



# AngelNav - User Guide

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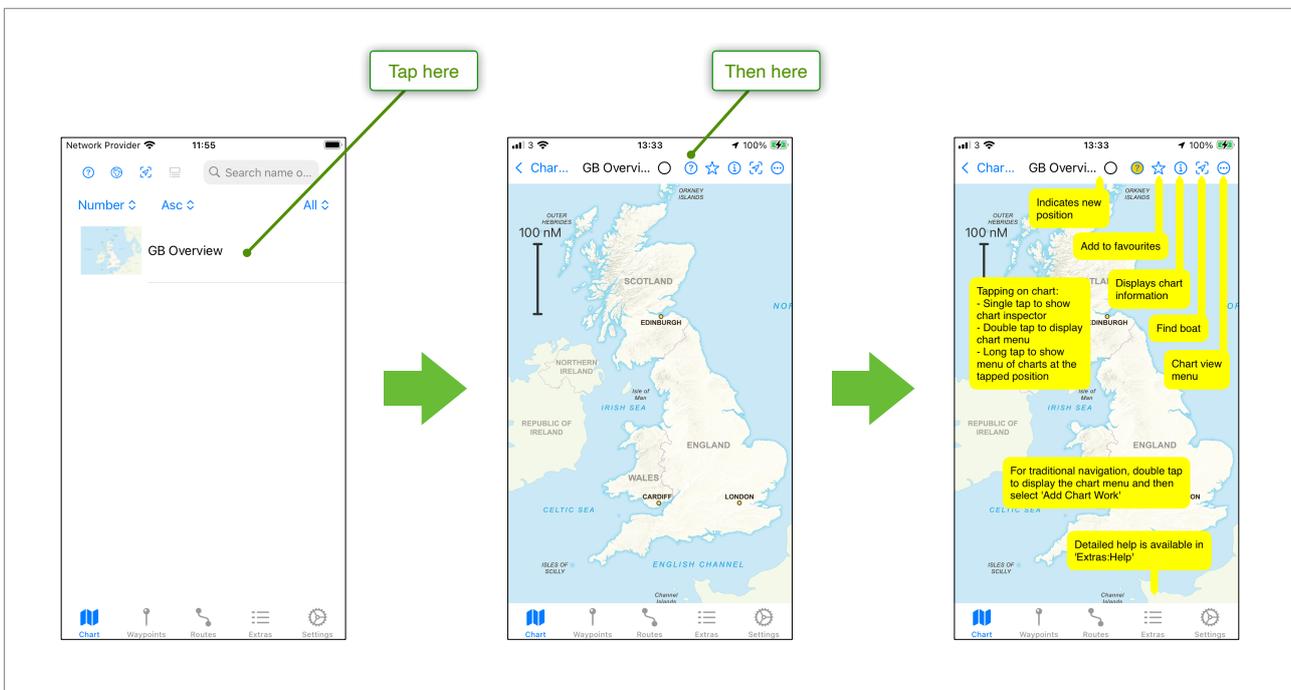
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## Quick start

When AngelNav is launched, you are presented with a list of available charts, which initially contains only one - 'GB Overview', a free chart to allow evaluation of the app (contains OS data © Crown copyright 2025). If you have enabled Location Services, and your location is within the chart, then the chart will load automatically, and your location will be shown.

- Tap on the chart to load it (if it has not already loaded).
- Zoom in and out by pinching, and scroll to view the chart.
- Single tap on the chart to display the chart inspector.
- Double tap on the chart to display a menu of options.
- Tap the help icon to display instant help (tap it again to dismiss).



The instant help display gives specific information on the functions available on the current screen.

You can fully evaluate the app for free, but for in-depth use you may wish to purchase a chart subscription, or a capability in **Extras: Store**.

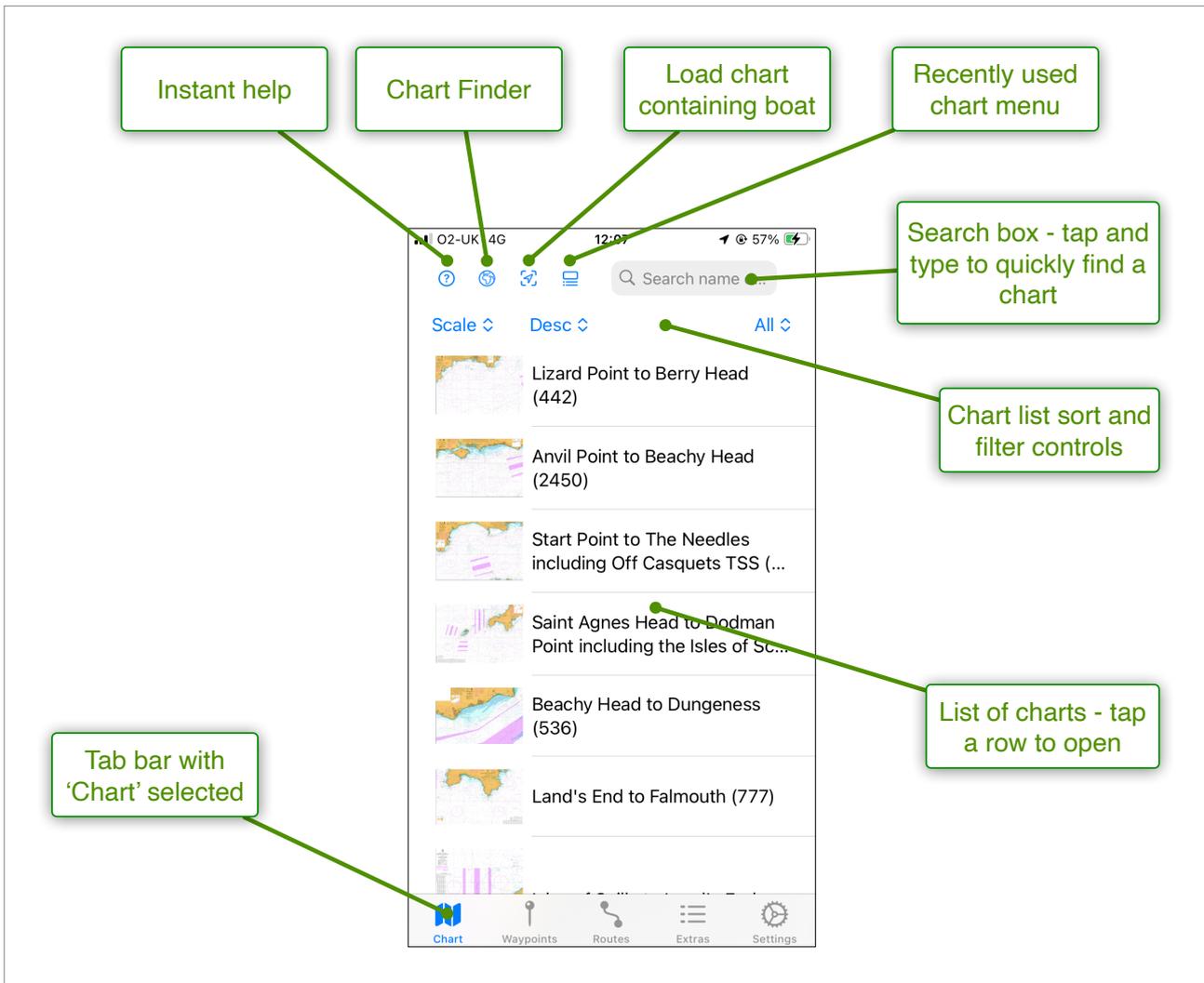
See [Simulation Mode](#) for instructions on how to simulate movement of the boat and demonstrate features of the app such as going to waypoints, or following routes.

When you run AngelNav for the first time, you will be asked whether you wish to receive notifications. We keep notifications to the absolute minimum required, but they are useful for the following:

- Downloading and updating of subscription charts
- The anchor alarm
- Important notices relating to the app or specific navigation issues

# Finding your way around the app

## The Chart tab



Adding Charts to the list requires either a subscription or a capability, which can be purchased in **Extras: Store**. Charts may be added in three different ways:

- Subscribe to a folio of charts. Once subscribed, the charts contained in the folio will automatically download and appear on the chart list.
- Purchase a capability (for example the ability to open BSB/KAP files). Download free charts from the internet (see [here](#) for an example), and move them to the file system of your iOS device using the 'Files' app. Go to the Charts section in **Extras: Settings**, and tap on **Browse** to choose the folder which contains the downloaded charts. Return to the chart list (tap 'Chart' at the bottom of the screen) and your downloaded charts will be on the list available for use.
- Create a Satellite chart in **Extras: Create satellite chart**. Further details are given later in this guide. Once created the chart will appear in the chart list for selection. You can create a satellite chart for free, but in order to view it you will need to purchase the Satellite Chart capability.

## Finding a chart

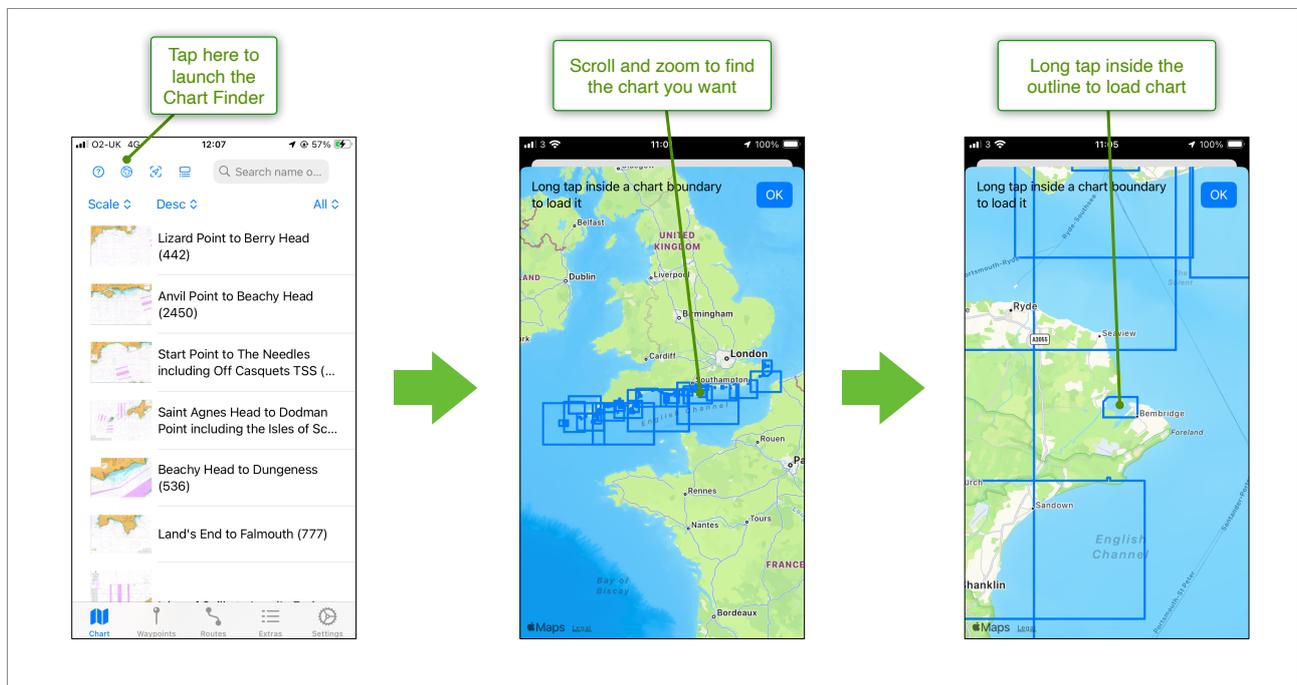
Once you have purchased a subscription, or downloaded some charts, the list of available charts becomes too long to easily find a chart by scrolling. However, there are several ways to make it easier to locate the chart you want.

- The Recent charts menu (top of the screen) displays a list of recently opened charts.
- If you know the name (or part of the name) or the chart number, type this into the search box and the list will be filtered to include only charts that match.
- If you are looking for a planning chart, change the 'Sort by:' values to 'Scale' and 'Desc', and charts covering the largest area will appear at the top of the list.
- Use the 'Filter on:' setting to show charts of a particular type (eg subscription charts).
- Set the 'Filter on:' to 'Favourites' which will show only those charts that you have marked as favourites
- Use the Chart Finder (see below) to search your charts graphically

To set a chart as a favourite, load it and tap the star shaped button at the top of the screen which will change to a filled star. Tap again to remove it from your favourites.

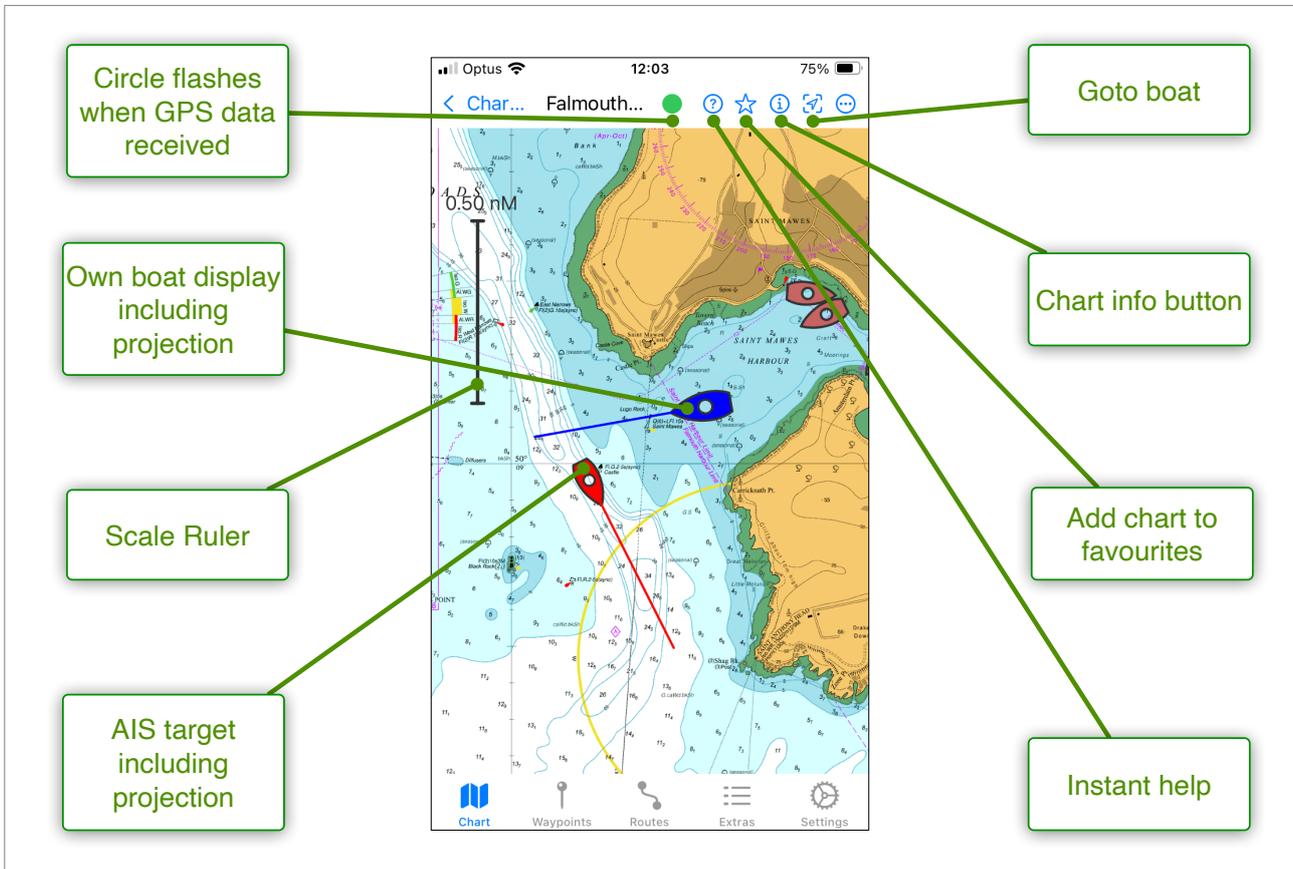
## The Chart Finder

The chart finder displays the outlines of all your charts on a scrollable and zoomable map. Once you have found the chart you want, a long tap within its outlines will load it.



## The Chart View

This view displays a chart and allows it to be scrolled and zoomed, and further information about the chart can be obtained by tapping the Chart info button. The circle at the top of the screen flashes when new GPS information is received. Note that AIS targets are displayed only if the appropriate Capability has been purchased.



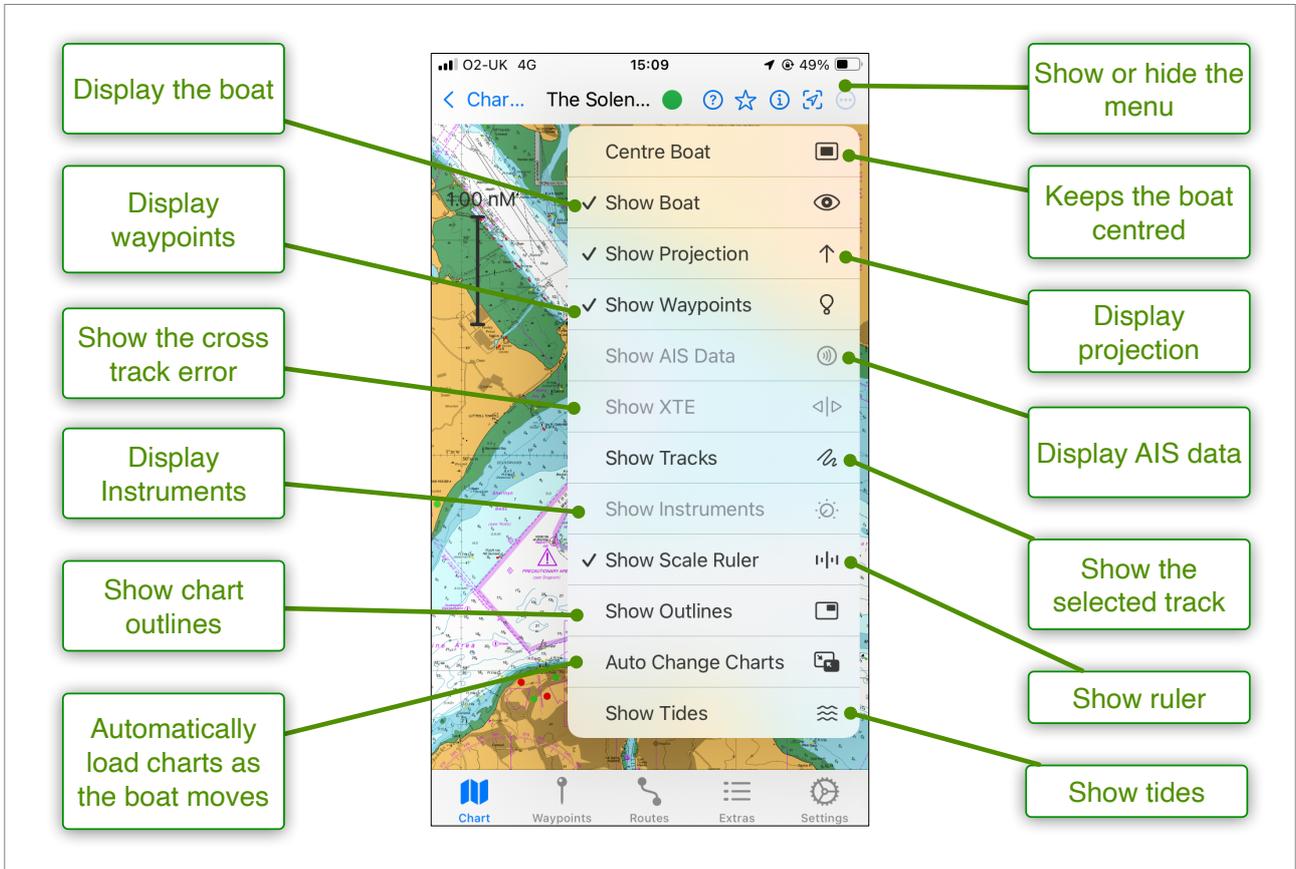
## Chart Info

Tapping on the **i** button will display additional information about the chart, for example projection and image dimensions. Not all information is displayed for all types of chart file (for example GeoTIFF files do not have a Title or a chart number). For UKHO-derived files, the sources displayed found on the chart is reproduced here (to save you scrolling the chart to find it).

The magnetic variation at the current date and at a position in the centre of the chart is also displayed. This is derived using the [World Magnetic Model](#) which is valid from 2025 to the end of 2029. A new version of the model for 2030 to 2034 will be included in updates of AngelNav released after the 1st January 2030. The variation is added to bearings automatically if **Settings: Bearing display** is set to magnetic.

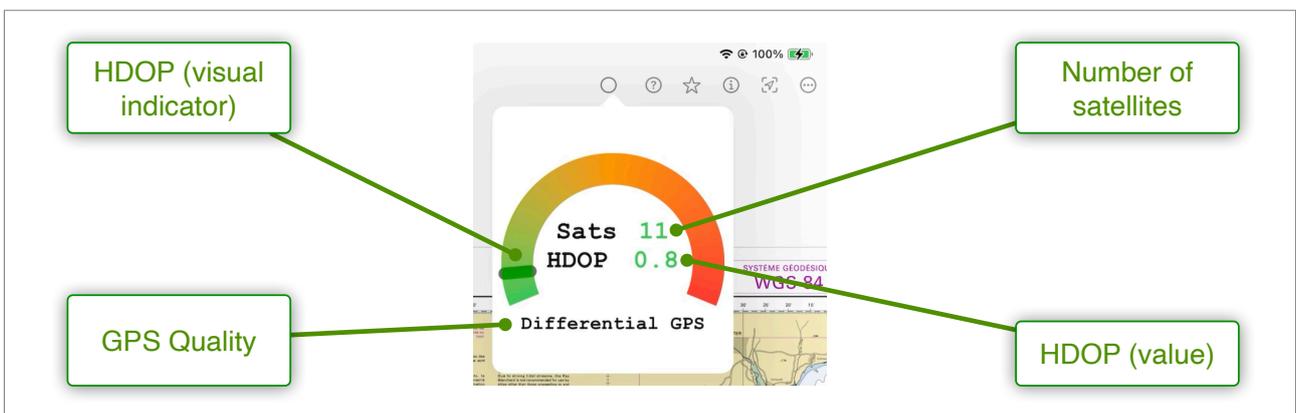
## The Chart View Menu

When a chart is displayed, many aspects of the display can be controlled using the chart view menu. The menu is displayed by tapping the ☰ symbol at the top right of the screen.



## GPS signal quality

If you are using NMEA as a source of navigational data, tapping on the green circle will display information about the quality of the GPS fix (type of signal, number of satellites and the HDOP (horizontal dilution of precision)). If using Location Services, an estimation of the HDOP will be displayed, but iOS does not provide additional information such as the number of satellites, or the GPS quality.



## The Waypoints tab

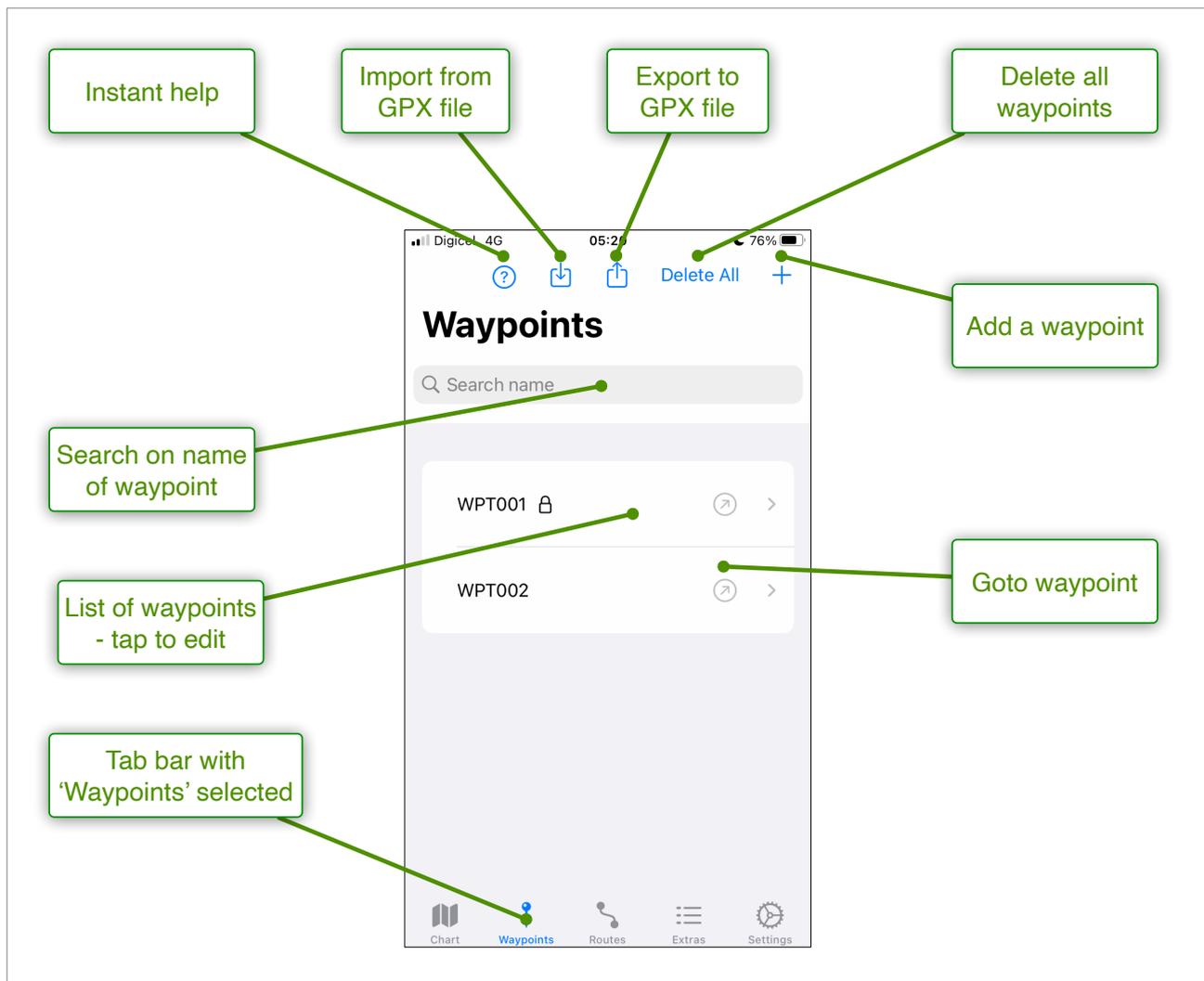
The waypoints tab allows the addition, deletion, and editing of waypoints.

Add a waypoint by tapping **+**. Waypoints can also be added by double tapping the chart at the desired position, and selecting **Add Waypoint** from the chart menu. A double tap on a boat (either your own boat or an AIS target) displays a menu which allows you to add a waypoint at its current position.

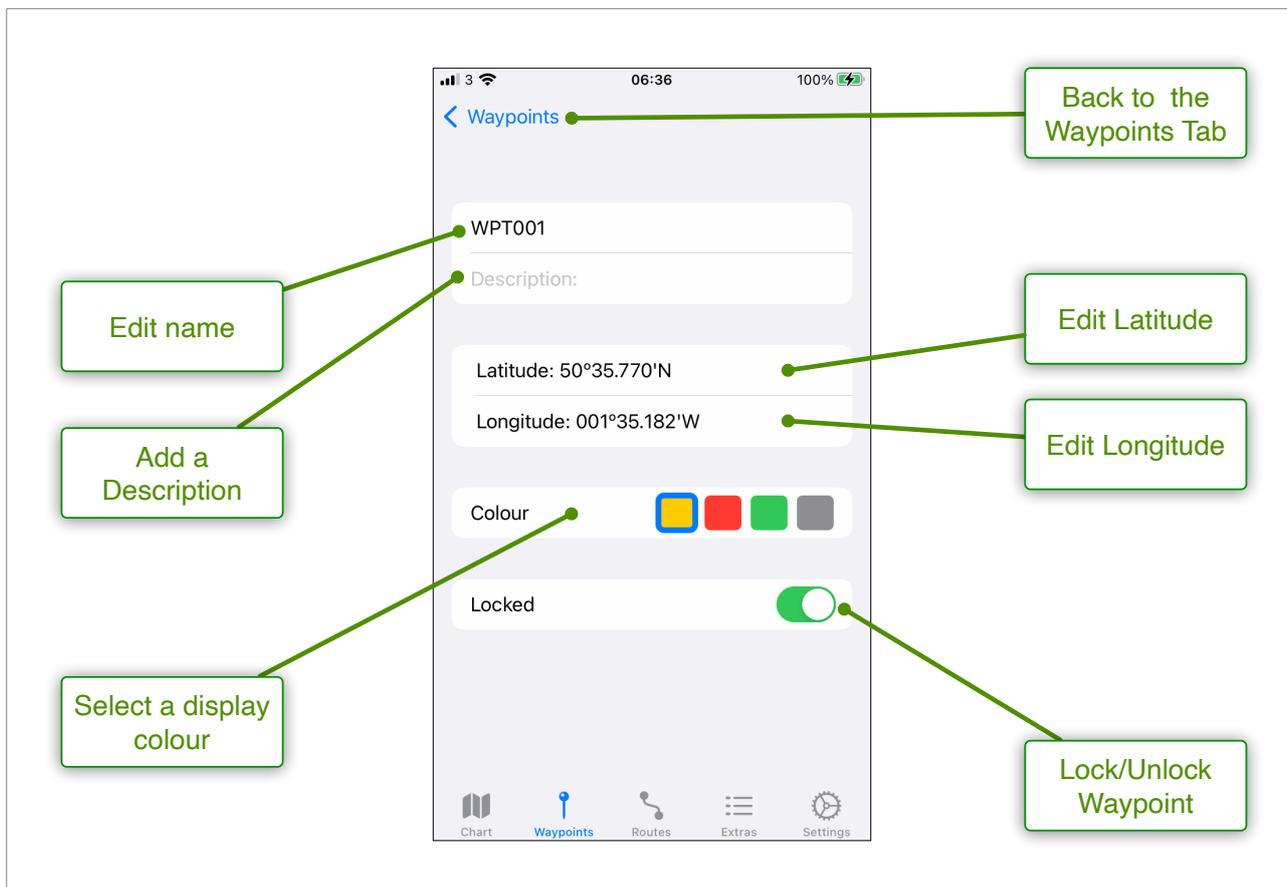
Tapping 'Delete All' presents a dialogue box giving the choice of deleting all waypoints, or deleting all unlocked waypoints.

