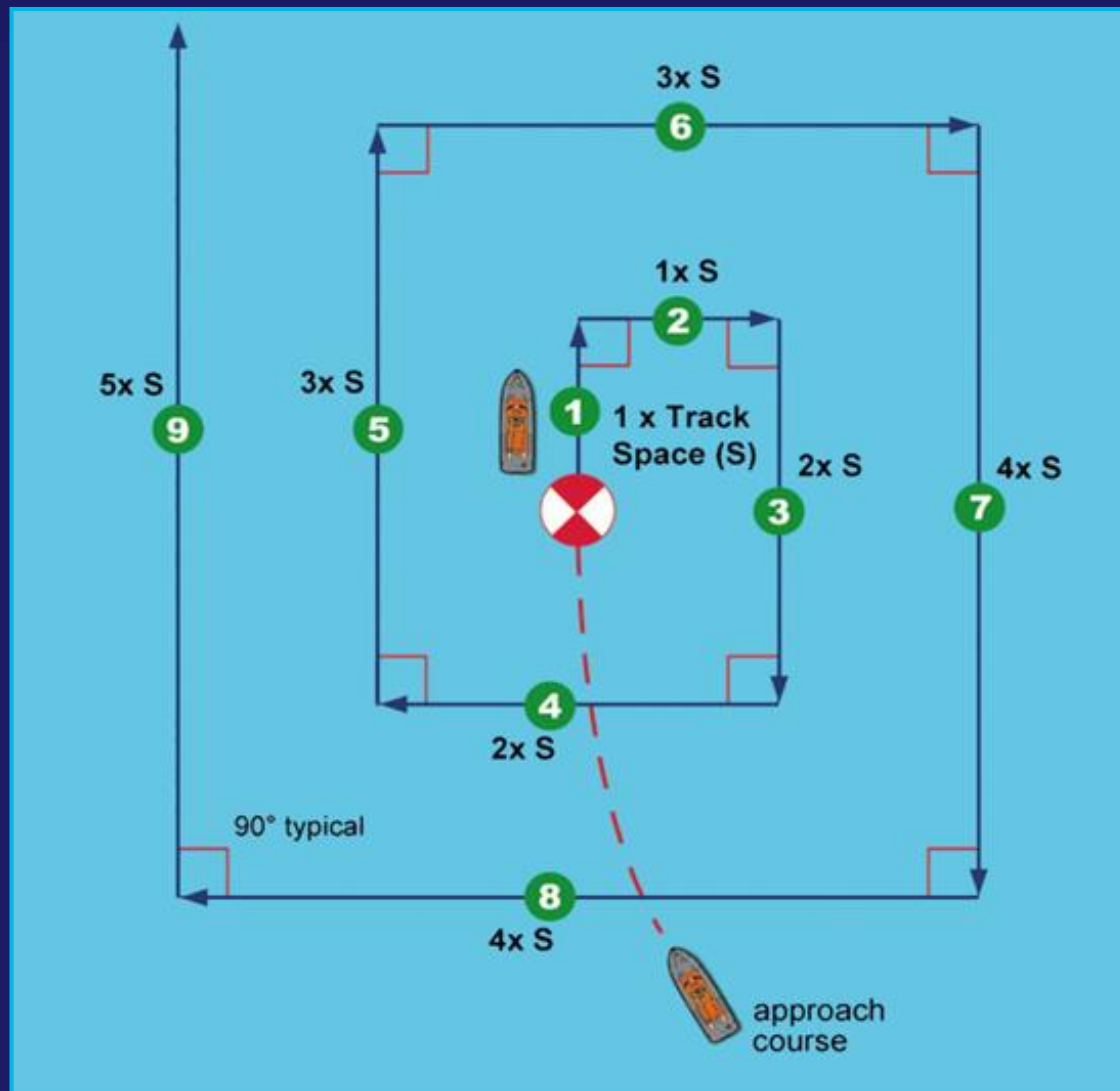
Course correction to pass through the datum

SUG  
COG

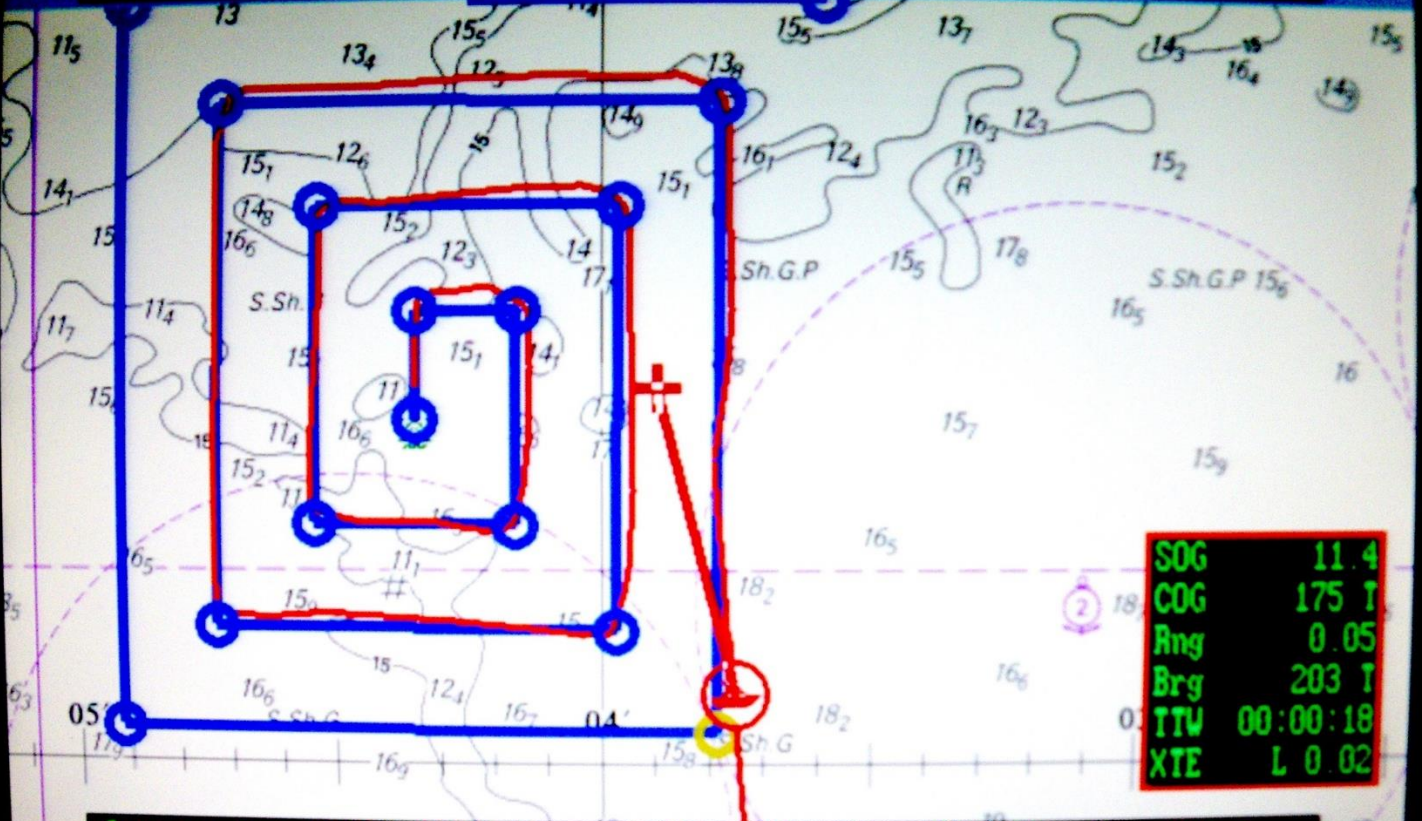
How the datum has moved during the search



