Neptune Planner App

Neptune Planner Links

The latest version of this manual and a list of relevant videos can be found on the Neptune website:

http://www.neptunenavigation.co.uk/android%20planner.htm

Neptune Planner Description

This app allows you to plan routes and calculate Course to Steer and Optimised Departure taking into account tides showing the best time to leave in a tidal situation.
It displays the predicted Course Over Ground and shows the course construction vectors to enable the navigator to cross check their own calculations.
Animations allow you to virtually sail the course, observe the possible wind over tide situations and display the cross track errors to be expected on the proposed route.
Tidal height stations displayed on chart makes it easy to obtain heights for any listed port for many years into the future.
The results of calculations can be used to create passage plans and with a couple of touches send them to others via email.
The app supports importing wind forecast and estimating boat speed from the wind (polar plot).
A specific create passage plan section allows you to enter boat and crew details, capture intended routes as screen shots and create an email of the plan prior to departing.
Waypoints and routes from other devices in the form of a standard GPX file can be imported and exported thus allowing you to share these important files across your navigation devices.

Trial Version

Demonstration charts are available and will predict tidal streams, tide heights and perform course calculations for 5 days from the date of download after this time the tidal data times out. After subscribing to a chart area the tidal data is then available for a year.

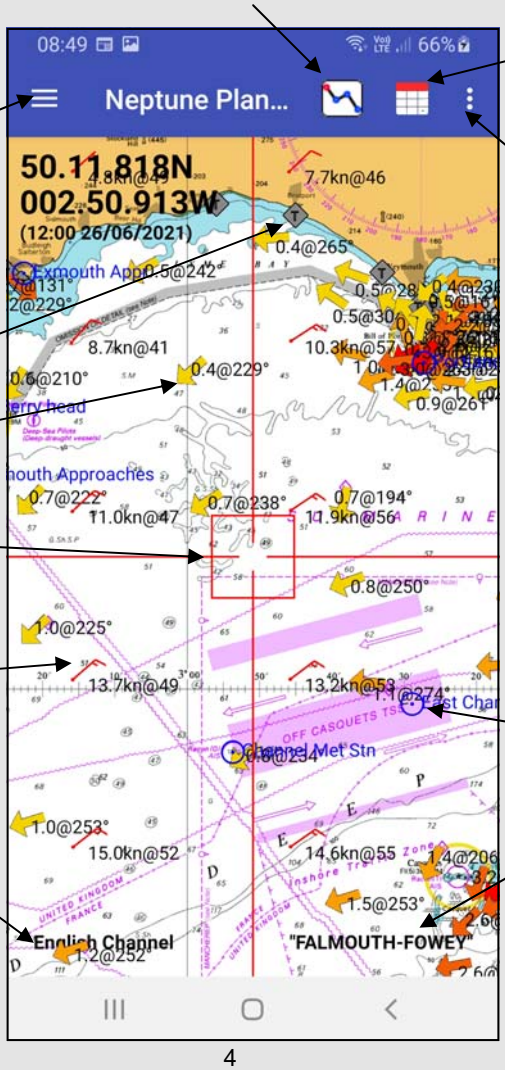
Subscriptions

The app uses data derived from various hydrographic sources and their royalty fees are included within the yearly subscription fee.
Charts are derive from UKHO data, Neptune Outline or Imray can be downloaded as required once a subscription is active.

Home Screen Overview

The “Home” Screen” is the control centre of the app where the chart is displayed and over which is displayed the tide, wind, marks, and routes, these are identified below.

On the top left is a menu button which when tapped presents a drop down list allowing management of View Layers, Configuration, Charts, Weather, Routes, Marks and Waypoints, Time and Date etc.



Planning Button

Calculate Button

Menu Button

More Items.

- Animate
- Clear
- Time +
- Time-
- Add Mark

Tidal Height Station

Tidal Streams

Cursor Area

Wind Barb

Mark or Waypoint

Chart Name

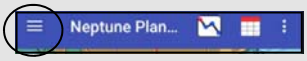
Route name.
(If loaded)

Contents

Creating a Route

The following steps illustrate route creation, calculating the course to steer taking into account tides and creating a passage plan.

Set the time and date using the main Menu if it is not set the app uses time and date is “Now”.

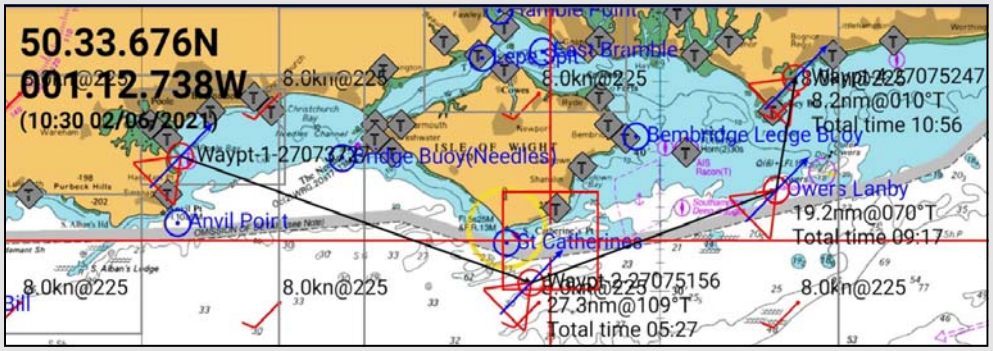


Position the chart so your start position is under the cursor.(Pan and zoom as required).

Tap the route planning button, (Turns grey for Planning mode).

Tap within the cursor area and you will be prompted to add a waypoint.
For sailing users the waypoint is shown with a black arrow for the wind direction and the boats tack angle drawn in as a red triangle.

Pan the chart for the next waypoint and add points until you have planned your route.
Notice that as we are displaying the wind over the waypoints we see that the route can be sailed, also at each waypoint the range and bearing between points and the approximate time taken is shown.

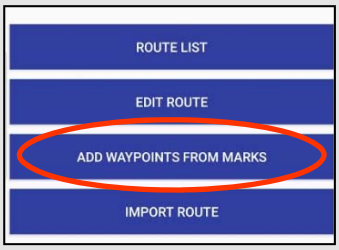


After the destination waypoint has been added leave the planning mode and press the Calculate button.

Route Creation From Marks

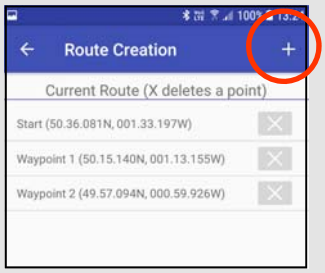
Ensure that the app is in the route creation mode.

From the main menu select “Routes” if the route mode is active the “Add Waypoints From “Marks” button will be visible.



When the button is pressed it will load the route as it has been created so far.

To add a waypoint from a mark, press the + from the screen banner.



A list of all the marks in the currently selected marks table is displayed, press on the required mark and it will be added to the route.

Add more marks as required or on returning to the main display, further marks can be added manually as described in the previous page.

Calculating the Route

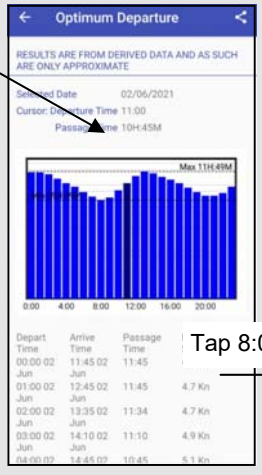
The calculate view displays a text summary of the proposed route. If you wish to change the details for a leg such as the boat speed simply tap on the leg of interest and the edit route appears.

Press the Calculate button to calculate the Course to Steer taking into account tides.

Vectors for CTS construction

Green line is COG at half hour intervals

Press the Optimise button to see the effect of different departure times. In this example, 8:00am is the shortest passage time, tap on the bar to calculate the Course to Steer departing at that time.



Note: this screen can be shared

Tap 8:00am

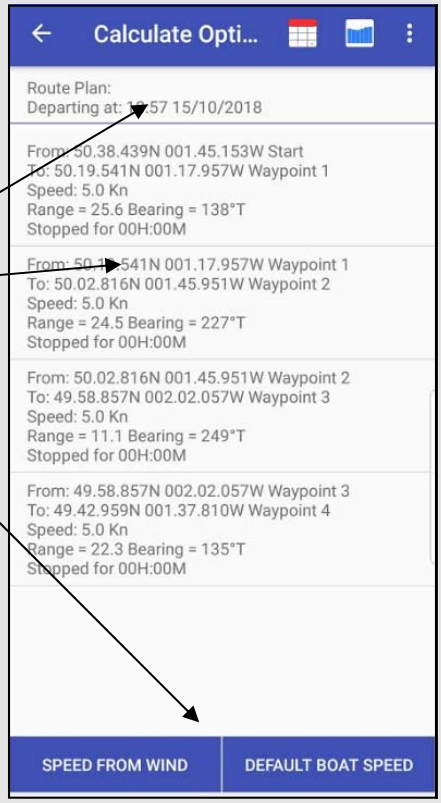
Calculation View

In the Calculation View you can edit any point for the route by simply touching the item in the list.

To change the departure date and time press the Departing at entry.

To change the coordinates of a leg point or a stopped for time press the appropriate leg entry.

Note the buttons on the bottom of the view.



Speed from Wind (Sailing Option)
If visible uses the Polar plot and either the Grib forecast or default wind to estimate the boats speed through the water for each leg.

Default Boat Speed restores the boat speed for each leg to the default value set in the Configuration.

Calculation Options

(These items will appear as a menu or icons depending on device orientation)

Calculate the course to steer taking into account tides press.

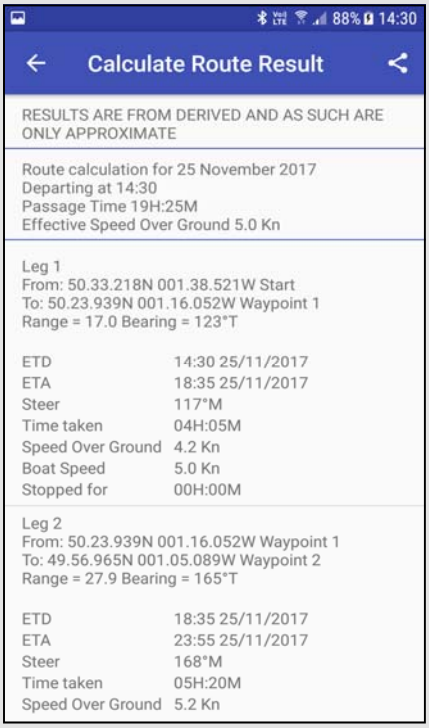
Calculate the optimum departure time taking into account tides press.

