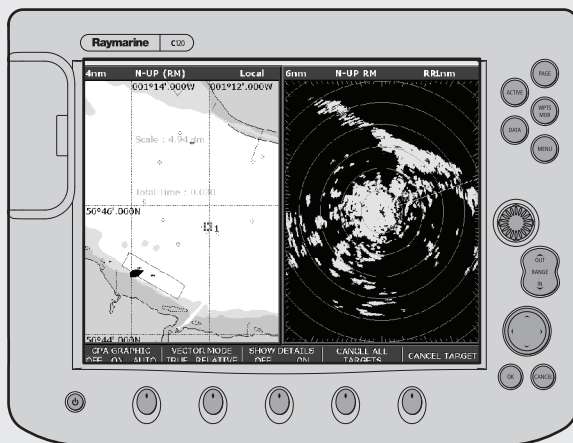


C-Series Display

Operating Guide

Raymarine®
www.raymarine.com



General Operation

The control panel	Card 1
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Using CompactFlash cards	Card 4

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AIS	Card 13

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Monitoring a course	Card 14
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What's under the boat?

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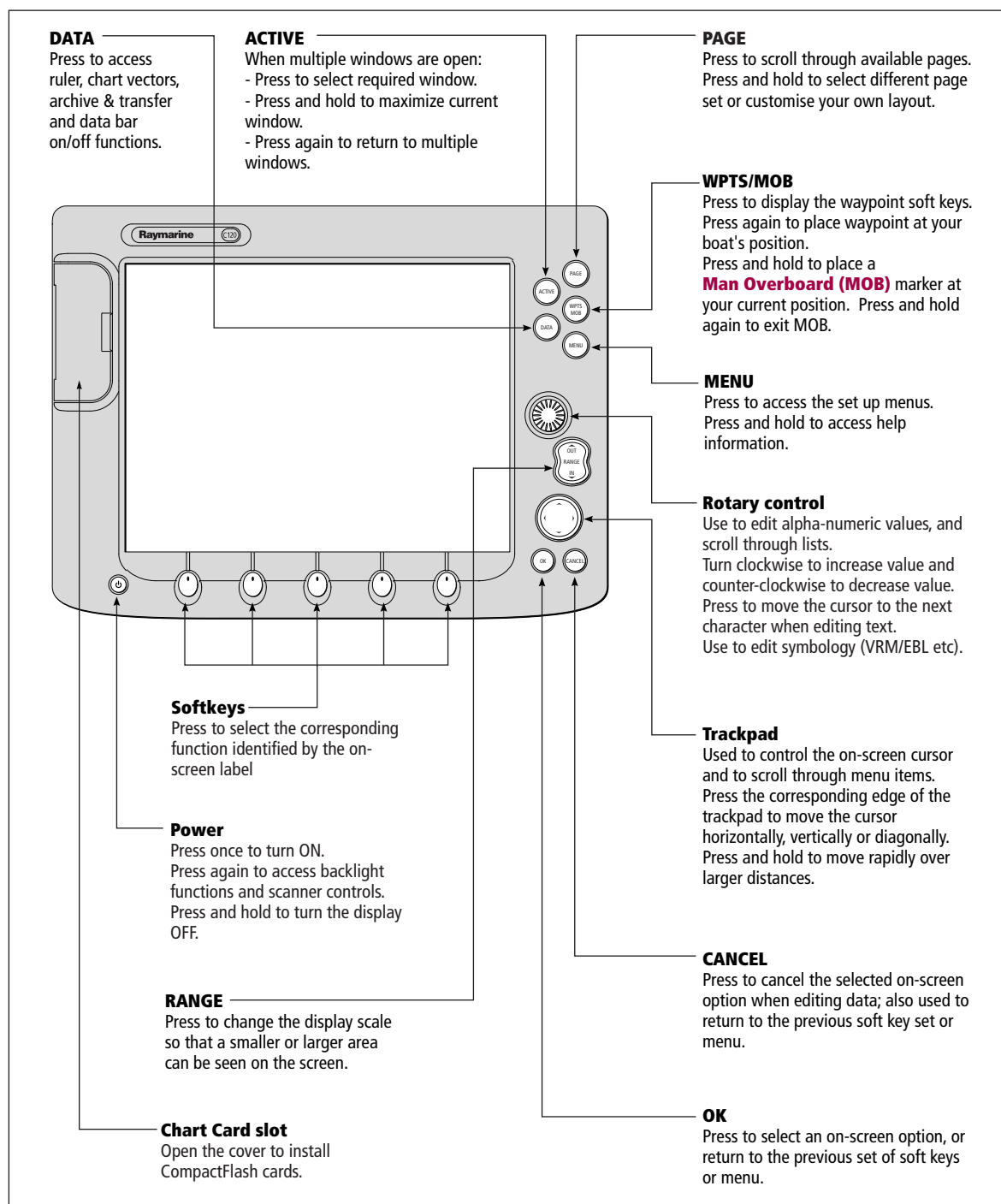
Other functions

Monitoring data and engines	Card 17
Navtex	Card 17

General Operation

The control panel

Card No. 1



WARNING: NAVIGATION AID

This unit is only an aid to navigation. Its accuracy can be affected by many factors, including equipment failure or defects, environmental conditions, and improper handling or use. It is the User's responsibility to exercise common prudence and navigational judgements. This unit should not be relied upon as a substitute for such prudence and judgement.

Always keep a proper look-out.

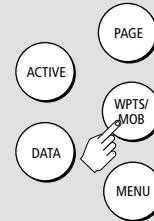
General Operation Using the controls

Card No. 2

How do the controls work?

Buttons

- Access system functions or change what you see on-screen. Within the text of this document they are written in bold capitals e.g. **WPTS/MOB**.
- Press and hold to access short cuts - see individual buttons on facing page.

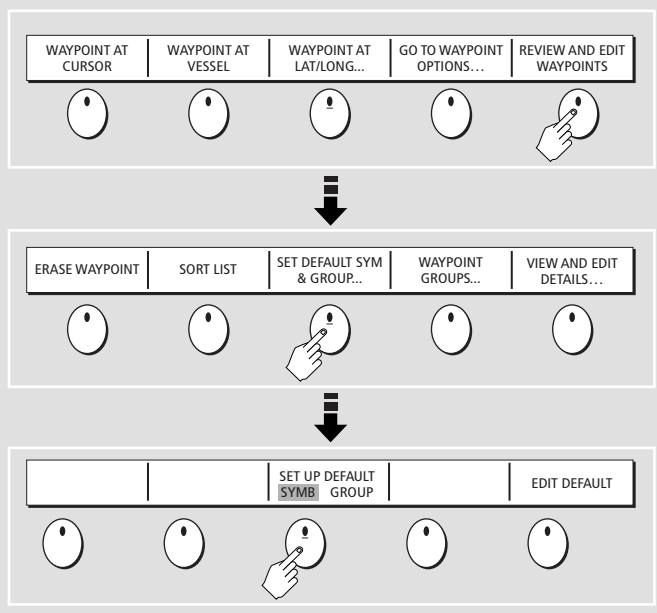


Example:

This example shows the series of button and soft key presses required to change the waypoint default symbol or group.

Soft keys

- They change depending on application or function being performed.
- Press and hold **MENU** to display help information for the currently displayed soft keys.
- Press the corresponding key (below the screen) to select.
- Further soft keys may be displayed. If a key has several options, each press will highlight the next option.
- If a key displays a single value or a slider above, use the rotary control to adjust.
- Within the text of this document they are written in capitals e.g. SORT LIST.



This process of pressing buttons and soft keys to navigate to the required function, is simplified within this guide and represented by a strip e.g.



The Cursor



The Cursor appears on the screen as a white cross.



To make it easier to locate on screen, the cursor changes to a circle with a cross in it, when it is moved after a 10 second period of inactivity.



The cursor is context-sensitive. When it is placed over an object e.g. a waypoint or chart feature, it changes color and a label or information associated with the object is displayed. When you place the cursor over certain items, the soft keys change to enable you to access related operations.