# Expanding Square Search



Lat 50 38 38.00N Lon 1:03 75.7W Time 04:37:40



SOG	11.4
COG	175 T
Rng	0.05
Brg	203 T
TTW	00:00:18
XTE	L 0.02

Cursor: Lat 50:38.434N Lon 1:03.900W Rng 0.35 NMi Brg 345 T

Del Table MoveTable PrevTable NextTable

Lat 50:38.560N

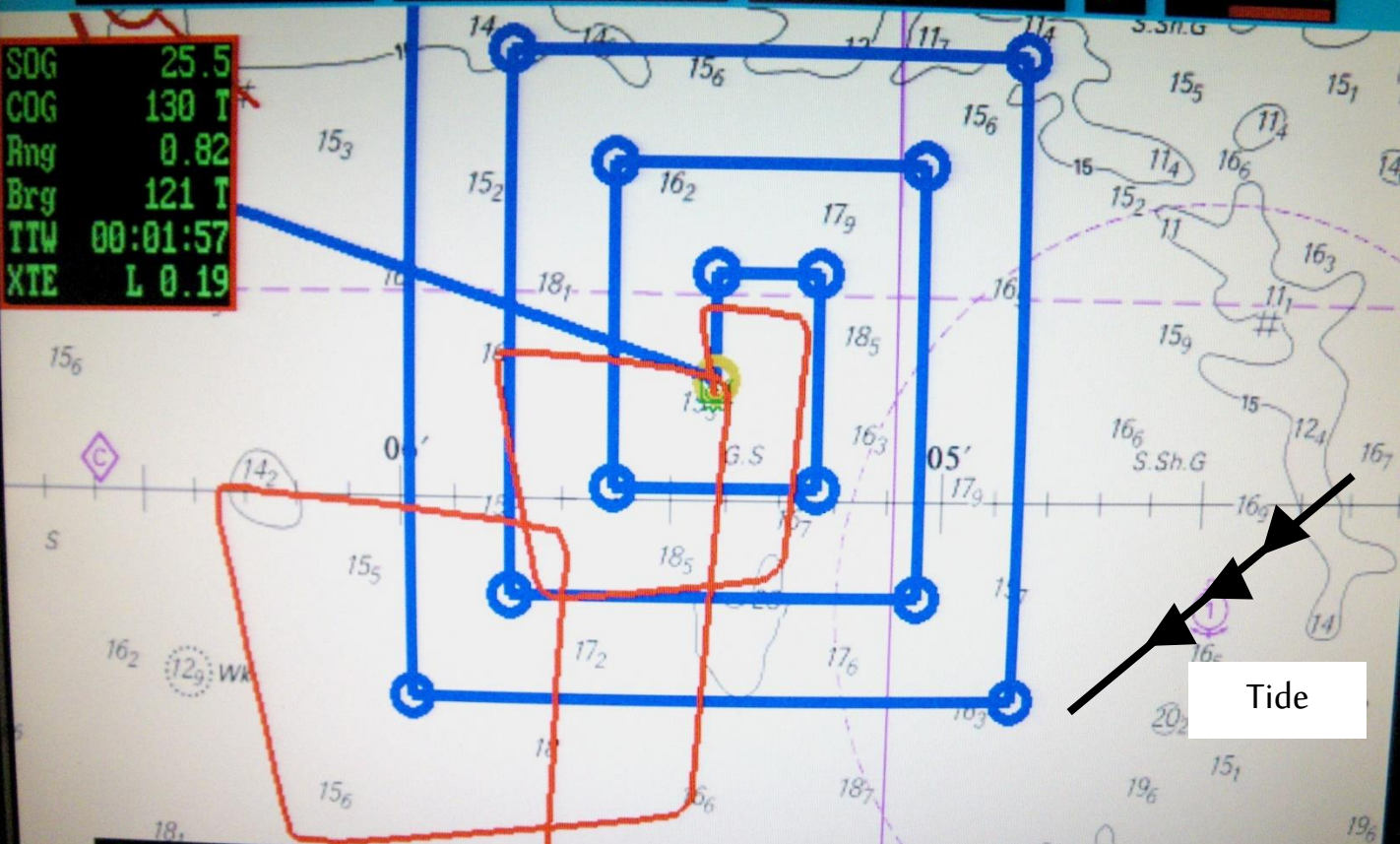
Lon 1:06.523W

Time 06:11:07

M

1/8 Nmi

SDG	25.5
COG	130 T
Rng	0.82
Brg	121 T
TTW	00:01:57
XTE	L 0.19