Waypoints can be exported to a GPX file and saved anywhere on the device, or on iCloud. Saved waypoints can also be imported which allows sharing of waypoints, or saving a collection for later use.

The Goto Waypoint can be selected from the list by clicking on the  symbol adjacent to your chosen waypoint, and deselected by clicking on the  symbol.



Tapping any waypoint on the list will display a screen which allows editing of the name, description, latitude and longitude, and lock status. In order to rapidly enter waypoints from latitude and longitude data (for example waypoints in a pilot book), AngelNav includes a dedicated 'keyboard' to make the process as painless as possible. To use the keyboard, tap on any waypoint in the list, and enter the latitude or longitude value.



A fill colour of the waypoint as displayed on the chart can be selected here. The colour scheme matches that used by the Solent Cruising and Racing Association (SCRA) who publish a GPX file [here](#). If their GPX file of Solent racing marks is imported, the colours of the waypoints match those seen on the water. For example port markers are shown as red, though cardinal marks are NOT shown with black and yellow stripes. Waypoints can be locked or unlocked using the 'Locked' control on this screen. Locked waypoints are displayed on the chart with a central padlock symbol, and when selected do not display a move handle.

Locking a waypoint removes the risk of moving it accidentally. In addition, locked waypoints are preserved when 'Delete All' is selected, followed by 'Delete All Unlocked'. This provides a useful way of managing waypoints in that you can lock the ones that you want to keep, delete the others, and then export the remainder to a GPX file for storage.

Locking a waypoint does NOT prevent it being deleted via the waypoint menu, or by swiping left on a waypoint in the waypoint list and tapping 'Delete'.

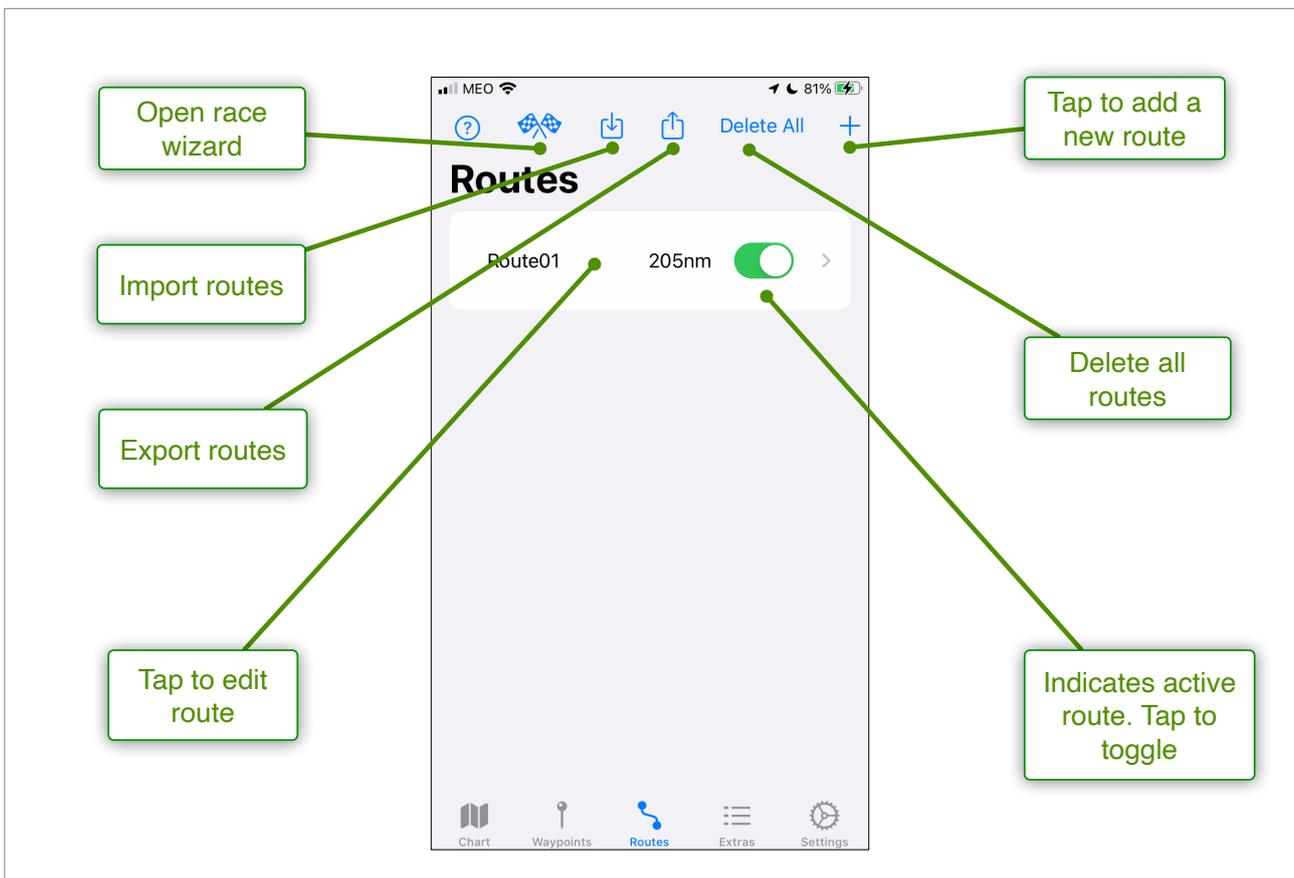
## The Routes tab

Create a route by tapping **+**. Routes can also be created by double tapping the chart at the desired start position, and selecting **Start Route** from the chart menu. Subsequent waypoints can be added to the route using the chart menu (**Add to Route**), or by editing the route in the Routes tab.

An intermediate point can be added to a route, by using the chart menu near to a segment between two waypoints. If the location of the double tap is near to the segment, a waypoint will be added between the two ends of the segment. Otherwise it is added to the end of the route.

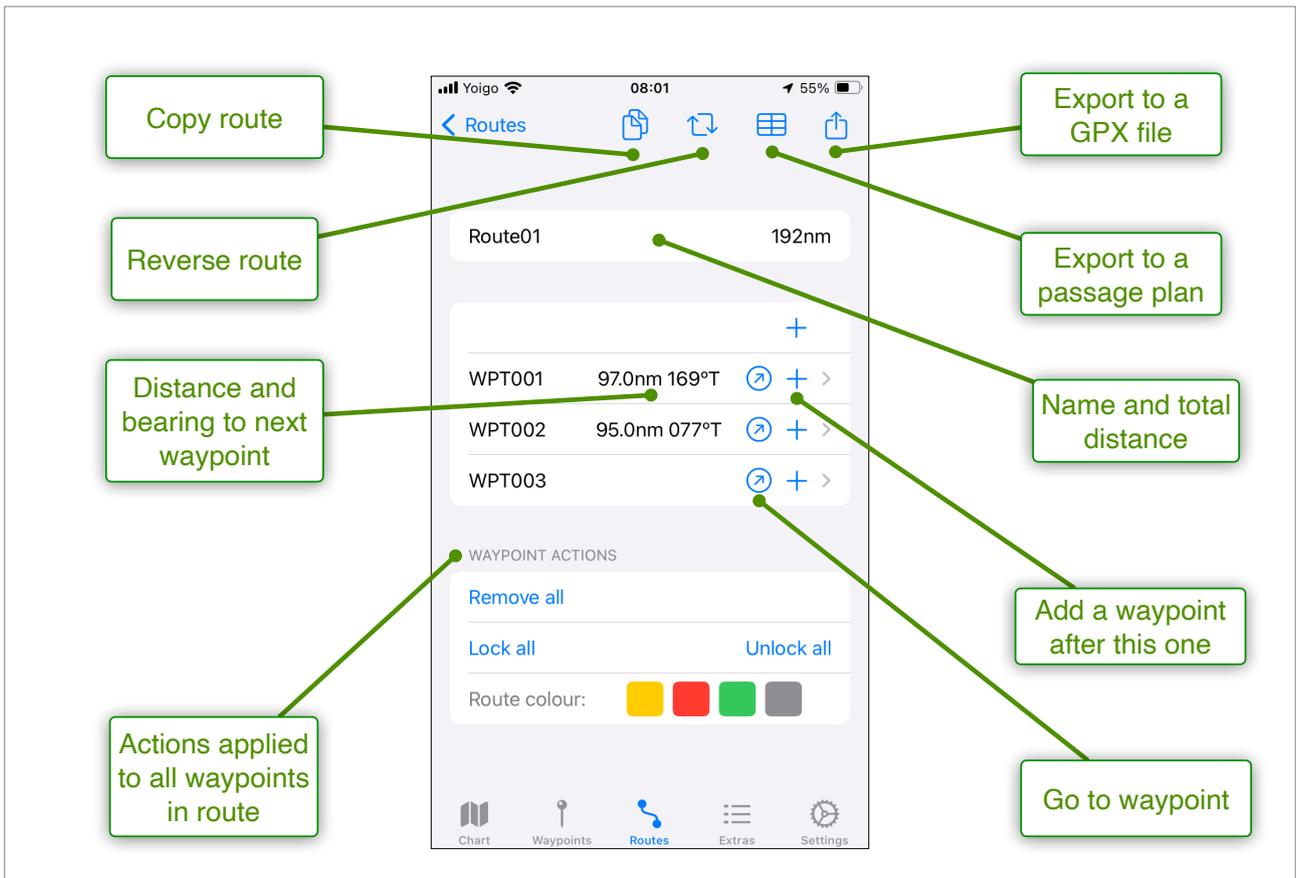
A route can be activated using the button at the right end of the route's row. An active route is displayed on the chart as a series of dotted lines. Only one route can be active at a time.

The course and distance of each segment is displayed around the middle of the dotted line if **Settings: Show course and distance** is selected.



Routes can be exported and imported by tapping the appropriate button at the top of the screen. Routes and the associated waypoints are saved in a GPX file which can be shared with other devices or people.

Tapping on the route entry displays another screen which allows detailed editing of the route.



A route can be copied by tapping the  button. Go back to the main routes list by tapping [Routes](#) in order to view and edit your copy.

The order of waypoints in a route can be reversed by tapping the  button.

Routes can be exported to a passage plan in CSV format by selecting a route, and tapping on the  button. They can also be exported to a GPX file by tapping on the  button.

Adding another waypoint to the route can be achieved by tapping the **+** button which inserts the chosen waypoint in the selected position (i.e. after the waypoint whose row contains the **+** button).

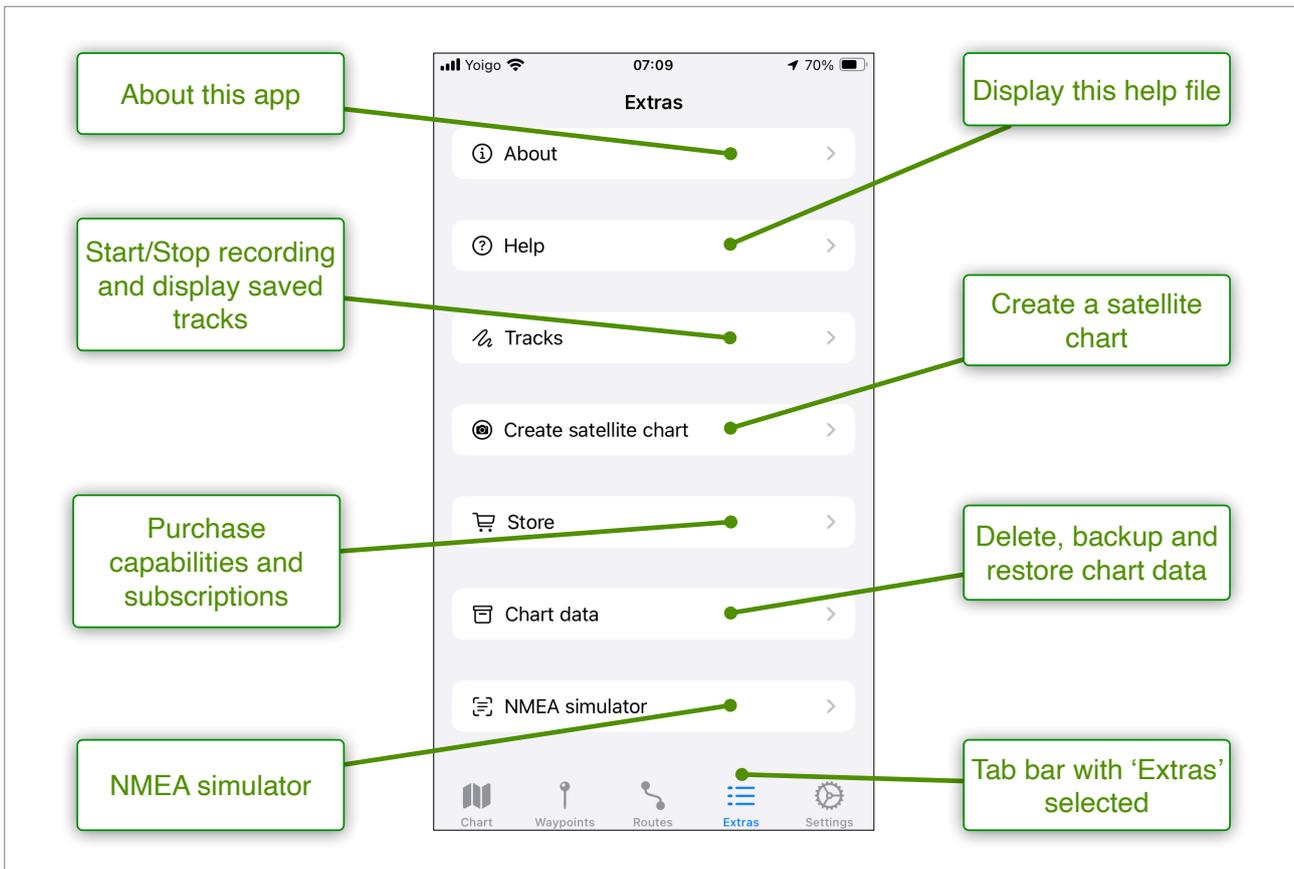
Each row containing a waypoint displays the distance and bearing to the following waypoint in the route. Tapping the  button will make the selected waypoint the goto waypoint.

Tapping a row will display the detailed editing screen for that waypoint.

The Waypoint actions section allows the application of certain editing functions to all waypoints in the route with a single tap. These actions are removing, changing the lock status, or changing the colour.

## The Extras tab

The extras tab allows access to the following features:



These features are summarised here:

Feature	Description
About	Information about the app including the version number and support contact details
Help	Access to this help file
Tracks	Displays a list of saved tracks along with the start/stop recording button
Create satellite chart	Allows the creation of off-line charts based on satellite images
Store	Allows the purchase and management of capabilities and chart subscriptions
Chart data	Allows deletion of routes, waypoints, chart work and notes, as well as backup and restore
NMEA Simulator	Controls playback of NMEA messages from a text file for demonstration purposes

## The Settings tab

The behaviour of the app can be adjusted in this tab, divided into the following sections:

### **GENERAL**

- Boat name - The name of your boat to be displayed on the chart
- Bearing display - Magnetic or true.
- Degree format - Select the format used for display and editing of degrees of latitude and longitude.
- Show splash screen on launching app - Whether to show the disclaimer message on each launch of the app.

### **NAVIGATIONAL DATA**

- Data source - The source of navigation data to determine boat position to display on the chart. Other options are shown depending on the choice of source. See the next section for more details.
- Connected - Tap to connect/disconnect - This starts/stops the input of navigational data (can be useful for testing).
- GPS Activity - The circle symbol flashes green when valid GPS data arrives.
- AIS Activity - The circle symbol flashes green when valid AIS data arrives.
- Show console - Tap to show a console which displays incoming position messages which can be useful for diagnosing connection problems.

### **CHARTS**

- Chart folder - Browse to select a folder on your device containing raster charts. Any charts contained in the folder appear on the chart list and may be opened (if the appropriate capabilities have been purchased). AngelNav monitors the folder for changes, so that charts added later are automatically displayed. Similarly, any charts that are removed from the folder are also removed from the chart list.
- Load chart on launch - If this is on, and the app is able to determine its position, then the largest scale chart containing that position is loaded when the app is launched.
- Include overview chart - The purpose of the overview is to evaluate AngelNav features without the need to purchase subscriptions or capabilities. This chart can be removed from the list by turning off this setting.
- Back button loads last chart - If this is off, the back button always returns to the chart list. If it is on, then AngelNav keeps a record of which charts have been opened and the back button then opens the previously opened chart. This can be useful when planning a route, and selecting larger scale charts for parts of the route.
- Brighten satellite charts - The images used to create satellite charts can be quite dark, which can make objects on the chart (boats, waypoints etc) difficult to see. Checking this option applies a gamma correction to satellite images making them brighter.
- Information duration - The Time in seconds that information is displayed (for example the move handles on a waypoint that appear in response to a single click on a waypoint).

- Display MOB button - if on, an MOB button is displayed on the right margin of the screen. When tapped, a waypoint is created at the current position, and the new waypoint is set as the 'Goto' waypoint.
- Single tap shows Chart inspector - if on, then a tap anywhere on a chart will display the chart inspector.
- Image memory limit - (only appears if the BSB/KAP capability has been purchased). BSB/KAP Files requiring image memory greater than this figure are reduced in pixel resolution by a factor of 4 in order to avoid crashes on smaller and older devices. If you have a recent device with plenty of memory, then this figure can be increased so that the images are loaded at full resolution. To calculate the memory required, get the pixel dimensions from the chart info button, multiply them together and then multiply by 3. For example a chart with a resolution of 12000 x 8000 uses 288MB of memory. If the image memory limit is set to 100MB then the image is loaded at reduced resolution, but if it is set to 300Mb then it is loaded at full resolution.
- Filter AIS targets - (only appears if the AIS capability has been purchased). If on, only vessels that are moving and have a CPA (closest point of approach) in the future are displayed.

#### **BOAT**

- Infinite projection - If on, the line from the boat to its projected position extends beyond the limits of the chart.
- Projection - The number of minutes ahead for calculating the projected position of the boat or AIS targets.
- GPS Spoofing alarm - if on, any suspected GPS spoofing attacks trigger a visual alarm and a notification,

#### **ROUTES**

- Show course and distance - If this option is checked, then the bearing and distance to the next waypoint are shown on the chart in the middle of each segment of the route.
- Delete waypoints with route - If this option is checked, then deleting a route will also delete the unlocked waypoints within the route.
- Hide waypoints when inactive - If this option is checked, waypoints that are part of a route are hidden unless the route is active.

#### **TRACKS**

- Always start a new track - When checked, then each recording session begins a new file. Otherwise new track points are added to the existing file.
- Interval - The interval in seconds between track points when recording a track.

#### **INSTRUMENTS**

- Toggles the display of individual instruments (only appears if the Instruments capability has been purchased)
- Show TWD TWS - True wind direction and speed
- Show AWA AWS - Apparent wind angle and speed
- Show TWA TWS - True wind angle and speed
- Show HDG STW - Heading and speed through the water

- Show COG SOG - Course and speed over the ground
- Show DPT - Depth in metres
- Show MTW - Water temperature in degrees Celsius

#### **TIDES**

- Display times in GMT - When on all the times associated with tides are displayed as GMT without automatic conversion to the device's current time zone
- Filter streams - When on, some streams that are crowded at lower zoom levels are suppressed making for a more readable display

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## Navigational Data

The range of navigational data available for display depends on the device that AngelNav is running on, as well as what other electronics are in the boat. AngelNav can accept data from five different types of source. The first three (Location Services, NMEA and SignalK) will provide live updates of position and other information. The last two (GPX files and Routes) display recorded or planned positions and are intended for simulation only.

### Location Services

This is Apple's built in source of navigational data, and provides position, speed, and course over the ground. There is a built in GPS chip in all iPhones, and in cellular iPads, but not in Wi-Fi only iPads. **WARNING: When Wi-Fi only iPads are connected to a WiFi network, location services will do its best to provide a position, but it may be inaccurate.**

### NMEA

Most small boats have sensors and instruments which display important information including speed, position, depth and wind. The majority of boat instruments communicate using messages defined by the National Marine Electronics Association (NMEA), a US based trade organisation. There are two standards in active use; NMEA0183 and NMEA2000. The standards refer to both the type of hardware connection and the format of the messages, and some boats have a mixture of both standards. AngelNav and other mobile apps are able to read these messages over WiFi, but only if the boat has a means of broadcasting those messages over a wifi network. Some boat systems (such as the B&G Zeus) have built-in wifi, but many do not and need the addition of an additional piece of hardware (a NMEA to Wi-Fi gateway). The gateway needs to be capable of taking either NMEA0183 or NMEA2000 messages as input, and broadcasting NMEA0183 messages over Wi-Fi as output. AngelNav can be configured to receive NMEA messages from the vast majority of such devices, and if there is an AIS receiver on the network, then the AIS messages will also be received.

### SignalK

If the boat has a SignalK server (eg [iKommunicate](#)) then AngleNav can be configured to receive messages from it. As for NMEA, if there is an AIS receiver is on the network, then these messages will also be received and displayed.

### GPX file

Generates navigation data from a GPX file containing a stored track.

### Route

Generates navigation data from a route.

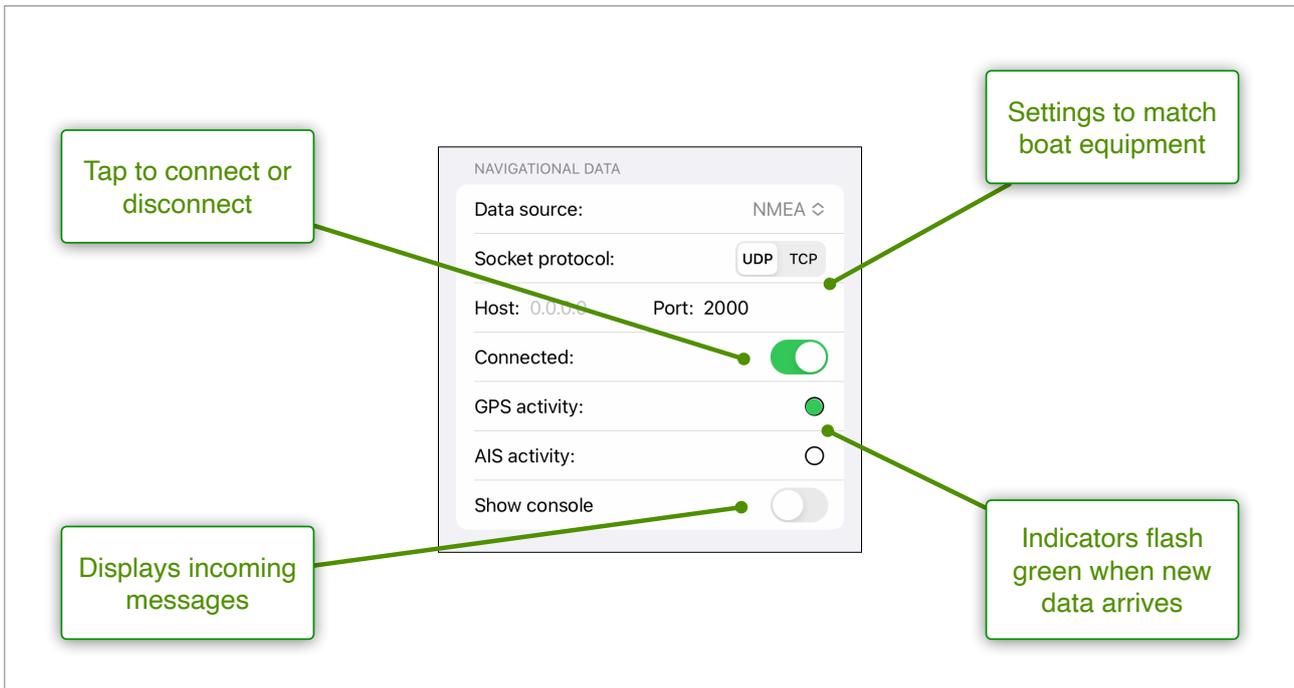
## IMPORTANT NOTE:

The operating system (iOS) limits the type of tasks that an app can perform while in the background, or when the screen is locked. Permitted tasks do NOT include processing the data from NMEA, SignalK, GPX files or routes, but DO include Location Services. In practice this only affects two functions in the app (recording of tracks and the anchor alarm). If you want to record an accurate track without gaps, then you should either select Location Services as the source of navigational data, or keep AngelNav in the foreground while recording. You can only set an anchor alarm if Location Services Is selected.

## Testing a connection

When connecting to a source of navigational data on the boat (for example an NMEA to Wi-Fi converter), the settings in the app have to exactly match what is required by the particular device being used. In order to help with testing, AngelNav indicates whether new data is being detected by showing a flashing green circle in the **Settings: Navigational Data** section of the App.

Tapping on Show console displays incoming NMEA/SignalK and other messages, along with a button to email them to SailTrack support in the event of a connection problem.



## Specific hardware settings

The following table shows specific settings for hardware that has been tested with AngelNav. If your device is not in the table, please contact us, as we would like to make this section as comprehensive as possible.

Device	Data source	Protocol	Host	Port
Digital Yacht iNavHUB	NMEA	UDP	0.0.0.0	2000
Digital Yacht WLN10 Wifi Gateway	NMEA	UDP	0.0.0.0	2000
Digital Yacht iKommunicate	SignalK	-	-	-
Actisense W2K-1	NMEA	UDP	<local IP>	60001
MiniPlex 3B022058	NMEA	UDP	10.0.0.120	10110
B&G Zeus3S	NMEA	TCP	<local IP>	10110
Vesper Marine XB-8000	NMEA	TCP	192.168.15.1	39150
Raspberry Pi SignalK server	SignalK	-	-	-

## Connecting to the B&G Zeus3

In the Zeus3 system, carry out the following steps:

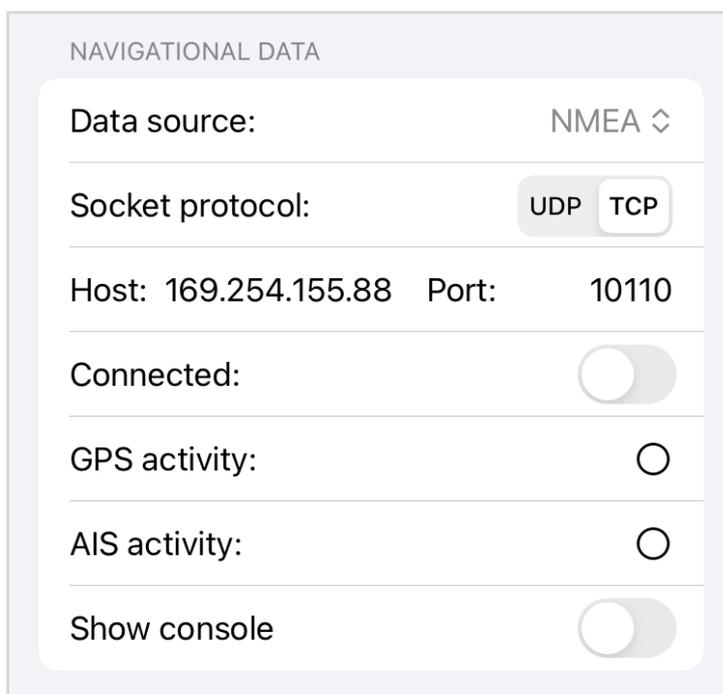
- Press pages, settings, network
- Press NMEA0183 then Ethernet/Wireless

The 'Ethernet' section of the page should display the IP address and the Port.