Calculate a course over ground for a leg or a single route point entry (e.g. in the event of losing something overboard to determine the likely direction of tidal drift).

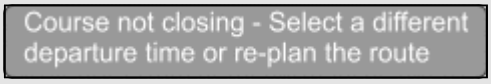
Copies the proposed route to an email.

Calculation Results

Calculation time varies depending on tidal conditions, on some occasions the calculation will appear to be rapid and for a different time the calculation will appear to take longer.
Calculation Results show a summary and the course to steer for each leg.



In areas of strong tidal streams it is not always possible to calculate a course that will fully converge with a waypoint. In this event a warning will be displayed.



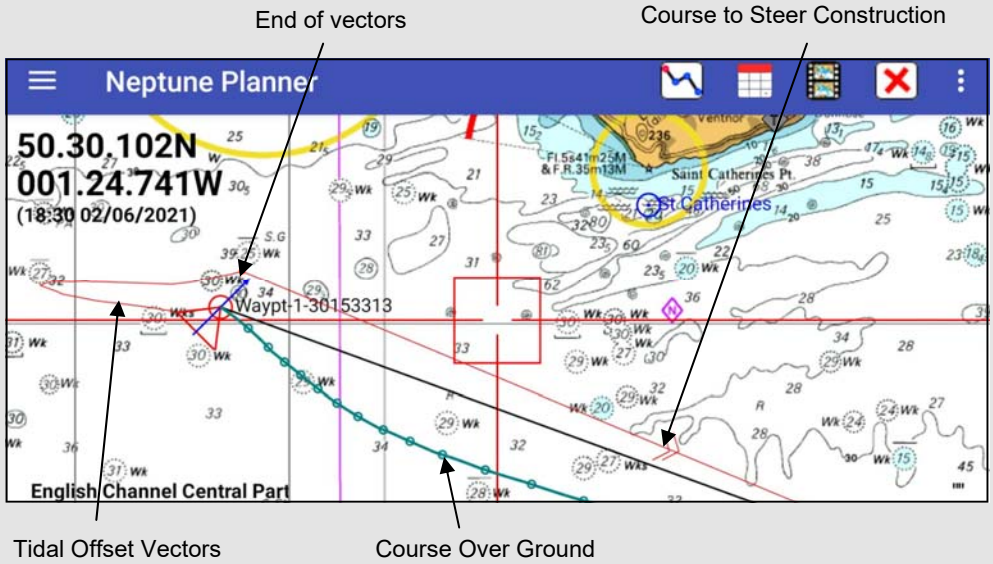
There is a setting under Configuration "Acceptable Route Closure" which is the determining factor for this message.

Examining the Route Results

Looking closely at the graphical output of the calculation on the chart gives an interesting overview of the proposed route.

In the image below the Course Over Ground (COG) is represented by the green line and the small circles are the predicted boats position every 30 minutes.

The red line with the dot at marks the end of the tidal offset vectors and the red line with the double chevrons from the end of the vectors to the end of line waypoint is the course to steer construction vector.



The tidal vectors are initially Westward setting and as the time progresses they become Eastwards, as the route is from West to East at the start of the passage the boat will be travelling against the tide, later it will have the tide assisting its passage.

Looking at the COG circles we see that at the beginning they are close together whereas after about 5 hours they are beginning to spread further apart as the tide has turned and it is now assisting the passage.

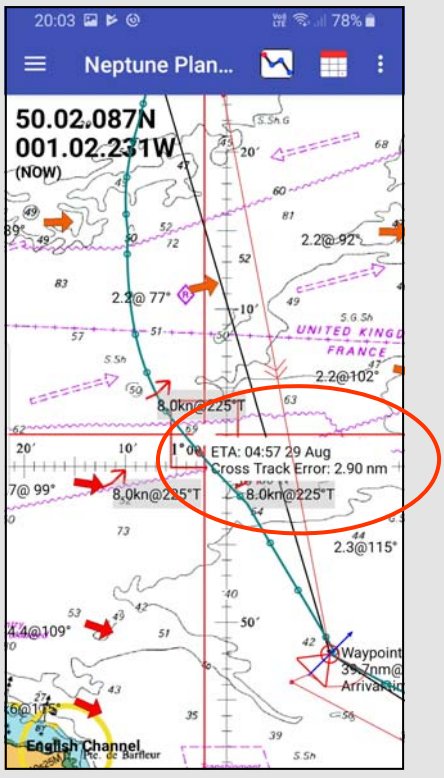
Animation & Course Over Ground

After a Course to Steer or a Course Over Ground calculation the results can be examined either by animating the proposed route or obtaining information about any course over ground point.

Information on a single point on the course over ground can be displayed by simply touching the point, eg at the maximum “Cross Track” error, touch the point and the screen will show the predicted arrival time, cross track error, tidal stream values and display the wind (or expected forecast wind) for the point.

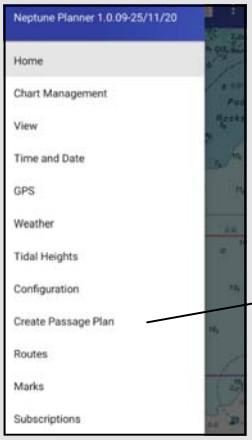
The route can be animated by selecting Animate from the toolbar. In this mode the details of COG are displayed successively with 1 second representing 15 minutes of passage time. Animating the route allows the route to be “virtually” sailed.

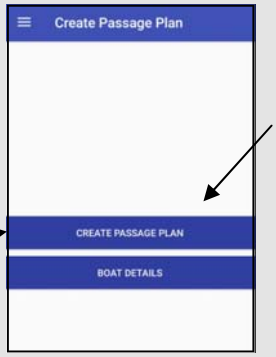
For comfort on passage the user is looking for the least amount of "Wind over Tide" during the planning stage.



Creating a Passage Plan

After planning your route, tap the Menu and select the item “Create Passage Plan”.
You can either enter details of your boat and crew or create a plan.





Select Create Passage Plan and the chart view will be displayed along with a “Screen Shot” button.

Adjust the view by panning and zooming and tap the screen shot button, you will be prompted to take more shots. When you answer “NO” the email app will be launched pre-populated with details of departure times, courses to be steered, boat details with the screen shots attached. Modify it if necessary and then fill in the recipients email address and press “Send”.

Screen Shot Button

Planning Departure for an Arrival Window

The Optimise departure can be of great use when trying to arrive at a particular time, for example if you wish to arrive at a destination at approximately high water.

In this example we wish to arrive sometime near high water in Poole on 2nd June 2021.

Time	Height
02:59	1.9
10:40	1.1
17:02	1.9
23:32	1.4

Days Range 0.8M

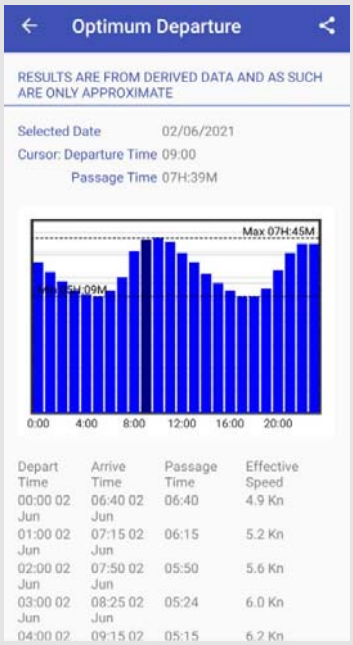
High water is at 17:02 so plan the route and do an optimise departure calculation.

Below the graph the results are tabulated and the columns are :

Departure Time, Arrival Time, Passage Time and Speed over Ground.

Examining these shows that leaving at 09:00 will have an arrival time at approximately 16:40 whereas leaving at 10:00 result in an arrival at 17:45.

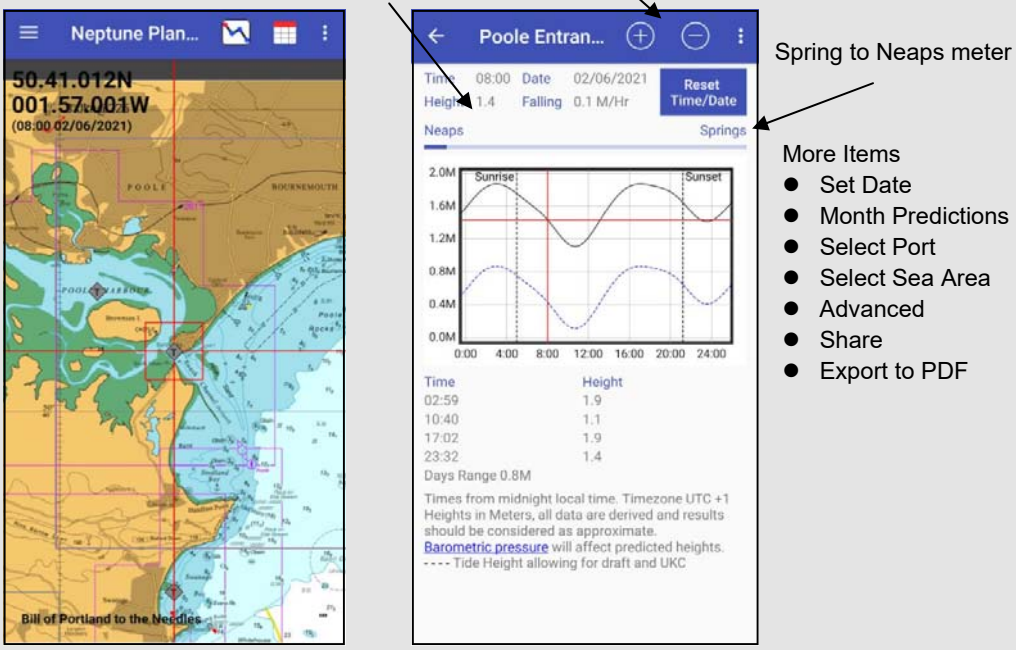
From the graph we also observe that following this plan may not be ideal as it will give the longest passage time and the slowest speed over ground.