Simulator:

To practice using your Display without data from a GPS scanner or fishfinder, switch on the simulator via the System Setup menu.

General Operation

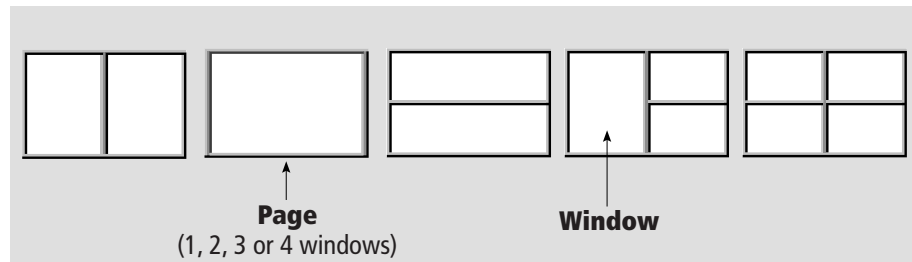
Setting up the display

Card No. 3

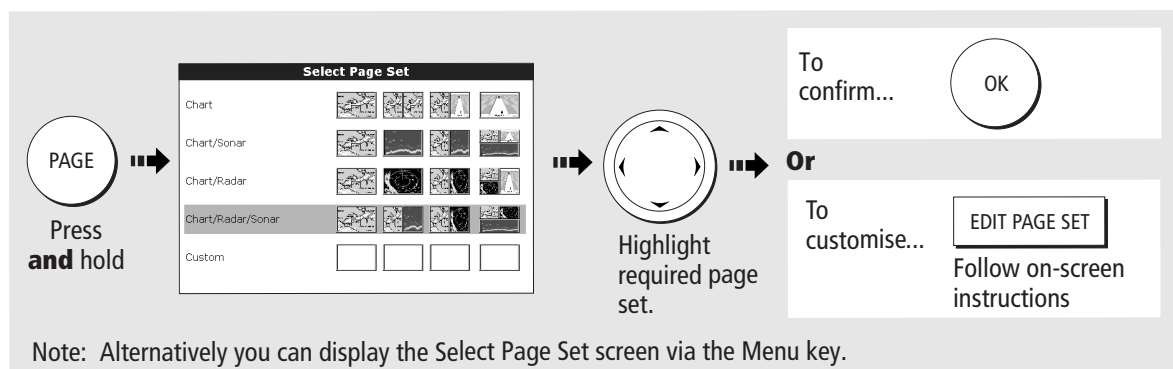
How do I select how the applications are displayed?

The applications are shown using a combination of page sets, pages and windows. There are five page sets each containing five pages with a combination of windows and applications in each. These sets can be edited to define the combination that suits your particular needs.

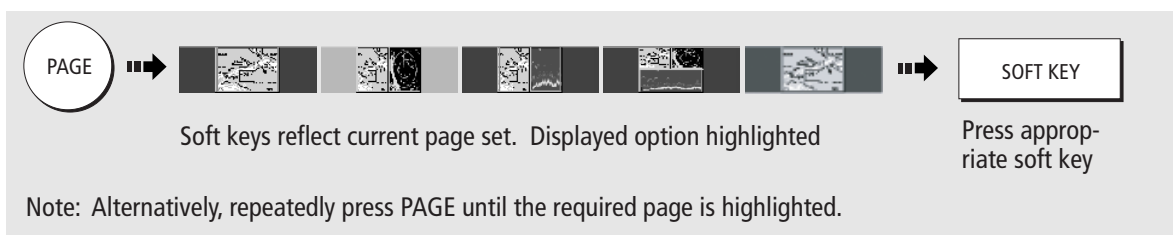
Any changes you make will be saved to the system. You can change these preferences as many times as you wish.



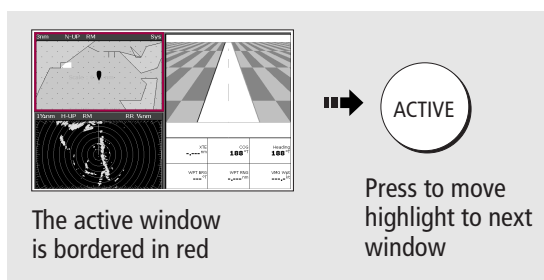
How do I select the Page Set?



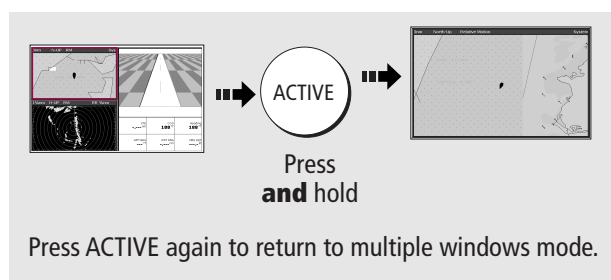
How do I select a Page?



How do I select a Window?



To temporarily maximise active window:



? More information See the 'General Operation' chapter of the Reference Manual

General Operation

Using CompactFlash cards

Card No. 4



CAUTION

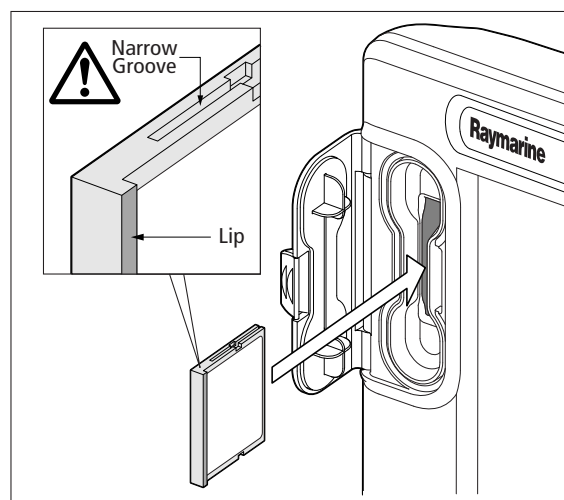
CompactFlash Card

In order to protect your C-Series Display and CompactFlash cards from irreparable damage, please adhere to the following:

- Fit the card the correct way around. **DO NOT** force.
- Ensure card door is firmly closed at all times.
- **DO NOT** use a metallic instrument (e.g. screwdriver or pliers) to aid card removal.
- Follow the correct procedure for removing a card (see below).
- **DO NOT** remove card during either a read or write operation.

How do I insert a CompactFlash card?

1. Check that you are using the correct type of card. Raymarine recommend Navionics Chart cards or SANDISK CompactFlash cards.
2. Open the chart card door, located on the front left of the display.
3. Insert the card as shown, with the lip of the card facing inwards. It should position easily. If it does not, **DO NOT** force it, check the direction in which the lip is facing.
4. Gently press the card home and then firmly click the chart card door shut.



How do I remove a CompactFlash card?

... with the unit powered

1. Press **MENU**. The Setup menu is displayed.
2. Use trackpad (up/down) to highlight and then (right) to select CF CARD REMOVAL. The system will now complete its checks.
3. When instructed to do so, open the chart card door and remove the card.
4. Firmly click the chart door shut and press **OK** twice.

... with the unit powered down

1. Open the chart card door.
2. Grip the card and pull to remove it from its slot.
3. Firmly click the chart card door shut.



More information... See the 'General Operation' chapter of the Reference Manual.