Now in AngelNav, go to the Navigational Data section of the Settings page and do the following:

- Set the Socket protocol to TCP
- Enter the IP address into the Host field
- Enter the port number into the Port field

For example, if the IP address is '169.254.155.88' and the port number is 10110, then the Settings in AngelNav should look like this:



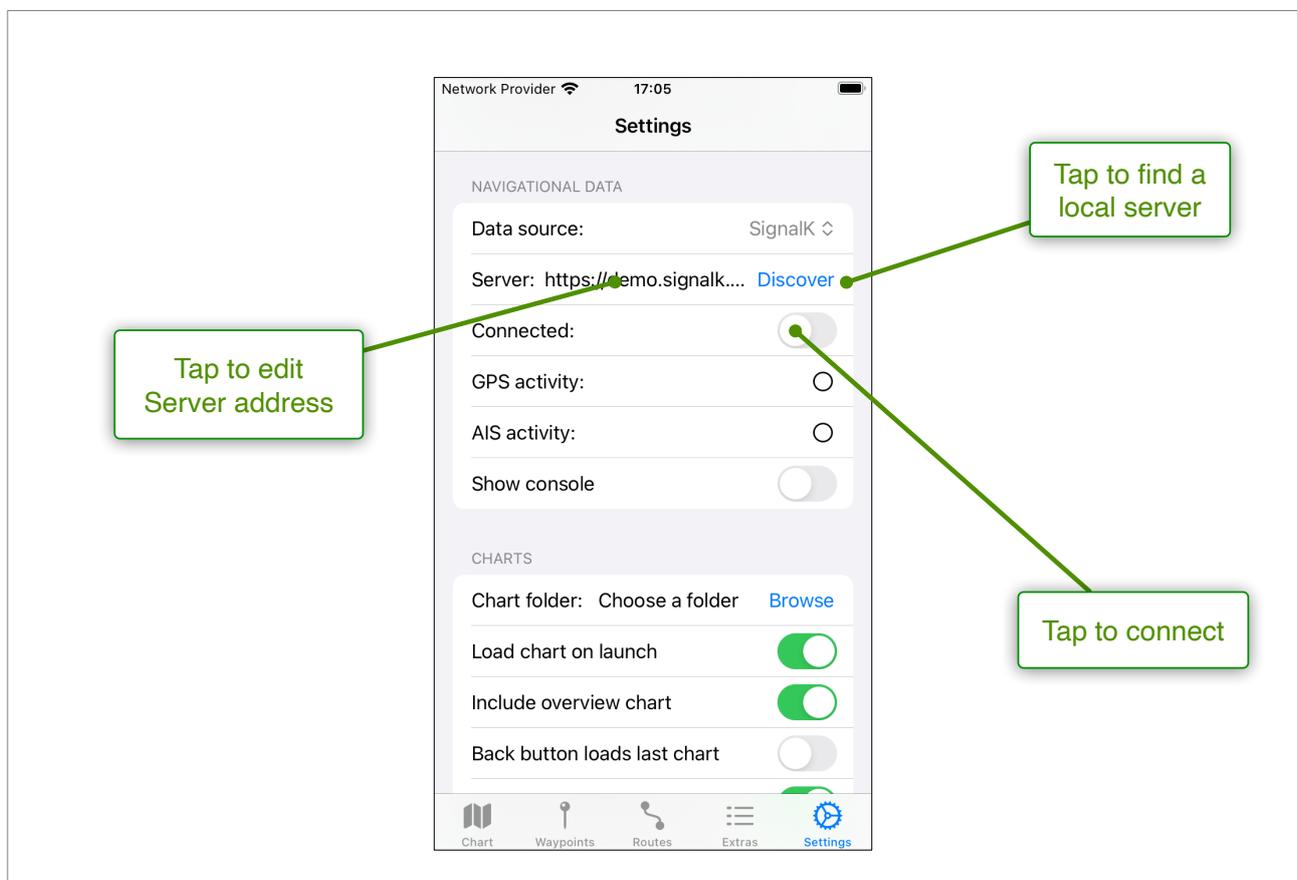
NAVIGATIONAL DATA

Data source:	NMEA ↕
Socket protocol:	<input type="radio"/> UDP <input checked="" type="radio"/> TCP
Host: 169.254.155.88	Port: 10110
Connected:	<input type="checkbox"/>
GPS activity:	<input type="radio"/>
AIS activity:	<input type="radio"/>
Show console	<input type="checkbox"/>

## Connecting to a SignaK server

In **Settings: Navigational Data** choose SignaK and this will show an editable field containing the internet address of the SignaK server. It defaults to a live demonstration server which continuously outputs data from a virtual vessel near Helsinki. If you tap the connect switch you should see the GPS and AIS buttons flashing green as the data comes in. However, the positions of the vessel and nearby AIS targets are outside the coverage of the GB Overview chart so its unlikely you be able to see them.

If you have a SignaK server on your boat (for example a Raspberry Pi) then you can enter the address of the server in the text box. However, SignaK servers should be 'discoverable'. This means that if you tap the **Discover** button while attached to the boat's wifi network, AngelNav will search for any SignaK servers and will automatically insert the address of the server in the boat.



## iKommunicate

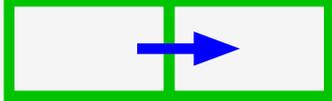
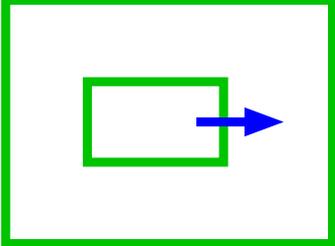
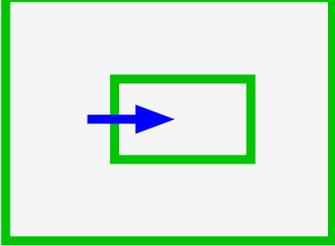
This interface from Digital Yacht was one of the first SignaK servers on the market but the most recent firmware update is June 2018, and the device has not been updated to match changes in the SignaK specification (see the iKommunicate note [here](#)). However, AngelNav continues to work well with it. Note that for AIS targets the call sign, ship type and length are not supplied.

## Position updates

Regardless of the source of navigational data, when AngelNav receives new position data, the updated position of the boat is plotted on the chart.

If 'Centre Boat' is selected in the Chart View Menu, then the chart is scrolled to keep the boat in the centre of the screen.

If the position of the boat leaves the boundary of the chart, then the behaviour of AngelNav depends on the value of 'Auto Change Charts' in the Chart View Menu, and is described in the following table.

Transition	Graphic	Auto Change ON	Auto Change OFF
Chart to no chart		Boat disappears off the edge of the chart	Boat disappears off the edge of the chart
Chart to adjacent chart or charts		The chart with the largest scale covering the new boat position is loaded	A list of available charts covering the new boat position is presented for selection
Chart to enclosing chart (or charts)		The chart with the largest scale covering the new boat position is loaded	A list of available charts covering the new boat position is presented for selection
Chart to enclosed chart (of larger scale)		The enclosed chart is loaded	The boat continues on the existing chart

If 'Centre Boat' is selected, the automatic scrolling to show the boat is temporarily suspended if the chart is manually scrolled so that the boat is no longer visible. This is useful for examining another area of the chart without it being automatically scrolled back to centre the boat until you are ready.

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## Interacting with a chart

### General

Under most circumstances a single tap will select or display, and a double tap will edit. The exact interaction is specific to the object being tapped and is described in the following table.

Object	Single tap	Double tap	Long tap
Chart	Displays the chart inspector showing latitude and longitude, as well as distance and bearing (if available)	Displays a menu of options	Displays a list of other charts which include the position of the tap
Boat/AIS target	Displays a table of information including SOG and COG	Creates a waypoint at the current position of the boat	As for single tap, but the information persists. Repeat or single tap to dismiss
Waypoint	Displays the name and position of the waypoint, and a move handle	Displays a menu of options related to the waypoint	-
Note	Displays a move handle for the tip of the arrow	Allows editing and deleting	-
Exclusion zone	-	Allows addition of a new marker and deleting	-
Chart work	Displays move handles	Allows editing and deleting	-

### Chart outlines

If 'Show Outlines' is selected in the chart view menu, then any chart of the same or larger scale that intersects with the currently displayed chart, is shown with a blue outline. This makes it easier to identify if there is another chart in the current view that could be useful. Long tap within the outline to launch the chart.

### Move handles

Move handles are used throughout AngelNav to move objects on the screen. The concept is that the handle is displaced from the object being moved, so that its exact location is not obscured by the user's fingertip.

The handles appear following a single tap on an object, and disappear when the movement is finished, or after a short delay if no movement takes place. The duration of the delay can be set in **Settings:Charts:Information duration**.

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## Specific interactions

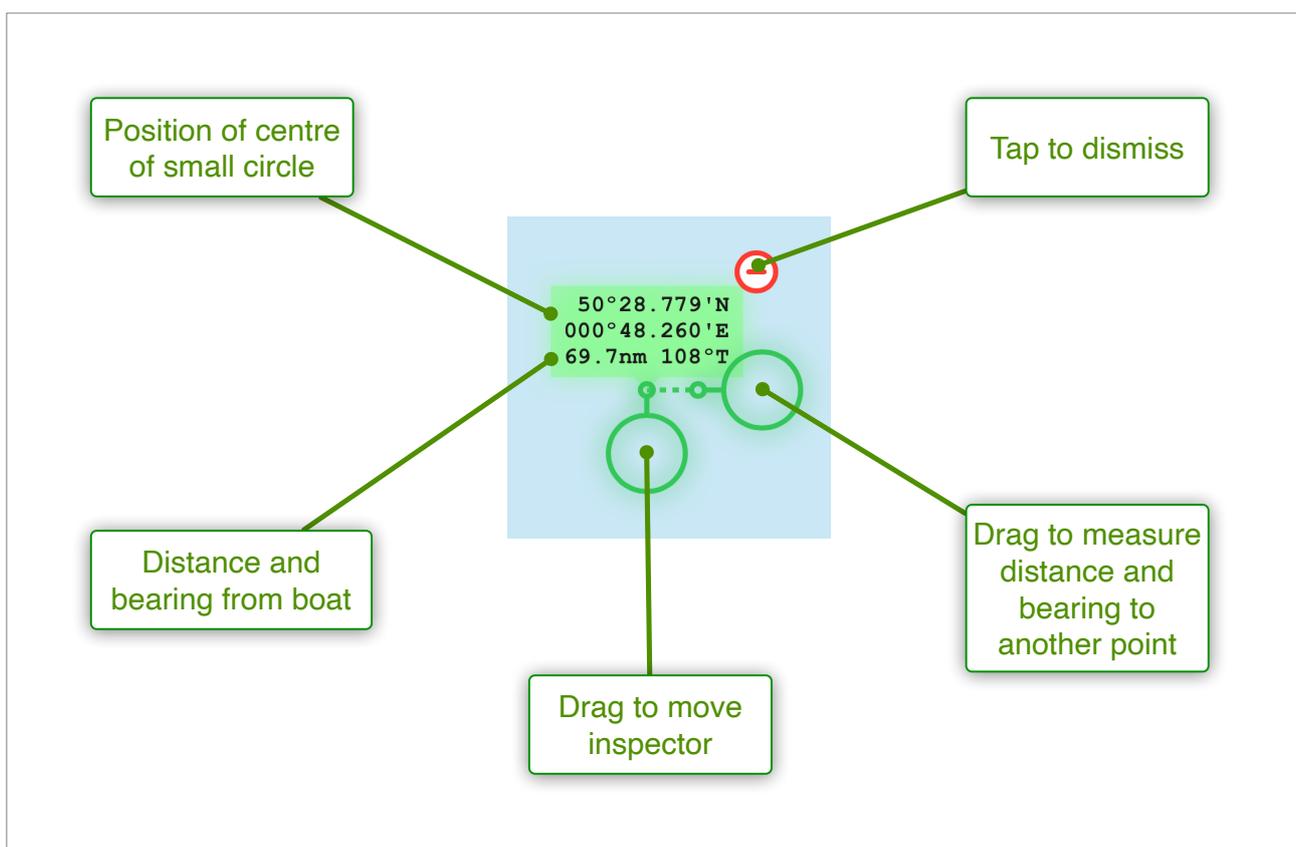
### The Chart Inspector

The chart inspector provides a simple method of displaying the latitude and longitude of a point on the chart. If the boat position is available the distance and bearing from the boat will also be displayed. It is invoked by a single tap anywhere on the chart, and dismissed by tapping the delete icon. It can be positioned precisely using the central drag handle.

Dragging the other handle creates a 'ruler' to measure distance and bearing to another point on the chart.

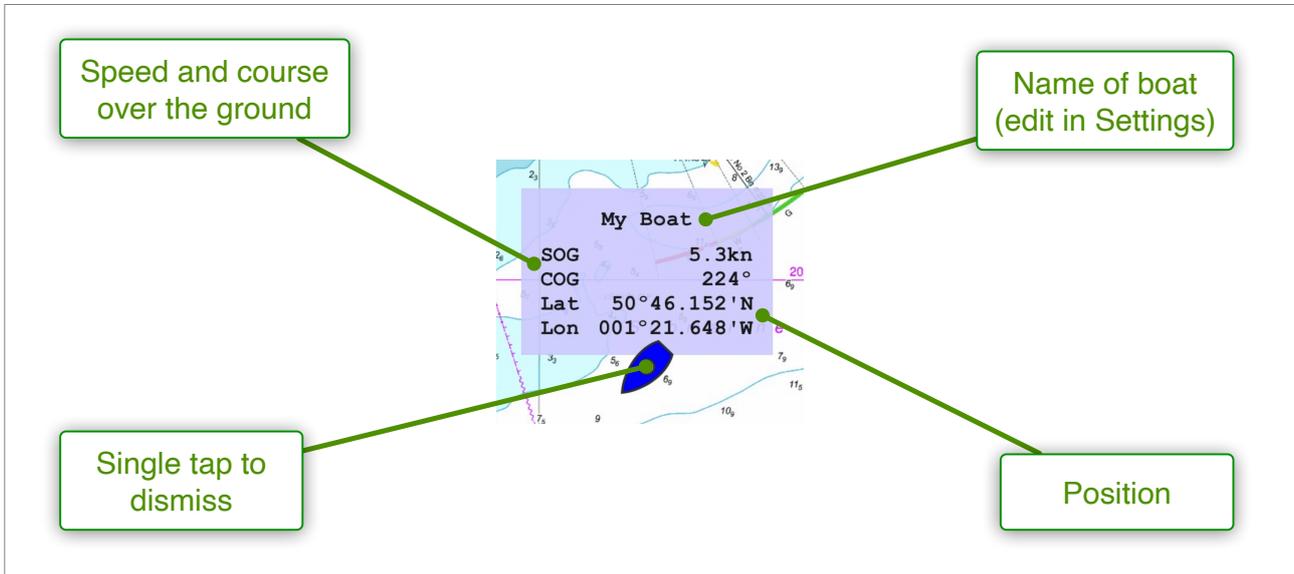
It is quite easy to call up the chart inspector by accidentally brushing your finger on the screen (ie a single tap). If you find this undesirable, then it can be switched off in

**Settings:Charts:Single tap shows Chart Inspector.**

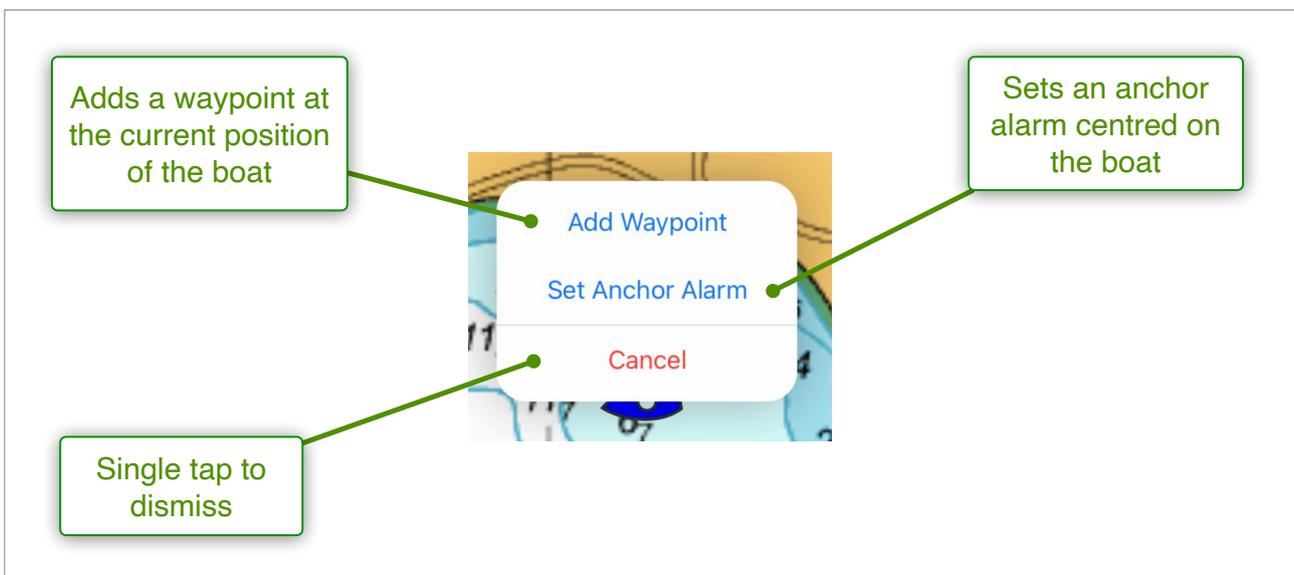


## Boat

A single tap on the boat will display relevant boat data as shown in the following diagram. The display will disappear after a short interval. A long tap will also trigger the display, but it will remain visible until there is another single or long tap on the boat.

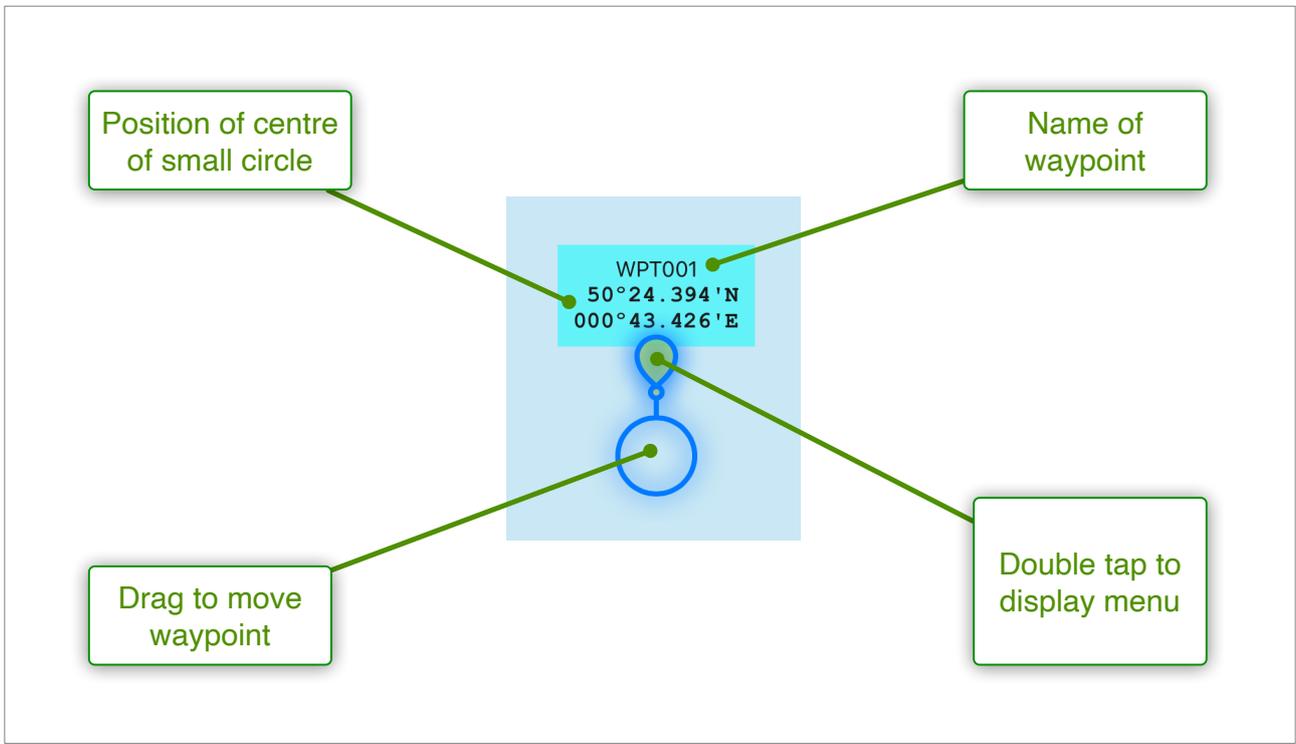


A double tap on the boat will reveal a menu of options including adding a waypoint at the current position of the boat, and setting an anchor alarm. *NB The anchor alarm option is only available if the source of navigation data is set to Location Services.* This is the only source of data which functions while the app is in the background, or when the device is locked.



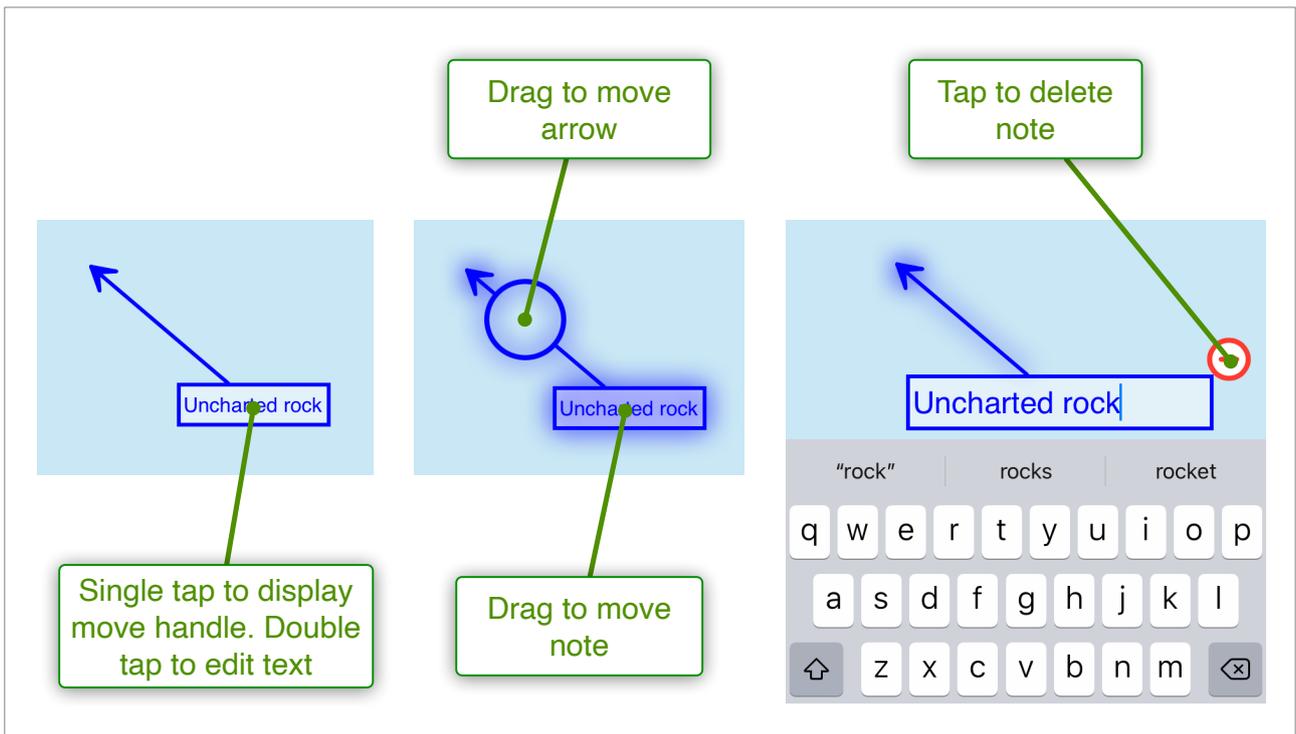
## Waypoints

A waypoint can be added using the chart menu (double tap on the chart), or from the Waypoints tab. A single tap on a waypoint displays its position and a move handle. A double tap displays a menu of options



## Notes

A note can be added using the chart menu (double tap on the chart). A single tap on the note displays move handles. A double tap displays the keyboard for editing the text.



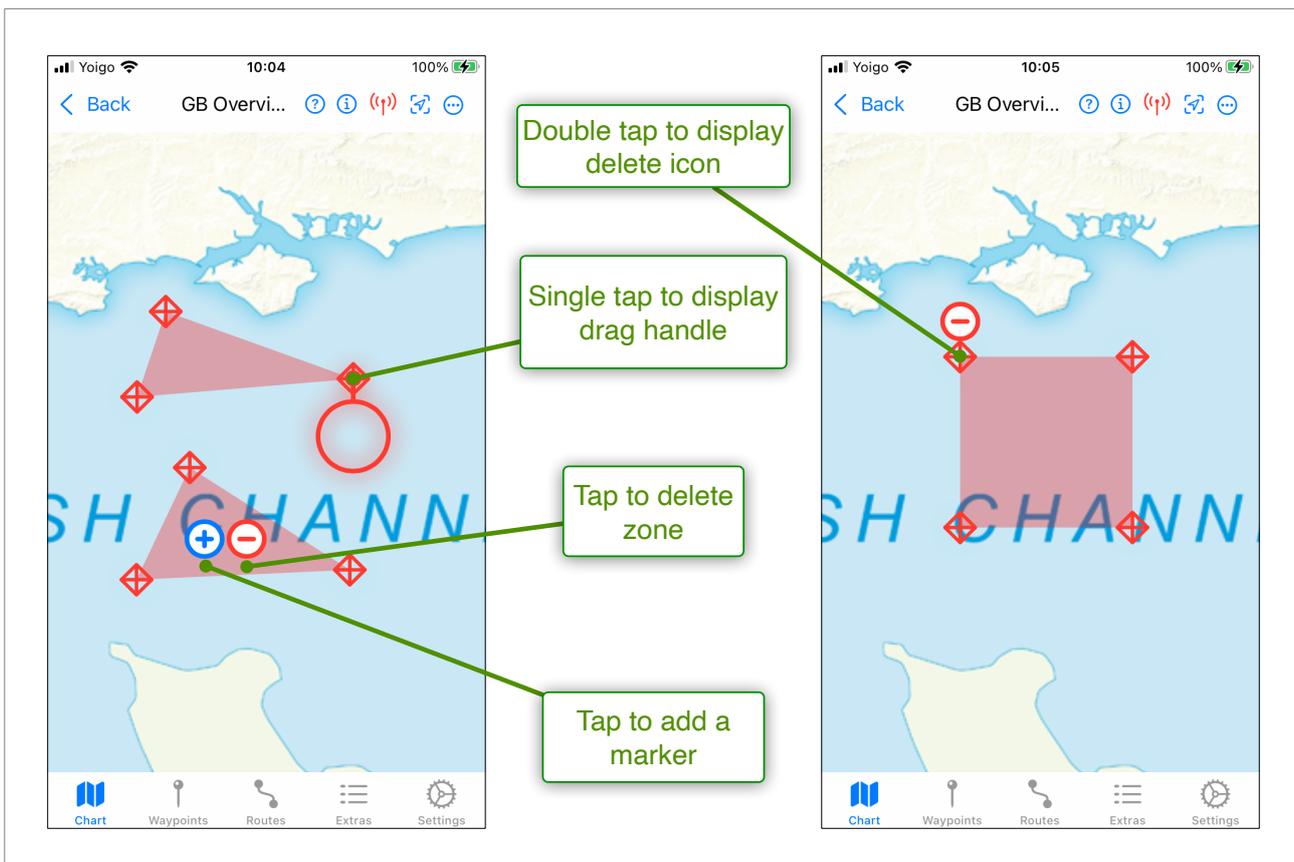
## Exclusion Zones

An exclusion zone can be added using the chart menu (double tap on the chart).

The default zone has 4 markers, each of which can be selected and moved. A marker can be deleted (a minimum of 3 markers is required to define the zone. Markers can be added by double tapping on the zone and tapping the + button.

The entire zone can be deleted by double tapping on the zone and tapping the delete icon.