Tidal Heights

Tidal height stations are displayed over the chart as a grey Diamond containing the letter “T”.

To obtain the tidal predictions for the selected date simply position the icon under the cursor and tap within the cursor area.



The main curve shows the water height with respect to chart datum.
The second dashed curve shows the prediction with the boats draft and under keel clearance taken into account.
Move a finger across the graph and the cursor moves and the time and height text is updated.
The Spring to Neaps meter indicates where we are in the tidal cycle.
A months predictions can be obtained using the extended menu
Time zone, draft and underkeel clearance are set-up in the app’s Configuration found under the main menu.
The advanced item displays the tide raising constituents (see page 47).

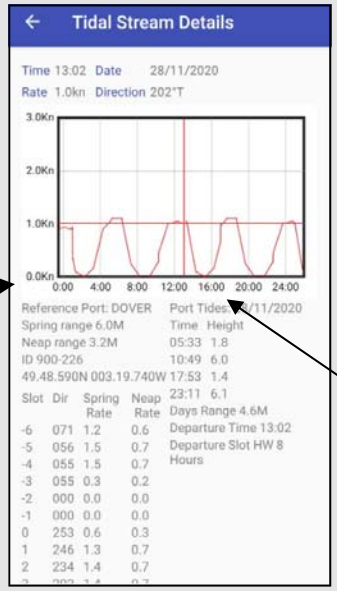
Tidal Streams

Tidal streams are derived from tidal diamonds and are shown on the chart as a coloured arrow with the rate and direction displayed beside them. The colour being a visual guide to the rate.

The streams layer can be turned on or off using the View option from the main menu.

To find Slack water time position the cursor over the over a stream icon and tap within the cursor area, a graph is shown indicating rate versus time in the day, move the cursor to update the Time and Rate.

A smooth curve is seldom seen on tidal streams as such data is from historical observations.



Minimums indicates slack water times.

Rate Range	Image and colour
0 to 0.1 knots	
0.1 to 0.9 knots	
1.0 to 1.9 knots	
2.0 to 3.5 knots	
3.5 or more knots	

Editing Routes - General notes

When constructing a route if you make an error on waypoint entry just select the Clear item on the toolbar This will clear the last item added, if there are multiple waypoints in the route continuous taps will remove them one at a time.

The Clear item is either the X icon in a landscape view or it is under the 3 vertical dots on a phone in portrait mode.

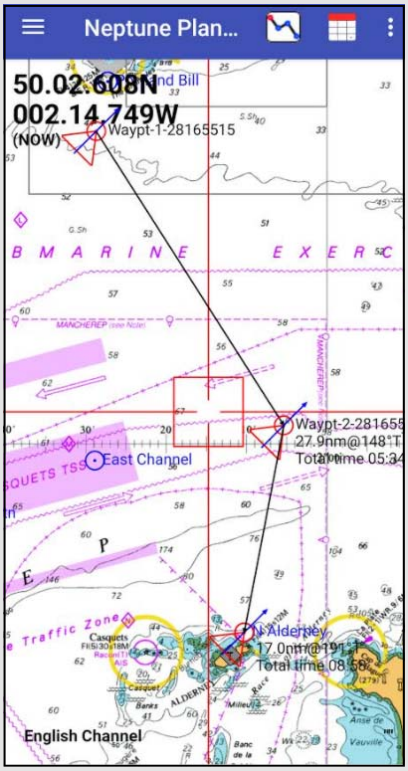
The Clear item will also have an effect on a time and date set.

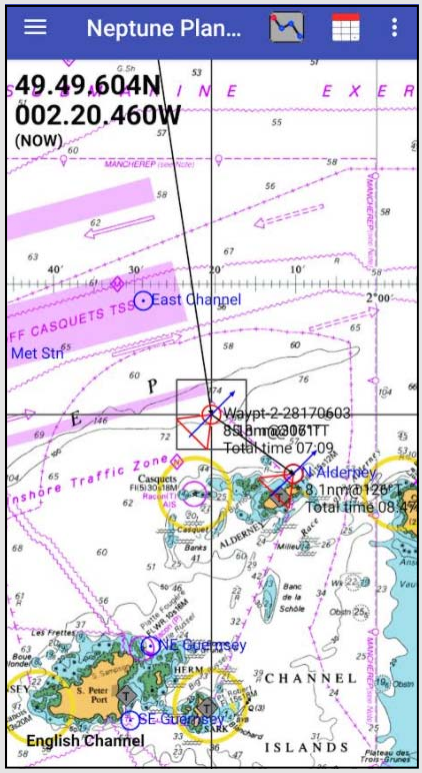
If there is a completed route on screen (i.e out of planning mode) pressing clear once will delete the route but will not reset the date and time in case you wish to plan another route for that date and time.

Pressing Clear a second time will reset the date and time to “Now”

Editing Routes - Dragging a Waypoint

Editing a route requires the app to be in the route planning mode.
To move a route point position the route point in the cursor area and do a long press the cursor lines will change from black to red, in this mode simply pan the chart and the waypoint will move with the cursor.
To exit this mode either tap elsewhere on the screen or wait 5 seconds and the app will resort back to planning mode ready to add a waypoint.
Tap the planning button to exit this mode.

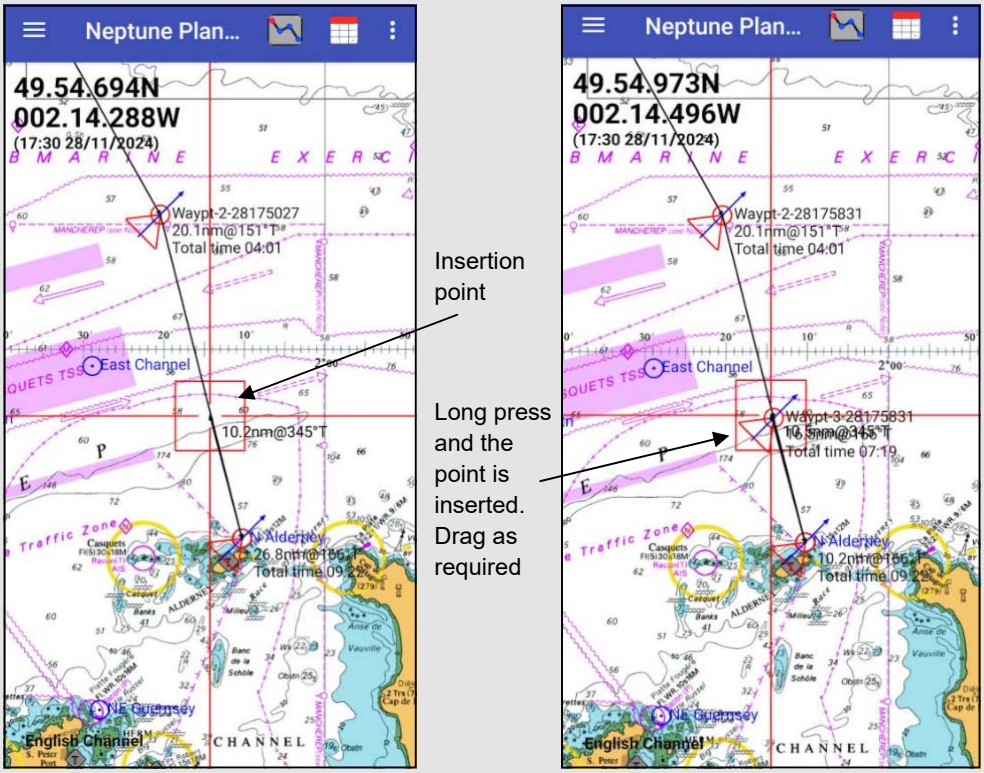




Editing Routes - Inserting a Waypoint

To insert a waypoint into your route:
Enter planning mode and position the cursor along the line of the leg where you wish to insert the waypoint. You will notice a range and bearing arrow from the last waypoint added, when inserting a waypoint ignore this.

Press within the cursor area for at least 1 second and this enables the insert mode and the waypoint is inserted into the line.
This waypoint can then be dragged to the desired position as described previously.
(For positioning the line just needs to be within the cursor area not precisely on top of it).



Insertion point

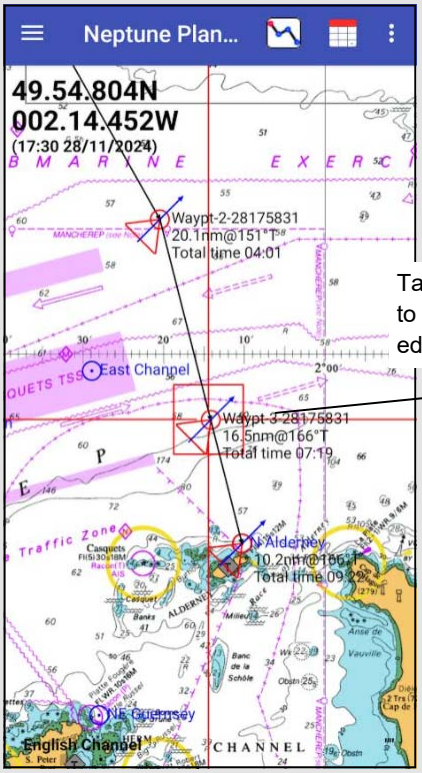
Long press and the point is inserted. Drag as required

Editing Routes, Waypoint Name & Coordinates

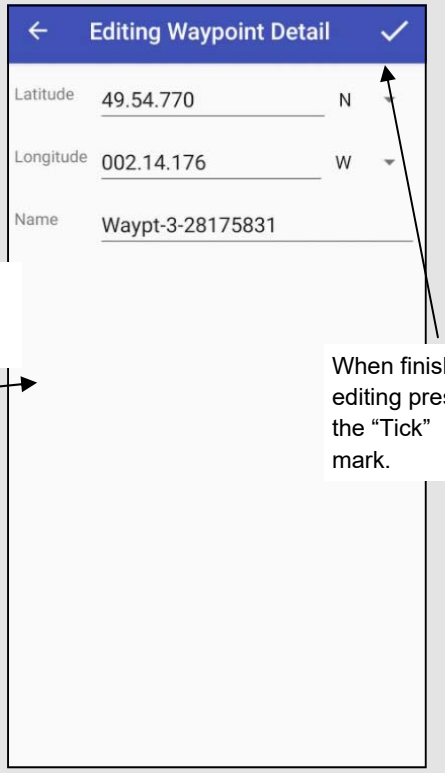
To edit a routes waypoint:

Leave the planning mode
Position the required waypoint under the cursor.
Tap within the cursor.