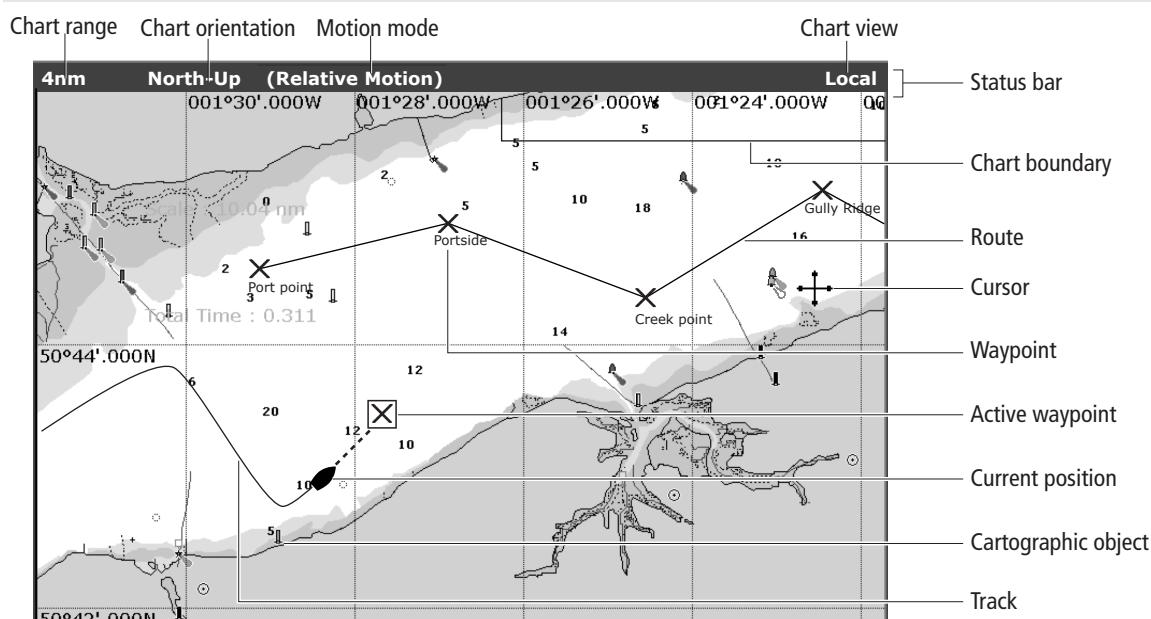
What can I see? Understanding the chart

Card No. 5



What can I use the chart for?

- Find where you are.
- Interpret your surroundings.
- Place waypoints at specific locations.
- Navigate to a specific point.
- Monitor where you are going.
- Record where you have been.
- Measure the distance between two points.
- Build and follow routes.
- Manage and edit routes and tracks.
- Distinguish between fixed & moving objects (radar overlay).



How do I move around the chart?

To change the scale:



- Press **RANGE (OUT)** to see a larger area of the chart.
- Press **RANGE (IN)** to see a smaller area in more detail.

To pan the chart:



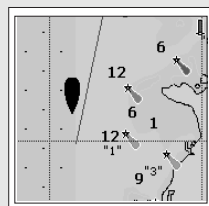
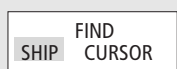
- Moves cursor. When cursor reaches window edge, chart pans to a different area.
- Press and hold to pan larger areas.

How do I find where I am on the chart?



The boat symbol indicates your position.

If you cannot find your boat symbol :



The screen automatically pans to your boat's position and re-activates the motion mode (see Card 6)

? More information ... See 'Using the Chart' chapter of the E-Series Reference Manual

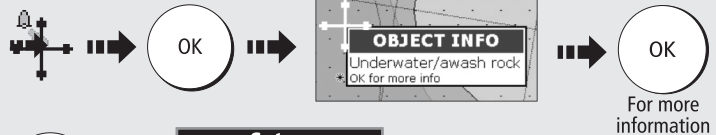
What can I see? Using the chart ...

Card No. 6

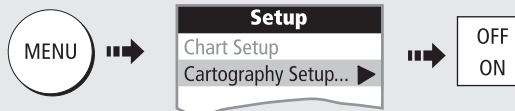


Viewing detail on the chart

- Display additional information on a cartographic feature:



- To show/hide individual cartographic features:



- To show/hide pre-set cartographic features:



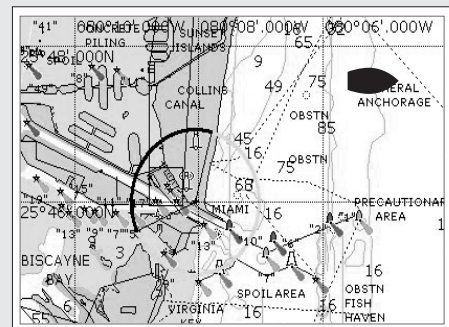
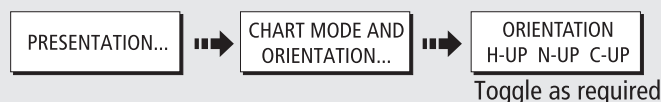
How do I change the chart orientation?

The **orientation** of the chart refers to the relationship between the chart and the direction you are travelling in. It is used in conjunction with motion mode (see below) to control how your boat and chart relate to one another and how they are displayed on screen. The default mode is **North Up (N-UP)**. This displays your chart with true north upwards. As your heading changes the boat symbol moves accordingly.

If desired, you can change the orientation mode to:

- **Head Up (H-Up)** - displays chart with boat's current heading upwards. As heading changes, boat symbol remains fixed
- **Course Up (C-Up)** - chart picture stabilized, current course upwards. Boat symbol moves as heading changes.

To change the orientation mode:



How do I change how my boat moves on the chart?

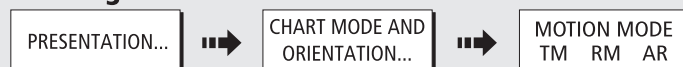
How your boat moves on the screen is referred to as the **motion mode**. The default setting for the chart is **Relative Motion**. This means that your boat is fixed on the screen and the chart moves relative to your boat i.e.



If desired, you can change the motion mode to:

- **True (TM)** - the chart is fixed and the boat moves in true perspective to fixed landmasses on the screen.
- **Autorange (AR)** - selects and maintains the largest possible scale of chart that will display both the boat and the target waypoint. This option is not available when radar/chart synchronization is ON.

To change the orientation mode:



NOTE: When you pan the chart or toggle FIND SHIP/CURSOR to CURSOR, the motion mode is suspended.

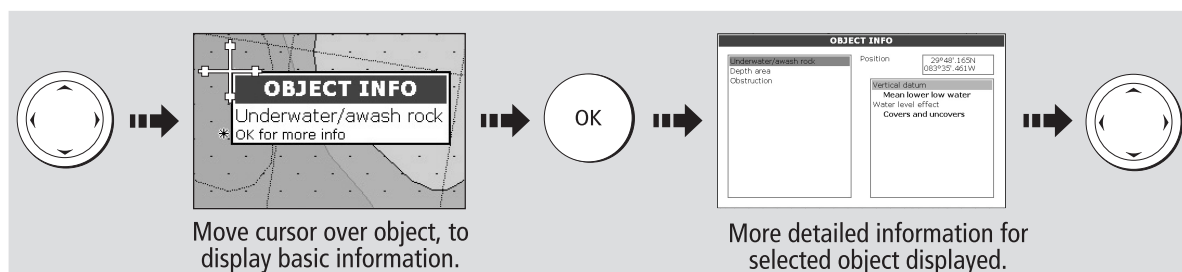
? More information See 'Using the Chart' chapter of the Reference Manual

What can I see?