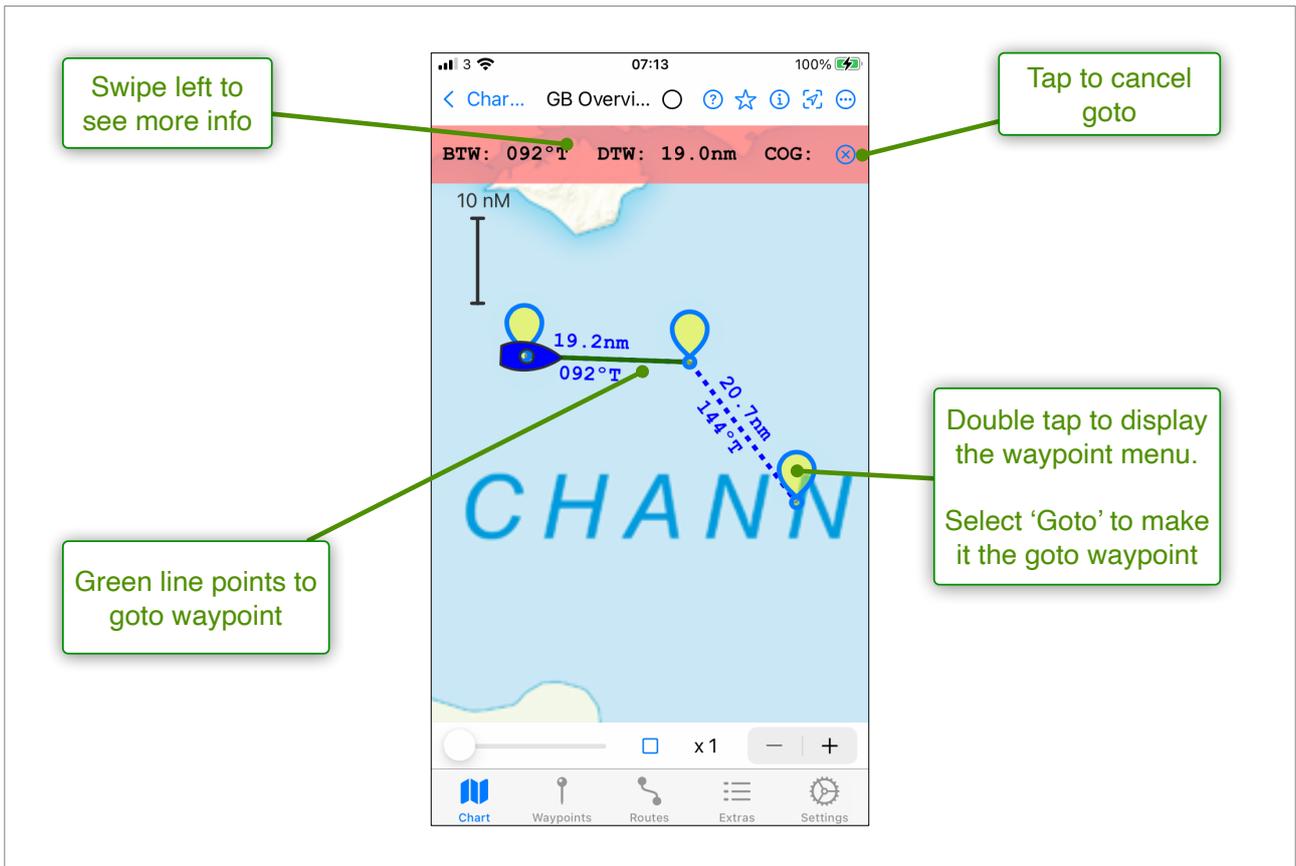
When the boat enters an exclusion zone, an alarm sounds for 10 seconds and the borders of the zone flash red.



# Goto waypoint

## Setting the goto waypoint

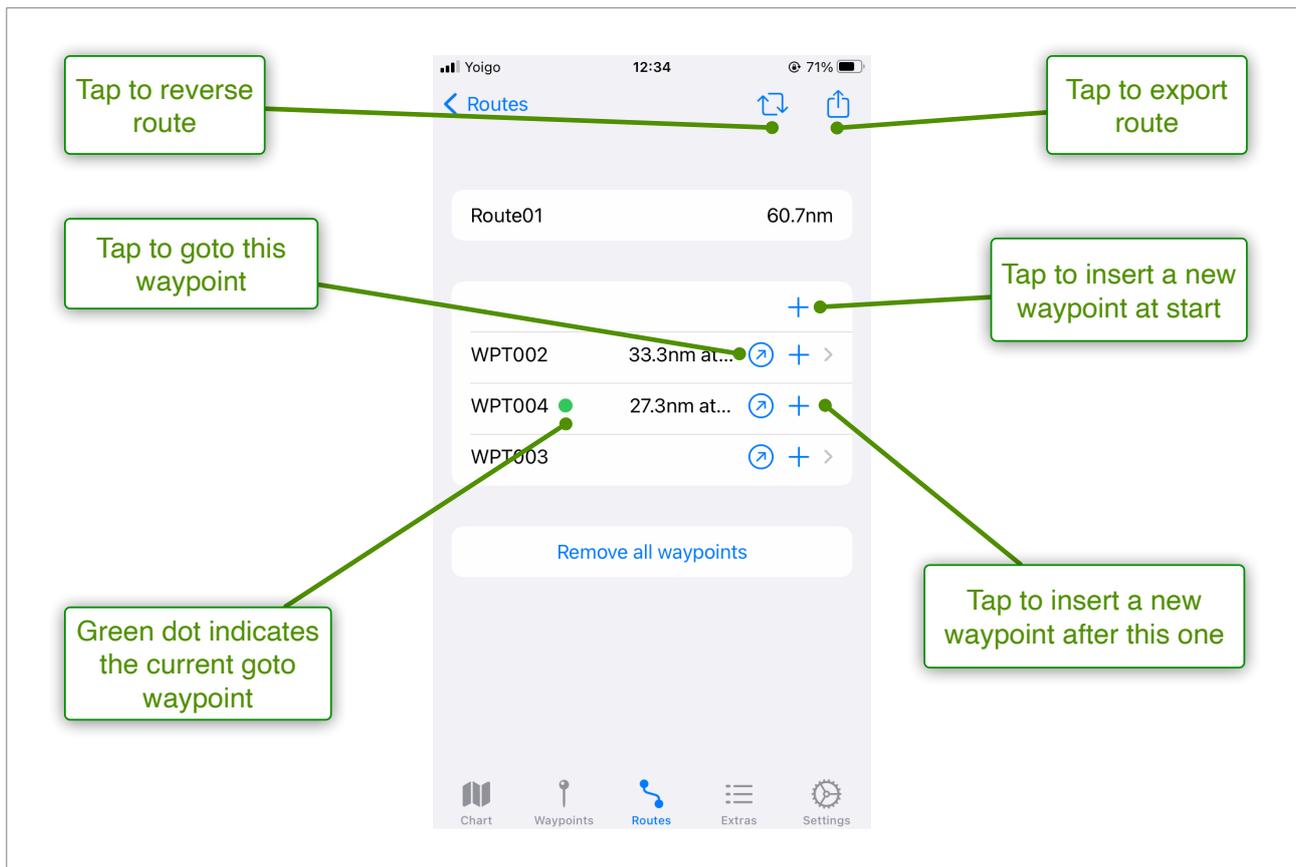
A waypoint can be set as the 'Goto' waypoint by tapping **Goto** in the waypoint menu, or tapping  in the waypoint list (or in a route's waypoint list). In addition, tapping **Goto** in the chart menu creates a new waypoint at the tapped position and starts going to it. Once set, a green line appears between the boat and the waypoint, and information (such as bearing and distance to waypoint) is displayed in a strip at the top of the chart:



The list of items of information displayed is shown here. On devices with smaller screens, swipe left on the information bar to see more items.

BTW	Bearing to waypoint	True or magnetic depending on settings
DTW	Distance to waypoint	The distance from the boat to the waypoint
COG	Course over the ground	In degrees true
SOG	Speed over the ground	In knots
VMG	Velocity made good	In knots
TTG	Time to go	The estimated time to get there at current VMG
XTE	Cross track error	Positive values indicate an error to starboard

The goto waypoint can also be set in route editing screen by tapping the  icon in the waypoint's row. A green dot is displayed adjacent to the goto waypoint (if there is one).



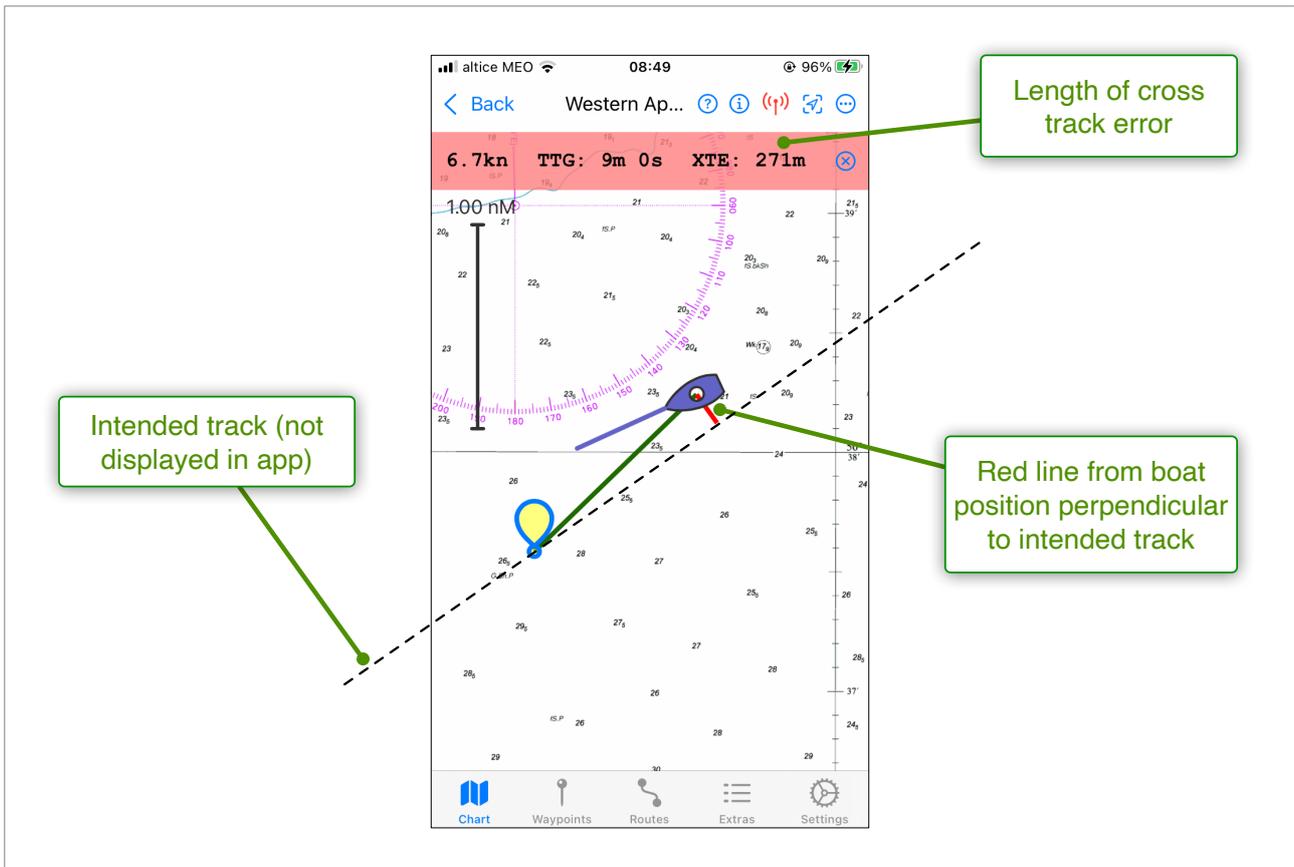
## Cancelling the goto waypoint

The goto waypoint can be cancelled in a number of different ways:

- Select **Stop goto** from the waypoint menu of the goto waypoint
- Tapping on the  symbol in the goto display bar
- Tapping on the  symbol adjacent to the waypoint in the waypoint list
- Tapping on the  symbol adjacent to the waypoint in a route display
- Deleting the waypoint

## Cross track error

When going to a waypoint, AngelNav records the position of the boat when the goto started. The shortest route from that point to the goto waypoint is a straight line, and the

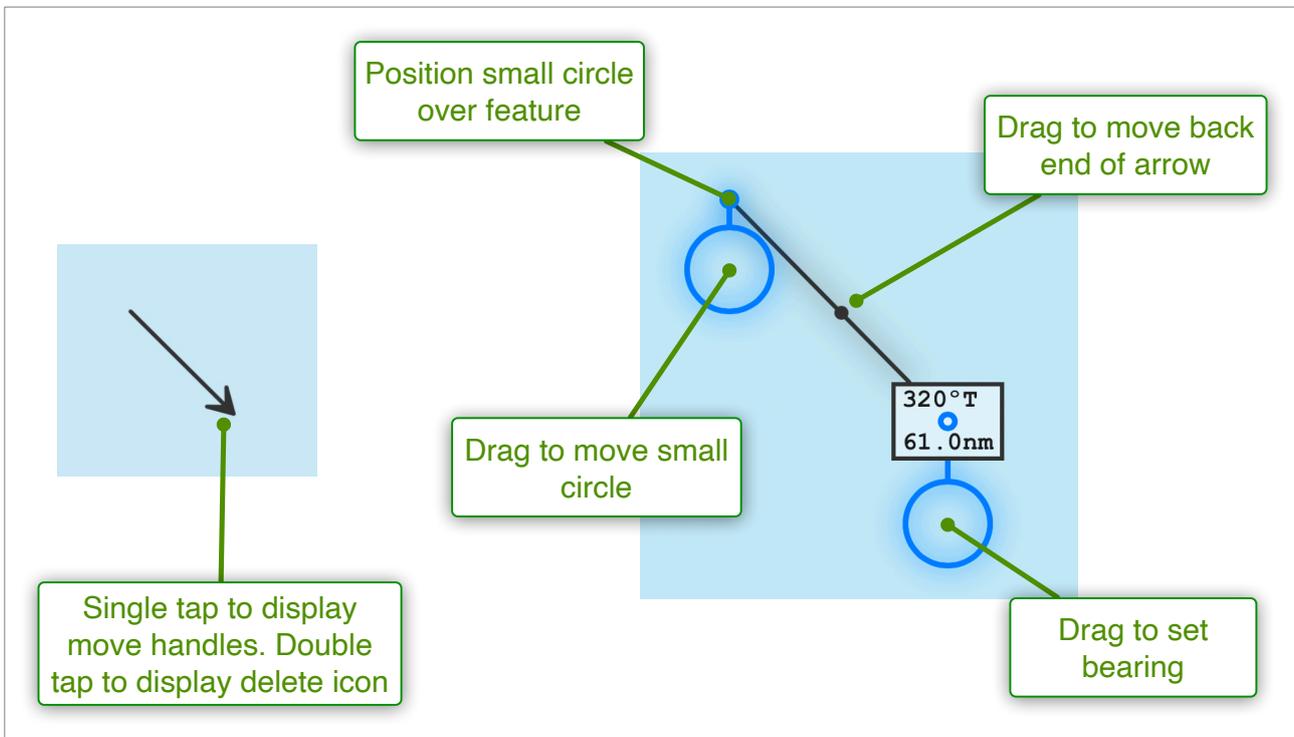


distance from the boat to that line is known as the cross track error (XTE). The value of the XTE is one of the items in the information bar at the top of the screen, but it can also be displayed on the screen by selecting [Show XTE](#) from the Chart View menu.

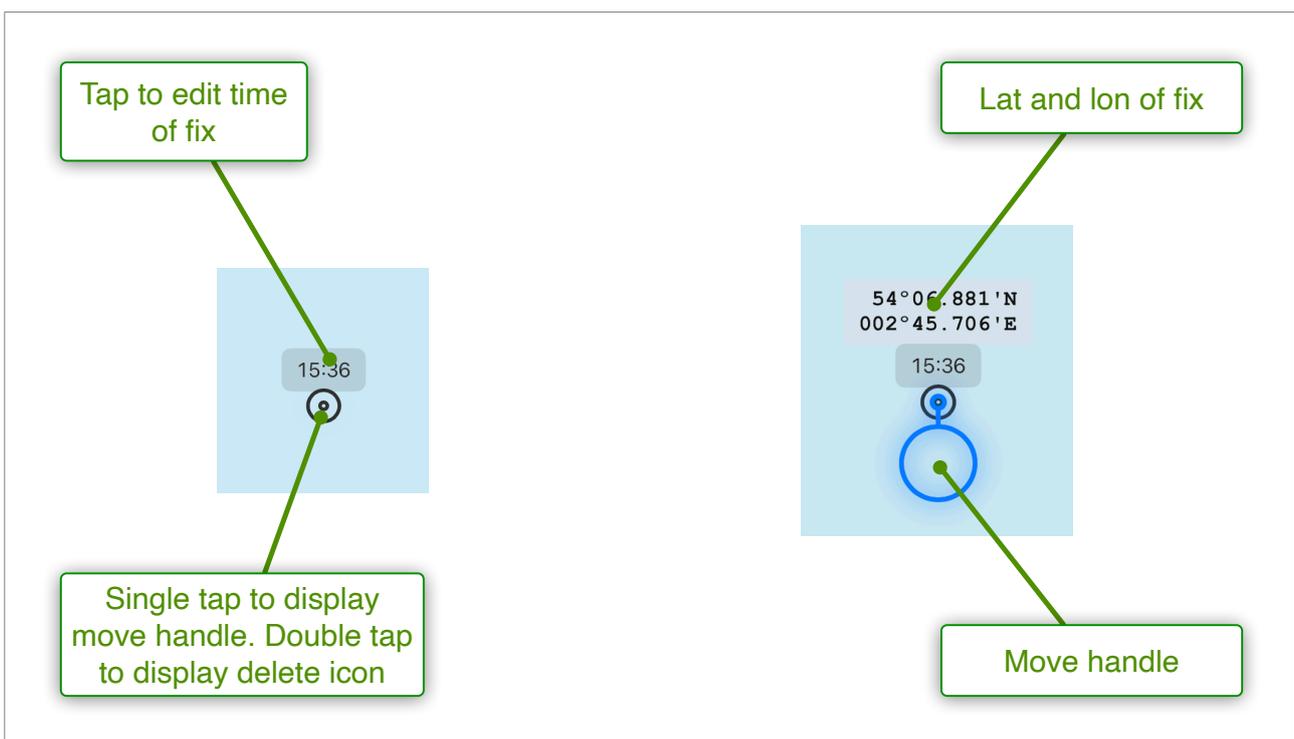
## Chart work

AngelNav allows the use of traditional navigational techniques directly on the screen. Select 'Add Chart Work' from the chart menu to add any of the following objects:

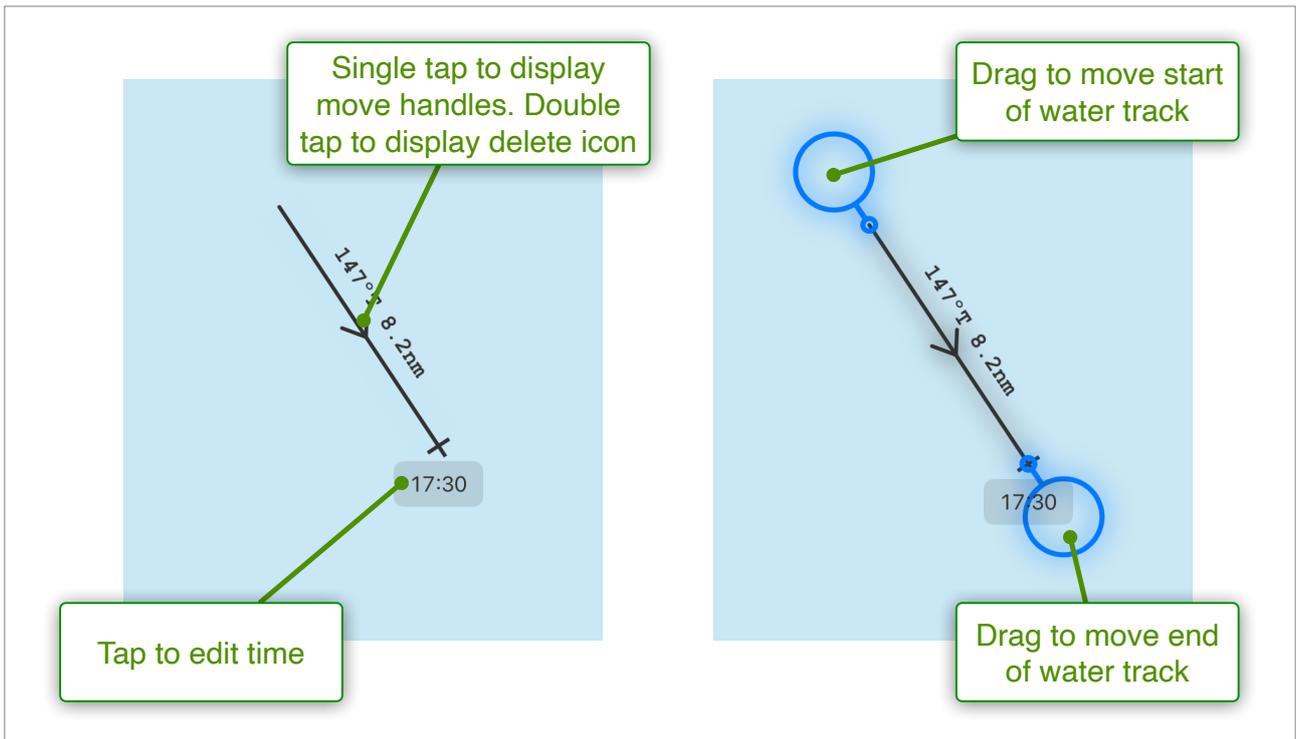
### Position Lines



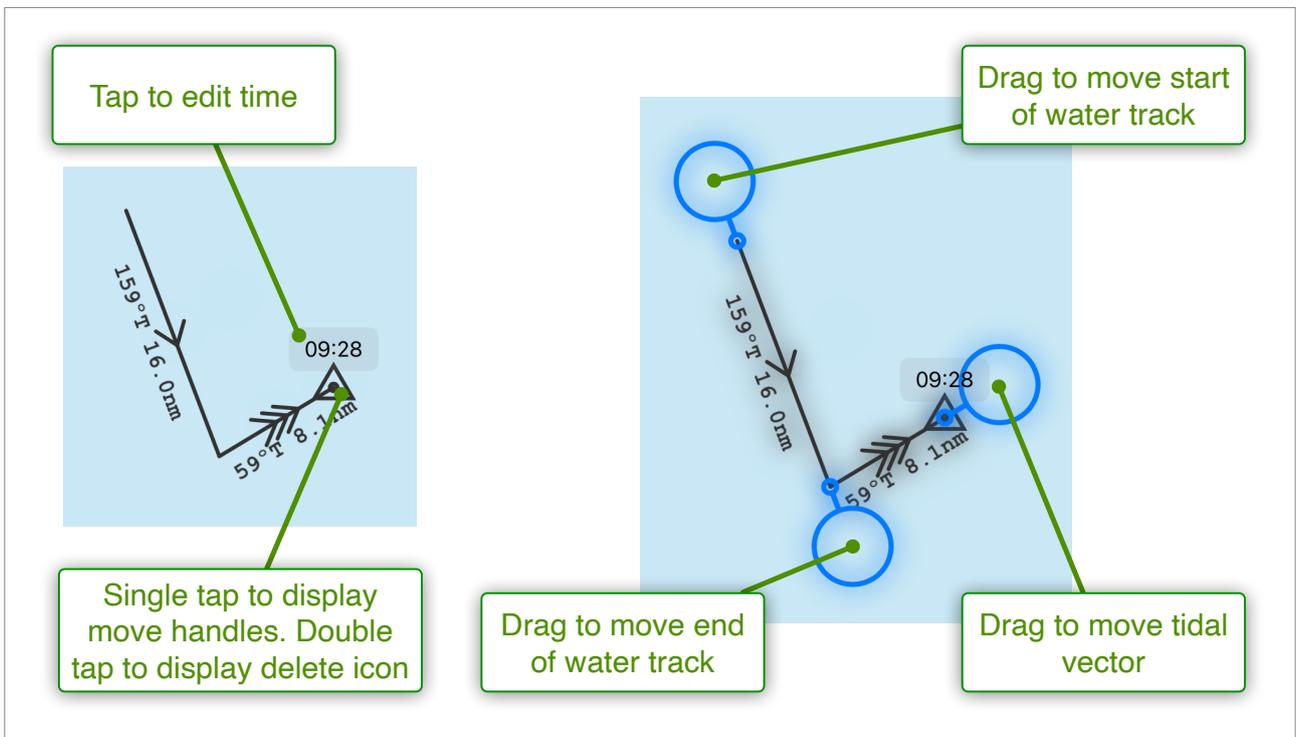
### Fix



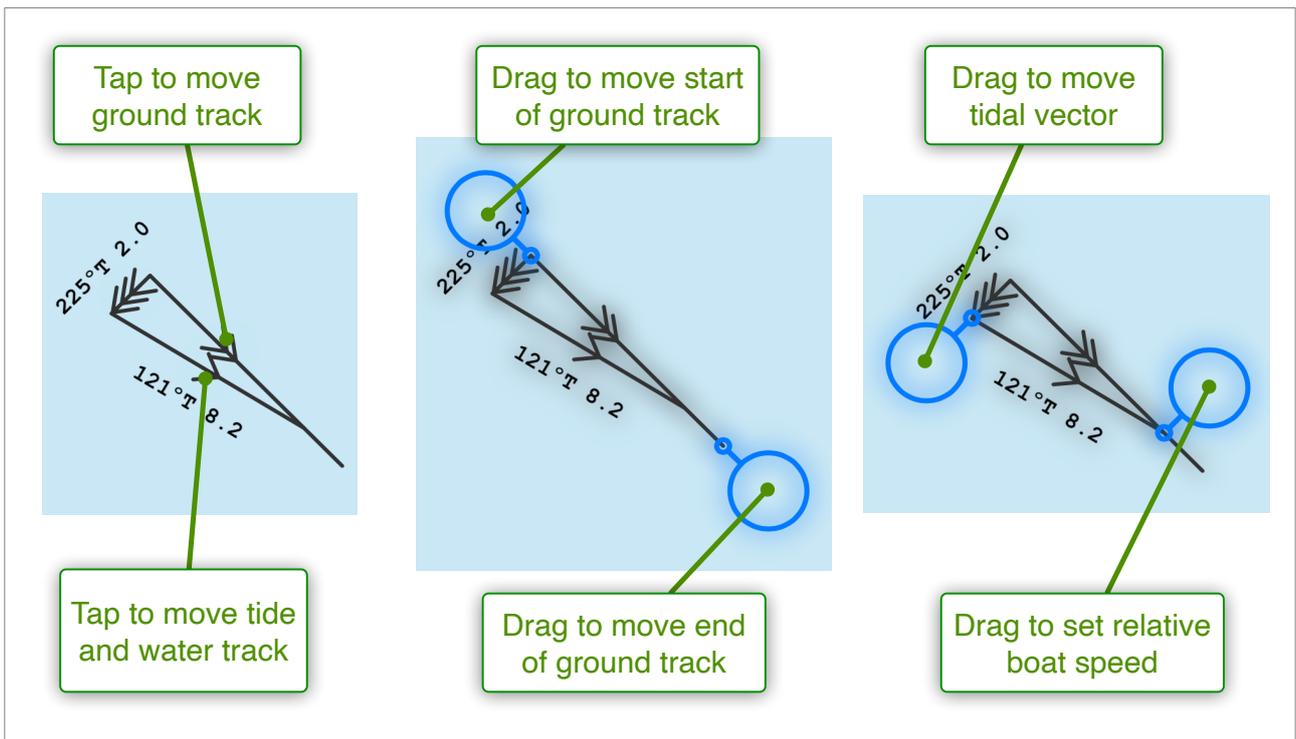
## Dead reckoning



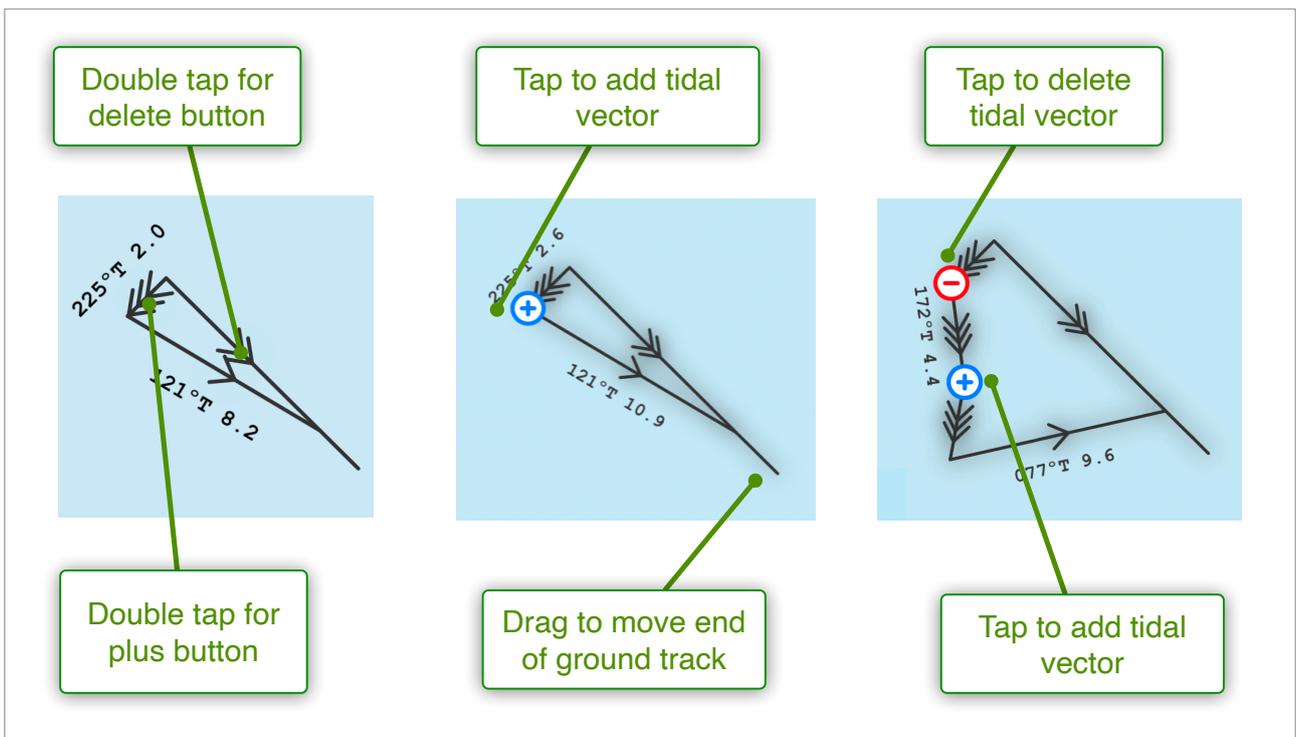
## Estimated position



## Course to Steer



For long legs (eg a channel crossing), it can be helpful to have multiple tide vectors. This can be achieved by double tapping the tide vector and tapping the + button.