Cursor: Lat 50:38.313N Lon 1:06.454W Rng 0.43 Nmi Brg 152 T

Routes    Tracks    Nav Tools    WayPoint    Nav Info    Special

Lat 50:37.599N

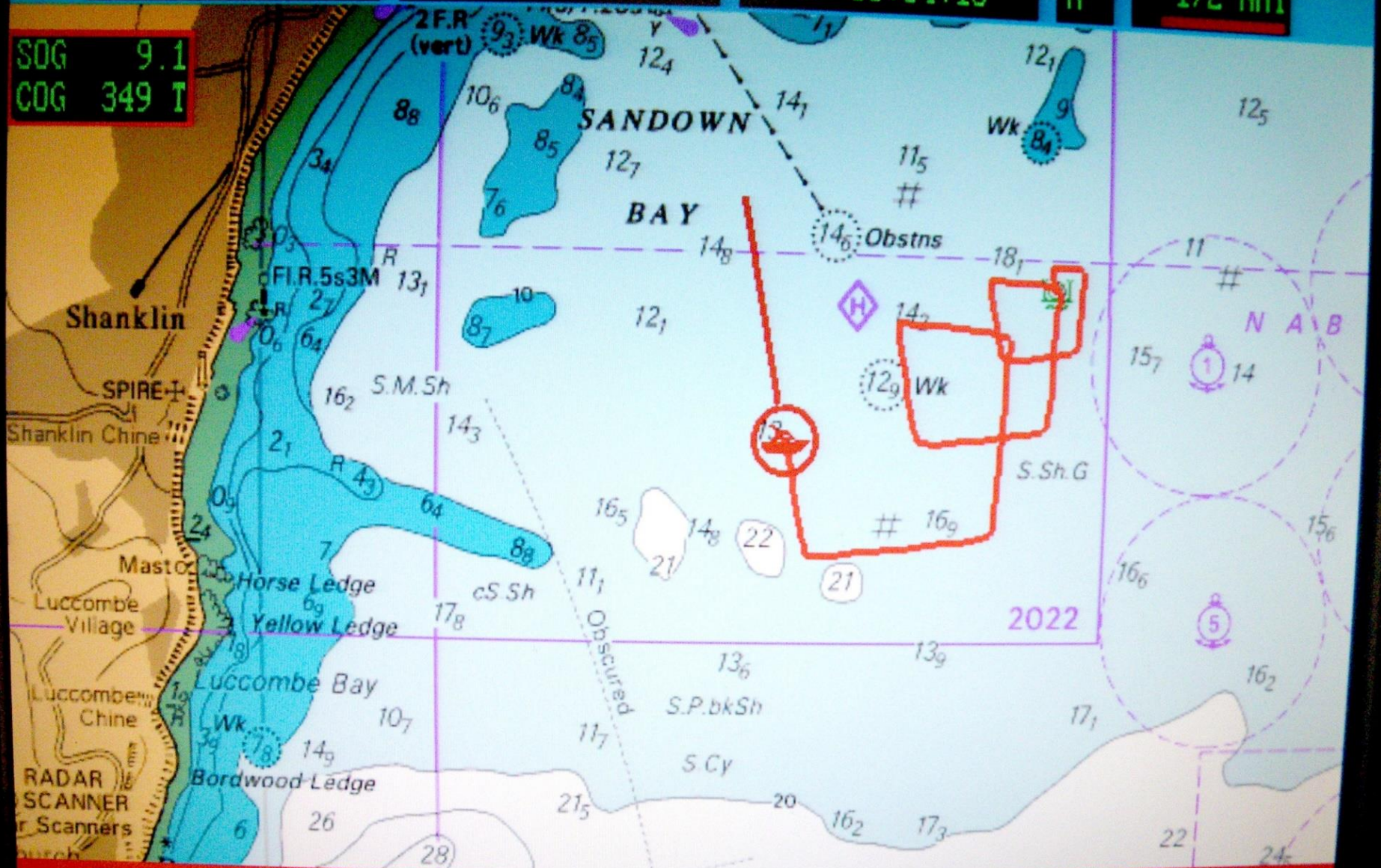
Lon 1:06.993W

Time 06:04:13

M

1/2 NMi

SOG 9.1  
COG 349 T



Routes

Tracks

Nav Tools

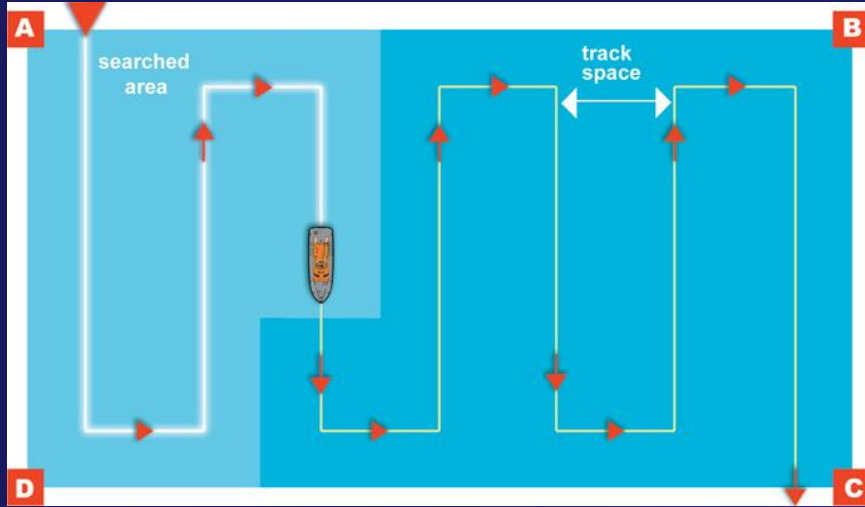
WayPoint

Nav Info

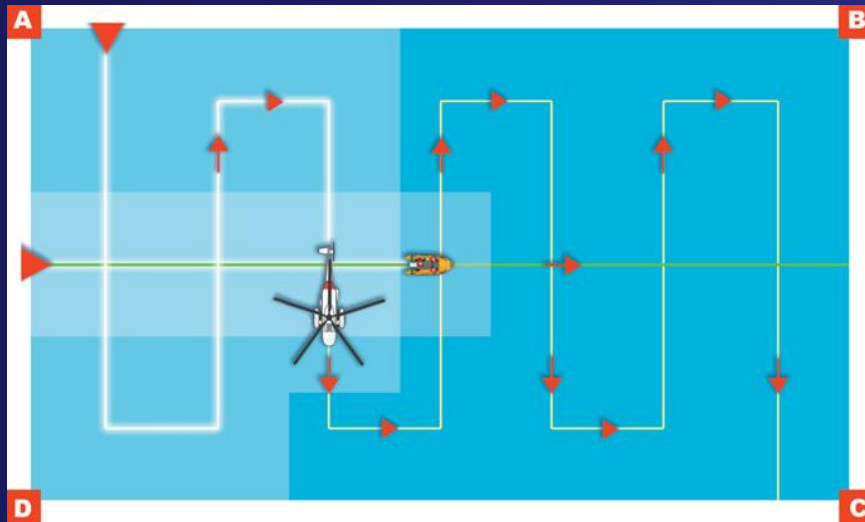
Special

# Area Searches

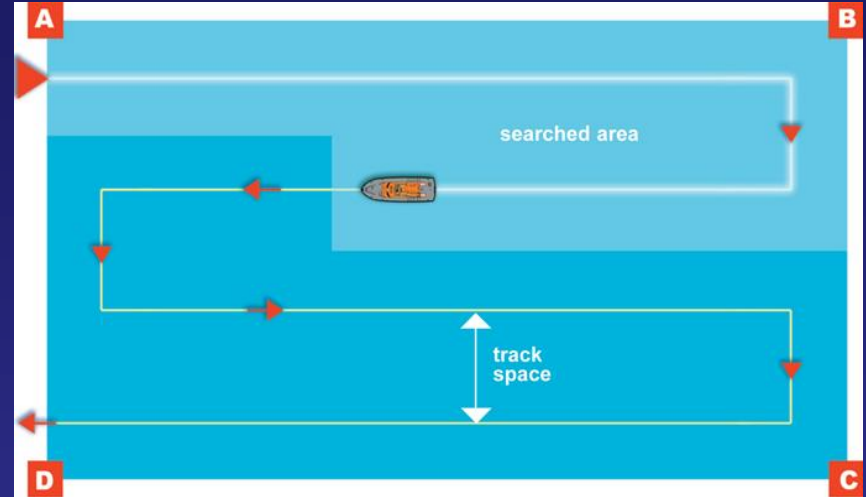