Displaying additional information

Card No. 7

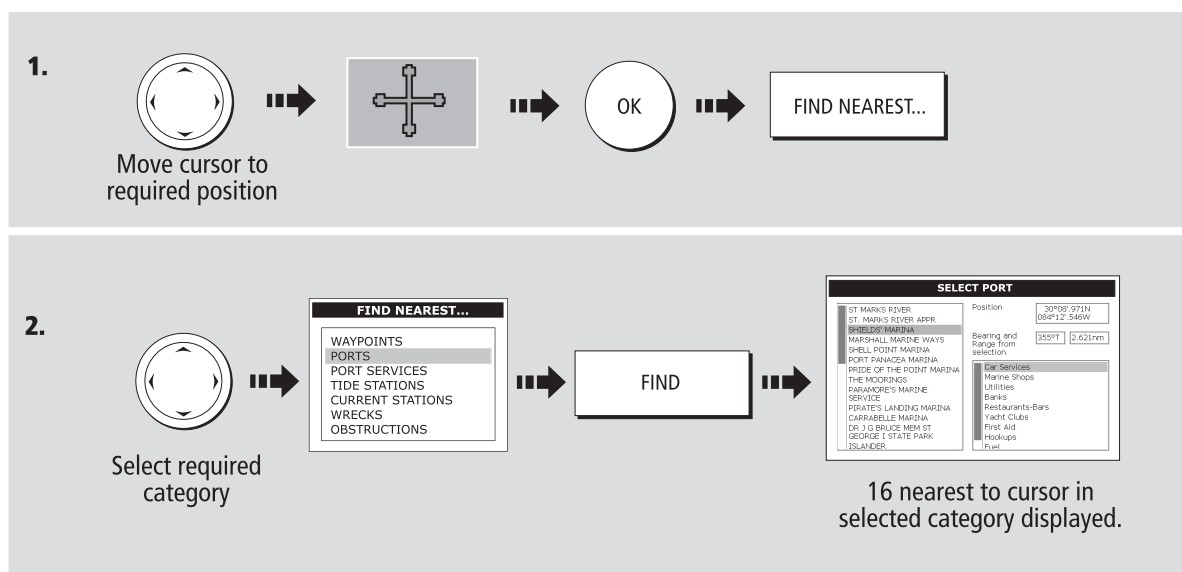
Viewing object information



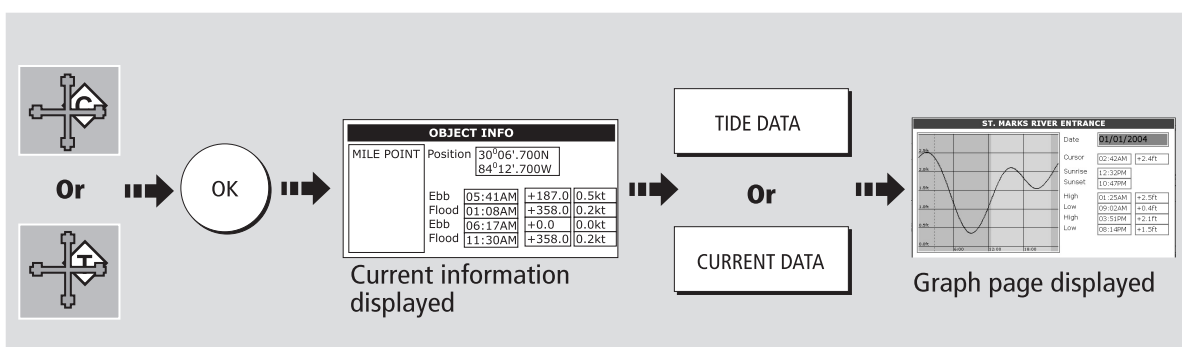
You can now:

- Locate the nearest waypoint, port, port service, tidal and current stations, wreck or obstruction, to the selected position.
- Search for a named port.
- View detailed data for the selected port, tidal or current station.

Finding nearby features and services:



Displaying tidal and current details:



? More information.... See the 'Using the Chart' chapter of the Reference Manual.

Basic Navigation Working with Waypoints

Card No. 8

WAYPOINT AT
CURSOR

WAYPOINT AT
VESSEL

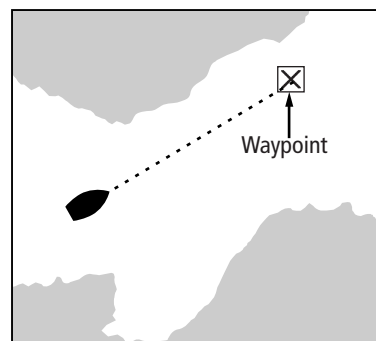
WAYPOINT AT
LAT/LON

GO TO WAYPOINT
OPTIONS

REVIEW AND EDIT
WAYPOINTS

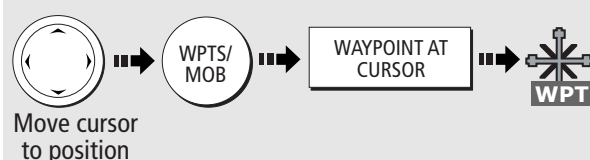
What is a waypoint?

A waypoint is a position marked on a chart, radar or fishfinder screen to indicate a site (for fishing, diving etc), or as a position to go to. You can place a waypoint at the cursor position, your boat's position or at a specified position. Waypoints are represented in chart or radar applications as an 'X' (default) and by a vertical line labeled WPT in Fishfinder. Active waypoints are displayed on CDI windows. The details of each waypoint are stored in a waypoint list (1000 waypoints maximum). Waypoints can be renamed, edited, grouped, or erased, as necessary. To make full use of waypoint features, ensure your display is receiving heading and position data. We recommend that you regularly back-up your waypoints by archiving them to a CompactFlash card. Waypoints can also be transferred to another NMEA compatible instrument.

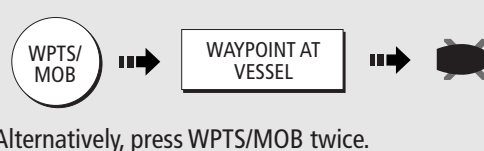


How do I place a waypoint?

... at the cursor?



... at the vessel?



How do I navigate to a point?

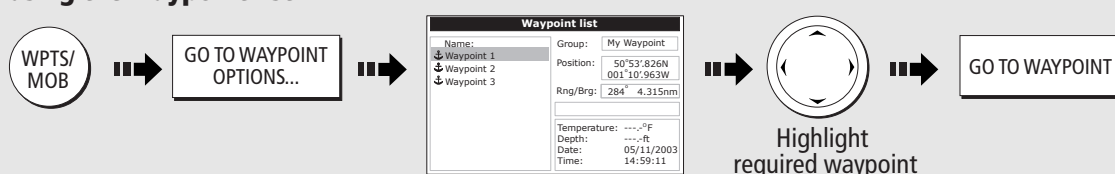


CAUTION

Always check that your route to a waypoint is safe before travelling towards it.

How do I navigate to a waypoint?

...using the waypoint list?



...using the cursor?



To stop navigation to a waypoint:



Can I edit a waypoint?

Once a waypoint has been placed it can be edited in as variety of ways. You can:

- Change the waypoint details
- Move a waypoint.
- Change the default group or symbol
- Erase a waypoint

? More information ... See the 'Working with Waypoints' chapter of the Reference Manual

Basic Navigation

How do I get to a point?