# Tracks

## Recording tracks

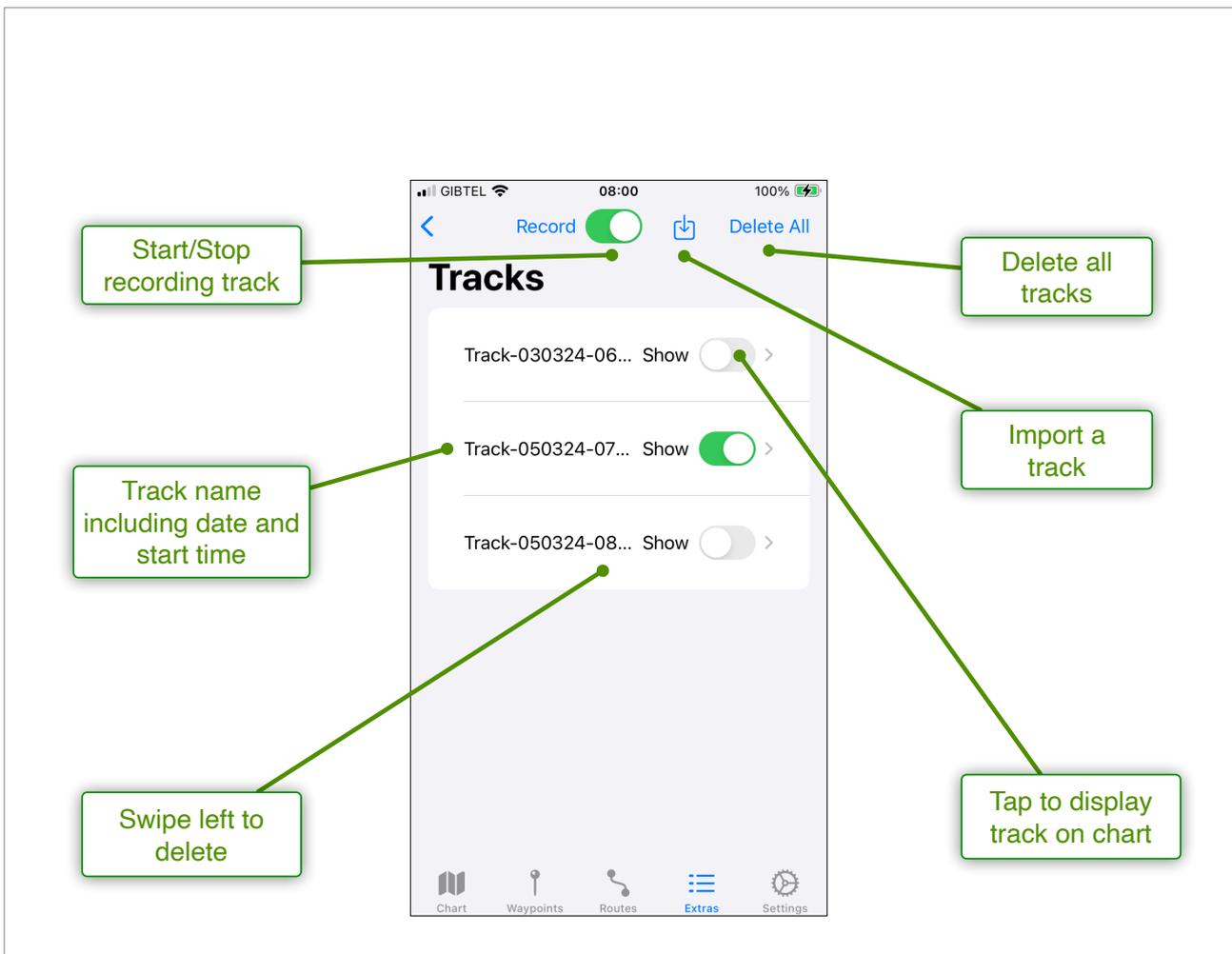
AngelNav can record a track provided it is receiving regular position updates. Track recording is turned off by default, but can be turned on by tapping the record button in **Extras: Tracks**.

In **Settings: Tracks** you can also select whether to continue to add new data to the existing track, or start a new track every time. You can also modify the interval between track points (default is 10 seconds).

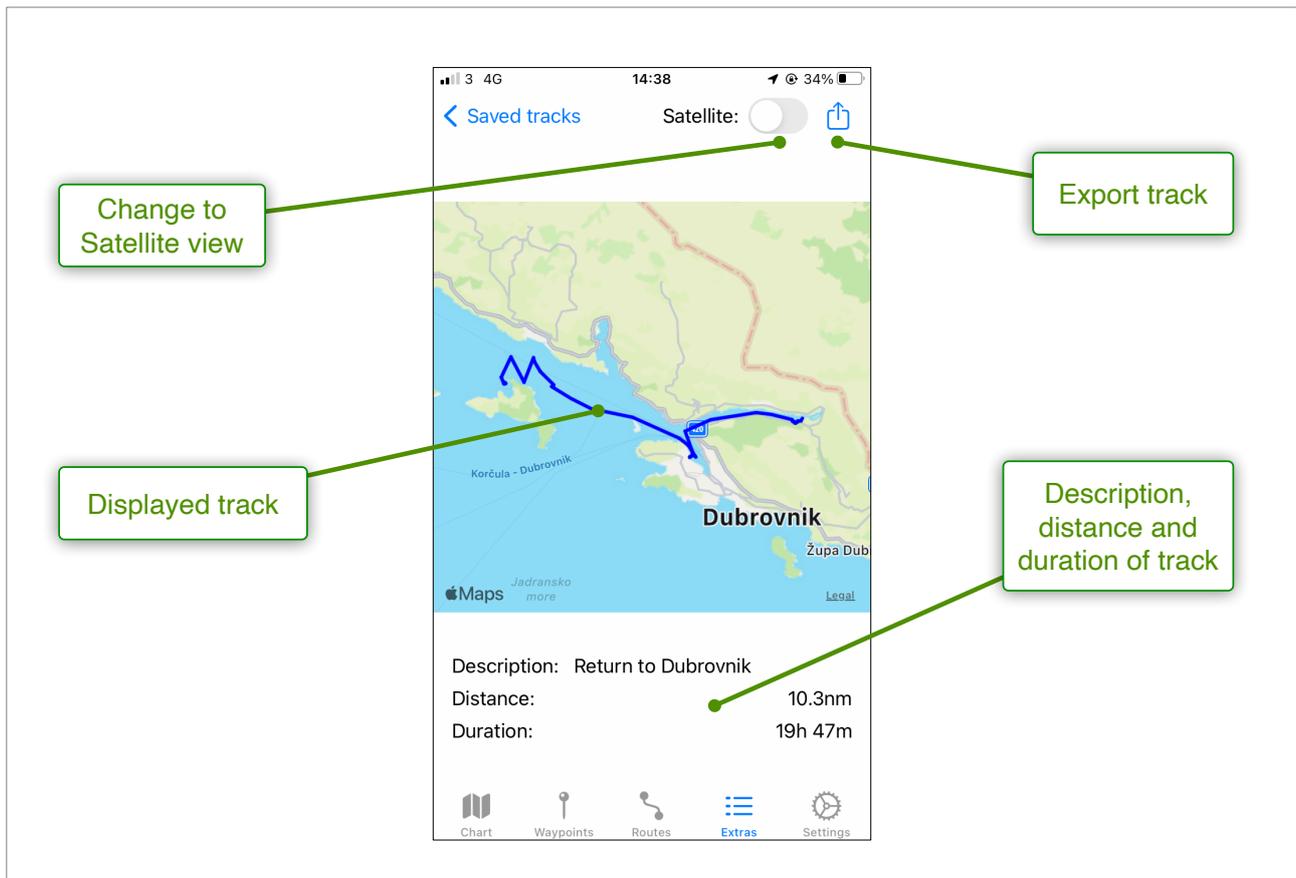
NB. If you select Location Services as the source of navigational data, the track will continue to be recorded when the app is in the background. With other sources of navigational data, tracks are only updated when the app is in the foreground.

## Displaying tracks

The current track can be displayed on the chart by selecting 'Show track' from the Chart View menu. Saved tracks can also be viewed by tapping the track in **Extras: Tracks**. If you have a track stored as an external GPX file, then this can be imported for display in AngelNav by tapping the import  button.



Tapping a track calls up a new screen which displays the track on a map, along with its distance and duration. You can edit the description of the track.



## Exporting tracks

Tracks can be exported to a GPX file allowing them to be displayed and played back in applications such as Google Earth. Tap the export button  at the top right of the screen.

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## Anchor alarm

### Description

An anchor alarm can be a useful aid for detecting dragging of the anchor. A circular zone is set and the app then monitors the position of the boat. If the boat moves outside the zone, an audible alarm sounds.

### WARNING:

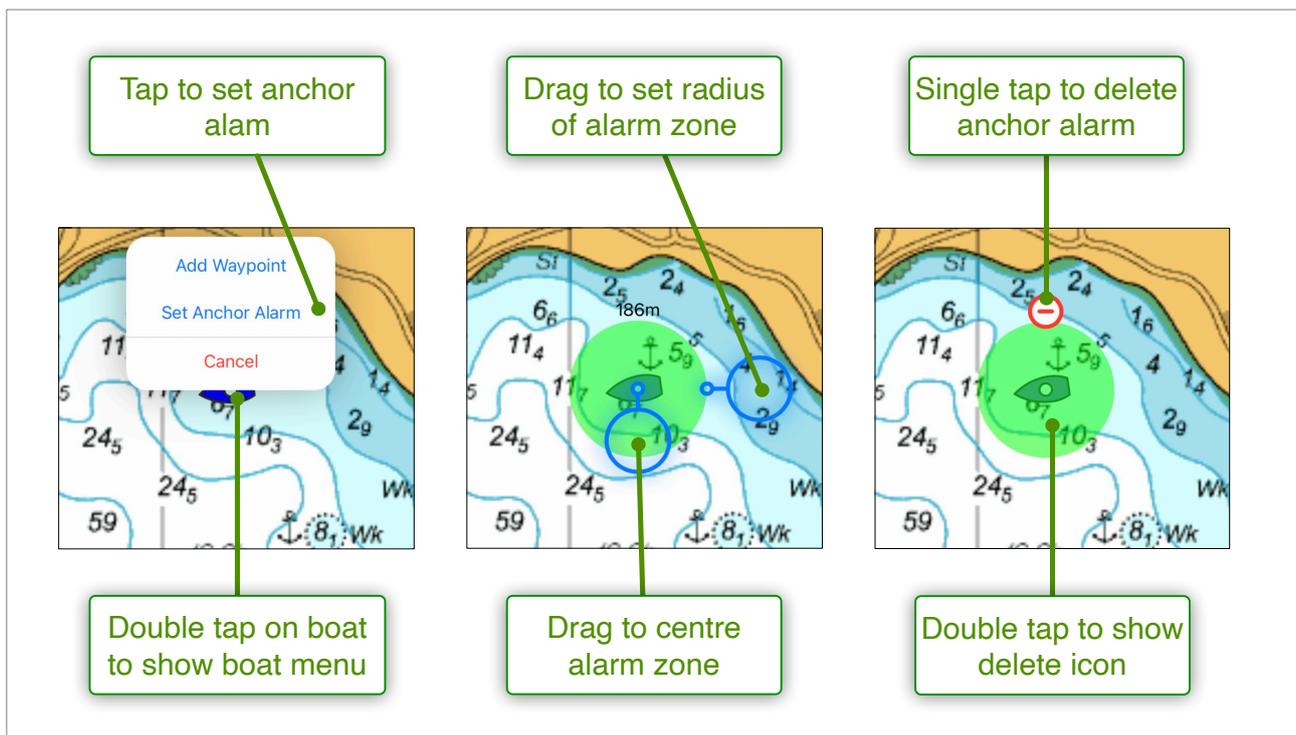
The anchor alarm functions in the background, so requires a device with a built in GPS, or one linked to a bluetooth GPS. It will NOT function with a Data source from an NMEA or SignalK network, both of which require the app to be in the foreground.

In order for the anchor alarm to work effectively the following points are vital:

- **Settings: Data source** is set to “Location Services”
- Location Services for AngelNav is set to “While Using the App”
- The anchor alarm is set appropriately (try to centre the zone over the anchor position, not the boat position)
- The volume on the device is turned up to a level sufficient for the alarm to be heard (switching silent mode on or setting ‘Do not disturb’ does not suppress the alarm)
- The device is connected to a power source (using location services in the background uses significant energy)

### Setting the alarm

Double tap on the boat icon to show the boat menu, and follow these steps:



# GPS spoofing alarm

## Background

Signals from global navigation satellite systems (GNSS) satellites are weak, and a portable and powerful transmitter can be used to swamp their signals. This is known as GPS jamming, and is easily detected in AngelNav by the colour change in the boat's icon (turns to pale blue when regular position updates stop).

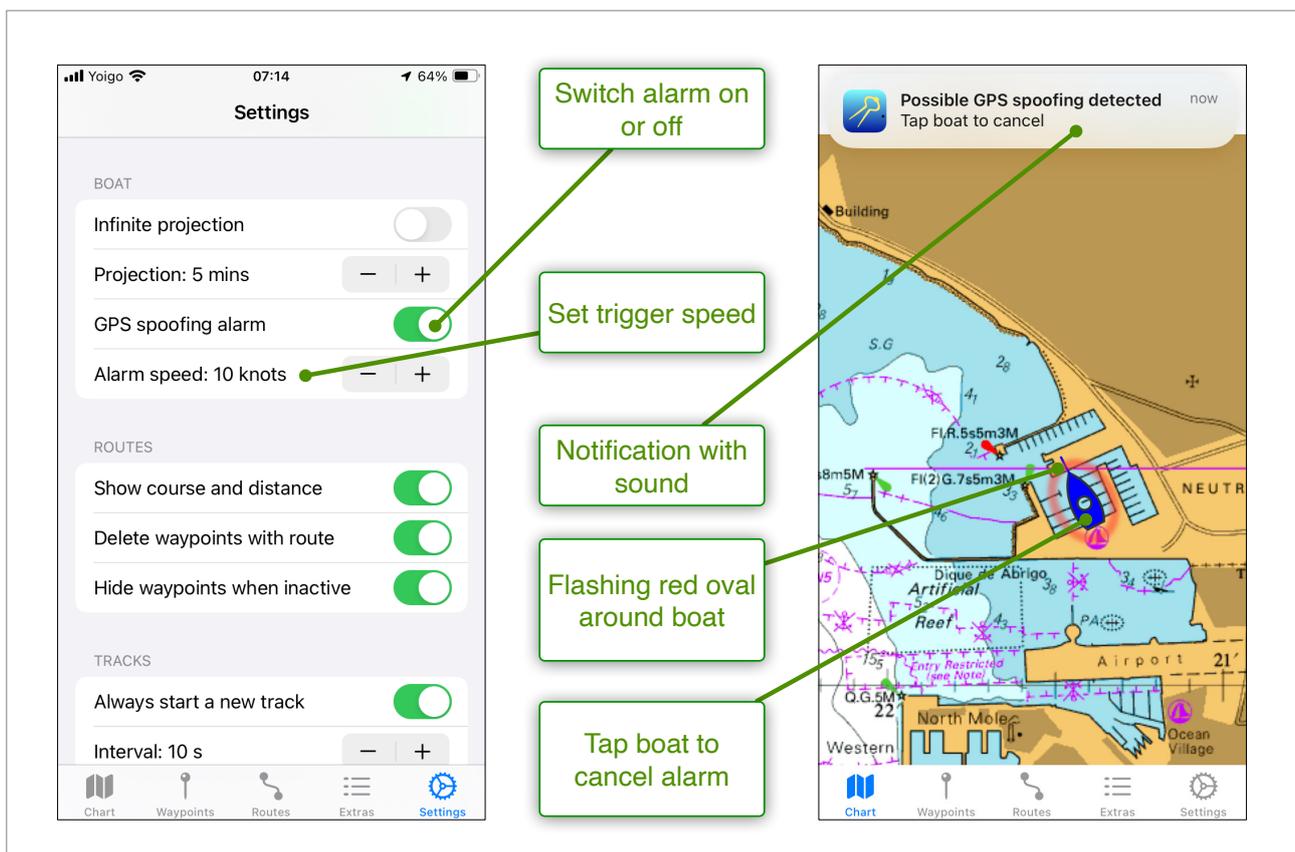
GNSS signals are also insecure, so that a ground based transmitter can replace them with apparently genuine but deliberately incorrect position messages. This is known as 'spoofing' and is more difficult to detect.

The spoofing alarm in AngleNav uses a published detection technique known as 'Physical Cross Check' (PCC). AngelNav takes consecutive pairs of incoming position messages and calculates the distance and time interval between them. From that data it calculates a speed and compares it with a set value.

At the moment your boat comes under the influence of a spoofing attack, the apparent position will shift and therefore cause a spike in the calculated speed. Even a small shift of 20 metres with messages arriving every second will result in a spike of 20 m/s (39 knots), and this is used to trigger the alarm.

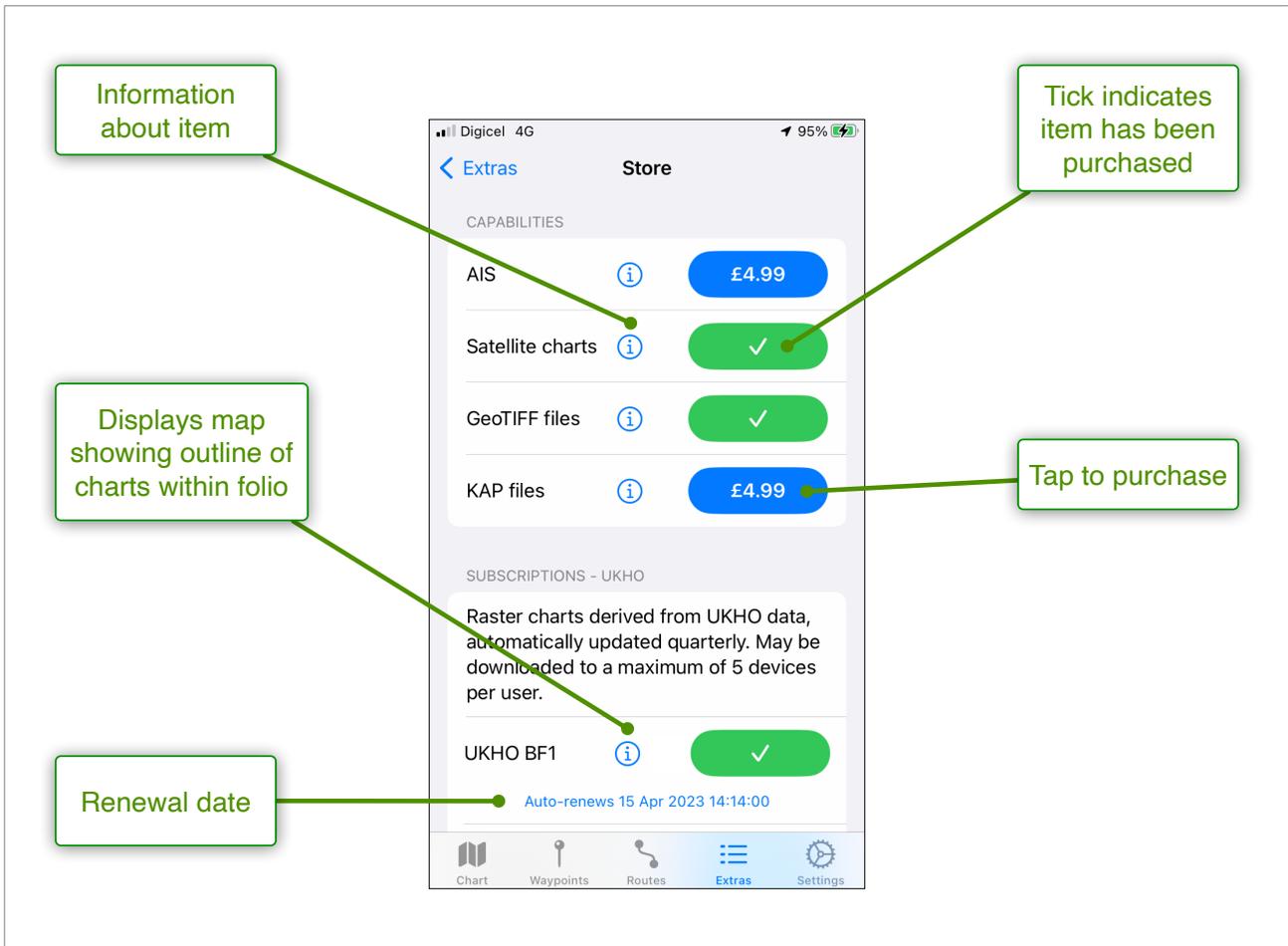
## Setting up

The alarm is off by default, as spoofing attacks are currently rare. It can be switched on in **Settings: Boat** and the trigger speed can be adjusted. We recommend that this is set to double your current speed in order to avoid false alarms from natural GPS variations.



## In App purchases

Go to the **Extras: Store** section to purchase capabilities and/or subscriptions for charts.



## Capabilities

- AIS - Decodes incoming AIS information (if available) and displays targets on chart. Displays projected position, and calculates closest point of approach for each target.
- Satellite charts - Displays satellite charts created using the 'Create Satellite Chart' function. The charts are geo-referenced satellite images, and are useful for providing information about difficult anchorages with poor coverage by conventional charts.
- GeoTIFF files - GeoTIFF files are geo-referenced image files. Commercial satellite images are often provided in this format, as are the excellent Antares charts covering the west coast of Scotland. Tap on the  button to display a scrollable and zoomable map which indicates the exact coverage of the folio.
- Instruments - Decodes incoming instrument messages (if available) and displays their values in instruments superimposed on the chart.
- KAP files - The capability to open charts provided in the KAP (BSB) file format. Many digital charts are provided in this format, including charts of North America from the NOAA, and Open Sea Map.
- GeoPDF files - The capability to open charts provided in GeoPDF format. This is the format used by the online NOAA chart creator ([link](#)).

- Race wizard - Allows rapid entry of race courses including mark rounding, and monitors TWA for sail change planning.

## Subscriptions

A list of available chart subscriptions with details of purchase and renewal dates. Currently subscriptions are available for charts derived from data supplied by the United Kingdom Hydrographic Office (UKHO), the Service Hydrographique et Océanographique de la Marine (SHOM), and Imray. Charts are grouped into folios, the exact coverage of which can be seen by tapping the information button ⓘ. This information is also available on the website [here](#).

## Store

- Manage Subscriptions: Tap this button to review your active subscriptions. You can use this link to cancel a subscription, or re-subscribe to an expired one.
- Restore Purchases: If you are using a new device, and the purchases associated with your Apple ID are not showing, tap this button to synchronise your purchases.

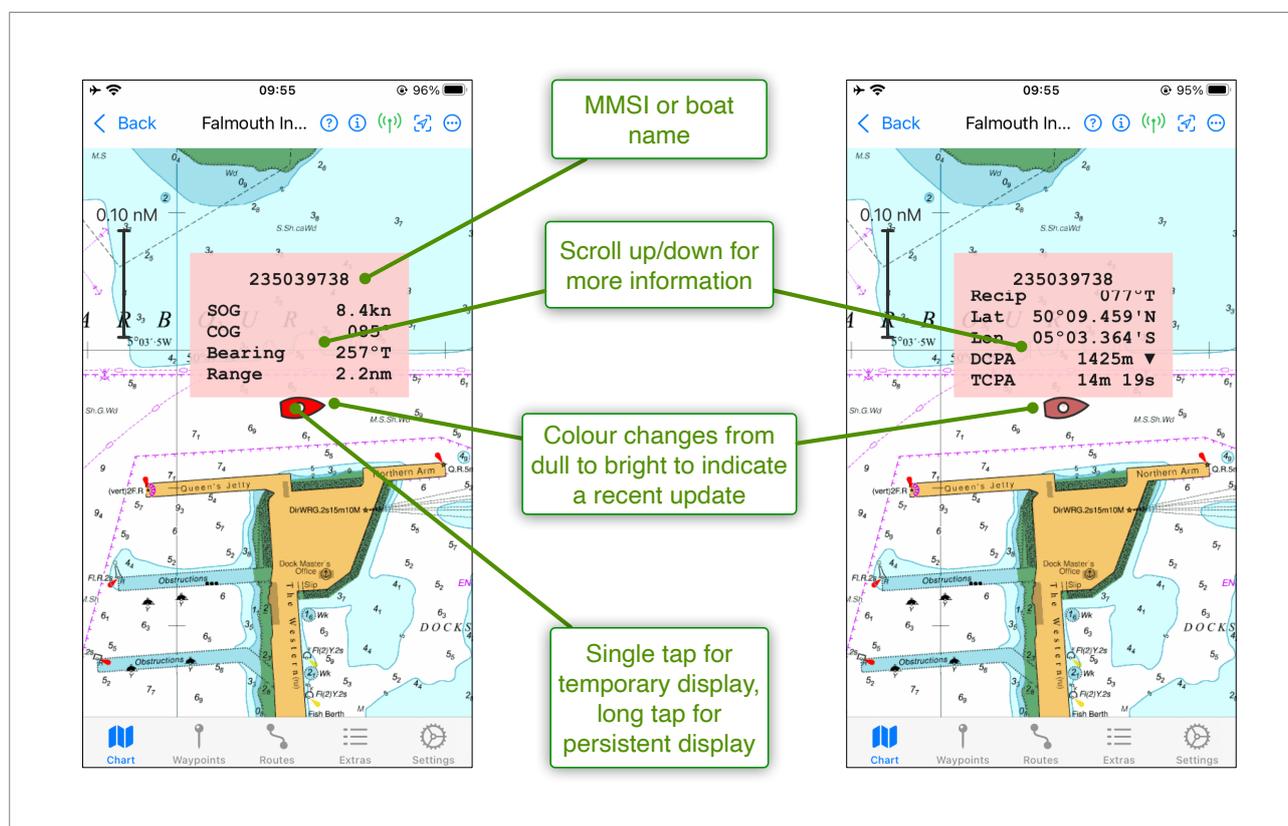
# AIS

## Requirements

- The boat has an AIS receiver
- The receiver is setup to broadcast NMEA messages over a WiFi network
- The AIS capability has been purchased (**Extras: Store: Capabilities**)
- **Settings: Date source** is set to NMEA or SignaK
- **Show AIS data** is checked in the Chart View menu

## Interactions

AIS targets are shown as red-coloured boat shapes which respond to user interactions in a very similar way to the user's (blue) boat.



Note the significance of the colour change. When an AIS update message is received, the displayed target colour is bright red. After a period of 30 seconds, the colour changes to a dull red to indicate that the updated position is old and therefore may not accurately reflect the target's current position.