Creeping Line ahead



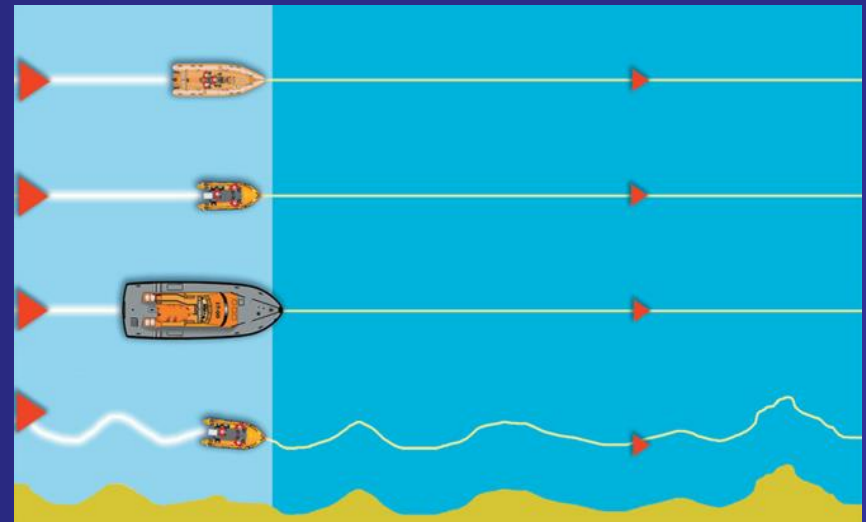
Ship / Aircraft



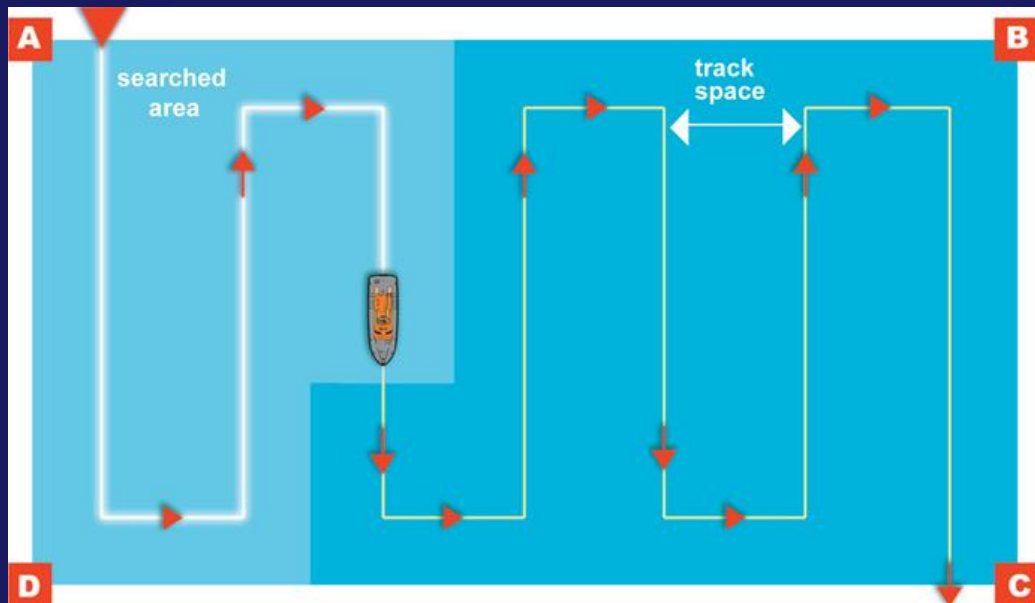
Parallel Track



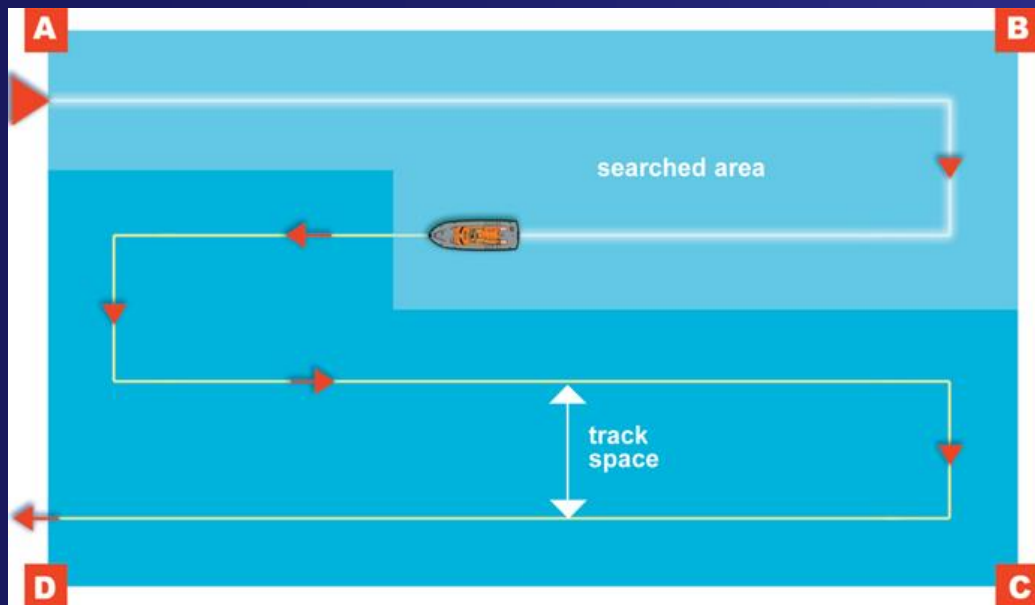
Multi Vessel



# Area Searches

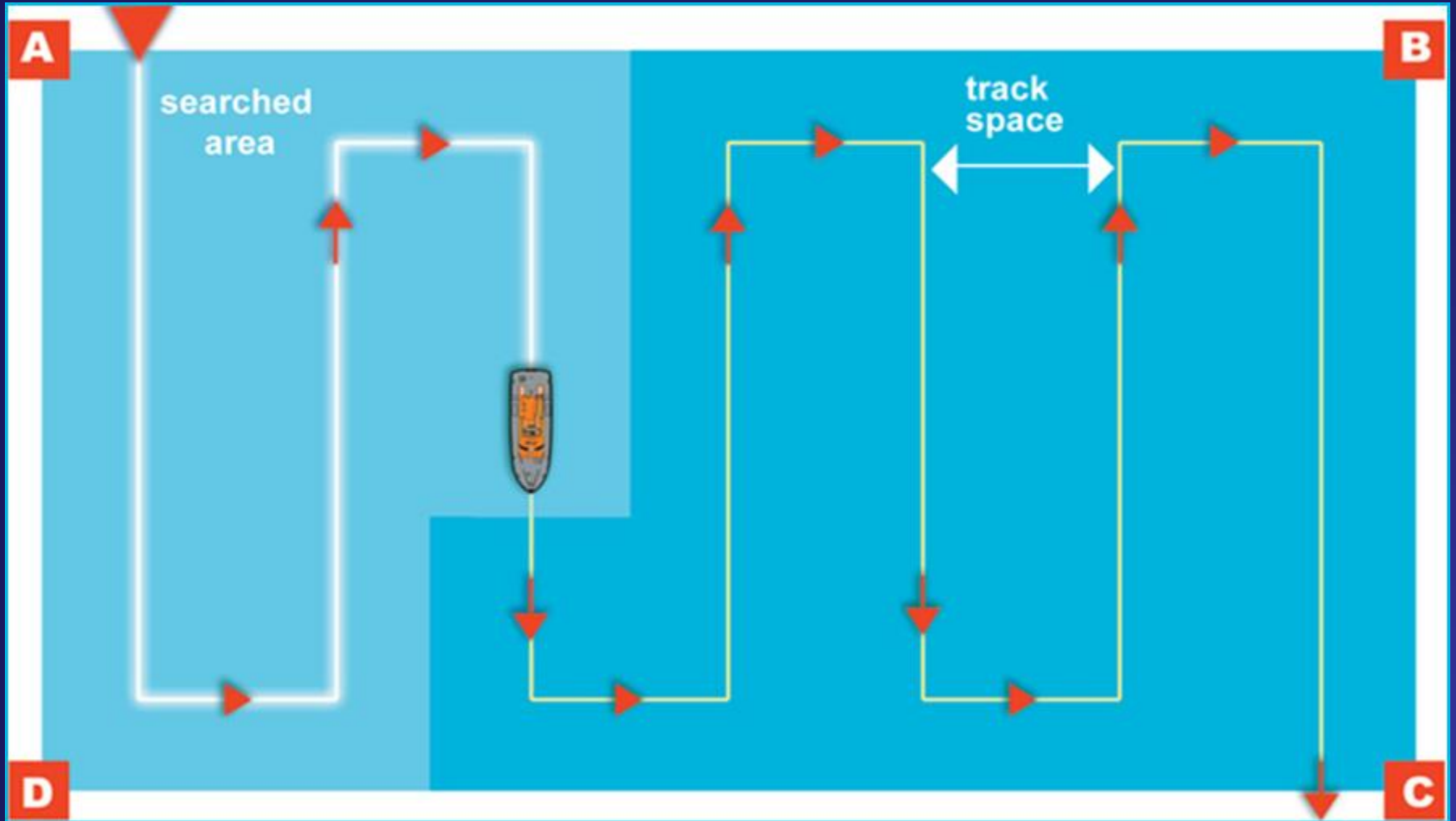


Creeping Line Ahead



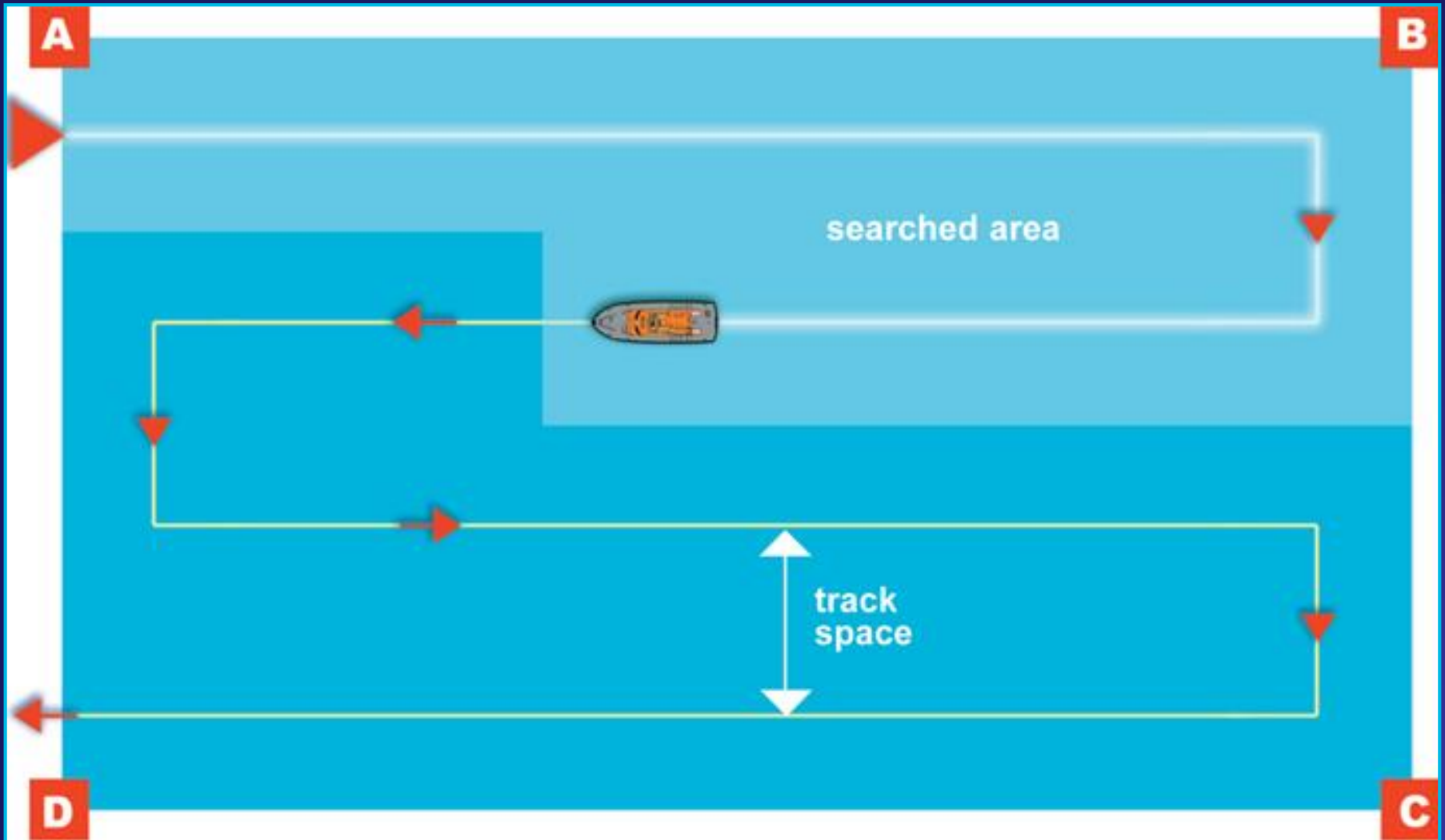
Parallel Track

# Creeping Line Ahead

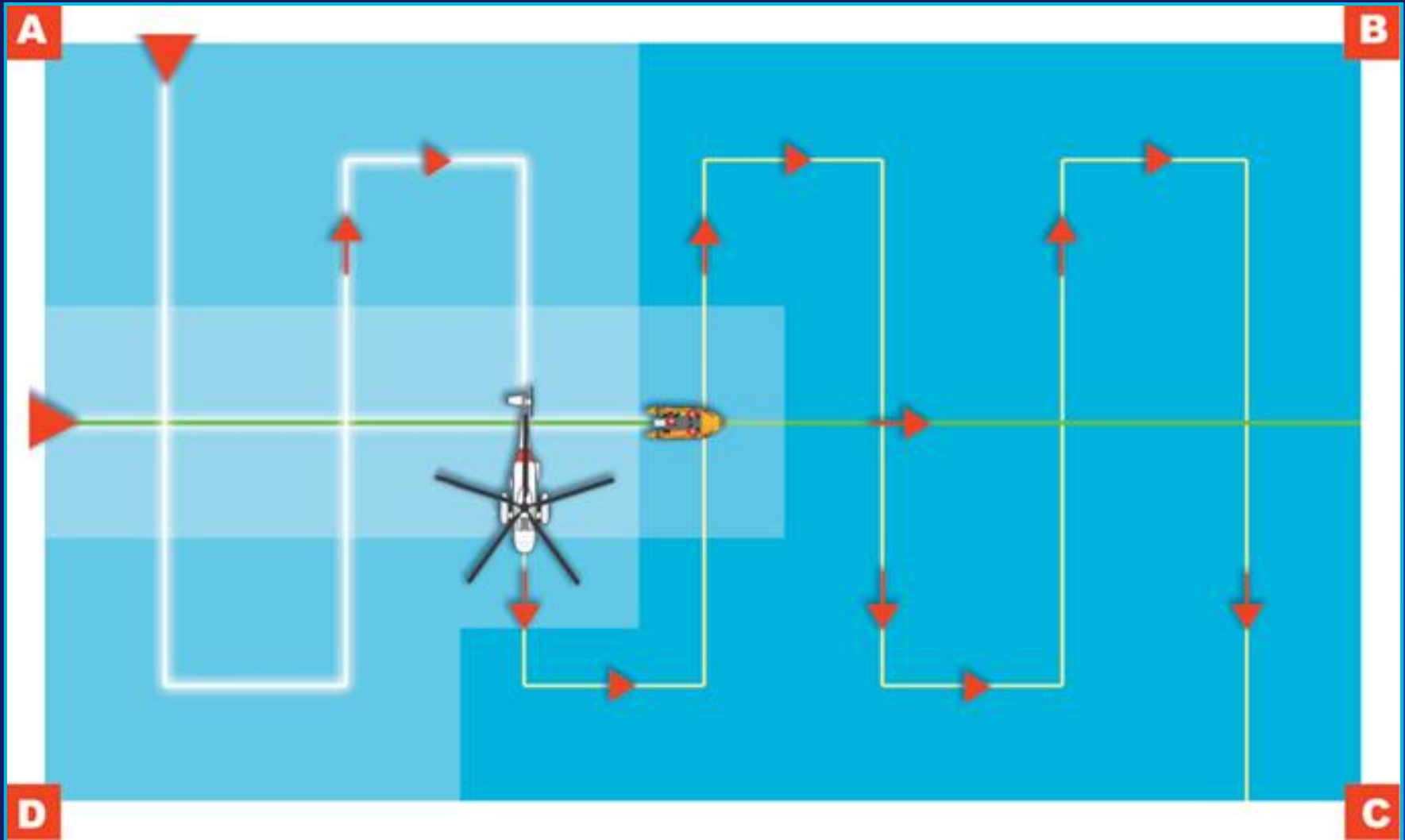