Card No. 9

SHOW/HIDE
ROUTES

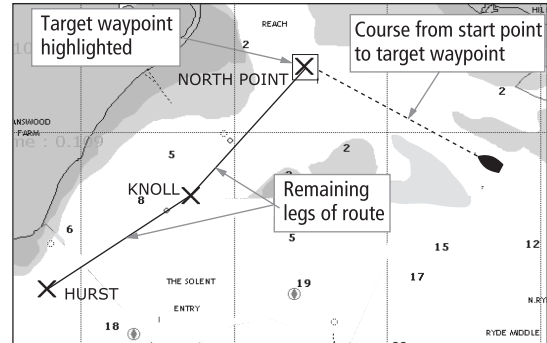
FOLLOW ROUTE
OPTIONS

BUILD NEW ROUTE

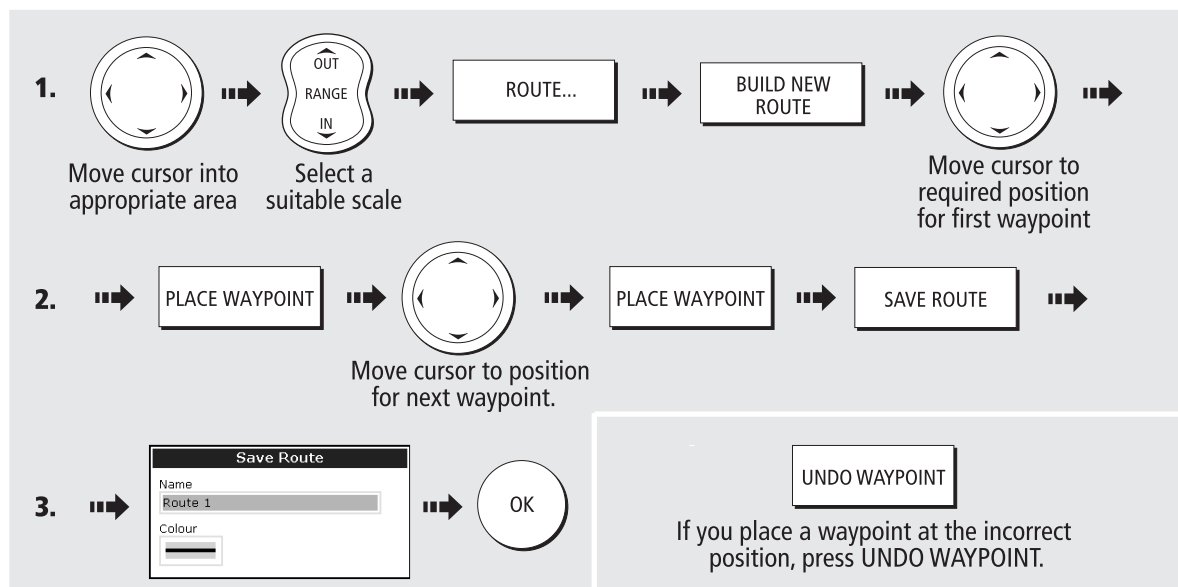
REVIEW AND EDIT
ROUTES

What is a route?

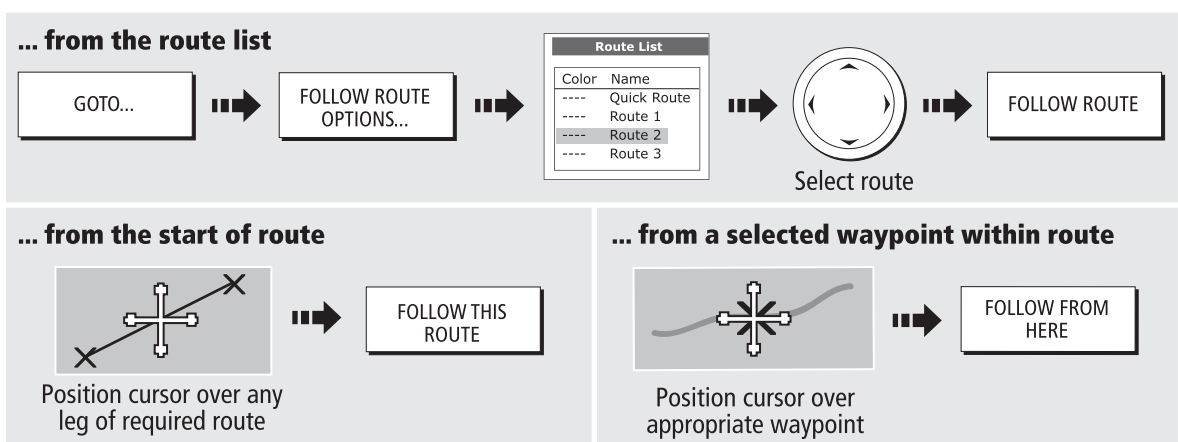
A route is made up of a series of waypoints. These waypoints can either be placed specifically for that route and/or you can use existing waypoints. You can save a route for future use or follow it immediately (Quick Route). Routes are stored in a route list. Routes can be named, edited, erased and archived. After routes have been created you can choose which ones are displayed on your chart.



How do I build a route by placing waypoints on screen?



How do I follow a route?

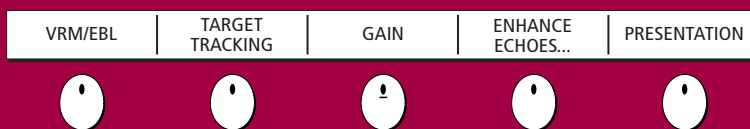


? More information

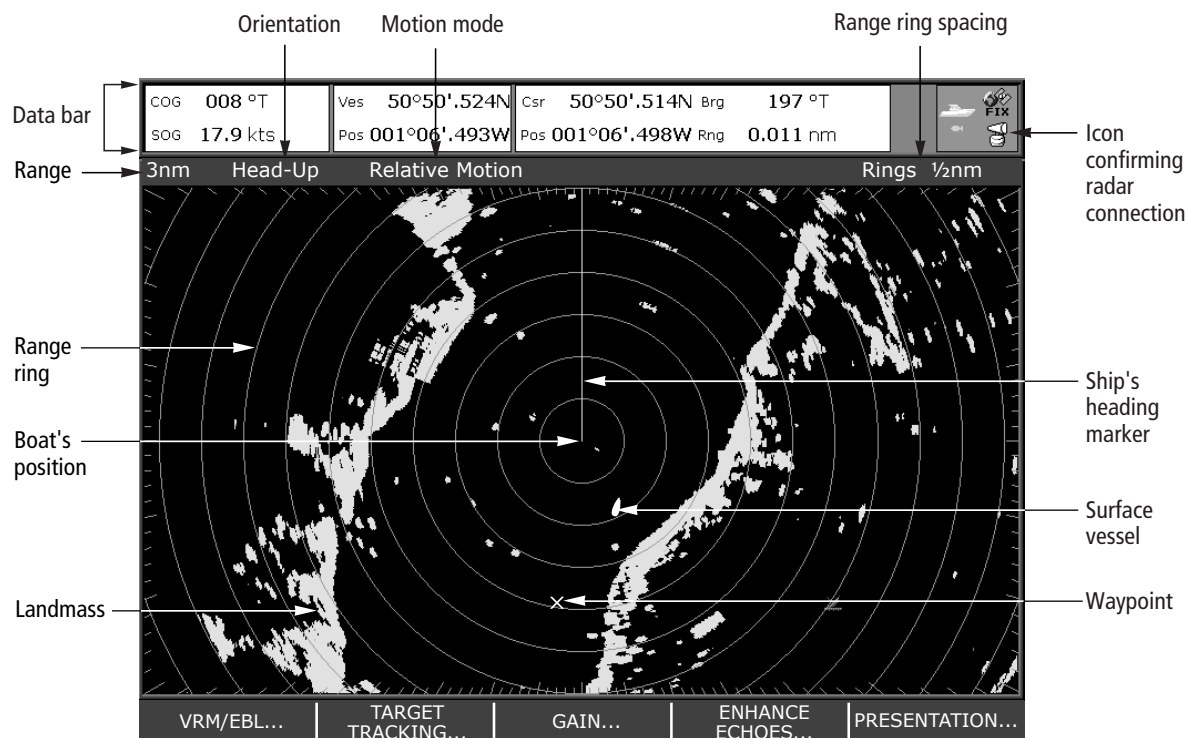
See the 'Using the Chart' chapter in the Reference Manual, for more Information on routes.

What is around me? Understanding the radar

Card No. 10



What does the radar show me?....



Typically your boat's position is at the centre of the display, and its dead ahead bearing is indicated by a vertical heading line, known as the Ship's Heading Marker (SHM).

Remember that the radar picture may vary from visual observations that you make; a nearby small object may appear the same size on the screen as a distant large object. However, with experience the approximate size of different objects can be determined by the relative size and brightness of the echoes.

How do I measure distances, ranges and bearings with the radar?

VRMs
Align a VRM on a target to display its range from your boat:
e.g. ADJUST VRM
1.800nm

EBLs
Align an EBL on a target to display its bearing relative to your boat's heading:
e.g. ADJUST EBL
30.0°S

Combined VRM/EBL
Combine a VRM and EBL to measure range and bearing of specified target.
e.g. ADJUST VRM
1.800nm ADJUST EBL
30.0°S

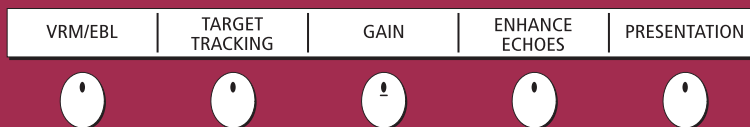
Range rings
Use the range rings to gauge the approximate distances between two points or from your boat.

Note: Range/bearing also displayed when VRM/EBL selected with the cursor.

? More information ... See the 'Using the Radar' chapter of the Reference Manual

What is around me? Avoiding a collision

Card No. 11



How can the radar help me avoid a collision?