## Displayed information

Regular AIS messages include the MMSI number of the target and its position, speed and heading. Less frequent messages include other data including the boat name. This means

that the target will initially be shown with the MMSI number, replaced by the boat name once that is received.

The target's SOG and COG is displayed along with the bearing and range from the boat. A projected position is shown (as for the boat) by checking 'Show Projection' in the Chart View menu.

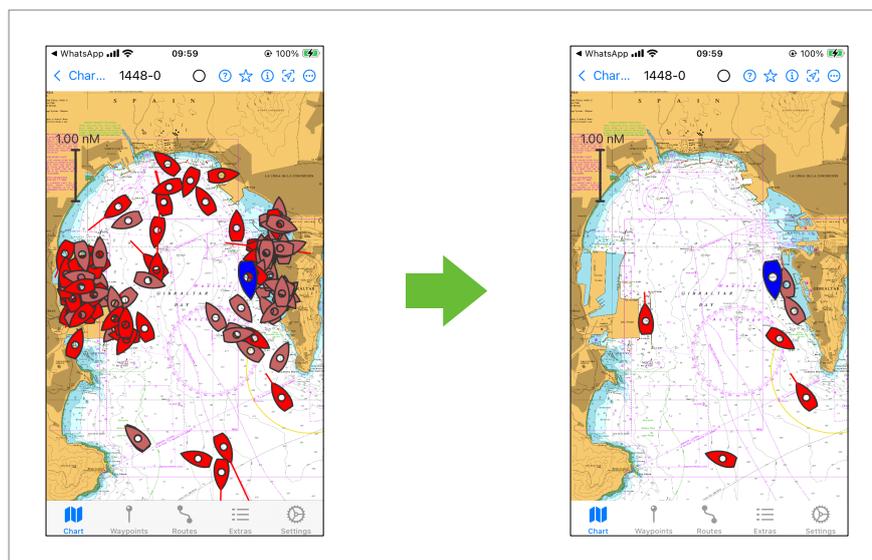
Additional information (see following table) can be viewed by scrolling the display vertically, including the CPA (closest point of approach) assuming that neither boat or target changes course or speed. The CPA is displayed as distance from the boat (DCPA) and the time before the point is reached (TCPA). The additional information includes a reciprocal bearing from the target to the boat. This can be useful when calling up a target on the VHF; "This is the sailing vessel bearing 077° from your position".

<b>Recipe</b>	The reciprocal bearing (The bearing of your boat from the target)
<b>Lat</b>	The latitude of the target
<b>Lon</b>	The longitude of the target
<b>DCPA</b>	Distance to the closest point of approach
<b>TCPA</b>	Time to the closest point of approach

The DCPA value is followed by an arrow head pointing either up (▲) or down (▼). If it is pointing up the CPA is ahead (i.e. the target will pass ahead of you), and if pointing down it is behind (i.e. the target will pass behind).

## Filter

If the number of AIS targets is very high, the screen can become cluttered so that it is difficult to determine which represent a potential collision. In these circumstances it can be beneficial to filter out those that are not a threat. In the Charts section of Settings, there is an option called 'Filter AIS targets'. When this is on, only those vessels that are moving and have a CPA in the future are shown. The following screen shots displays the difference between unfiltered and filtered views in a busy sea area.



# Race wizard

## Requirements

- The Race Wizard capability has been purchased (**Extras: Store: Capabilities**)

## Introduction

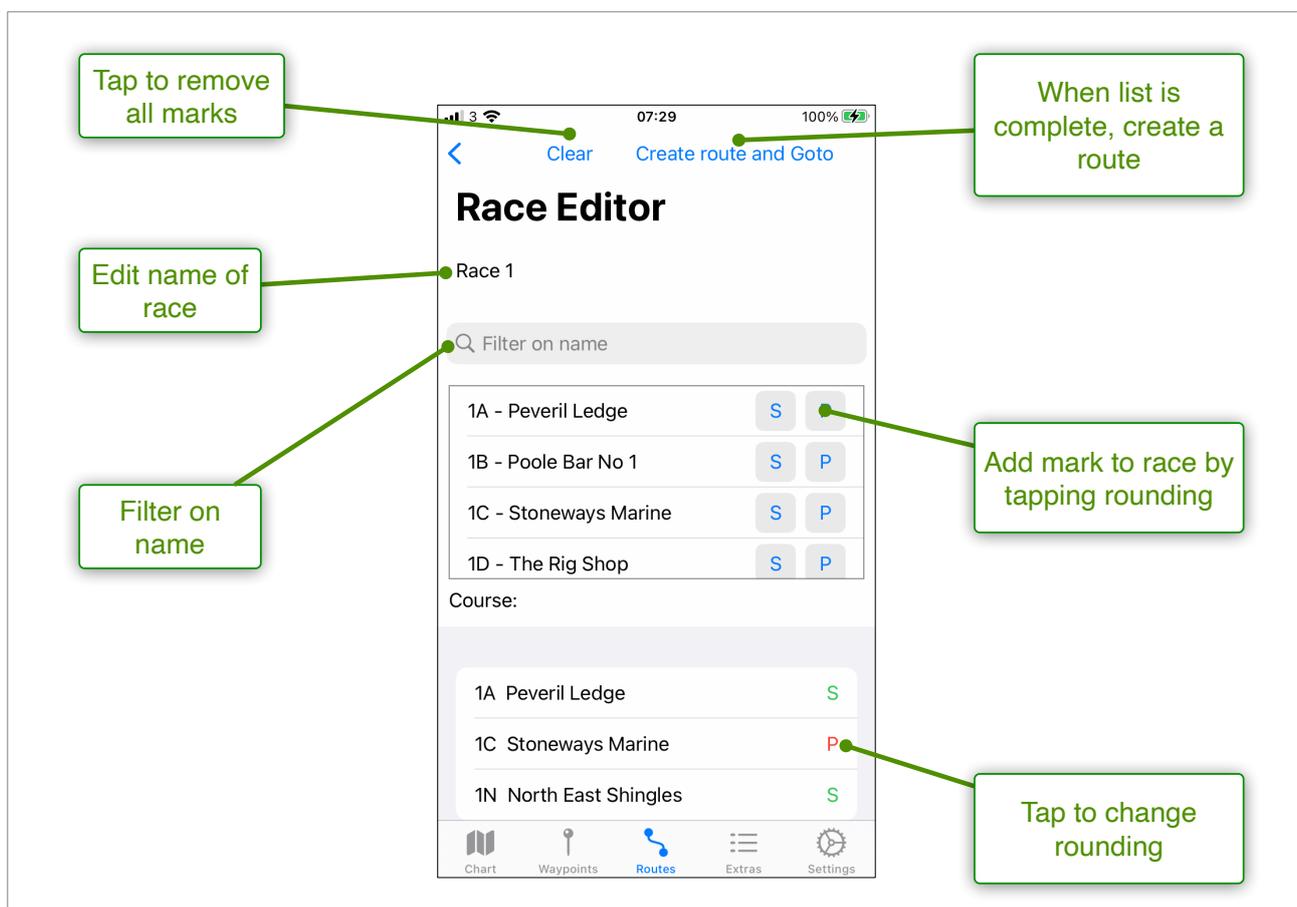
The race wizard is designed to assist the navigator/tactician during a 'round the cans' type yacht race in two specific ways. Firstly by aiding the rapid entry of a race course, either from a VHF announcement or from a board on the side of the committee boat. Secondly by calculating the apparent wind angle (AWA) for a future leg of the race so as to give timely instructions to the foredeck crew about the required sail plan.

## Operation

The race wizard is opened by tapping on the  button at the top of the **Routes** tab. If there is an active route, the wizard 'attaches' itself to that route. If there is no active route, the wizard starts a new empty race named 'Race n' where n starts at 1. The following is a typical sequence of events when using the wizard

### Before the start:

Enter each mark by tapping either S or P for the rounding. To find the mark, type any text from the name in order to filter the list. Using the filter in this way will minimise the number

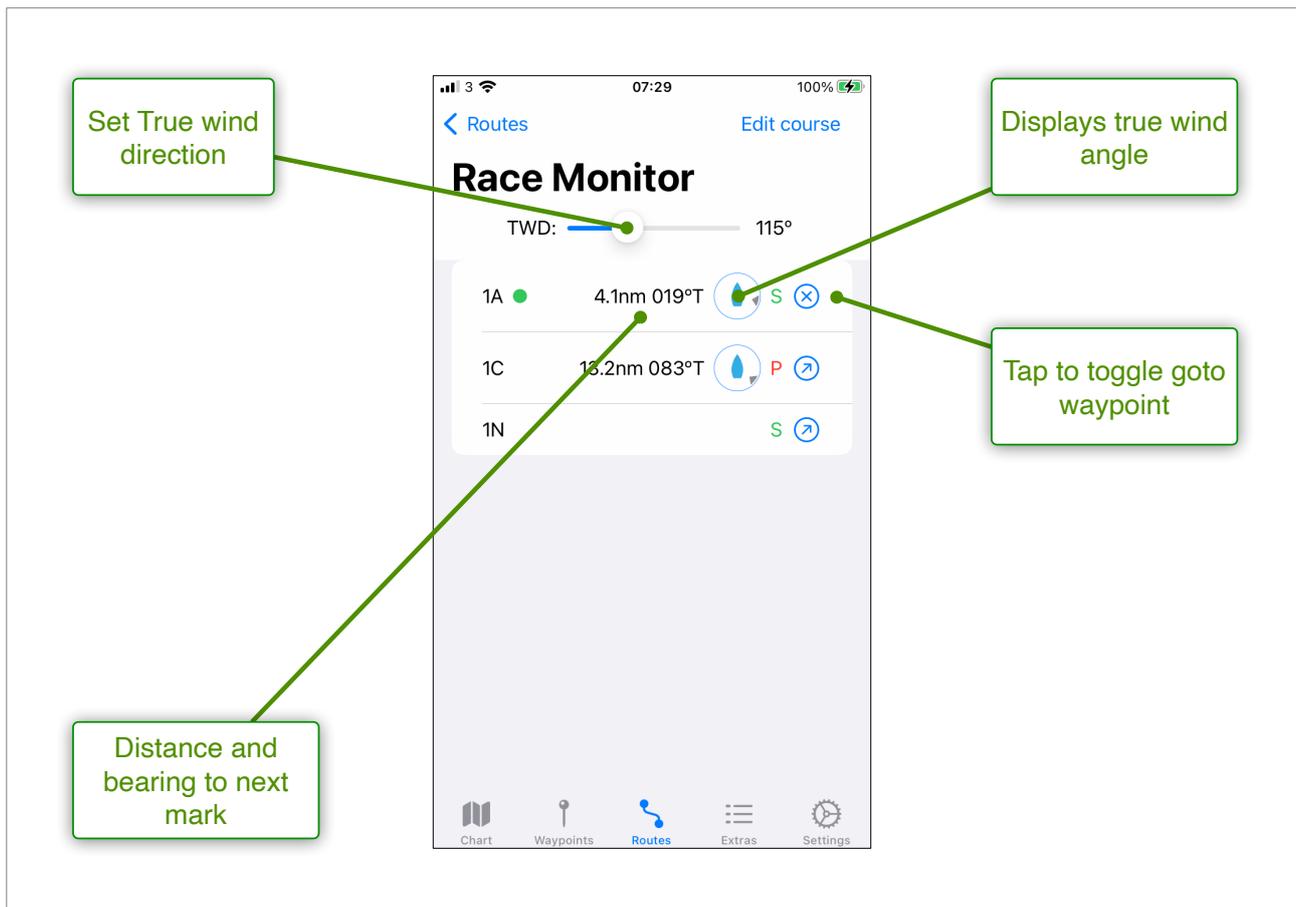


of taps required to enter a course, and with practice it can be done in real time, rather than writing it down on paper and transferring it later.

When the course has been entered, tap 'Create route' to create a route which can be followed in the normal way.

### During the race:

The wizard can be called up at any time during the race to review the mark rounding, and other information such as distance and bearing to the next mark. If the true wind direction is set, the display also shows the projected true wind angle (TWA) for future legs of the course. This is useful information for the foredeck crew to get sails ready after the next rounding.



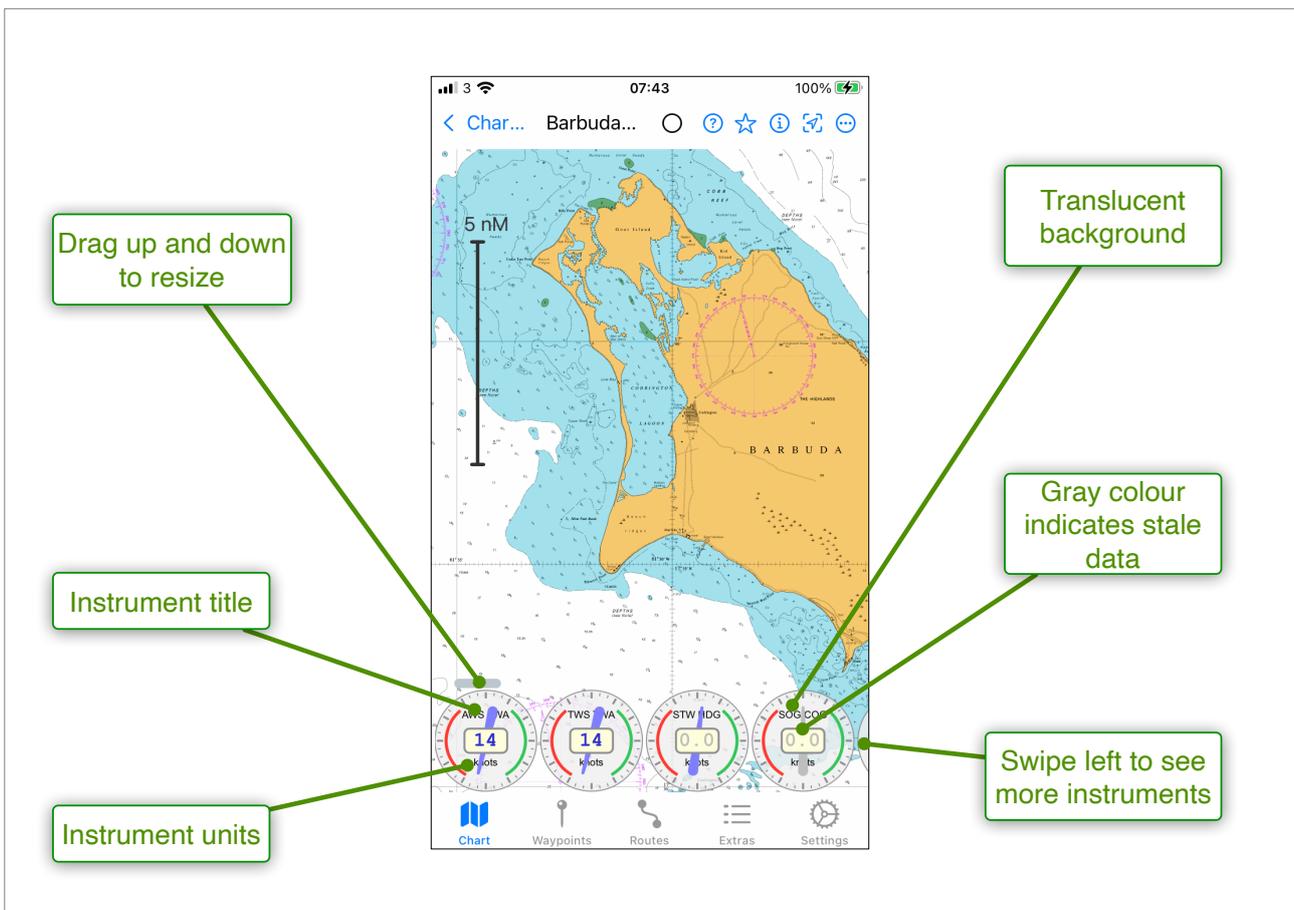
# Instruments

## Requirements

- The boat has instruments connected to an NMEA or Signalk network
- The boat's device is setup to broadcast messages over WiFi
- The **Instruments** capability has been purchased (**Extras: Store: Capabilities**)
- **Settings: Date source** is set to NMEA or Signalk
- **Show Instruments** is checked in the Chart View menu
- At least one of the available instruments is selected in **Settings**

## Operation

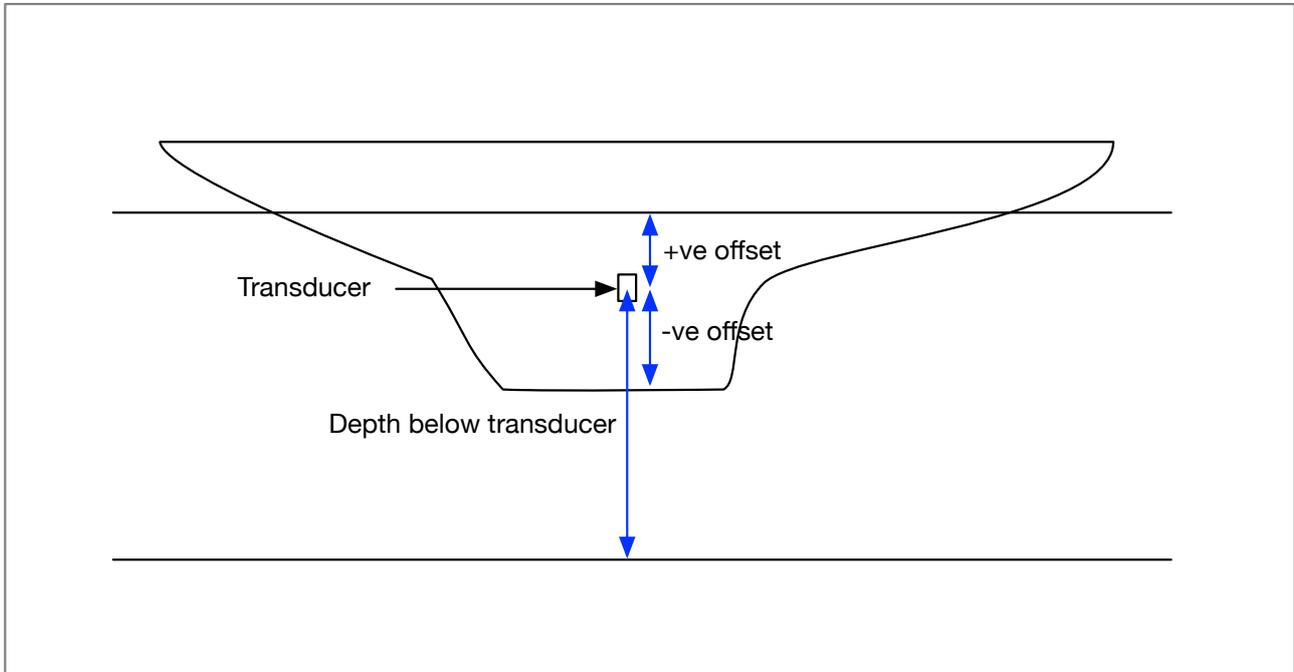
The instrument panel displays a number of dials showing relevant sailing information. Each dial has a translucent background so important chart features are not obscured. If new data does not appear at the expected time, the colour of the needle and digital display changes to gray, but continues to display the last data received.



The instruments that are displayed can be selected in **Settings**, and all are hidden if **Show instruments** in the chart view menu is unchecked. The instrument panel can be resized by dragging the grey resizing bar up and down. If the panel does not fit into the available screen, then it can be scrolled horizontally.

## Depth offset

Most sources of NMEA data have the ability to apply an offset to the depth measurement. The 'raw' measurement is the depth of water below the transducer, so by applying an offset, the display can be set to show depth either below the waterline (using a positive offset), or the keel (using a negative offset).



When a depth offset has been set in the system which is the source of the NMEA data (e.g. a chart plotter), the outgoing NMEA messages contain two numbers; the depth below the transducer and the offset. AngelNav adds these numbers together and displays the corrected depth in metres which should then be the same value as that shown on the system.

Unfortunately there is at least one popular chart plotter which outputs an incorrect NMEA message where the first of the two numbers is the corrected depth, rather than the depth below the transducer. This results in AngelNav displaying a depth which is different from that on the chart plotter, as the offset is applied twice.

For owners of such systems, AngelNav offers the ability to apply an additional offset which should be set to the negative value of the offset applied in the chart plotter. Instructions for use are as follows:

- Go to **Settings** and scroll down to the Instruments section
- Long tap on the section title 'INSTRUMENTS' to make the offset value appear
- Tap on the offset and enter the desired value using the keyboard

*NB. Don't use this setting to enter a 'regular' depth offset. This should be set in the boat's instrument system*

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## Chart updates

### General

Purchasing a chart subscription results in the charts for the purchased folio being downloaded to your device (or devices) and being available for 12 months. The subscription also includes a three monthly update service. Every quarter, updates that are made available from the supplier (UKHO, SHOM, Imray) are automatically downloaded when AngelNav is connected to the internet. If you have notifications switched on for AngelNav, then you will be alerted when the update process starts and completes.

### UKHO derived charts

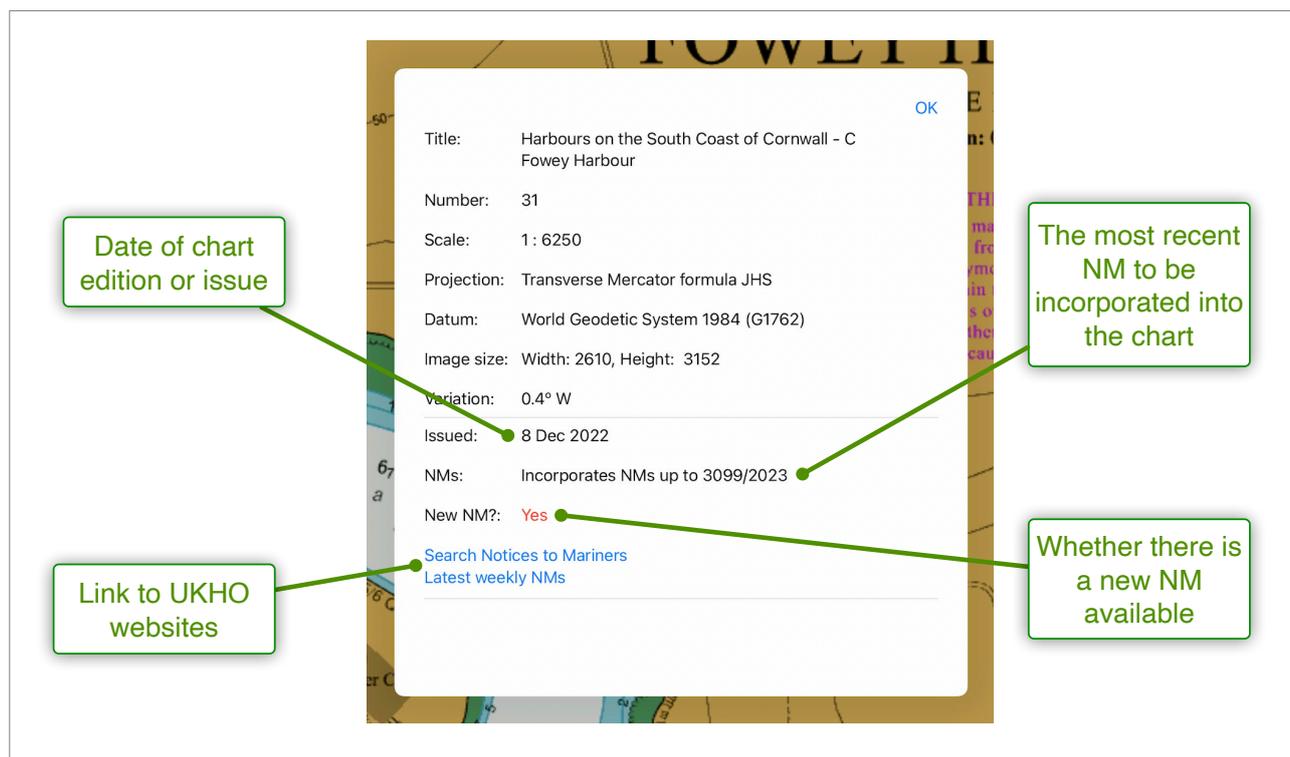
The UKHO provides an update information service for charts called Notices to Mariners. When an important change takes place (for example a new navigational buoy is installed in a harbour) the UKHO issue a Notice to Mariners for the relevant charts. The new charts that are issued every quarter incorporate as many NMs as possible within the chart itself, but because of the time taken to produce it, there will be some relevant NMs that are not included on the day of release. Therefore, the prudent navigator will check the most recent NMs for all the charts used on a passage before going to sea.

Since version 2.0.4, AngelNav makes it easier for the navigator to ensure they have the most up-to-date information, by automatically checking whether a NM has been issued since the chart was produced. This works in the following way:

When a chart is opened, AngelNav talks to an online database (which is updated weekly) to determine whether there is a new NM available for that chart. If there is, then a red circle is displayed on the chart information button at the top right of the screen.



Tapping on the chart info icon ⓘ brings up the chart information screen which has a section containing information on relevant NMs.



## Recommended process for passage planning

- Determine the chart numbers needed for the passage and open each chart in turn
- If there is a red notification symbol, tap on the chart info icon
- Tap 'Search Notices to Mariners' to find and read the NM
- Tap 'Latest weekly NMs' to check the latest weekly report

## Notes

NMs are associated with the chart number, but this may involve several charts within AngelNav. This is because a numbered paper chart may have panels within it of larger scale which have been separated into individual digital files.

The NM format is number/year with the number increasing throughout the year. Hence 3099/2023 is a later NM than 2436/2023.

The letters T and P within the NM (eg 1018(T)/2025) indicates that the NM is temporary or preliminary respectively. Temporary NMs are not incorporated into charts, but can remain active for long periods of time.

There can be a delay of a few days between the issuing of a NM, and the appearance of the NM in the database used by 'Search Notices to Mariners'. The navigator is advised to also tap 'Latest weekly NMs' for the most up to date information.

## Example

The following is an extract from the NM for chart 31. You can see from the chart information display above that NM 3099/2023 has been incorporated into the chart, but NM1018(T)/2025 has not (and won't be, as it is a temporary notice).

**3099/2023 \* ENGLAND — South Coast — Drying heights.**

Source: Par Harbour Survey 2023

**Chart 311721 (Panel B, Par Harbour) ETRS89 DATUM**

Insert	drying height, $L_9$	(a)	50° 20' ·641N. , 4° 42' ·133W.
Delete	drying height, $L_3$ , close W of:	(a)	above
Insert	drying height, $L_2$	(b)	50° 20' ·622N. , 4° 42' ·193W.
Delete	drying height, $L_7$ , close SE of:	(b)	above
Insert	drying height, $L_4$	(c)	50° 20' ·610N. , 4° 42' ·058W.
Delete	drying height, $L_6$ , close NW of:	(c)	above
Insert	drying height, $L_3$ , enclosed by 0m low water line		50° 20' ·405N. , 4° 41' ·848W.

**1018(T)/2025 ENGLAND — South Coast — Light.**

Source: Fowey Harbour Commissioners Local Notice to Mariners 2025/02

1. Fowey Lighthouse, LFl.WR.5s28m11M/9M, in position 50° 19' ·63N. , 4° 38' ·83W. is temporarily extinguished.
2. Mariners are advised to navigate with caution in the area.

(ETRS89 DATUM)

**Chart(s) affected 31**

## Withdrawn Charts

If a chart is withdrawn by the supplying authority, then the chart is removed from the folio at the quarterly update, and is no longer included for new subscriptions to the folio.

However, if the subscription was purchased or renewed *before* the chart was withdrawn, then the chart is NOT deleted and remains available for use (at least while the subscription remains active).

A withdrawn chart triggers the same notification warning as a new NM (a red dot on the chart information button). Tapping the info button gives additional information including the date of withdrawal.

The image shows a screenshot of a chart information dialog box. The dialog box contains the following text:

- Title: Approaches to Den Helder
- Number: 126
- Scale: 1 : 60000
- Projection: Mercator variant A
- Datum: World Geodetic System 1984 (G1762)
- Image size: Width: 3746, Height: 5488
- Variation: 2.4° E
- Issued: 7 Dec 2017
- NMs: No information
- New NM?: No
- Status: **Withdrawn. The UKHO no longer update this chart**
- Message: Date of withdrawal 07/03/2024

At the bottom of the dialog box, there are two links: [Search Notices to Mariners](#) and [Latest weekly NMs](#). An 'OK' button is located in the top right corner.

Four callout boxes with green borders and lines pointing to specific elements in the dialog box:

- Date of chart edition or issue**: Points to the 'Issued: 7 Dec 2017' line.
- Link to UKHO websites**: Points to the 'Search Notices to Mariners' link.
- Indication that the chart has been withdrawn**: Points to the 'Status: Withdrawn. The UKHO no longer update this chart' line.
- Any additional information**: Points to the 'Message: Date of withdrawal 07/03/2024' line.

**WARNING:** Withdrawn charts are not updated, and will no longer have any NMs issued. Therefore if used, the navigator should proceed with extreme caution.