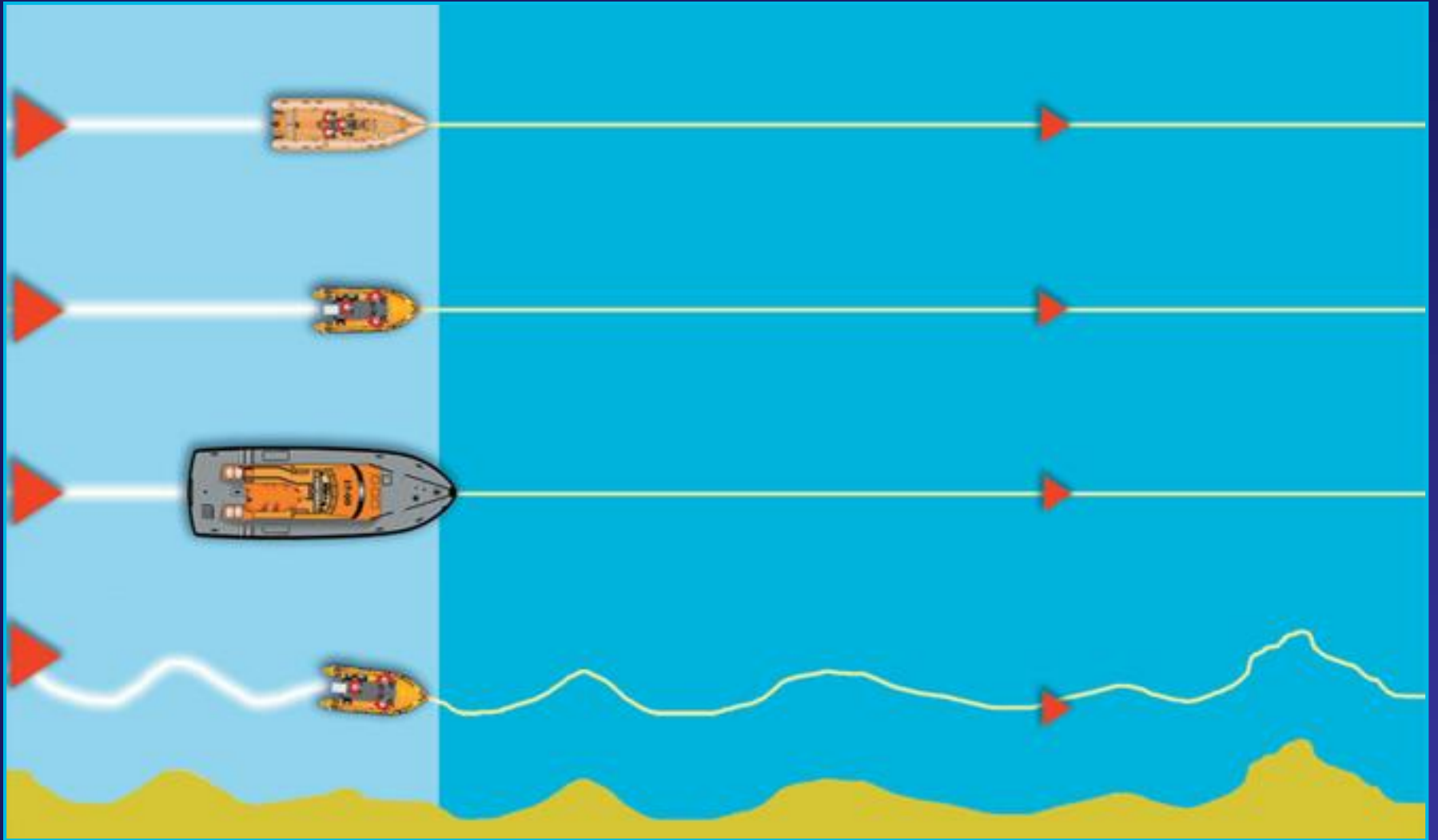
# Parallel Track



# Ship / Aircraft



# Multi-Vessel Search





Lifaboats

The RNLI is the charity that saves lives at sea



[Home](#) > [News Centre](#) > Swanage and Poole RNLI lifeboats launch to search for a missing diver

## Swanage and Poole RNLI lifeboats launch to search for a missing diver

Lifeboats News Release

Date: 24/05/2015

Author: Becky Mack

**Yesterday afternoon on 24 May Solent Coastguard received a call from a dive boat skipper reporting one of their divers had not surfaced in a position South of Swanage.**

Swanage all-weather lifeboat, Poole all-weather lifeboat, Poole inshore lifeboat, and the Coastguard rescue helicopter were tasked to the scene to carry out an extensive search of the area approximately 7 nautical miles south off Peveril Point.