You can set up your C-Series Display to sound an alarm when anything comes within a pre-set range of the boat. These guard zones allow you to take any necessary action to avoid a collision.

Guard zones

A sector or circular zone fixed with respect to the Ships Heading Marker (SHM). If the SHM moves, or the centre is offset, or the range scale changes, the zone moves accordingly.

What does a guard zone display?

Sector Zone

Circular Zone

IMPORTANT

A guard zone:

- Will only operate when a whole zone is displayed on screen, or displayed by offsetting the centre.
- Is inactive for 10 seconds after it is placed or resized, to avoid inappropriate alarms.

How do I set up a circular guard zone?

1. Select guard zone function:

TARGET TRACKING... → MONITOR IN ZONES... → ZONE 1 ON OFF → SET UP ZONE 1

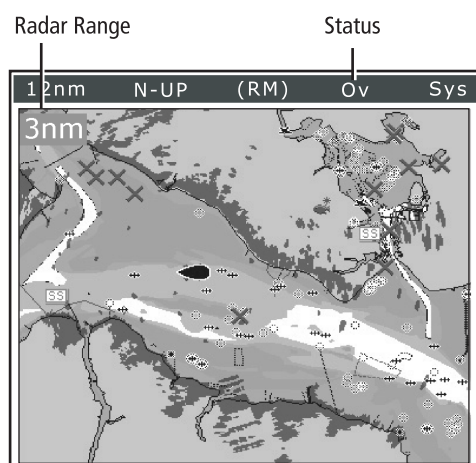
Toggle to ON

2. Select guard zone option:

ZONE SHAPE SECTOR CIRCLE → SET INNER xx.xx nm → Turn → Turn to set inner boundary → Press → Turn → Turn to set outer boundary → OK

Toggle to required shape

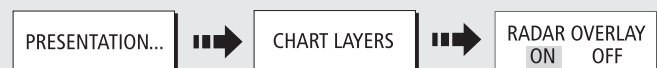
How do I distinguish between fixed and moving objects?



To switch radar overlay on/off:

You can overlay radar image data on your chart allowing better distinction between fixed objects and other marine traffic.

With a 2D chart window active:



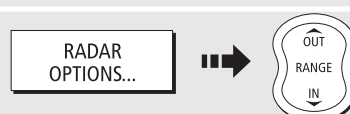
To switch chart/radar synchronization on/off

For best results, also switch on chart/radar synchronization.

With a 2D chart window active:



To change scanner range in this mode:



? More information.... See the 'Using the Radar' chapter of the Reference Manual.

What is around me? Using MARPA....

Card No. 12

MONITOR
IN ZONES

ACQUIRE TARGET

MARPA & AIS
OPTIONS

MARPA LIST

AIS LIST

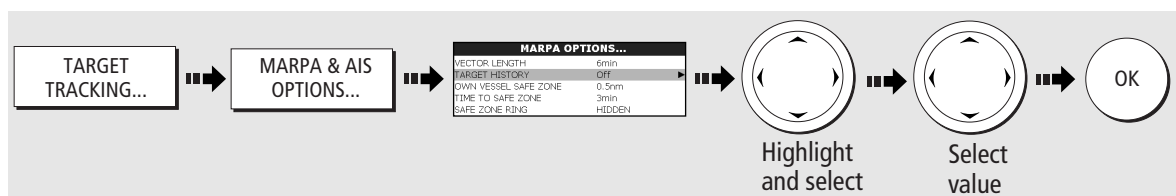
What is MARPA?

Mini Automatic Radar Plotting Aid (MARPA) functions are used for target tracking and risk analysis. MARPA improves your standards of collision avoidance by obtaining detailed information for up to 10 targets, and provides continuous and rapid situation evaluation.

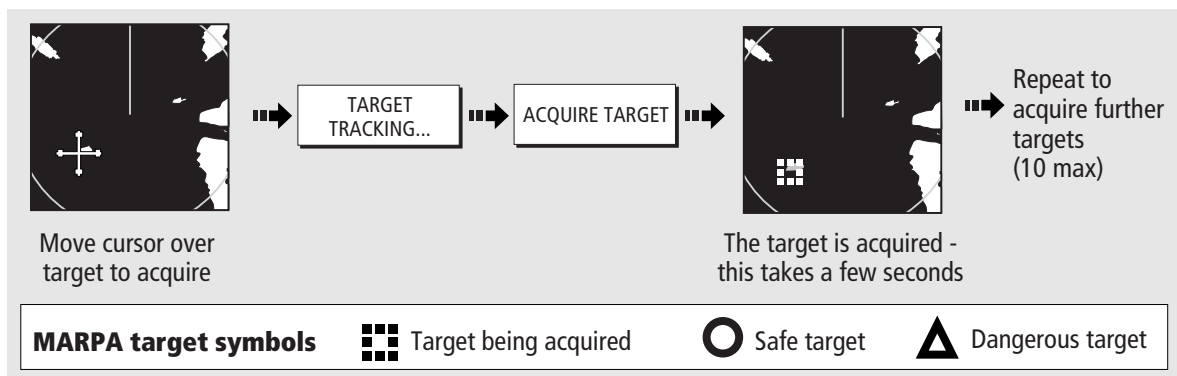
MARPA tracks the selected targets and calculates target bearing, range, true speed, course, Closest Point of Approach (CPA), and Time to Closest Point of Approach (TCPA). Each tracked target can be displayed with a CPA graphic depicting the approximate target speed (vector length) and course (vector direction). Alternatively, move the cursor over the target to display the range and CPA. You can now access bearing and speed. Each target is continually assessed. An alarm sounds if a target becomes dangerous or lost.

NOTE: For MARPA to operate, fast heading data is required.

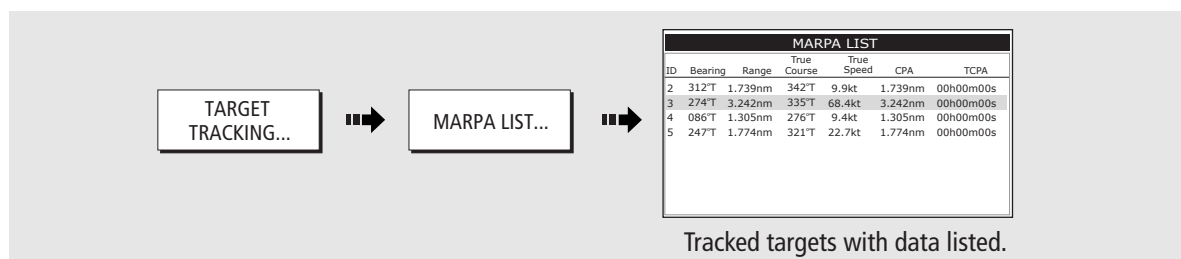
How do I set up the MARPA functions?



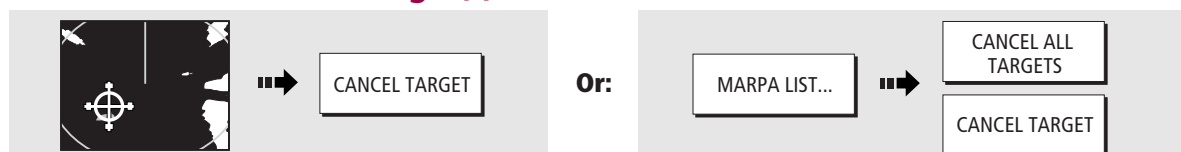
How do I acquire a MARPA target?



How do I view details of MARPA targets?



How do I cancel MARPA target(s)?



? More information.... See the 'Using the radar' chapter of the Reference Manual.

What is around me? Using AIS

Card No. 13

VRM/EBL

TARGET
TRACKING

GAIN

ENHANCE
ECHOES

PRESENTATION

What is AIS?

AIS uses digital radio signals to broadcast 'realtime' information between vessels and shore based stations via dedicated VHF frequencies. This information is used to identify and track vessels in the surrounding area and to provide collision avoidance data. AIS will augment your radar application, as it can operate in radar blind spots.