A view opens up allowing you to rename or adjust the waypoints coordinates.



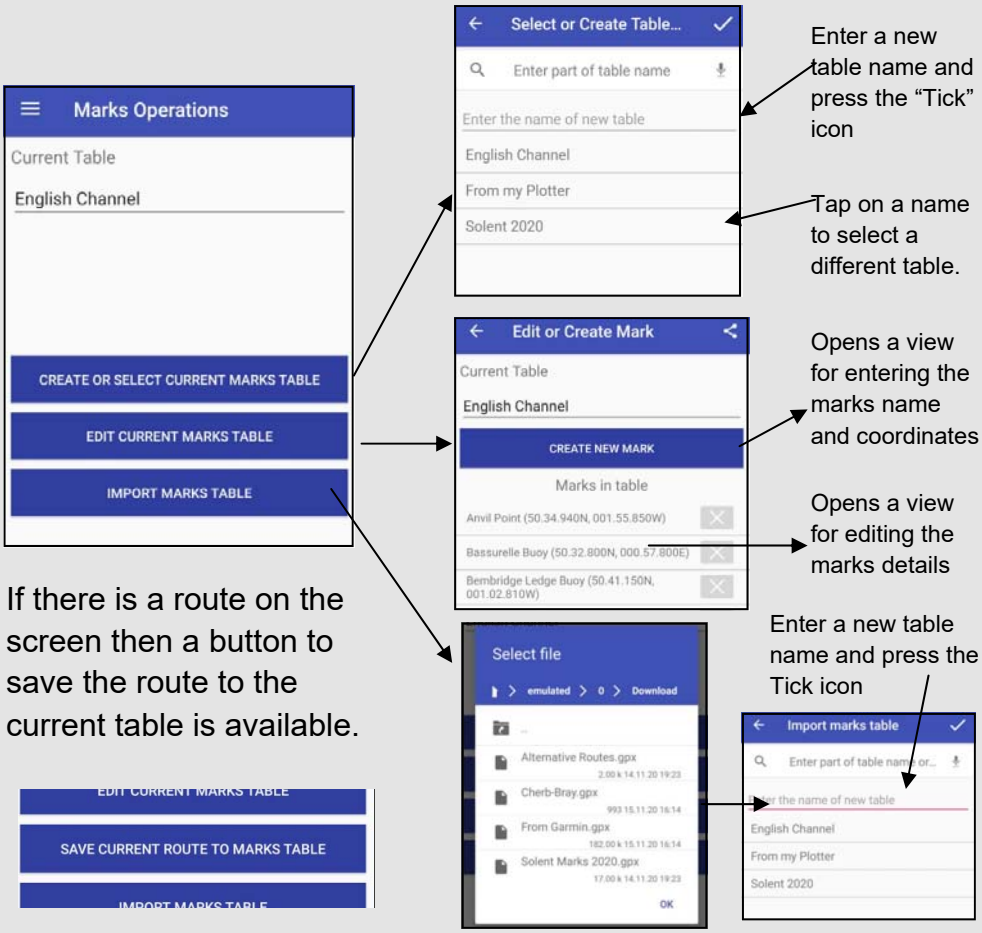
Tap in cursor to open the editing view.



When finished editing press the “Tick” mark.

Inserting and Managing Marks

Marks are displayed on the chart as a blue circle and are used as waypoints in route planning, they are managed by keeping them as separate tables in a database. You can have a large number of different tables stored on your device.
Marks are managed from the main Menu by selecting the “Marks” item where a series of buttons allow easy management.
The current Marks Table can also be edited or added to from the main chart screen.
Note : For compatibility with other systems, Marks and Routes are imported and exported in GPX format



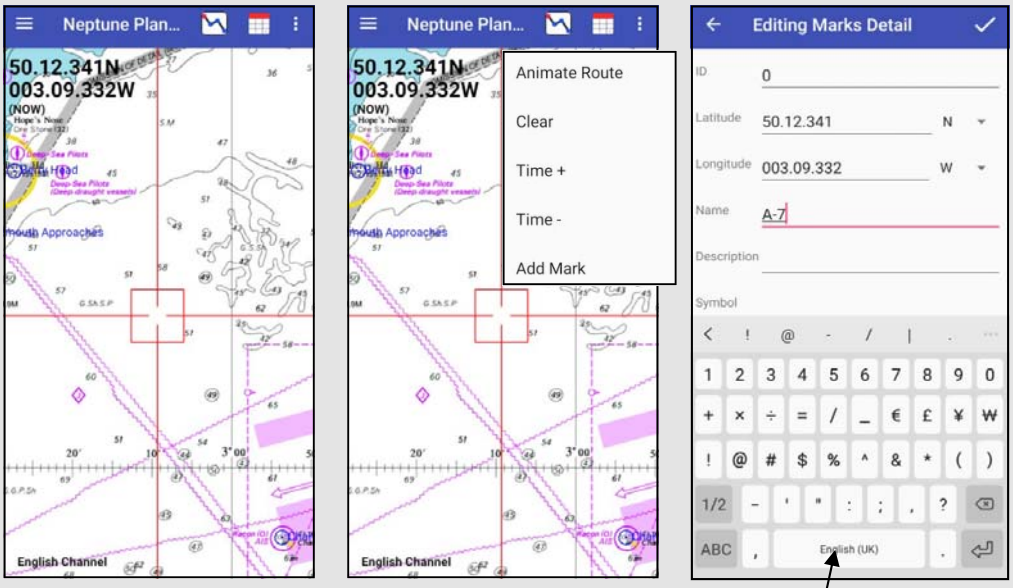
If there is a route on the screen then a button to save the route to the current table is available.

Contents

Managing Marks on the Chart

Marks displayed on the chart can be edited by positioning the mark under the cursor and tapping within the cursor area. A view appears that enables you to edit the details.

Enter a name for the mark and press the “Tick” icon when editing is complete



An existing mark can be edited by positioning the cursor over the mark and tapping within the cursor area, the view for editing the mark’s detail will be displayed.

Importing Route and Marks from other Systems

GPX has become a popular format for exchanging routes, marks and waypoints and Neptune only accepts this format.

Ensure that your other navigation system stores the files in gpx format and either save them to your Google Drive or attach them as an email to yourself.

Download the file into the devices Downloads folder to enable the app to locate them.

From the main menu select Routes or Marks as required and select the import button.
The downloads folder opens and shows all the files with gpx extensions.

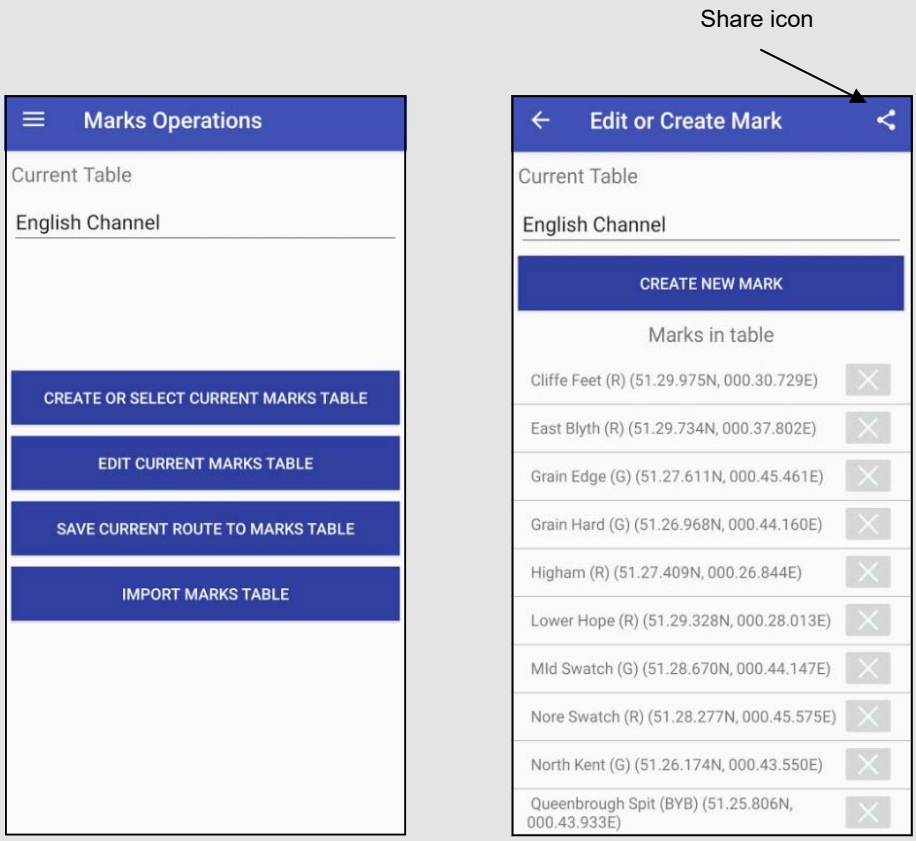
If the imported file contains multiple routes then these will be imported as separate routes.
On a successful import the a short message will be displayed and the view will revert back to “Route Operations”.
The imported routes will now be available for use via the Route List.

Exporting the Current Marks Table

To back up your marks and routes the method supported by the app is to export them as a gpx attachment to an email.

To back up your marks from the Marks menu select Edit Current Marks table.

In the Edit view the table can be exported by tapping the share icon and the email app will launch with the table attached as a gpx file.