Two dive ribs remained in the area to assist with the search, and other vessels passing through the area were asked to keep a sharp look out.

After over 6 hours of searching all search units were stood down to return to station at 11.45pm.

Our thoughts are with the family and friends of the missing diver.

**Ends**

**RNLI media contacts**

For more information please contact:

Becky Mack, Swanage RNLI Press Office, [Info@swanagelifeboat.org.uk](mailto:Info@swanagelifeboat.org.uk) [07812 558487](tel:07812558487)

Lat 50:30.250N

Lon 1:56.130W

Time 18:55:36

M

4 NMi

SOG	10.1
COG	344 M
Rng	0.45
Brg	348 M
TTW	00:02:41
XTE	R 0.02



Routes

Tracks

Nav Tools

WayPoint

Nav Info

Special



WIDE LEADER IN  
S & FENDERS

73416

574215

1833734



SAR 111232506



Status:  
**Underway**

Speed/Course:  
**44.0kn / 234°**

Destination:  
**Not provided (Class B)**

ETA:  
-

Received:  
**1 min ago**  
(AIS Source: 2172)

- Show Vessel's Track
- Distance to...
- Itineraries History
- Position History
- Port Calls
- Nearby Vessels

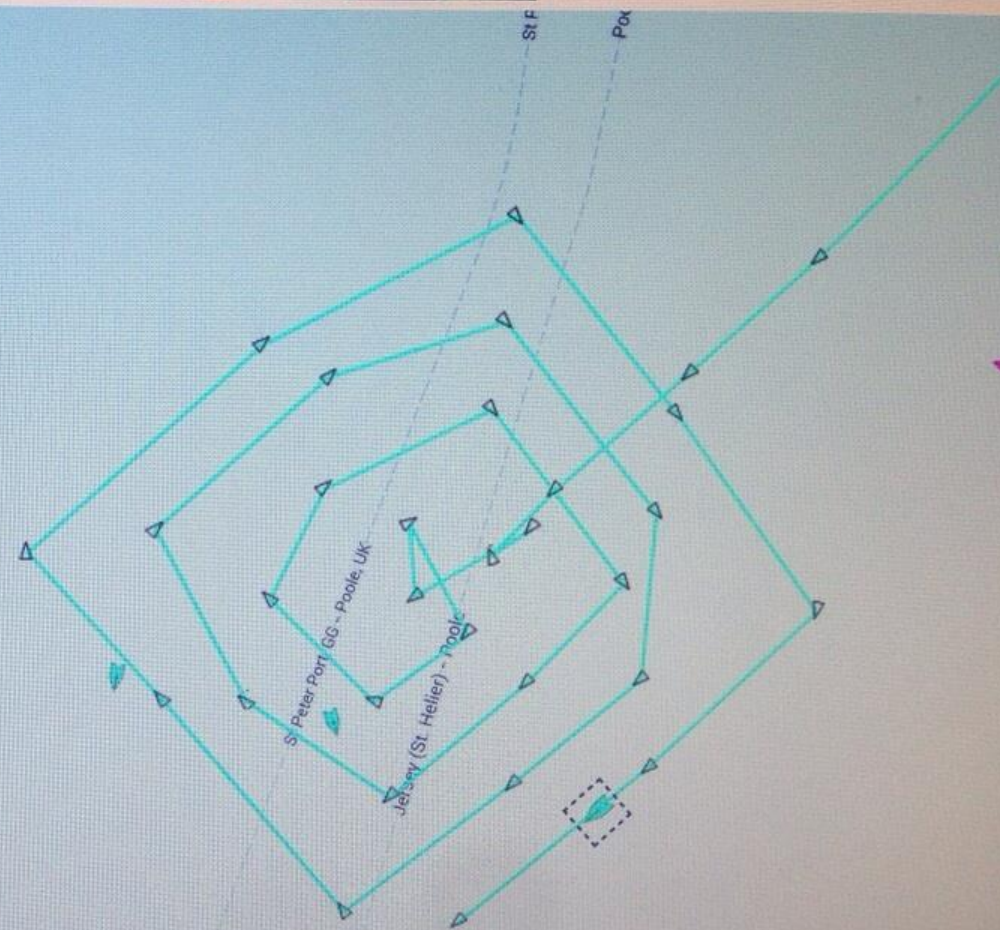
Add to Fleet

Vessel's Details >

Type:  
Aircraft

Length x Breadth:  
0m

Weight:



Show Track Options

Keen IO - IoT Analytics  
The tracking database for millions  
of connected devices.