# Satellite charts

## Requirements

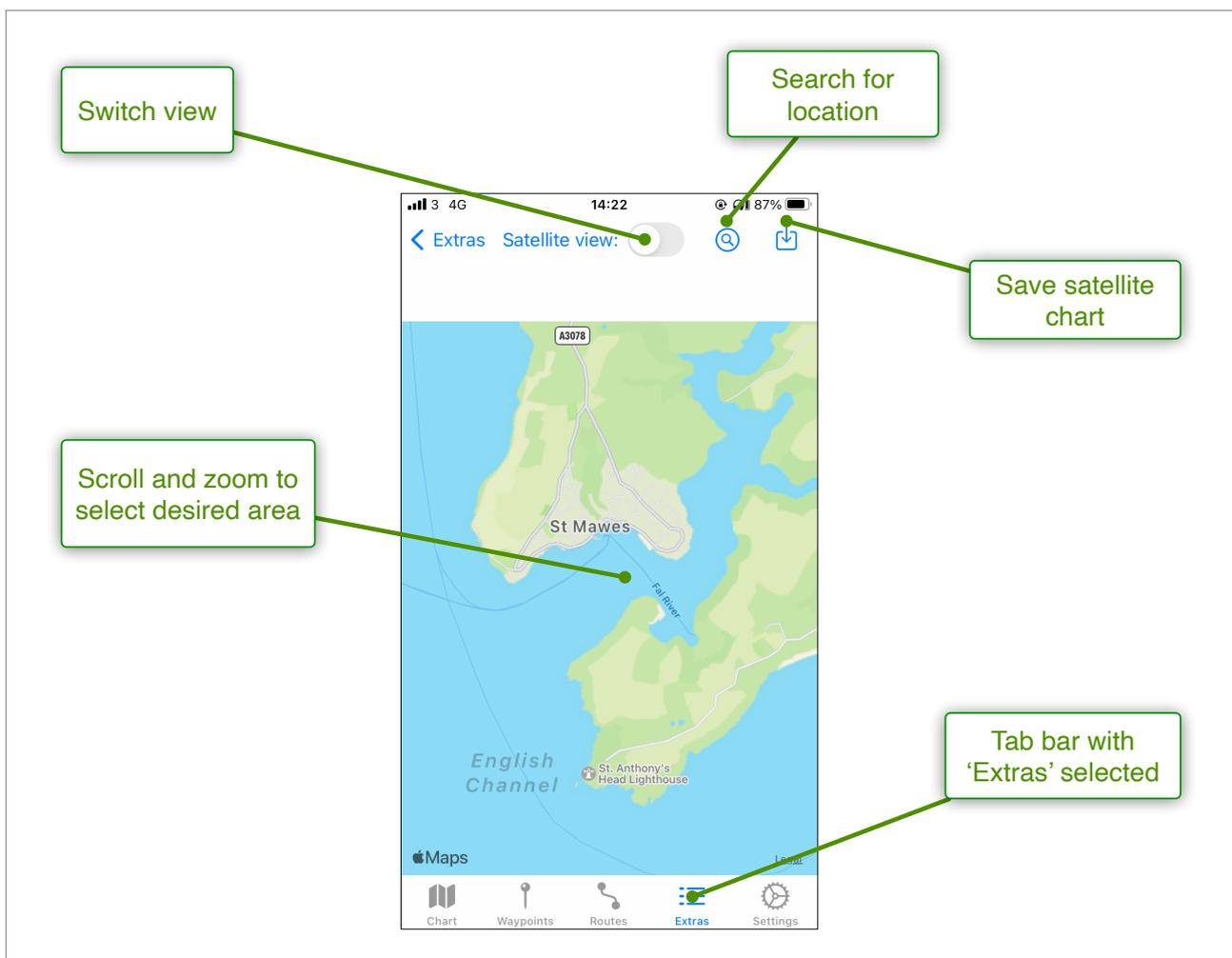
- The Satellite charts capability has been purchased

## Introduction

AngelNav has the capability to create a geo-referenced satellite image that can be used in the same way as a conventional navigational chart. You can create any number of charts while online for later offline use. They are particularly useful for pilotage in shallow areas to identify hazards (eg coral reefs) that may not be visible on a conventional chart.

## Operation

You create charts in **Extras: Create satellite chart**. An outline map is shown which is centred on the current position available. To find the area of interest you can either scroll to it, or search for it by typing in the search box.



You can preview the detail available by selecting **Satellite view**.

You can use the device in either portrait or landscape mode depending on the desired aspect ratio of the chart. When you are happy with the area covered, tap the download button.

You will be prompted for a name for the chart. Tap **Save** and the chart will be saved to your device and will appear in the chart list for selection and viewing.

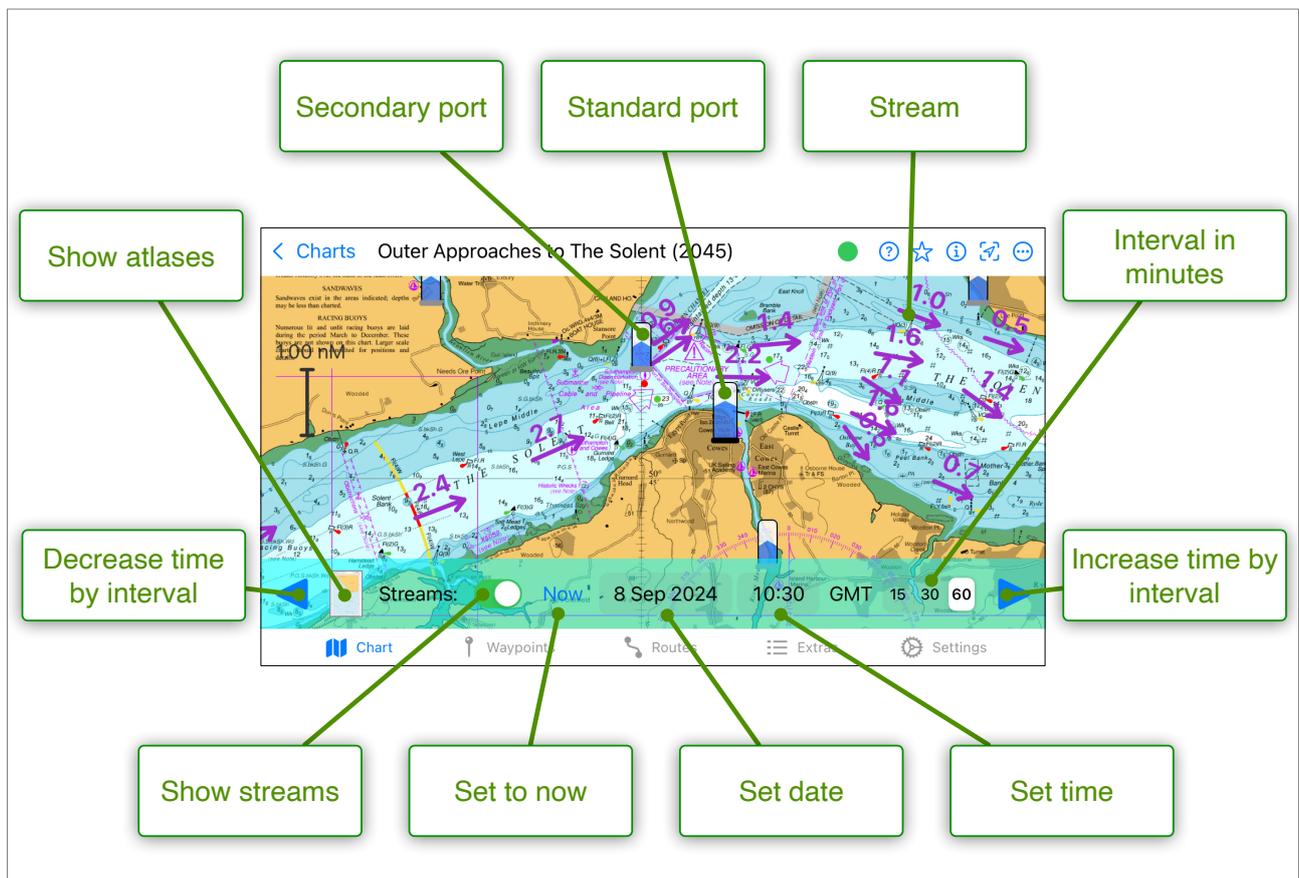
# Tides

## Requirements

- The tidal data for the year has been purchased (**Extras: Store: Tides**)
- **Show Tides** is checked in the Chart View menu

## Introduction

The tides module provides predictions of tidal heights and streams derived from data supplied annually by the UKHO. Accessing the tides module requires the purchase of a licence for a geographic area and a full calendar year (for example the United Kingdom and Ireland for 2025).



## Operation

Tidal information is displayed overlaying the chart by selecting 'Show Tides' from the chart view menu. When this option is checked, an overlay appears showing tidal ports (standard and secondary), and optionally tidal streams. The data shown is for the date displayed on the date controller bar at the bottom of the screen, which defaults to the current date provided that there is tidal information available.

The date can be changed either by tapping on the date or time in the control bar and editing them accordingly, or by tapping the arrow heads at the right and left of the display. Each tap on an arrow advances or retards the time by the number of minutes selected as

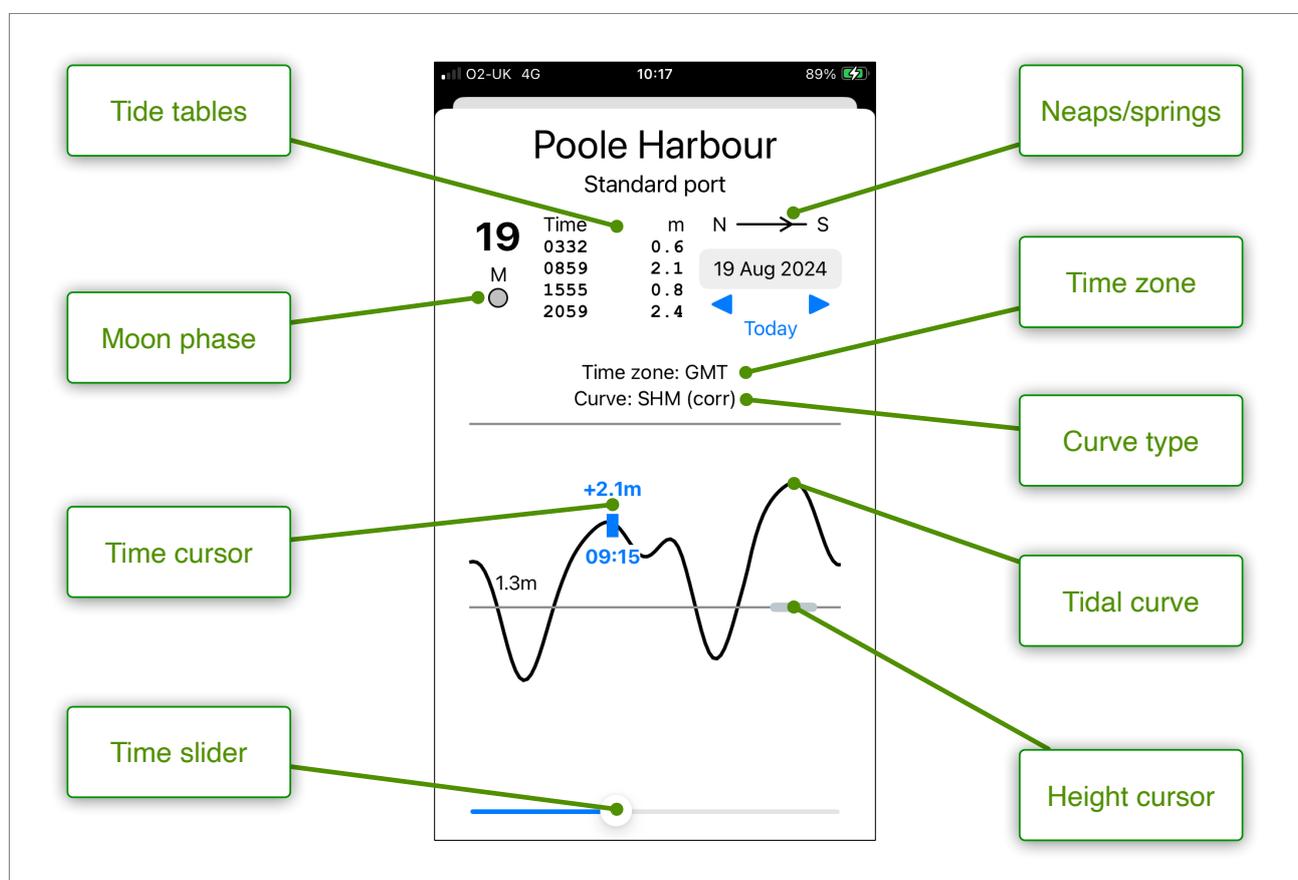
the interval (15, 30 or 60). Long tapping on an arrow head will keep changing the date at the rate of three intervals per second.

Ports are indicated by an icon representing a tide gauge, with a level (between LT and HT), and an arrow indicating the direction of travel. The icon for primary ports have a black base, and those for secondary ports are slightly smaller with a grey base.

Tidal streams are indicated by an arrow showing the direction of the tide at that geographical point. The length of the arrow is related to the speed of the tide, which is also shown as a value in knots in adjacent text. The streams are usually at the location of a tidal diamond and give the same information on speed and direction.

## Port display

Tapping on a port icon displays additional detailed information about the port.



Tables of predicted heights are displayed for all primary and secondary ports in the purchased area for the duration of the year. The daily times and heights of high and low waters for standard ports are exactly the same as those published in Admiralty tide tables, and are presented as such, with a familiar layout of date, day of week and time information. Secondary port information is presented in the same format and is derived from reference port data using the UKHO time and heights differences method.

In addition to the information you will find in paper tide tables, there is a date selector which allows data for any day in the year to be displayed, along with buttons that change the date by plus or minus one day. A neaps to spring indicator shows where the selected date is in relation to the lunar cycle, along with an arrow head which shows the which is next.

Below the tabulated information, there is a graph of the tidal height throughout the selected day. The derivation of the curve depends on the information available, and is described in detail in the following table:

Curve Type	Derivation
Sin	A sin curve drawn through the HT and LT points in the tide table
SHM	A curve calculated using the Simplified Harmonic Method (SHM)
SHM (corrected)	As for SHM but with a correction derived from the tide tables

The SHM (also known as the ‘Admiralty method’) uses a subset of the most important harmonic constants in order to derive the predicted height. Standard ports have HT and LT predictions supplied by the UKHO, and these are based on up to 200 harmonic constants. As such they are likely to be more reliable than the results of the SHM. Therefore, when available (ie for standard ports), these predictions are used to modify the curve to enhance its reliability.

For secondary ports, the graph may produce values which are slightly different from the HT and LT points displayed in the tide table (which are calculated using the differences method). When no harmonic constants are available (for some secondary ports), then a simple sin curve is drawn through the HT and LT points predicted using the differences method.

There is a cursor which shows the time and height at any point during the day, and it can be moved using the slider at the bottom of the screen, allowing the predicted height at intervals of 15 minutes to be read easily.

Finally there is a 'height' cursor which can be dragged up and down and intersects with the graph. This can be used to predict when a particular tidal height is reached. For example if you decide that your boat requires a minimal height of 1.5 metres above chart datum, set the height line to 1.5. You can then move the cursor to the intersections to display the times of your chosen height.

## Times

The times shown on the date controller and in the port view are GMT by default (in order to match the convention with Admiralty Tide Tables. However, if you prefer to use the local time zone set on your device (typically BST in the summer), then go to **Settings** and uncheck ‘Display times in GMT’.

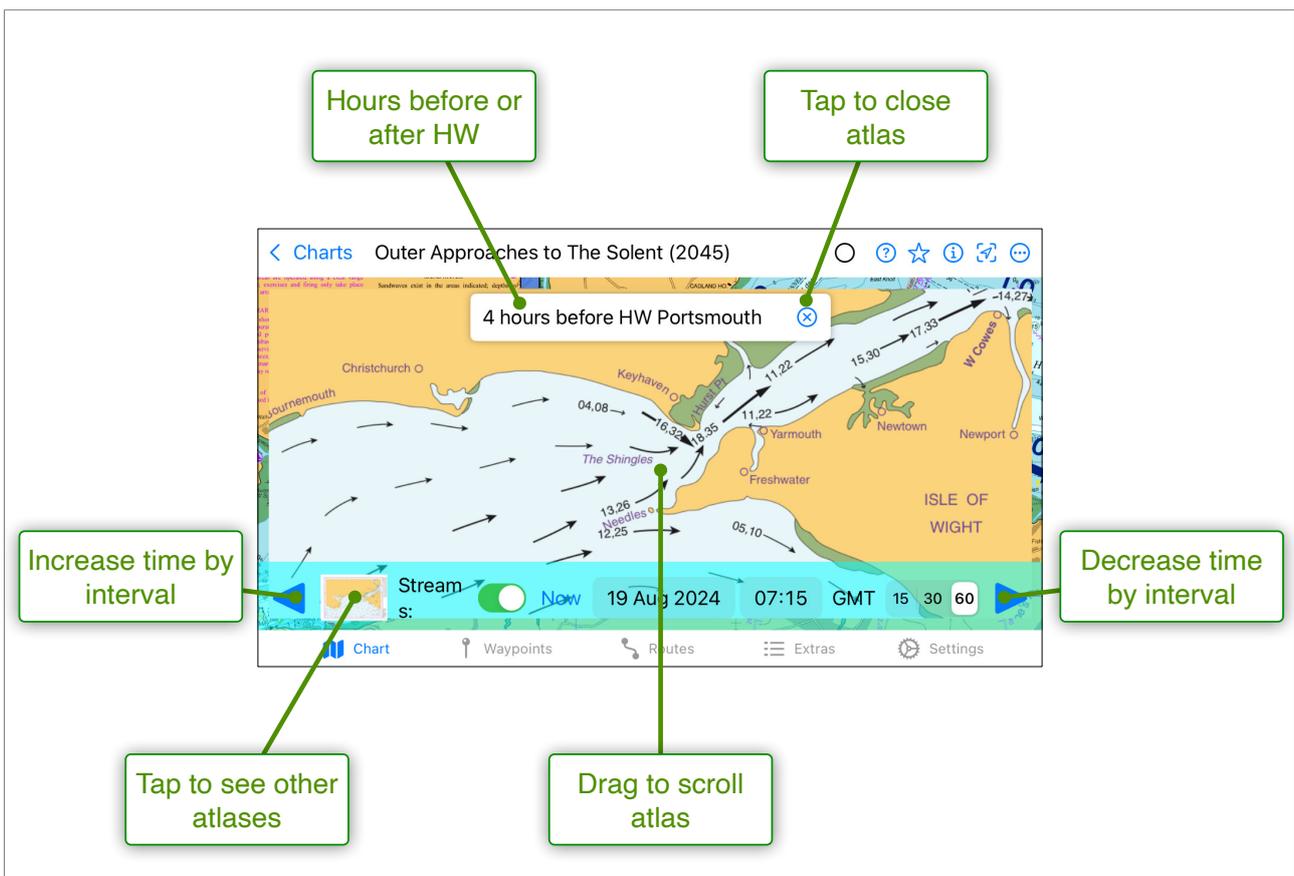
## Tidal Streams

Tidal Streams are shown as purple arrows with an adjacent number indicating the speed of the time in knots at the selected date and time. All available streams are displayed including those for larger scale charts contained within the displayed area. This may result in a cluttered display on smaller scale charts with many tidal stream arrows. Zooming in will separate the arrows and reveal more detail. Alternatively switching on ‘Filter streams’ in Settings will suppress display of densely packed arrows at lower zooms.

## Tidal Stream Atlases

There are a number of tidal stream atlases which give more detail than tidal diamonds for 32 different areas around the UK. If there is an atlas covering an area which intersects with the current chart, then a thumbnail will appear in the date control bar. Tapping on the thumbnail will either display the atlas, or if there is more than one, display a menu of atlases for selection.

Each atlas contains a separate page for different states of the tide relating to a reference port from 6 hours before to 6 hours after HT. The selected page is controlled by the date control bar. The atlas can be scrolled in order to view all of it, and can be dismissed by tapping the  button (see diagram below).



## Warning

The tidal predictions displayed in AngelNav do NOT allow for the effect of wind, atmospheric pressure, and weather, all of which will affect the tidal heights and streams that are actually experienced. They are NOT to be relied upon in situations where precise information is needed to avoid death, injury, or damage to property.

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## **Additional help**

### Instructional videos

There are a number of instructional videos in the help section of the AngelNav website. These can be viewed by pointing your browser to this [link](#).

### User forum

There is a new user forum which has been set up at this [link](#). Sign up to post a question, comment, or a request for a new feature.

### Support

If you have a question or if AngelNav is not behaving as you expect, send an email to AngelNav support [here](#).

## Advanced techniques

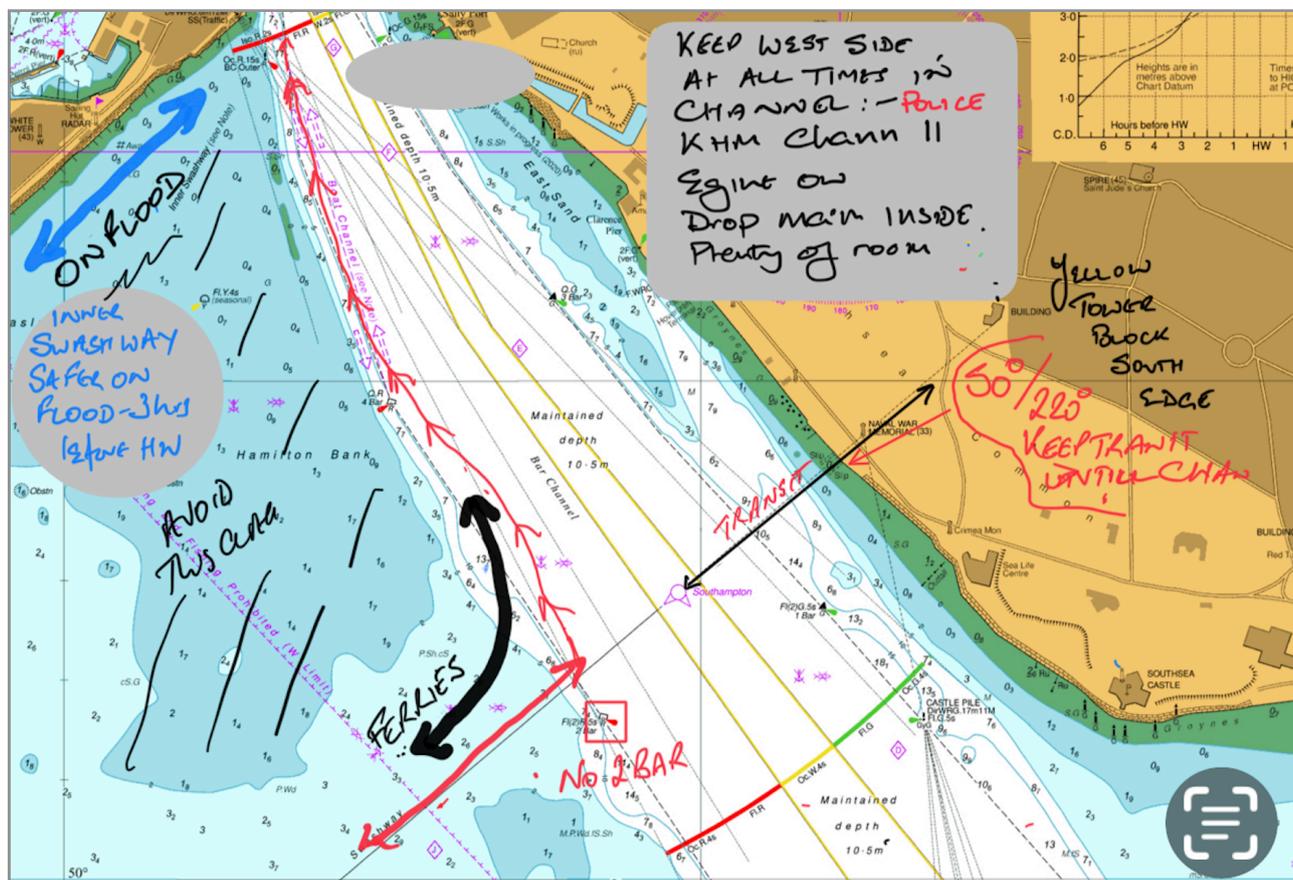
We are grateful to Jeremy Kaye for suggesting and describing the techniques included in this section.

### Saving and loading waypoints and routes

Judicious use of the export and import functions can ease the management of waypoints and routes, so that for example a route appropriate for the passage can be chosen from a selection stored in iCloud. The great advantage of the export / import function is the ability to have only the routes or waypoints that are relevant to your trip that day. The key is an organised folder system on iCloud. If a primary folder is created with multiple sub folders for instance Routes, Waypoints, Pilotage Notes, Anchoring spots etc. Any route or set of waypoints can be specifically labelled when saving into the chosen subfolder. Additional files including screen shots or Apple Notes can be saved into the relevant subfolder keeping all relevant information together. In addition, any file whether a route, way point, pilotage note, can then be shared via the internet or if out of internet range using Bluetooth and Airdrop. This is great for sharing with the crew.

### Taking and annotating screen shots

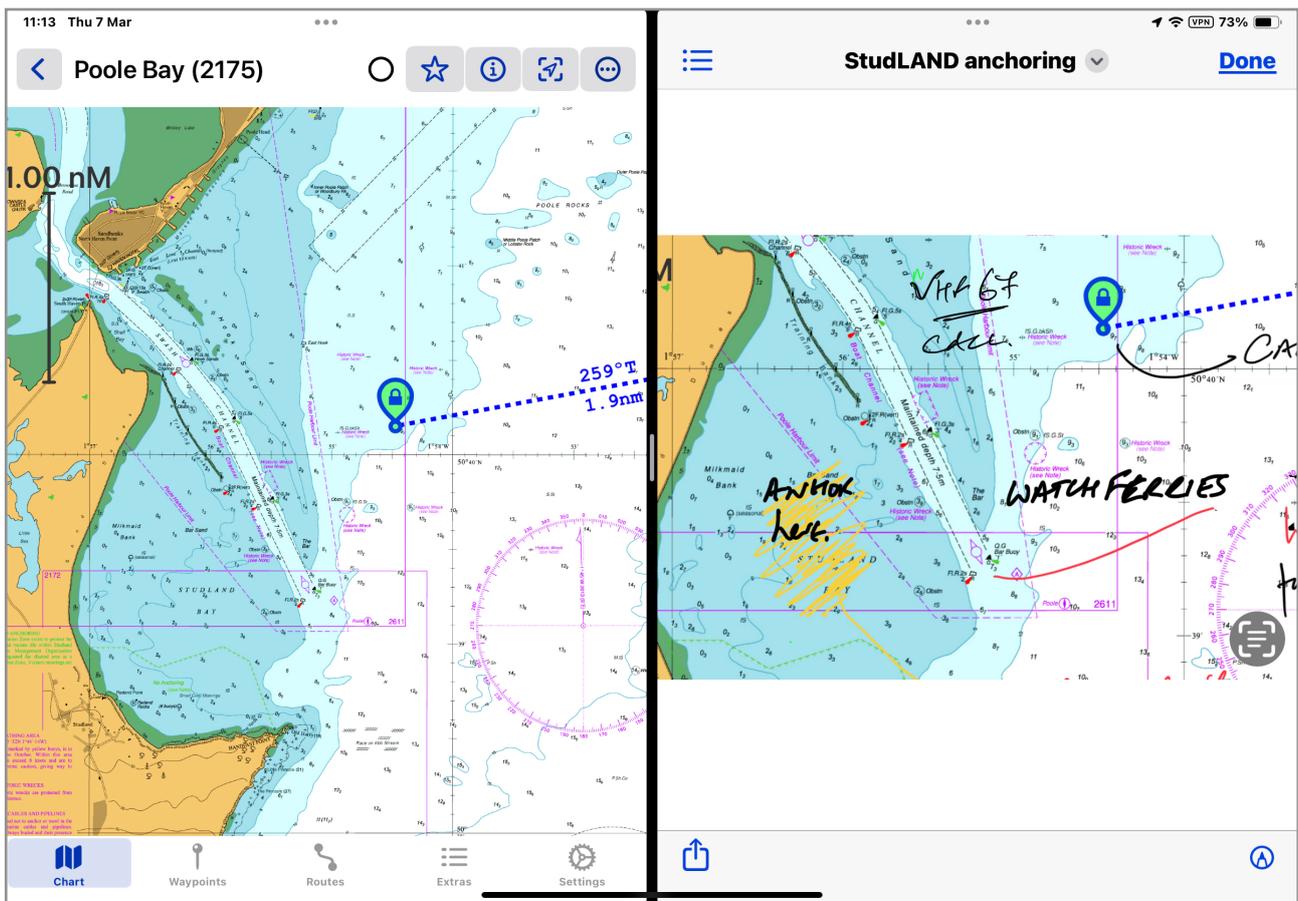
It can be useful to take a screen shot and then annotate it using Apple's built in editing tools and an Apple Pencil. This allows detailed notes and diagrams to be added to the area of interest, for example pilotage notes. Here is an example describing an approach to Portsmouth harbour.