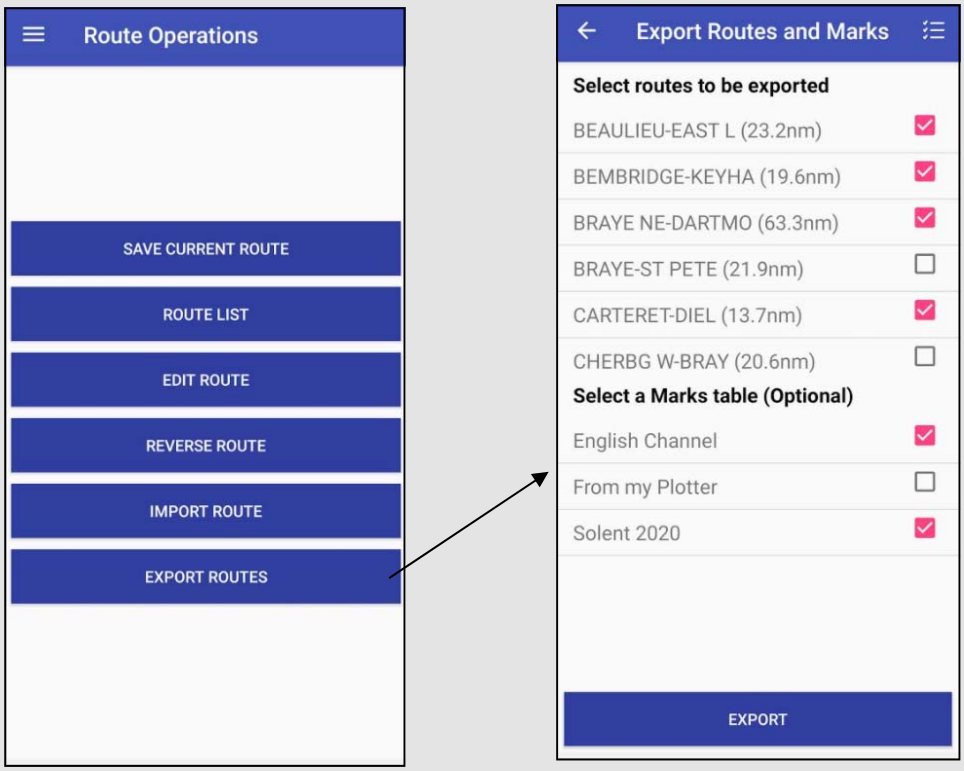


Exporting Routes and Marks

Some GPS ‘s and their management programs keep marks and waypoints within the same gpx file, the app supports this style

In order to export your routes and marks in the same file from the main menu select Routes.
From the view that appears select the Export Routes and Marks item.

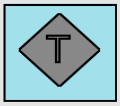
Check those items to be included and then press the Export button, the email app will be launched with the tables as a gpx attachment.



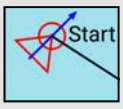
Description of Chart Symbols

Location of tidal diamonds. Position the cursor over the centre of the icons base line and either tap the cursor centre to obtain further details of the stream. If configured (View menu) the stream rate and direction is also shown. The tidal stream rate is colour coded.

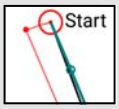
Rate Range	Image and colour
0 to 0.1 knots	
0.1 to 0.9 knots	
1.0 to 1.9 knots	
2.0 to 3.5 knots	
3.5 or more knots	



Location of tidal height ports. Position the cursor over the item and tap the cursor centre to obtain tidal heights for the time and date selected.



A route waypoint showing the wind over waypoint, the direction the wind is blowing from is shown by the arrow and the configurable tack angle is shown by the triangle.



The start of a route leg (wind turned off for clarity). The green line is the predicted Course Over Ground. The small red line are the tidal offsets (Vectors) and the long black line is the rhumb line.

Wind barbs are a visual indication of the wind direction either the default or obtained from a GRIB import. They can be configured to display the rate and direction beside the barb.

Downloading Charts

Charts can be downloaded from the Neptune server whenever required so long as there is a valid subscription.

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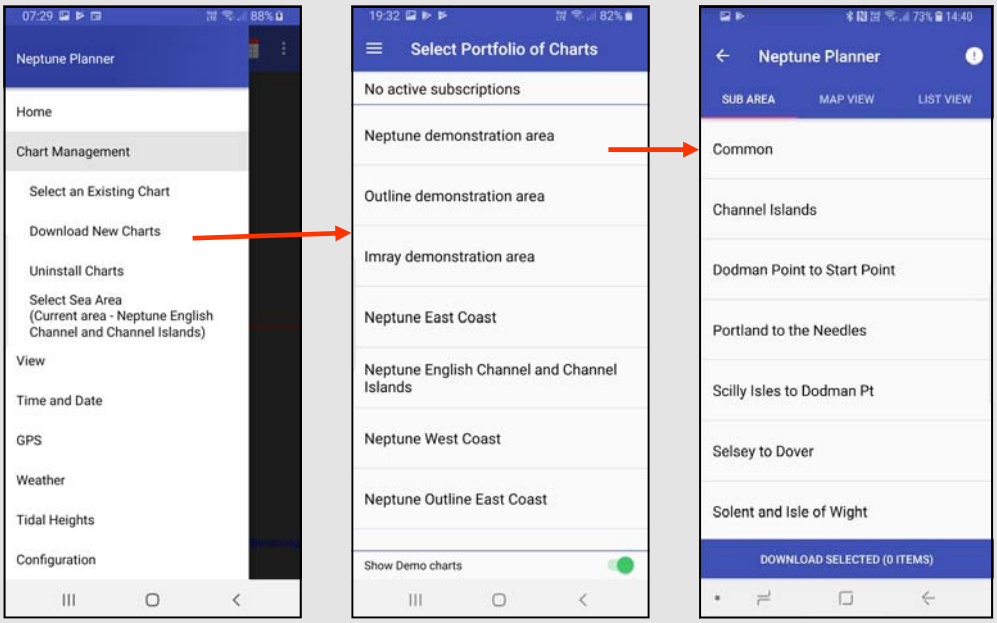
After use a chart can be retained on your device or removed using the “Uninstall Charts” option, Charts can be downloaded and uninstalled as you choose.

From the main menu select “Chart Management” and the menu expands presenting the available options.
There are hundreds of charts available from several sources and different areas, initially choose Select “Download New Charts” and choose an area. UKHO derived charts, Imray and Outline charts are available.

Charts are updated annually.



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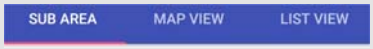
Downloading Charts

Once an area has been selected, a new view appears containing 3 tabs:



Sub Area : Each area is divided into sub-areas, for convenience you can tap on a sub-area and download all the charts from the area. Always download the Common sub-area obtain the region's base charts

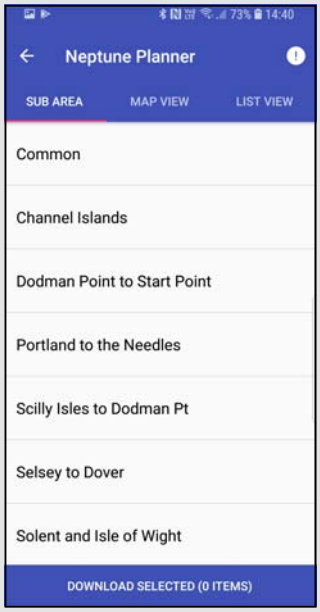
Map View : Shows an outline of all the sub areas available within the portfolio. A long press within the map area will select the main chart and sub-charts within the area. An option list will be shown if sub areas overlap and selecting from the list will show just the charts contained in the area. Check all the charts required and press the Download button.

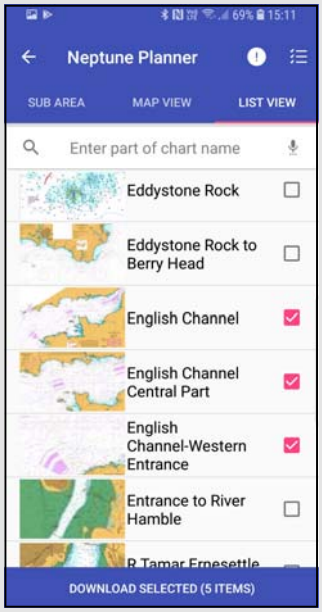
List View : If a sub area is not selected the list view will display all the charts available within the area. Select the charts required and press the Download button

If a subscription is required you will be prompted to subscribe.

When the download is complete press "Home" from the main menu.

The Sea Area you have downloaded will become the default sea area.





Toolbar

The toolbar is used for passage planning and obtaining information such as tidal heights and tidal stream details from the chart.

Passage Planning

Pressing this icon and the background turns from white to grey indicating the app is in the planning mode. Pan the chart to a desired point and a tap within the cursor box adds a waypoint to the route under construction.
In this mode marks can be added via the Routes menu item.

Calculate Icon

When a route has been constructed, or if a single waypoint has been created pressing this icon takes the app to the calculation view where a Course to Steer, Optimised Departure and Course Over Ground can be generated. Optimum departure time can be calculated.

Animate Icon

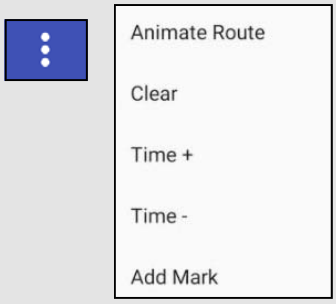
When a route has been calculated, pressing this icon steps through the Course Over Ground every second showing the Cross track error, predicted tidal stream and the user entered wind allowing the passage to be visualised.

Clear Icon

During route construction the clear icon clears the last point added otherwise it clears the route and results.

Toolbar

The toolbar functions are normally hidden in portrait or landscape view and are accessed by pressing the 3 vertical dots on the right of the toolbar.



Animate Route

When a route has been calculated, pressing this icon steps through the Course Over Ground every second showing the Cross track error, predicted tidal stream and the user entered wind allowing the passage to be visualised.

Clear

During route construction the clear icon clears the last point added otherwise it clears the route and results.
If a time has been set for the route and the app is not in planning mode the first clear action clears the route and the second one re-sets the time and date to “Now”.

Time + and Time -

Adds or subtracts half an hour from the time, if a route has been previously calculated and the results are on screen then the route is recalculated for the new time.

Add Mark

Creates a new mark under the cursor position and opens up a view to adjust the coordinates and name the mark.

Main Menu Items

Home

Returns to the main chart view.

Chart Management

The app is distributed with the base chart of the UK and a sample chart of the English Channel. Other charts and areas are available by annual subscription. The user must select the active area using the “Select Area” menu item. Chart subscriptions can be managed from the “Subscription” menu item.

View

Wind, tidal streams, tidal height ports, routes, marks, waypoints and chart boundaries are drawn over the base chart. This can lead to screen clutter, turn off unwanted objects using the “View” menu.