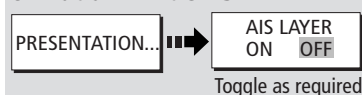
In order to use the AIS feature, you will need a GPS and compass for timing and position information together with data from a suitable AIS receiver.

How do I display AIS?

On chart windows:



On radar windows:



How is AIS data displayed?

The AIS system displays other AIS equipped vessels in the surrounding area as targets overlaid on a chart or radar window. Up to 100 targets are displayed and are scaled according to the size of the vessel. A vector indicates the direction of travel of the vessel. As the vessel's status changes, the symbol for the target will change accordingly.

You can view detailed AIS data, safety critical target information, alarm messages (ALR) and safety related messages (SRM). You can also set up a safe zone.

How do I view target information?



How do I view detailed AIS data?



? More information....

See the 'AIS' chapter of the reference manual for data classes and how to customise this feature.

AIS target symbols

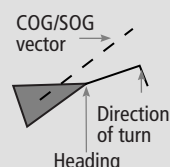
Sleeping target

- Target not activated, dangerous or lost.



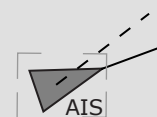
Activated target

- Target activated i.e. AIS vector displayed.
- Vector line (optional) shows predicted distance travelled within given time.



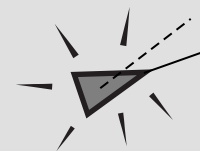
Selected target

- Target selected with cursor.
- Can activate the target and view detailed data.



Dangerous target

- Targets within specified distance (CPA) or time (TCPA).
- Dangerous target alarm sounds and target flashes.



Uncertain target

- Calculated CPA/TCPA value uncertain.



Lost target

- When signal of a dangerous AIS target not received for 10 seconds.
- Target orientated in COG or CSE direction as appropriate.
- Alarm sounds and target flashes



WARNING:

Smaller vessels do not have to be fitted with AIS and whilst it is mandatory for larger commercial vessels to carry AIS, its use is not. You should not assume that your AIS will display ALL vessels in your area.

Where am I? Monitoring a course....

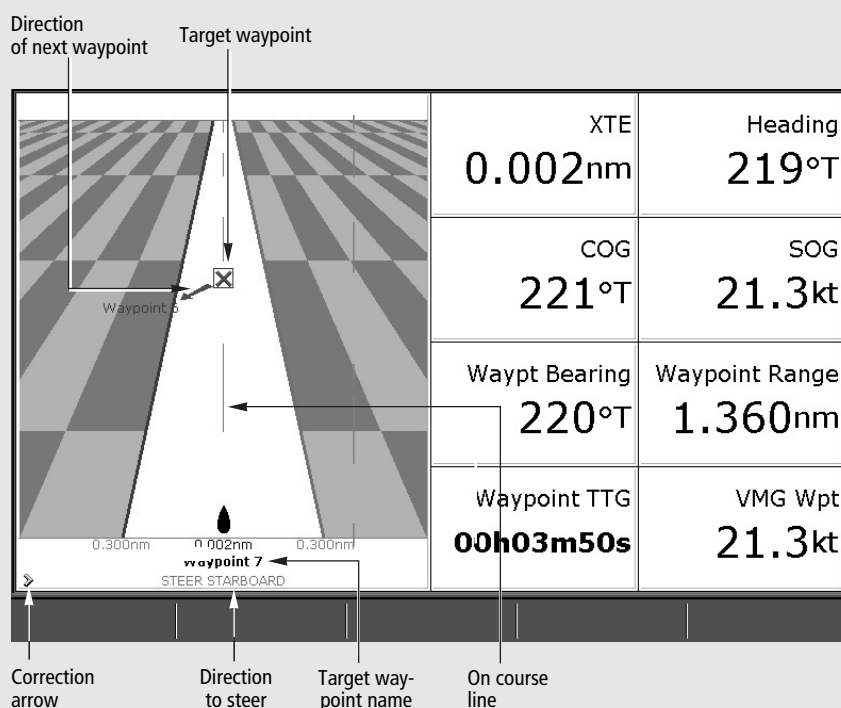
Card No. 14

How do I monitor my course?....

- Your course is shown on the chart application whilst motion mode is active.
- Using COG and heading vectors (Press DATA - CHART VECTORS - COG/HDG VECTORS).
- Use the Course Deviation Indicator (CDI). With your display receiving accurate heading and position information, you can monitor your course and accurately steer to a target waypoint.

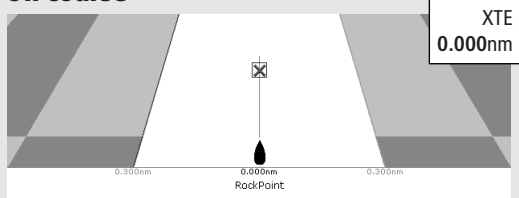
What does the CDI show me?....

The CDI gives a graphical representation of your boat's course. This 'rolling road' format represents a width of sea equal to the Cross Track Error (XTE) limits that you have specified in the Setup menu. As you travel towards the target waypoint, the checkered pattern moves down the screen to simulate movement at a rate proportional to your boat's speed.



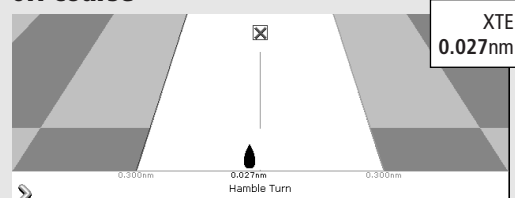
What do the steering instructions tell me?

On course



- Boat on center line.
- Zero XTE

Off course



- Boat off center line.
- Correction arrow(s) indicate direction to steer to maintain course to target waypoint.
- The greater the XTE, the more arrows.