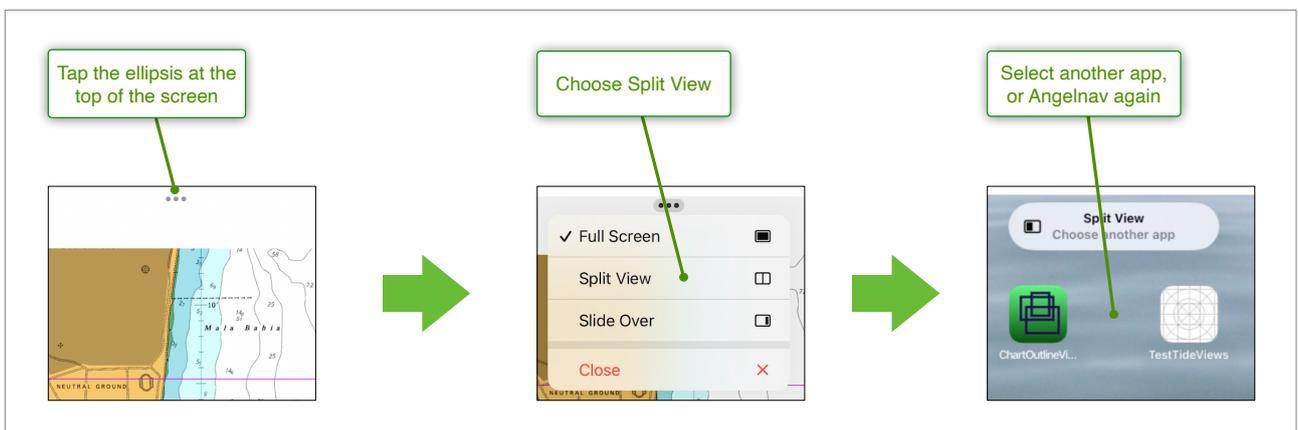
## Split screen

This facility is available on iPads and allows two apps or different pages of the same app, to be open at the same time. One can chose two different tabs of AngelNav eg chart with route displayed side by side with the route detail for editing, or the active GPS position page side by side with another app such as a marked up screen shot for pilotage, or the Notes app, or a diagram of pilotage for a night entry into a port. On the iPhone, although split screen facility is not available, a similar concept switching between two apps can be used.

For example here is a split screen view of an approach to Poole harbour showing an annotated screen shot with pilotage notes and the chart plotter view of AngelNav.



To enter split screen view follow the steps in the following diagram:



Here are some additional examples:

The image displays four screenshots of a nautical charting application interface:

- Top Left:** A nautical chart titled "Langstone and Chiche..." showing a coastal area with various navigational markers, depth soundings, and labels like "Chichester Harbor" and "Eastoke Pt". A scale bar indicates 0.50 nautical miles.
- Top Right:** A zoomed-in view of a nautical chart titled "Chichester night entrance". It features handwritten annotations in green and red, including "GREEN BUOYS COUNT THE 5 BOARDS BUOYS" and "FL 2G 10". A red circle highlights a specific buoy location.
- Bottom Left:** A nautical chart titled "The Solent and Southa..." showing a route through the Solent. The route is marked with blue and red waypoints and lines. Key locations include "Calshot" (with coordinates 50°48.360'N, 001°16.982'W) and "Portsmouth". A scale bar indicates 0.50 nautical miles.
- Bottom Right:** A "Routes" management screen showing a list of waypoints for a route. The waypoints are:
  - Southampton Cowes: 2.3nm
  - Reach near: 1171m 166°T
  - Calshot: 1193m 224°T
  - WPT003: 974m 208°T
  - WPT004: 869m 170°T
  - WPT005
 Below the list are options for "WAYPOINT ACTIONS": "Remove all", "Lock all", and "Unlock all".

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## Frequently asked questions

*Where can I find free charts to download?*

The OpenCPN project has a comprehensive list of sources of free charts [here](#).

*Can I use the subscribed charts on more than one device?*

Yes, up to a limit of 6 devices (this is a licence stipulation of the chart suppliers). The charts will be downloaded onto any iPhone or iPad for which you are logged on using your Apple ID. The subscriptions support [family sharing](#), so the charts will also be available on devices registered to family members..

*How do I cancel a subscription?*

Check that your device is connected to the internet, then go to **Settings: Extras: Store** and tap [Manage Subscriptions](#). Select the subscription you wish to cancel, then tap [Cancel Subscription](#). You will still have access to the charts until the end of the subscription period, after which they will be automatically removed from your devices. You can also cancel a subscription outside of AngelNav in Media & Purchases in the Apple ID section of Settings on your iOS device.

*How do I follow a route?*

Make sure that the route is active (by tapping the slider next to the route in the **Routes** tab). The active route will then be displayed. Double tap on any waypoint in the route to select [Goto](#) for that waypoint. Once it is reached, the next waypoint in the route becomes the next goto waypoint and so on.

*How do I find my boat?*

If the chart list is displayed, tap on the location icon at the top of the page. If there is no boat position available it will be greyed out. If there is a boat position, then all the available charts will be searched to find those that include it. If there are more than one, the chart with the largest scale will be loaded, and the chart will scroll to the boat's position.

If a chart is already loaded and the chart includes the boat's position, tapping on the location icon will scroll the chart in order to display the boat.

*How do I reduce the number of charts in my chart list?*

You can use the filter menu button at the top right of the chart list screen in order to only view certain types of chart. Typing in the search bar will display only charts containing that letter or number sequence in the title. You can also change the order of the list to (for example) present small scale planning charts at the top.

*Why can't I see my charts in the chart list?*

Check that the filter at the top of the chart list is set to 'All', or to the type of chart you are looking for.

If your chart files are stored on iCloud, use the Files app to check that they have actually been downloaded (see next question).

*Why are my non-subscription charts no longer on the device?*

If you store non-subscription charts on iCloud, and your device storage reaches a certain limit (about 80%), then iOS actively manages the storage by removing certain files so that they can be downloaded again later. Clearly this is an issue if you are going to sea without internet and need access to your charts.

Therefore its important to check that the files are present before departing, or alternatively use the Files application in iOS to move the charts to the device itself “On My iPad/ iPhone” rather than on “iCloud Drive”.

NB. This does NOT apply to subscription charts which are stored within the app’s private storage and are not subject to unexpected removal.

*Why is ‘Set Anchor Alarm’ greyed out?*

The anchor alarm needs to keep working even when AngelNav is in the background, or the screen is locked, and therefore it is only available if **Settings: Data source** is set to Location Services.

*I have a large number of waypoints, how can I organise them?*

Keep the ones that you want by locking them (on the edit page), and then deleting all the unlocked waypoints. The remaining ones can then be saved by exporting them to a GPX file. This file can then be imported later. GPX files are plain text, so If you have a text editor then it is possible to edit them directly (NB you need to know a bit about XML to do this).

*Why is the active route is no longer showing the distance and bearing of each segment?*

The display of these two values can be switched on or off in **Settings:Show course and distance**.

*The boat information on an AIS target keeps disappearing after a few seconds. How do I keep it displayed?*

After a single tap, the display will disappear after 3 seconds (this time can be adjusted in **Settings**). However, the display will remain while you are scrolling up or down to see more information. If you want the display to remain visible for example if there is an AIS target with an unsafe closest point of approach and you want to keep the DCPA and the TCPA continuously displayed, then long tap on the target to keep the display visible. Tapping again will dismiss the information display.

*Why is ‘Race Wizard’ greyed out?*

The race wizard requires the purchase of the Race Wizard capability from **Extras:Store**. Once this has been purchased, the button will become active.

*AngelNav keeps crashing when opening NOAA KAP charts*

Some NOAA charts contain very large images that require up to 700 MB of memory. On smaller and older iOS devices this may cause a crash, particular in versions of AngelNav earlier than 1.1. For later versions **Extras: Settings** has a memory limit which can be set. Any KAP files with images greater than this limit have their pixel resolution halved.

*I have purchased a folio of charts, but they won't download*

Ensure you have an active internet connection, and check that the button next to the folio you have purchased (in **Extras: Store**) is displaying a green tick. If it isn't then the purchase has not gone through for some reason (for example the credit card associated with your Apple ID might have expired). If it is, then quit the application (by double tapping the home button and swiping up on the AngelNav preview). Then launch the app again and keep it in the foreground for several minutes. If you still do not see a list of charts in the chart list, then please contact SailTrack support (**Extras: About: Contact**).

## Simulation Mode

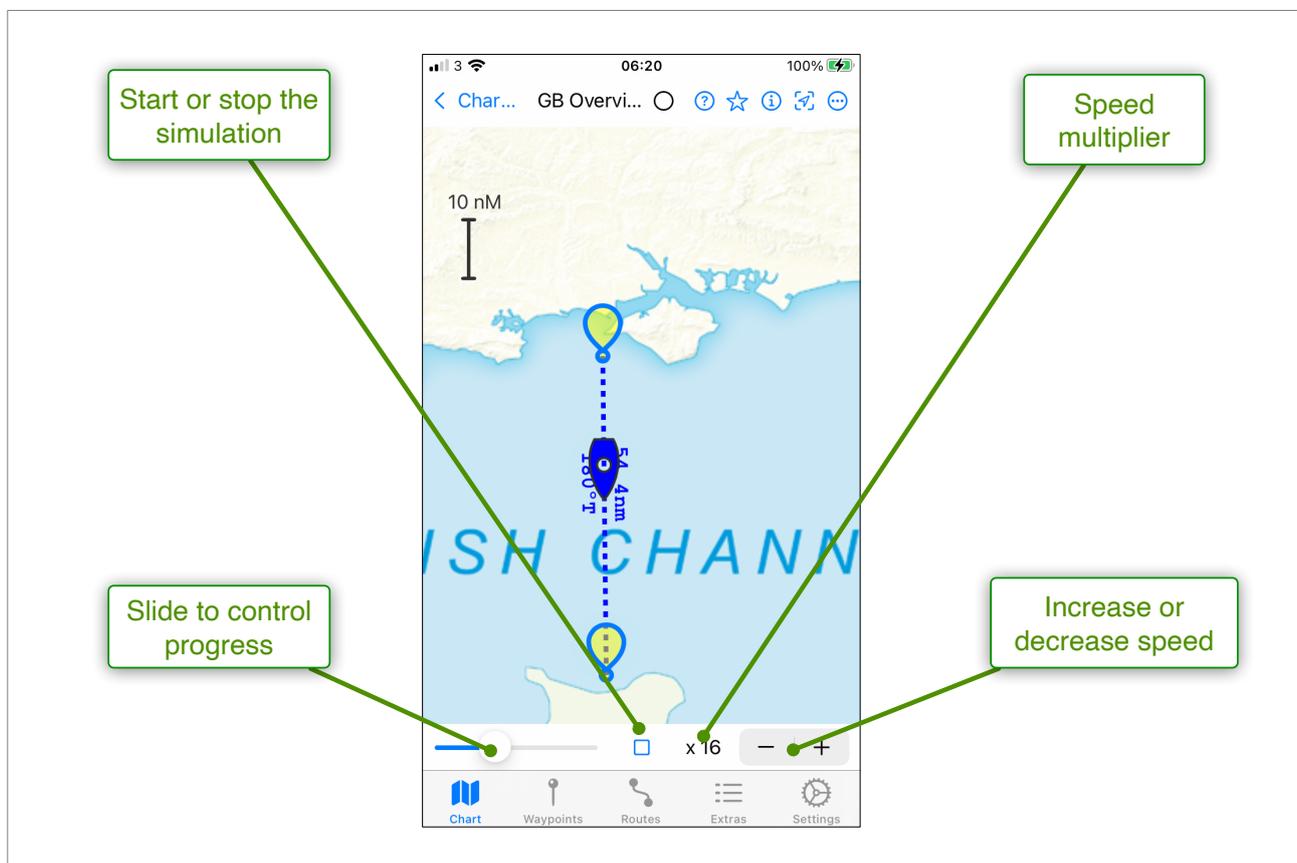
In order to demonstrate those features of the app related to the position and movement of the boat, AngelNav provides three simulation modes. Navigational data (position, speed and heading) can be derived either from a GPX file containing track data, from a route or from a text file containing NMEA data. To begin, tap on the Chart tab and load the GB Overview chart.

### Simulation using a GPX file (iOS 16.0 and above):

- Obtain a GPX file containing a track (an example may be downloaded [here](#))
- Save the file on your iOS device (either in 'iCloud Drive', or 'On my iPhone/iPad')
- Go to **Settings: Navigational Data: Data source** and select 'GPX file'
- Tap the 'Browse' button and navigate to the saved GPX file

### Simulation using a Route:

- Double tap on the chart to show the chart menu and select 'Start Route'
- Double tap somewhere else and select 'Add to Route'
- Go to **Settings: Navigational Data: Data source** and select 'Route'
- Tap 'Route' and select the route you have just created (Route01)Simulation controls (GPX file or Route):



## Simulation using an NMEA file:

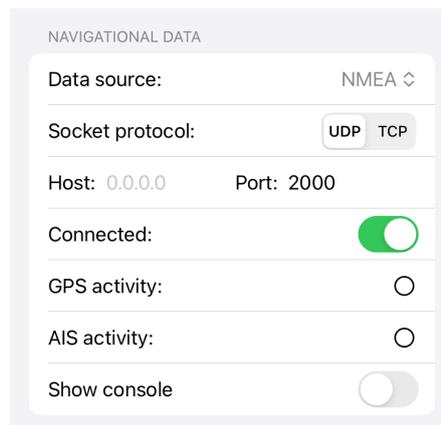
This mode behaves slightly differently from the other two, but has the advantage that it can also simulate AIS and Instrument display. You will need to obtain a text file containing NMEA messages. These are short pieces of text used to communicate between most transducers and displays which look like this;

```
$IIDPT,006.8,+0.0,*49
$IIGLL,5010.043,N,00500.169,W,183024,A,A*46
$IIHDG,160,,,*50
$IIMTW,+18.0,C*31
!AIVDO,1,1,,B3P=G9@06grAUW7;BuEOswdUoP06,0*2A
$GPGGA,183025.00,5010.04371,N,00500.16496,W,2,12,0.76,5.6,M,51.5,M,,0000*4C
$IIMWV,202,R,00.0,N,A*13
$IIMWV,200,T,02.4,N,A*11
!AIVDM,1,1,,B,33P:TDGOhbObE5ILVUq>1JrI00w0,0*6E
$IIVLW,11071,N,001.5,N*51
$GPRMC,183026.00,A,5010.04313,N,00500.16445,W,2.560,153.13,040719,,D*7E
$WLXDR,P,102304.00,P,STPM,C,30.00,C,STTM*53
$GPGGA,183026.00,5010.04313,N,00500.16445,W,2,12,0.76,5.6,M,51.5,M,,0000*45
$IIGLL,5010.042,N,00500.168,W,183025,A,A*47
$IIHDG,160,,,*50
$IIMTW,+18.0,C*31
$IIMWV,204,R,00.0,N,A*15
$IIMWV,204,T,02.2,N,A*13
$IIVHW,,,160,M,02.2,N,,*63
$GPRMC,183027.00,A,5010.04251,N,00500.16388,W,2.615,152.78,040719,,D*73
```

Some boat systems have a ‘console’ that displays the incoming messages and can save them in a file. An example recorded during a passage in Falmouth harbour can be downloaded [here](#).

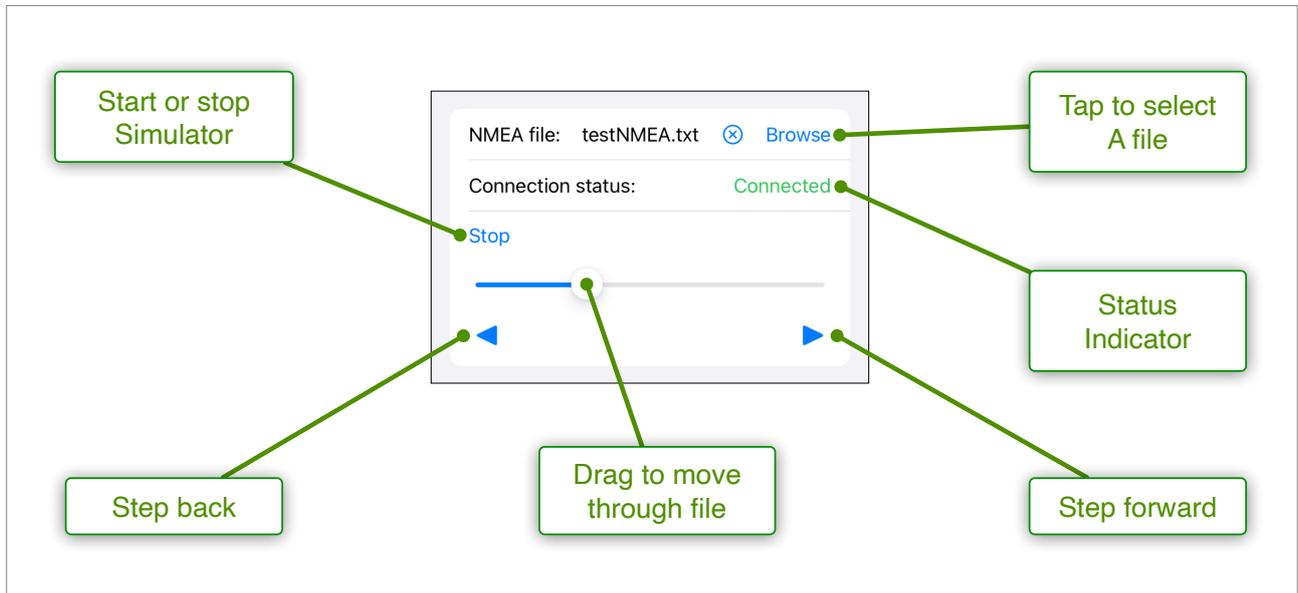
Detailed instructions are as follows.

- Obtain a text file containing NMEA messages (an example may be downloaded [here](#))
- Save the file on your iOS device (either in ‘iCloud Drive’, or ‘On my iPhone/iPad’)
- Go to **Settings: Navigational Data: Data source** and select ‘NMEA’
- Adjust the settings to exactly match those in this screen image:



- Got to Extras: NMEA Simulator where you will find the simulation control panel
- Tap on [Browse](#) to locate and select the downloaded NMEA text file
- Use the controls to stop, start and ‘scrub’ through the simulation
- Go to the Charts tab and select the GBOverview chart. You should see a boat in the area of Falmouth. Now select **Show AIS data** and/or **Show Instruments** from the chart

view menu and you will be able to see a number of AIS targets and/or the instrument display.



## Installing Antares Charts

Antares charts are large scale charts of anchorages in the North West Scotland. They can be purchased from the Antares [website](#) in BSB(KAP) format and downloaded as a ZIP archive. The unzipped files can be saved to your iOS device.

NB. In order to open Antares charts (or any KAP files), the KAP capability is also required, which is available as an in-app purchase.

The loading process is made easier by a 'wizard' in **Extras: Store** which work as follows:



At the end of the process, the charts are unzipped in the chosen location, and will be imported into AngelNav. Each chart is processed to create a thumbnail image for use in the chart list, and this can take 10-15 minutes to do.

An updated set of charts is issued annually in January. Tapping the reset button starts the wizard again so that a new set of charts can be purchased and imported.

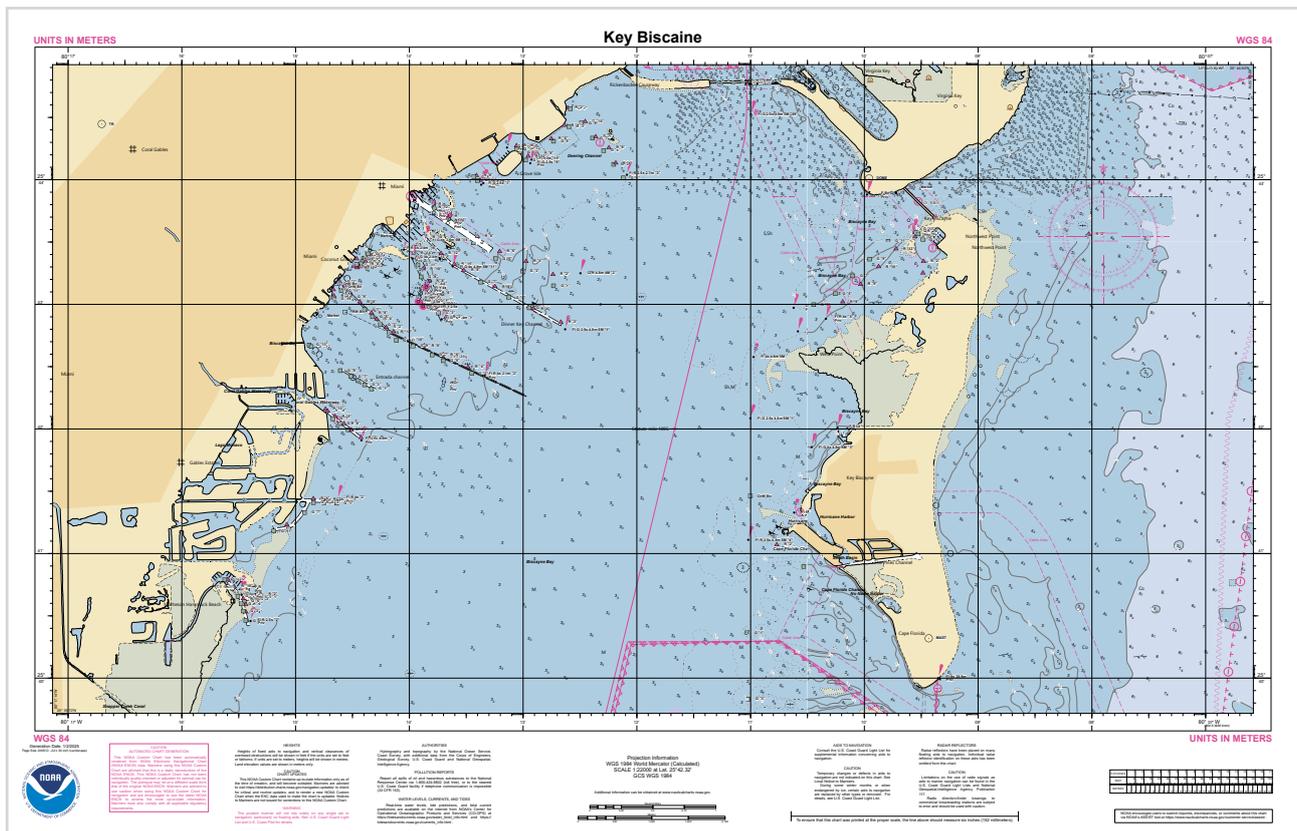
## Installing free NOAA charts

The NOAA (National Oceanic and Atmospheric Administration) supplies free charts for the coastal waters of the USA and its territories. Previously the charts were downloadable in BSB/KAP format, but the NOAA withdrew this facility last year. Legacy charts are still available from some sources and continue to be readable within AngelNav provided the BSB/KAP capability has been purchased.

The NOAA has also released an innovative online [tool](#) which uses up-to-date hydrographic data from their database, and allows the user to produce a raster chart from it. The area and scale can be defined, and the output is a geo-referenced PDF file. From version 2.0.3, AngelNav offers the capability to open and display these GeoPDF files (it can be purchased in **Extras: Store**).

This tool gives the sailor the ability to create their own set of charts, exactly covering their sailing area, using the most up-to-date information available and all free of charge.

The image below shows an example of a generated chart of Key Biscayne in Florida (courtesy of NOAA's Office of Coast Survey).



In order to use this facility, the following steps are required:

- Go to the online [tool](#) and read the instructions (there is also a video tutorial)
- Create one or more charts and download them to your device
- Purchase the GeoPDF capability
- In **Settings: Charts: Chart folder**, browse to the enclosing folder and select it.

## Installing free OpenSeaMap charts

The following steps are required for downloading charts supplied by the OpenSeaMap project. These charts are free and have wide coverage, but lack depth contours. The KAP capability is required.

The charts are downloaded as a compressed file (.7z) and you will need decompression software to open it (for example 'Easy Unarchiver - ZIP, RAR' available from the App Store).

- Open Safari and go to this [link](#)

### Index of /pub/misc/openstreetmap/openseamap/charts/kap/

<a href="#">../</a>			
<a href="#">OSM-OpenCPN2-KAP-Adria.7z</a>	02-Apr-2024 16:55		328627826
<a href="#">OSM-OpenCPN2-KAP-Adria.geojson</a>	29-May-2023 08:08		1741
<a href="#">OSM-OpenCPN2-KAP-ArabianSea.7z</a>	19-Apr-2022 18:57		321357092
<a href="#">OSM-OpenCPN2-KAP-Baltic.7z</a>	25-Mar-2024 16:55		741836108
<a href="#">OSM-OpenCPN2-KAP-Baltic.geojson</a>	29-May-2023 08:08		1937
<a href="#">OSM-OpenCPN2-KAP-Bodensee.7z</a>	21-Apr-2022 17:25		29041778
<a href="#">OSM-OpenCPN2-KAP-Caribbean.7z</a>	26-Mar-2024 01:40		480471512
<a href="#">OSM-OpenCPN2-KAP-Caribbean.geojson</a>	29-May-2023 08:08		2535
<a href="#">OSM-OpenCPN2-KAP-Channel.7z</a>	31-Mar-2024 20:05		295148338
<a href="#">OSM-OpenCPN2-KAP-Channel.geojson</a>	29-May-2023 08:08		2223
<a href="#">OSM-OpenCPN2-KAP-EastChineseSea.7z</a>	31-Mar-2024 11:50		284606786
<a href="#">OSM-OpenCPN2-KAP-EastChineseSea.geojson</a>	29-May-2023 08:08		2073
<a href="#">OSM-OpenCPN2-KAP-Europal.7z</a>	25-Mar-2024 01:34		2096723997
<a href="#">OSM-OpenCPN2-KAP-Europal.geojson</a>	01-May-2023 07:32		1741
<a href="#">OSM-OpenCPN2-KAP-Germany-NorthEast.7z</a>	21-Apr-2022 19:08		305546650
<a href="#">OSM-OpenCPN2-KAP-GreatLakes.7z</a>	31-Mar-2024 12:42		137170383
<a href="#">OSM-OpenCPN2-KAP-GulfOfBengal.7z</a>	08-Apr-2024 15:02		89205415
<a href="#">OSM-OpenCPN2-KAP-GulfOfBengal.geojson</a>	29-May-2023 08:08		1935
<a href="#">OSM-OpenCPN2-KAP-GulfOfBiscay.7z</a>	25-Mar-2024 09:38		201814204
<a href="#">OSM-OpenCPN2-KAP-GulfOfBiscay.geojson</a>	29-May-2023 08:08		1859
<a href="#">OSM-OpenCPN2-KAP-LakeConstance.7z</a>	12-Jul-2021 05:52		45837504
<a href="#">OSM-OpenCPN2-KAP-Lake_Balaton.7z</a>	21-Apr-2022 17:38		32143139
<a href="#">OSM-OpenCPN2-KAP-MagellanStrait.7z</a>	25-Mar-2024 22:26		37341829
<a href="#">OSM-OpenCPN2-KAP-MagellanStrait.geojson</a>	29-May-2023 08:08		2176
<a href="#">OSM-OpenCPN2-KAP-MediEast.7z</a>	25-Mar-2024 05:18		806260374
<a href="#">OSM-OpenCPN2-KAP-MediEast.geojson</a>	29-May-2023 08:08		1935
<a href="#">OSM-OpenCPN2-KAP-MediWest.7z</a>	03-Apr-2024 11:08		669833385
<a href="#">OSM-OpenCPN2-KAP-MediWest.geojson</a>	29-May-2023 08:08		2039

- Tap on the .7z file corresponding to the area you want, and wait for the file to download.
- Launch the Easy Unarchiver app (or equivalent) and tap on 'Open Archive' at the top of the left hand column
- Browse to the downloaded file, select it so that a tick appears, and then tap 'Open' at the top right. You should now see a folder with the name of the file
- Long tap on the folder and select 'Extract' from the menu
- Navigate to where you want to store the files then tap 'Open'
- Wait for all the files to extract (several minutes)
- In AngelNav, go to **Settings: Chart Folder** and browse to the folder containing the extracted files (called OSM-OpenCPN2.KAP....). Tap on the folder and tap 'Open'
- Go to the charts tab and you should see new charts appearing. It will take 2-3 minutes for AngelNav to import them and create thumbnails