Time and Date

Once set this time and date is applied to the tidal predictions and passage making calculations.

GPS

If available the internal GPS is switched on and will record the vessels position and draw in a track plot. An external GPS is not supported in this version.

Weather

Wind, wave height, rain, pressure and temperature can be obtained from a forecast file. Alternatively wind can be entered manually. Wind is use as an on screen visual guide to assist in passage planning and estimating wind over tide situations after a calculation. Wind is also used in the Polar Plot section for estimating a sailing boats speed during passage planning.

Main Menu Items

Tidal Heights

Tidal height predictions for many UK primary and secondary ports.

Configuration

Most of the apps defaults and other settings are controlled from here. You can set the Time Zone, Default Boat Speed, Tack Angle, Wind Speed and Direction, Underkeel Clearance, Variation, Draft, Under Keel Clearance and also control the devices behaviour such as Screen rotation, zoom levels, device mode and fonts.

Create Passage Plan

This option allows you to set and change boat and crew details for use in a passage plan.
Following a course to steer calculation for a selected time and date you can create a passage plan which includes details of your boat, route you intend to take, screen shots of the route and predicted course over ground.
The “Create Passage Plan” takes you to the screen shot mode and when satisfied with your screen shot of your proposed route opens up the e-mail (if set up) for emailing your plan to interested parties.

Routes

Routes created can be saved for future use, loaded, edited shared or created using marks from this option. Routes and Marks can be imported or exported as GPX files via email.
GPX files are common amongst navigation systems and this system allows your files to be used on other systems.

Main Menu Items

Marks

In this app a Mark is location containing a latitude, longitude, Name, Description and a symbol description. They become a waypoint when added to a route.
Marks can be edited added and deleted using this menu item. Waypoints can be added to a route when in the “Route Creation” mode on the toolbar. When the GPS is turned on a button is visible under this menu to create a mark of the boats current position. The mark is given a name of the current time, this can be changed using the Edit button. Marks can be shared as GPX files via email.

Subscriptions

This app uses data under licence from various authorities and as such the data usage is limited to an annual fee.
This menu enables you to view the status of your subscription.

User Guide

Displays this PDF manual.

Contact Neptune

This item launches an email addressed to:

sales@neptunenavigation.co.uk

It contains the details of the app to allow an easy contact and support link.

Changing Charts (Manually or Automatically)

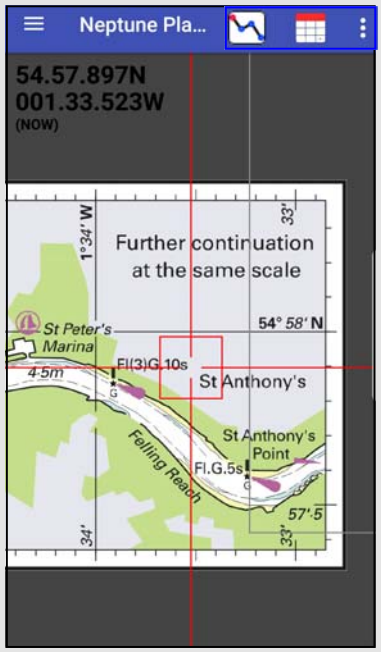
The marine charts used in this app are derived from images of paper charts of differing scales and unlike the apps such as Google maps they cannot not seamlessly tile together. Neptune attempts to overcome this limitation as follows:

In the Configuration menu there are 2 items.

Chart Auto Change When this is turned on if you have downloaded a more detailed chart you will automatically open this chart on zoom in. (Chart boundaries are turned on in View menu in the example)
Quilting If you have downloaded an adjacent chart and you pan beyond the boundary of the current chart into the adjacent chart it will automatically load the chart.
In the Configuration menu, the item “Quilting” is initially set to On.

Quilting Off—No chart change on panning beyond the chart edge

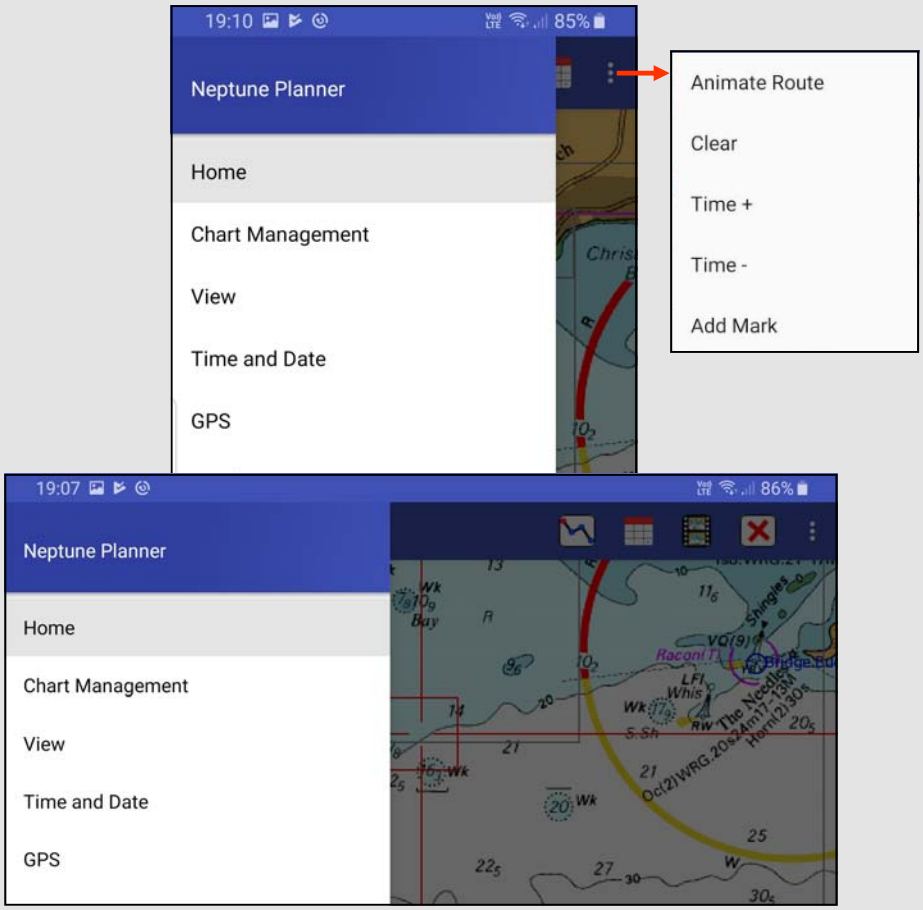
Quilting On — The adjacent chart loads automatically on panning



Orientation & Toolbar Items

The app operates in landscape or portrait orientation, if desired the orientation can be locked to portrait or landscape using the configuration menu.

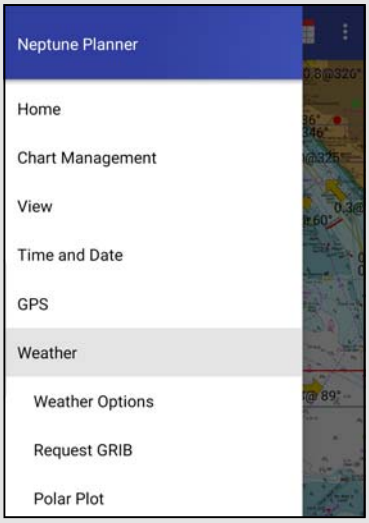
In portrait mode there is insufficient space to show all the items and those not visible are revealed by pressing the 3 vertical dots on the right of the toolbar.



Weather

This section of the app gives the user the option of either entering a global wind value or obtaining a forecast from a weather provider.
A forecast is imported in the form of an email attachment.
This app requires GRIB1 and defaults to Saildocs as the provider.

For sailing users, Polar Plots allows boat speed to be automatically obtained from the wind strength and direction, once set up for your boat the vessel's speed can be obtained automatically in passage planning.



Weather options allow either:

- A wind speed and direction value to be entered manually.
- Request and use of a GRIB forecast.

The wind value is drawn as a grid, on the chart every 0.15° and can be turned off from the "View" menu. The wind value, either the default or the forecast, can be displayed over waypoints on a route to assist in passage planning.

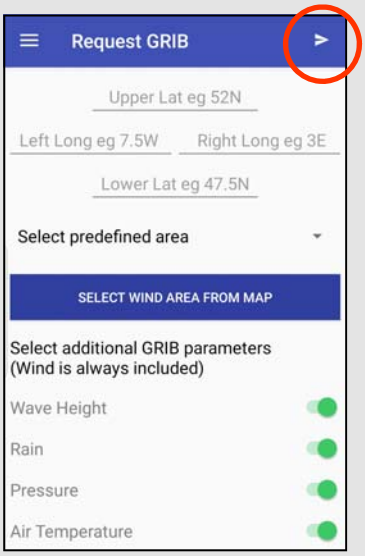
Wind is also displayed near the boat position during route animations.

To exit the "Weather Options" press Home on the menu.

Obtaining a Forecast

Selecting **Request GRIB** from the Wind menu opens a view with several options.

- Manually enter the areas boundaries.
- Select predefined area and a drop-down appears with areas pre-defined.
- Use a map and zoom to the an area.
- Select the required parameters. Wind is always downloaded but wave height, rain, pressure and air temperature are also available.



Note : The more parameters selected the longer the download and decode times.

After selecting an area or manually entering boundaries press the Mail icon (circled), this causes a pre-populated email Grib request for Saildocs to be generated according to Saildocs requirements.

Do not change the email contents or header.

Press Send on the email, a reply can be expected within minutes.

Saildocs is provided by https://sailmail.com which is a membership owned free email service built by cruising sailors for cruising sailors.

It is strongly recommended that you use a Gmail address as this will simplify downloading the Grib attachment to the "Download" folder on your device which makes import of the data a simple matter.

Other GRIB sources may be used if they conform to the GRIB 1 specification. It is up to the user to conduct their own tests and determine the best way of obtaining alternative data.

GRIB is an acronym for **G**eneral **R**egularly distributed **I**nformation in **B**inary form, this is a format used in communicating weather information between interested parties.

There are 2 versions available, **This app supports Grib version 1**.

Weather Import

A reply from Saildocs can be expected within minutes.