Map data ©2015 Google Terms

View all >

Port Calls

My



Lat 50:28.400N

Lon 1:55.740W

Time 18:16:54

M

1/2 NMi

SOG	11.9
COG	341 M
Rng	2.30
Brg	350 M
TTW	00:11:46
XTE	L 0.02



Routes

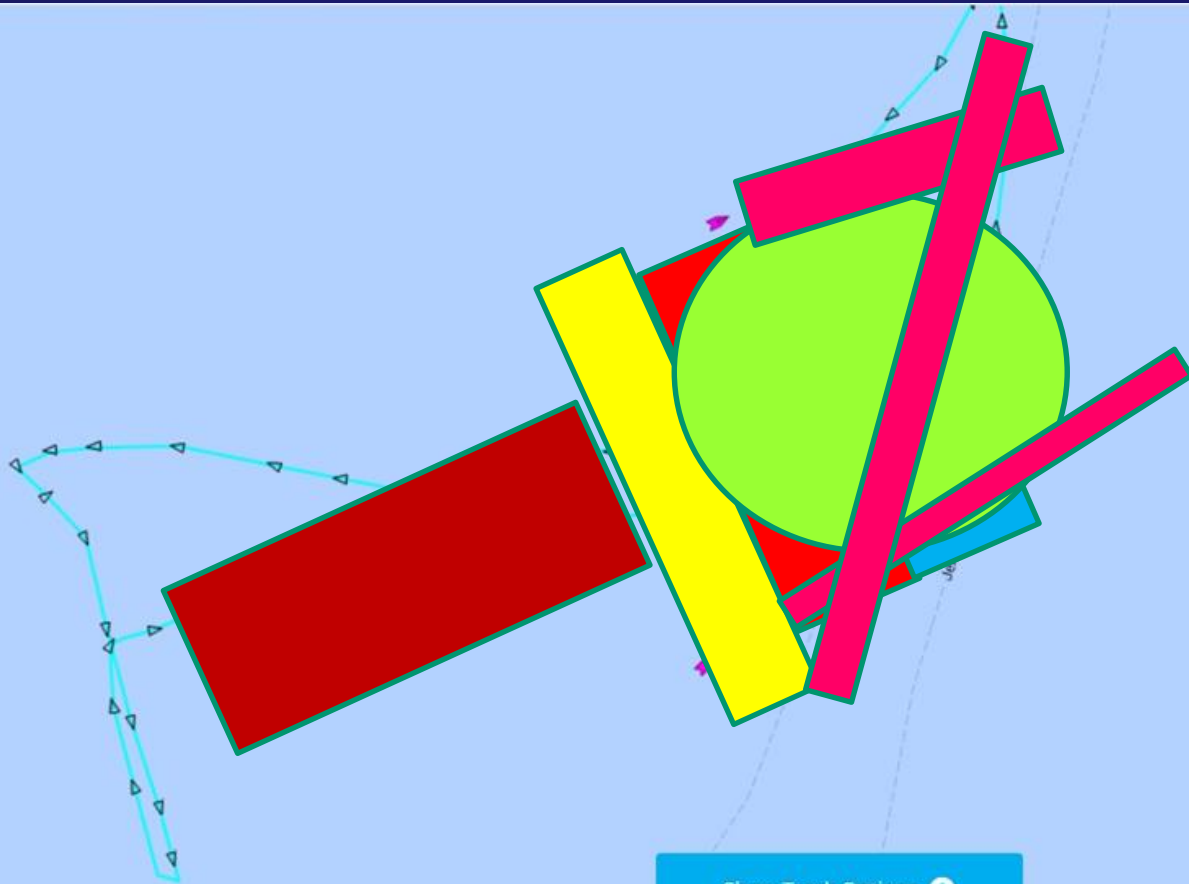
Tracks

Nav Tools


WayPoint

Nav Info

Special



N50°26'05.29"  
W001°53'19.02"  
(50.4348, -001.888)

Show Track Options 

Canoeing In London 2015  
Pick Up A Paddle And Challenge  
Yourself For Go Canoeing Week.

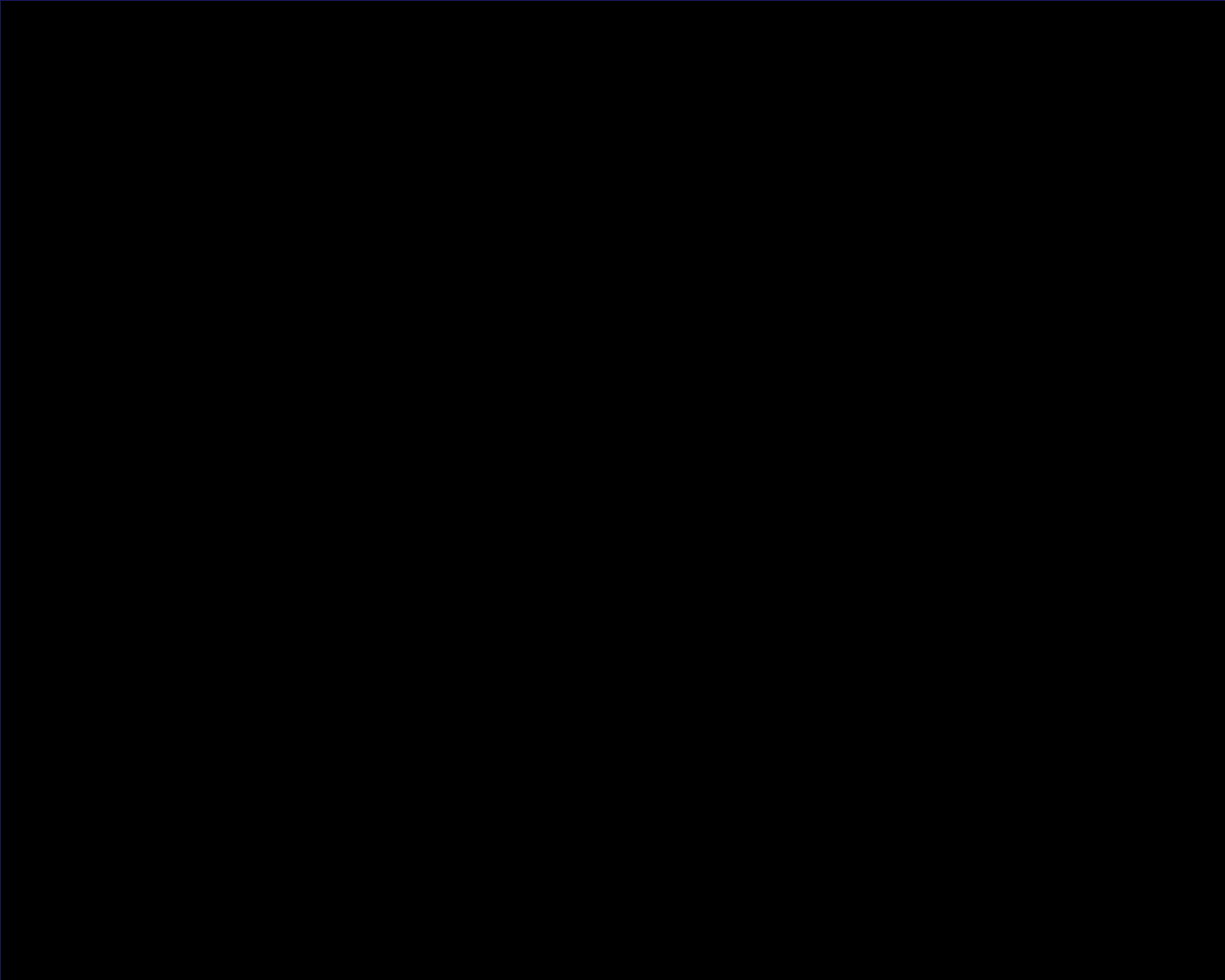


Map data ©2015 Google 1 km  Terms

Thank you  
for your support!



Lifecoats





Lifaboats

# A RNLI perspective

# Beacon Strengths and Limitations



Lifeboats

- Manually activated only
- Must have a clear view of the sky
- Do not float
- Unlimited Range
- Contact directly to the rescue services
- Can be used on the land as well as the sea

# AIS devices strengths and limitations



Lifeboats

- Has a range of around 5 miles in open water.
- Not monitored as a method of calling for help.
- Sends a message to everyone with AIS receiver, class A or B
- Is not a recognised way of calling for help
- Can be automatically activated
- Not all AIS receivers show the same information