SEAPILOT – for iOS / Android
User-Guide

Use the following guide for better understanding of prerequisites and important features in the Seapilot navigation app.
Seapilot for iOS and Android differ somewhat in menu structure. Also, certain extra features available in one platform version may still not be implemented in the other.
This guide is based primarily on app-version 4.4for iOS, and version 4.2.5 for Android.

NB: Seapilot is a navigational aid only. It never substitutes any navigational equipment required by law or regulations for your specific vessel. Nor does it substitute your responsibility as a master or boat owner, in operating your vessel with respect, good judgement and in safest possible manner.

In order to fully utilize and enjoy Seapilot, you should have at least some prior knowledge of nautical charts and navigation at sea.

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GENERAL INFORMATION ABOUT THE SEAPILOT APP

Seapilot navigation app is free for download

Seapilot is free for download from app stores for iOS and Android. The app consists of all basic functionality needed to use the charts you choose to install. The app also features a default world map. This rough map is just for your basic orientation, until an actual sea chart has been paid and installed.

Certain extra features, e.g. Route planning, past Track, Internet AIS etc requires Seapilot Premium, which you purchase directly in the app.

36-hours Trial-period:

From the moment you first "sign in" a Seapilot app to your newly registered user account, you may during 36 hours fully use all of the app features without restrictions, and freely download any available chart of your choice, for free test and judgement before any purchase is made. Installing the charts is always made from inside the app Settings ->Products:Charts.

After the 36 hours free Trial, access to charts and extra features is locked, until payment is made in your user account, for the charts/features you choose.

"Trial" means a time restricted access to all charts and certain extra features. It is still the same app you use later on with paid charts and features.

Hardware- and Operating system requirements

Seapilot supports:

- iOS version 5.1 or later (in iPad or iPhone)
- Android version 4.0.3 or later (in tablet or smartphone)

Seapilot requires (for proper positioning in the chart):

- a GPS receiver – either built-in in your tablet/smartphone, or as external device connected via Bluetooth or WiFi-NMEA.

Seapilot is recommended:

- 1 GB free storage, for the app + chart for one country. The app itself requires approx.. 80 MB, while the chart size differs from country to country. E.g. chart "Sweden" (with 270NM coast line), consists of approximately 600 MB of data. The more charts installed, the more storage required – same storage used for other apps, photos, movies, music-files etc.

Seapilot user account

On first start-up, the app will require you to sign in to a user account, necessary for registering chart subscriptions and access to extra features. You may create the account on our website www.seapilot.com/create prior to starting up your Seapilot app. Alternatively choose "Create account" from inside the app on first start-up.

At www.seapilot.com/shop you can overlook your chart subscriptions. Current price for each charts can be found directly in the app (Settings/Charts).

NB. Special rules for Seapilot v 3.62 (or older) in iPad/iPhone. That version was on sale up until October 2014, and was then substituted with present free iOS-universal Seapilot app.

The old app version 3.62 remains fully functional for those having once purchased it. However it is standalone, and cannot be used together with user account on Seapilot's web site. Charts for app v 3.62 are only available as "in-app-purchase" using your AppleID at AppStore.

Username

As username for your Seapilot account, any email address of your choice can be applied. It should be a valid address to which we may reach you with auto-generated verification emails, as well as important e-newsletters, campaign offers etc. In case you have changed email account and thus need to change your Seapilot username, please submit a short mail to support@seapilot.com and we will arrange this for you.

Password

In case you have forgotten your password, or the password isn't accepted for login, you may any time reset to a new password. On www.seapilot.com/shop you will find the link "Forgot password?..." link just below the Sign in button.

Click there, enter your email address (=Seapilot username) and follow link in the automatic verfication mail then received, in order to submit a new password in the double field form displayed. The password is case sensitive and must be 6 characters or longer.

Installing charts

In a newly installed Seapilot-app, you will find the chart view being rather simple and without much details. That is just a rough world map for general orientation, until a real chart is installed for your chosen country/countries. If using Seapilot during the 36 hours free Trial, or if you actually purchased one or more chart subscriptions, you still need to install each chart from inside the app Settings ->products:Charts. Once installed, the chart remains stored inside the app displayed instantly whenever the app is running, also without internet connection.

A reason for not pushing out charts for automatic download, is for you to choose opportunity and internet connection for download of a chart, several hundred of megabytes in data size. Many users with more than one Seapilot-device assigned to the same user account, and with several charts purchased, also wish to decide which chart is to be installed in which of their Seapilot apps – e.g. due to storage limitations in any of their devices.

Charts may be purchased as 12 month subscriptions on Seapilot's web site, but the actual download is always done by clicking inside the app Settings ->products:Charts.