Switch to your email and locate the reply from Saildocs, scroll to the bottom of the email to locate the attachment (illustrated for Gmail) and tap on it to download.

The header of the screen (circled) provides an indication the download has occurred, press on this area and drag down to see if the download is complete.

NOTE: the construction of the grib file name it is of the form: gfsYYYYMMDDHHMMssss.grb

These identify the date and time this grib file was generated.

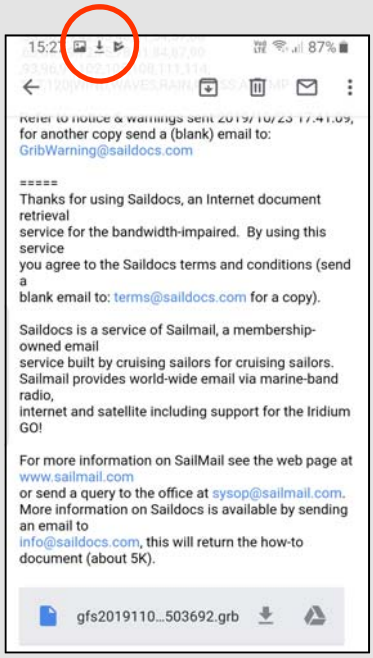
Return to Neptune and select “Weather Options ” from the “Weather” menu.

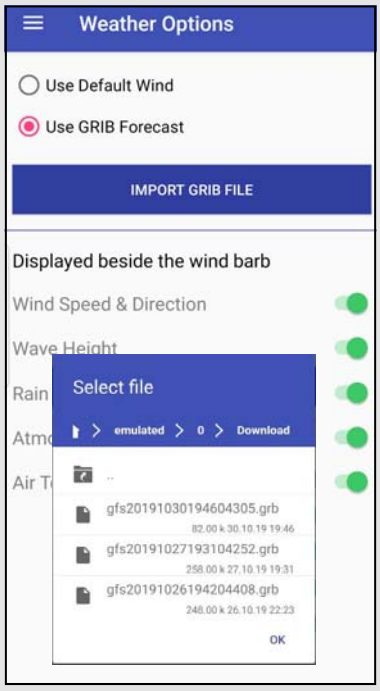
Select the “Use Grib Forecast” button and press the “Import Grib File Button”.

A list of downloaded files is shown, select the required file and press OK to import the data,

Note the more parameters and the larger the area to be imported the longer the import times, this can take several minutes.

After the import is complete return to the “Home” screen to see the wind data.



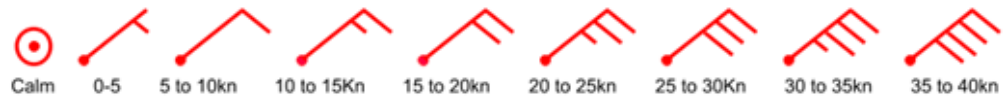


Contents

Weather Display

Wind strength is represented graphically as Wind Barbs.

A dot is shown at the forecast position, a line is drawn showing the direction the wind is from with barbs on the end showing its strength.



A long barb represents 10 knots and the short barb represents 5 knots. This allows the user to look at an area and gain an immediate insight of the wind strength and direction.

If configured in Weather Options then any of the following parameters can be displayed beside the wind barb:

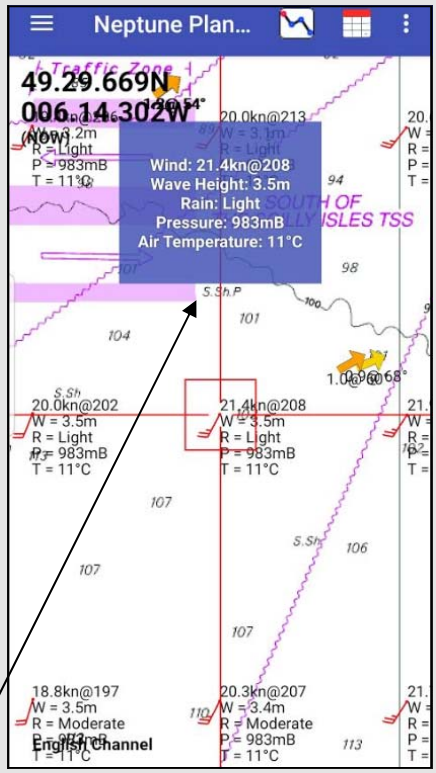
Wind strength and direction

W = Wave heights in metres. (note this figure represents waves as swell and not wind over tide effects).

R = Rain classified as follows:

- Light rain (0 to 2.5mm per hour).
- Moderate rain (2.5mm to 7.5mm per hour.
- Heavy rain greater than 7.6 mm per hour
- P = Atmospheric pressure in mBar

T = Air temperature in degrees C.



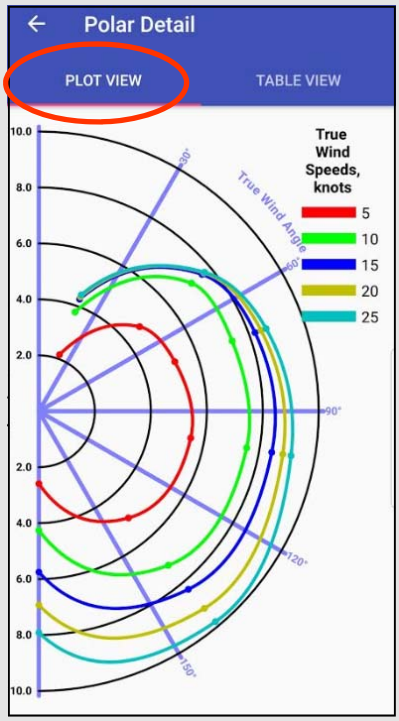
If a wind barb is positioned under the cursor and the cursor is tapped a box appears showing all the available parameters. This is especially useful if the app is configured not to display text values by the barb and a quick check of a prediction is required.

Polar Plots (Sail users only)

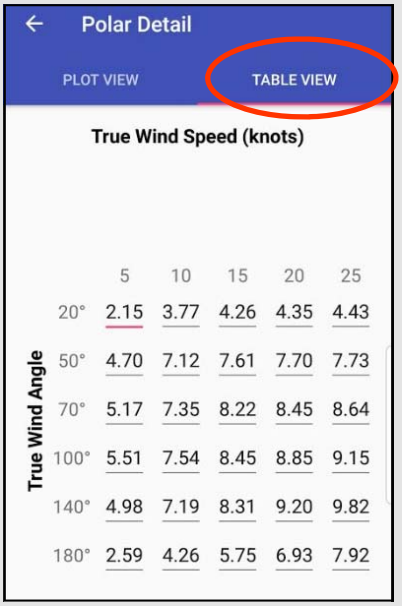
A polar plot is a graph of boat speed shown as a series of concentric circles, with the boat speed for various wind speeds plotted over it.

The polar plot shows the wind direction relative to the boat from 0 to 180 degrees, the radial lines are drawn at 2 knot intervals. In the example coloured lines represent the boats performance in 5, 10, 15, 20 and 25 knot winds.

To find the boat speed in a 10 knot wind with a wind angle of 120 degrees to the boat follow the green line around to 120° and look at which radial line it intersects with, it is between 6 and 8 knots scaling off shows 7.4 knots.



The data in the polar plot is easily changed, it is arranged as a spreadsheet.
Switch to the table view.
Wind speeds are shown in the column headers and appropriate wind direction is shown on the first cell of each row.
Select a cell and a keypad appears enabling the data to be changed.
Switch back to the Plot tab to observe the changes.
Multiple polar tables can be kept, selected for use, edited or created in the app.
To back up your polar data use the share icon.



GPS and Track Plots

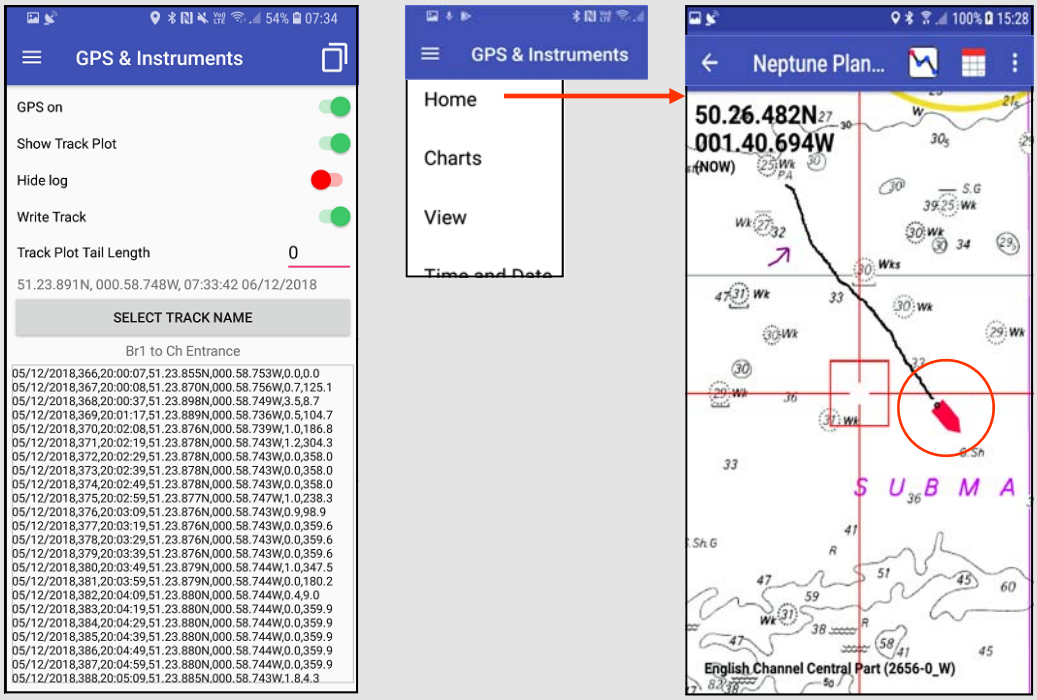
The internal GPS can be used to track the progress of the vessel.

Select “GPS” from the main menu, if you want to just mark the point of your vessel check the “GPS on” box and press the back arrow to return to the chart.

If you want to record the track of your vessel then Select a track name. If the track exists with data it will be shown in the list.

After a short while the incoming GPS data will appear, below the “Track Plot Tail Length” control.