? More information ... See the 'Using the CDI' chapter of the Reference Manual

What's under the boat? Understanding the fishfinder

Card No. 15

TRANSDUCER
SETTINGS

ZOOM

BOTTOM LOCK

A-SCOPE

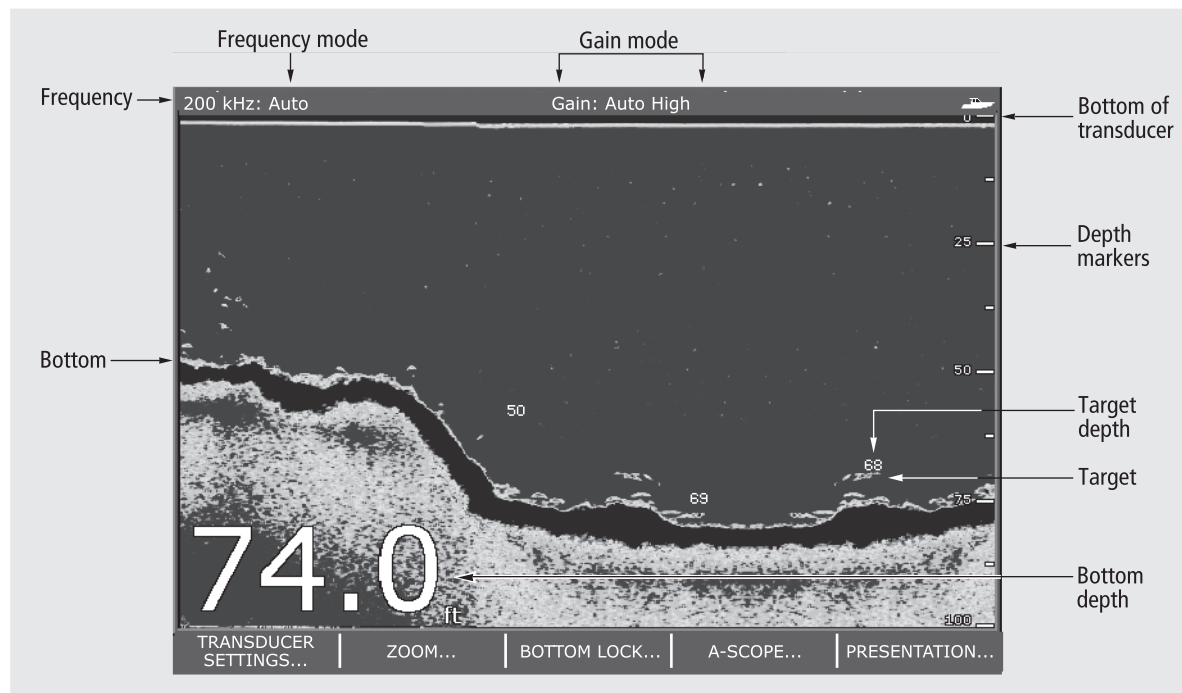
PRESENTATION



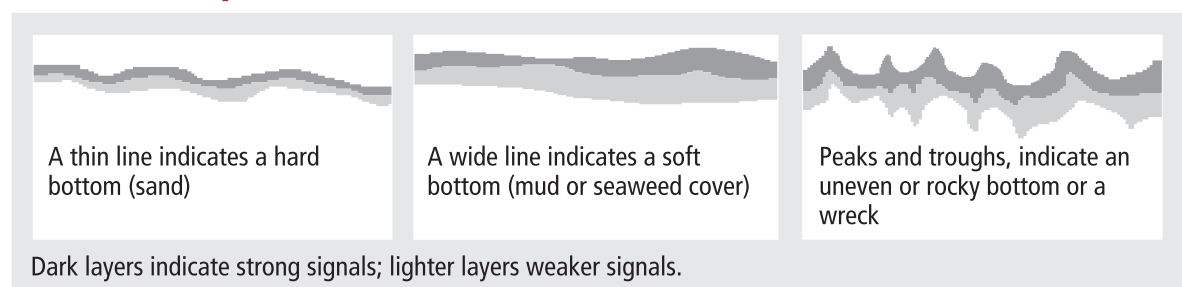
What's under the boat?

The fishfinder application, when connected to a suitable Digital Sounder Module (DSM) and transducer, will help you to see fish, bottom structure and underwater obstructions. The image scrolls from right to left at an automatically selected range and frequency to provide a record of the echoes seen. You can mark with a waypoint any positions of interest that you may wish to return to. These waypoints are added to the waypoint list and can be used by other applications.

What can I see on the screen?



How do I interpret the bottom?



What influences target display?

The shape and size of echoes indicating targets, is influenced by a combination of:

- Boat speed - flatter at slower speeds
- Transducer frequency - broader at lower frequencies
- Target depth - larger near the surface
- Target size - larger targets return larger echoes

? More information..... See the 'Using the Fishfinder' chapter of the Reference Manual.

What's under the boat? Using the fishfinder....

Card No. 16

TRANSDUCER
SETTINGS

ZOOM

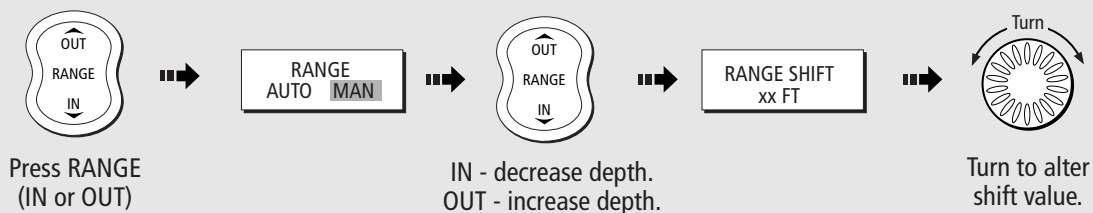
BOTTOM LOCK

A - SCOPE

PRESENTATION

How do I change the range or shift the image?

Your system automatically adjusts the display depth range, selecting the shallowest depth that keeps the bottom on the lower half of the window. You can however, set this manually if required and move the image within the selected page up or down. Using the range controls will affect all fishfinder windows.



How do I change the operating frequency?

Auto mode - automatically selects 50 kHz or 200 kHz. This is the default mode.

Manual (MAN) - Single or dual

- **200 kHz** - for maximum definition in shallow water.
- **50 kHz** - for maximum depth penetration in deep water.
- **Both** - 200 kHz & 50 kHz displayed simultaneously. Only available if FREQ MODE set to DUAL.



How do I change the gain mode?

The system automatically adjusts the gain control to display the sharpest image. If required, you can select the gain level to suit your fishing mode:

- **Low** - when cruising
- **Med** - when trolling
- **High** - when fishing



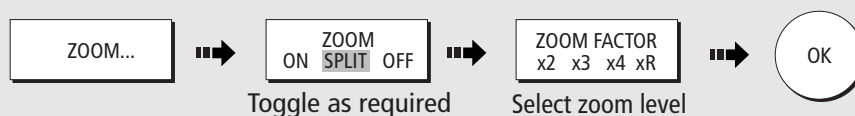
To define the gain mode still further, select manual gain mode and then adjust the level using the rotary control.

How do I zoom in on an area of the screen?

To see more detail of the bottom structure, target images etc, zoom in and enlarge a portion of the image.

Zoom

- **On** - zooms fishfinder image
- **Split** - displays zoomed image and standard fishfinder image simultaneously.



? More information.... See the 'Using the Fishfinder' chapter of the Reference Manual.

- Monitoring data and engines - Navtex

Card No. 17

How do I monitor data?

NAVIGATION	WAYPOINT	ROUTE	FISHING	SAILING
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Ves Pos 25°45'.940N 080°09'.718W	GOTO CURSOR 220°T 1.28nm	TTG --h--m--s	VMG Wpt -. -kt
Depth 78.8ft	Cog Sog 286°T 0.0kt	Heading 293°T	Speed 0.0kt
Set Drift 355°T 0.0kt	XTE 0.00nm Steer >	Trip 0.00nm	Local Time 01:42:12

The **data application** enables you to view numeric data generated by the system or by instruments available on NMEA 0183, SeaTalk, Seataalk², NMEA 2000 and SeaTalk^{hs}. This information is displayed in a series of panels which contain data relating to a particular function or activity. These can be reconfigured to your needs.

Press the appropriate soft key to select the panel of your choice

How do I monitor the engine(s)?

ENGINE	ENGINE & FUEL	FUEL RESOURCES	ENGINE & RESOURCES	TWIN ENGINE
--------	---------------	----------------	--------------------	-------------

Tach	Oil
Alternator	Coolant
	Boost

The **engine monitor application** enables you to view data from up to three compatible engines. The information is displayed in a series of panels which contain data relating to engine, fuel and fuel resources. These can be reconfigured to your needs. Press the appropriate soft key to select the panel of your choice.

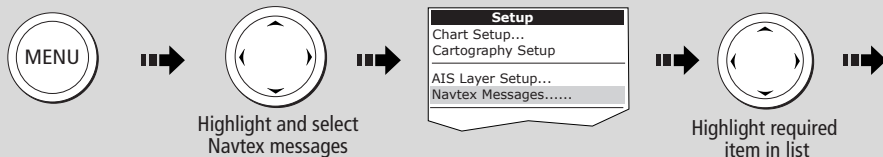
To view data from 3 engines, change the 'No. of engine' setting in the Panel Setup Menu.

Navtex

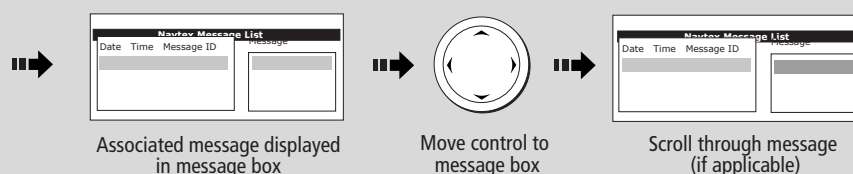
If connected to a Navtex receiver, you can use your display to view weather forecasts and marine warnings. Details of these alerts are displayed whenever an incoming message is received for the alert categories you have specified. After you have read the message you can either erase it or save it to the database (100 maximum). To select the alert categories or to sort the message list, refer to the 'Weather (Navtex)' chapter of your Reference Manual

Viewing saved messages

1.



2.



? More information.... See the appropriate chapter for the Reference Manual.

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