Pressing “Home” from the menu returns to the main view.



GPS Options

"GPS on" turns on the device's GPS. In this mode the battery drain on the device is increased and Android warns the user by the circled small satellite aerial icon on the status (top) bar.

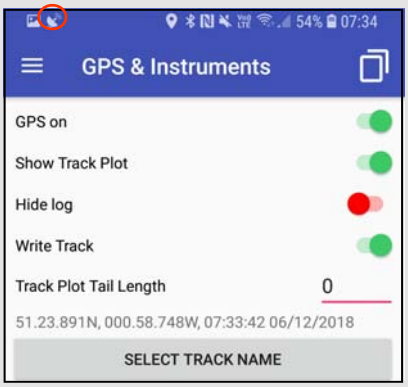
"Show Track Plot" displays or the vessels historical track, this is useful for preventing screen clutter.

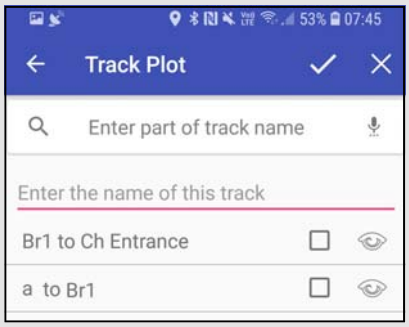
"Hide Log" hides the positional information from this screen's data panel

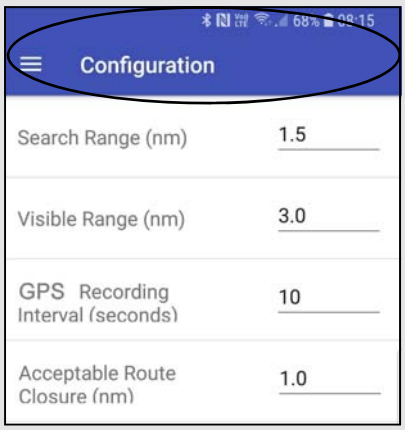
"Write Track" Starts or stops logging data e.g. when at anchor or when the boat is on a mooring.

"Track Plot Tail Length" this is the number of points behind the boat that are displayed.
To display the entire track plot set this to zero.

A point is logged at the GPS recording interval which is found in the "configuration" menu





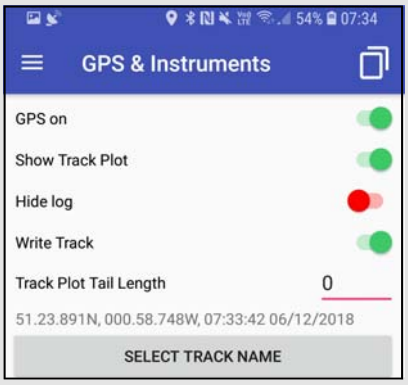


Contents

GPS and Track Plots

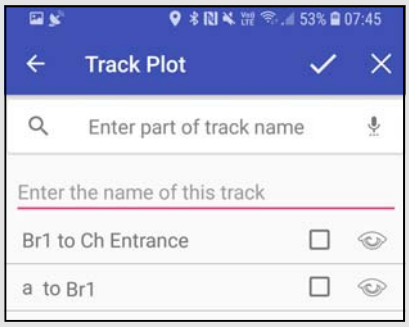
There are several options available with the GPS. A track name must be entered if a track plot is to be displayed.

Press the “Select Track Name” button and a different view is presented showing any historical tracks.



Press the “Select Track Name” button and a different view is presented.
Enter the required name of the track and press the tick mark on the toolbar.

Tap on an existing name and it will become the current track, the view will change back to the GPS view. Returning to the main chart view the entire track plot will be visible.



Select a track’s check box and you have the option of deleting it from the device using the “X” button on the tool bar.

Press the view icon  to see the details of the logged data, this can be shared via email to export it from the device for historical record keeping or copied to the clipboard for pasting into other apps.

View Menu

The view menu shows or hides the objects drawn over the chart.

Tidal Streams	Shows or hides the tidal stream arrows.
Tidal Stream Rates	Displays the value of the stream if the arrow is visible.
Marks	Displays the marks from the selected marks table.
Marks Name	Displays the marks name if marks are visible.
Ports	Displays the position of tidal height ports (grey diamond symbol).
Show Wind Grid	Displays either the default wind value or the forecast (obtained from a GRIB request)
Wind Speed and Direction	Shows the wind strength and direction.
Wind Over Waypoint	An arrow shows the wind direction and the triangle is Tacking Angle (No Sail Area).
Chart Boundaries	Draws in a light grey line showing the boundaries of downloaded charts.
Chart Boundary Name	Shows the chart name on top left of the boundary.
Course Construction Vectors	Following a course to steer calculation the tidal offsets for a classic course to steer are displayed to enable the navigator to cross check their manual calculations.
Show Area Name on Chart	Displays the chart name in the lower left of the chart boundary.
Colours	Opens a view to change the default colours.

Configuration

The Configuration menu controls the apps variables and non view items.

Device Orientation	Allows Auto-rotate or locks in Landscape or Portrait mode. Note that Android 4 auto-rotate is not supported.
Route Calculation type	Fast is a first approximation to the course to steer. Optimum the calculation takes longer and may return a better value. Fast is of use for an overview of a plan on slower devices.
Font Size	Offers a choice of Normal or Large.
Time Zone	Enter your time zone with respect to UTC. In the UK winter use 0, Summer Time use +1. In Europe set for +1,+2 or +3 as appropriate. In the use Caribbean –4 or -5.
Chart North Up	If this is Off then the chart can be rotated on with a two finger rotate action.
Chart Auto Change	By default a chart of a better scale will be displayed if the zoom exceeds the setting of “Next Chart Zoom Percent”. Turning this off allows the chart to be over zoomed.
Boat Speed	The default boat speed used in calculations.
Tack Angle	The value entered here is drawn in over the boats direction when planning a route with the wind grid showing. This enables the navigator to easily visualise their point of sail when passage planning.
Calculation Interval	In minutes, Neptune breaks down a calculation into time increments of minutes. A value of 5 here would calculate the effect of tides for every 5 minutes of a passage.

Configuration

Boat Draft	In metres, this value is used in the tidal height prediction section of the app and is added to the underkeel clearance to display a dotted line under the tidal height curve to allow the user to visualise when the water beneath their boat puts them at risk of grounding.
Underkeel Clearance	In metres, this is the safety margin the user wishes to use with the boat draft.
Search Range	In nautical miles. When information is required on an object all visible objects within this range are searched. If there is more than 1 object the results will be displayed in a list for the user selection.
Visible range	In nautical miles. A circle is drawn around the boats position when the GPS is on. The circle can then be used, for example, to gauge if a buoy is likely to be visible.
GPS Recording Interval	In seconds. This determines how often the GPS data is written to the track record and the position is updated
Acceptable Route Closure	In nautical miles. In a course to steer calculation it is not always possible to close a route to exactly to the end waypoint (because of cross tides, calculation intervals and boat speed a leg cannot be sailed to close exactly. This setting is the maximum non-closure acceptable before raising an alert.

Configuration

Next Chart Zoom factor	Specifies the zoom factor before changing to the next chart if available. This number may be as little as 100 on devices with a low screen resolution. On devices with high screen resolution the factor may be in the region of 300 to 500 depending on your preference.
Prev. Chart Zoom factor	When zooming out specifies the zoom factor before picking the next scale chart. This is typically between 30 and 90 depending on your preference.
Quilting	If you have downloaded an adjacent chart and you pan beyond the boundary of the current chart into the adjacent chart it will automatically load the chart once the cursor is within its boundary
Sail Boat User	Sailing boats use wind for power. turning on this option exposes the polar plot functions and allows the boat speed to be derived from the wind speed for each leg of the proposed route.
Magnetic Variation	In degrees East or West. The Course to Steer Calculation produces a result in degrees True and this is presented as degrees magnetic by adding the variation if West and subtracting the variation if East. If you wish the results to be in Degrees True enter a figure of 0 in this field.

Tidal Height Constituents

This area of the app exposes some of the tide raising forces for the users further understanding of this subject. By using the Next and Previous Day buttons you will be able to observe the variations in the tidal constituents as you proceed through a tidal cycle.

Tide raising forces are astronomical in their nature and the principal gravitational forces are solar and lunar in origin. When observing the output of the curve produced by this section of the software note the following:

The mean level of the port above chart datum is the red dotted horizontal line (Z0)

The principle solar tide raising force is the red curve. (S2)

The principle lunar tide raising force is the blue curve. (M2)

When we have neap tides the solar and lunar forces are in opposition (out of phase) and their contributions work against each other, i.e. we still have their contributions but while we have a flooding solar tidal we have an ebbing lunar tide.

At spring tides the solar and lunar curves are adding to each others effects and hence we see much higher observed water levels.

Within UK and nearby waters the O1 and K1 constituents produce only small (but cannot be ignored) contributions.

The shape of the sea bed and the route that the waters approach the port also have a resonance effect on the observed tides and these are shown by the f4 and f6 curves (quarter and sixth diurnal effects) It is these constituents that account for many of the interesting and complex tidal patterns that can be observed. (eg Cowes or Poole Entrance).

Advanced Tides Menu

The shallow water effects on complex ports become extremely pronounced at spring tides, roll through the tidal cycle to see how all these curves work together to contribute to the days tides.

As the cursor is moved within this area each constituent's instantaneous tide raising contribution is displayed together with the time and sum of all constituents on the screen.

DESCRIPTION OF TERMS

Because the orbits of the Earth and Moon are periodic with respect to the Sun, the observed water level may be calculated as a combination of independent waves, where each wave has its own characteristic frequency, amplitude, and phase.

ZO This is the elevation of mean sea level of the port above chart datum.

M2 this is principal lunar semidiurnal constituent. This constituent represents the rotation of the Earth with respect to the Moon.

S2 this is the principal solar semi diurnal constituent. This constituent represents the rotation of the Earth with respect to the Sun.

K1 and O1 are generated by the lunar and solar interactions.

f4 and f6 shallow water constituents are short-period harmonic terms introduced to take account of the change in the form of a tide wave resulting from shallow water conditions. These constituents result from the vector sum of many 4th and 6th diurnal effects.

A more detailed description is beyond the scope of this guide and the user can research further at their leisure.