Active Device

You may sign in on up to five Seapilot-apps in different devices (iOS/Andro) to your one and same user account, giving access to downloading the same purchased chart in all your devices.

GPS and Own position

Seapilot, as any navigator app, retrieves positioning data from "Location services" in the tablet or smartphone in which it is installed. In cities and other more densely populated areas as well as along bigger roads, "Location services" using triangulated measurement signals from

cullular network towers or from WiFi-hotspots with known coordinates – will often provide the map with location of satisfactory accuracy.

However, farther away from such networks, and especially out on the open sea, there is only one kind of reference for reliable positioning. That is the GPS-satellites up in space. And for "Location service" in your device to interpret and convey this satellite-referenced position to your map, a dedicated GPS receiver is needed.

How do I know if there is a built in GPS-receiver in my device?

Most of today's modern smartphones are equipped with built-in GPS-receiver. That is a requirement from international search and rescue (112) services, in order to accurately trace mobile emergency calls from smartphones.

However, for tablets there is no such requirement, and thus variations are great.

For iPads there is a general "rule of thumb":
-**Cellular(3G/4G)+WiFi iPad**, with slot for a SIM card = GPS-receiver is built in.
-**WiFi-only iPad** = No built in GPS receiver.

The same applies to several other types of tablets, but you need to verify this in the technical specifications to be sure.

GPS reception and SIM card for cellular internet have indeed no interrelation, and you don't need to insert a SIM card for this. But both modules are normally mounted on same integrated circuit inside the device, and one reason for WiFi-tablets being sold at a lower price, is just because the manufacturer has omitted this whole circuit card and its antenna.

Verify with tech-specifications, that your tablet is in fact equipped with active GPS receiver, not just localizing via "Location services" in general.

Without a built-in GPS receiver, you need to connect your tablet to an external GPS receiver instead, e.g. via Bluetooth. Internet sharing from a smartphone allows internet surfing in your tablet – it still doesn't provide any GPS coordinates for positioning.

An external GPS-device is easily found for purchase over internet, e.g. from bad-elf.com, gps.dualav.com, Garmin, Navilock – or any retailer of those or similar products.

With an existing and functioning GPS receiver, built-in or externally attached to your Seapilot device, there are no technical obstacles for Seapilot taking adantage of GPS positioning, if only the settings are correct.

As soon as Seapilot receives positioning data from the hardware (with an accuracy of 100 m or better), the actual Latitude/Longitude coordinate will appear in upper left corner of the chart. With coordinates in place, you will also see digits for SOG (Speed over ground), COG (Course over ground) as well as icon for your own position in the chart. Consequently you will then also be able to click on "Follow", to center the chart onto your own GPS position.

GPS receiver is verified, but still no own position in Seapilot chart

If all above checked OK, but you still don't see your own position in Seapilot, there is most probably some setting in need of adjustment.

Check Seapilot app settings:

- "Use GPS" = ON
- "Use NMEA" = OFF (NMEA in Seapilot only to be activated for directly WiFi-connected GPS/AIS device, with an IP-number to set as Host)

Check the tablet/smartphone's own settings:
- "Location services" must be activated
- Seapilot as app, must be allowed to share position data from "Location serivces".

HOW TO USE SEAPILOT:

Finding the app settings

In Seapilot, there is a row of icons below the chart. From left:
- Own vessel (own position)
- Search (chart-names /AIS-ships)
- Routes
- Marks
- MOB (Man Over Board)
- Settings
-

Zooming and panning in Seapilot chart

Use same method as in any other chart-app or webb page.
- **Panning**: Drag your finger along chart, which then will move in that direction
- **Zooming**: Use two fingers on chart, stretch them apart to zoom in (enlarge), and pinch them together to zoom out.
NB: With "Follow lock" (see separate chapter below) activated, your chart view is locked around your own GPS position, making the chart unable to move away freely.
Click "Follow Lock off", and the chart is released for free panning in any direction.

Chart scale

On either side of the chart, you will always see a scale ruler, divided into different colored graduation marks.
Grey/black graduation marks (when zoomed out):
Each part 1 M (1 Nautical Mile = 1852 meter = 6072 feet) - total length of the scale ruler 10 M.
Orange/black graduation marks (when zoomed in):
Each part is then 1/10 M (185,2 meter = 607 feet) with total length of the scale ruler 1 M.

Instrument for Position, COG & SOG etc

In the upper edge of the chart there are instruments with **current position** coordinates and digits for **COG (Course over ground)** and **SOG (Speed over ground)**.
Those values require the app to receive accurate position data from your GPS receiver, and COG/SOG reflects changes in the GPS-position. It therefore requires you to do at least a little forward speed.
-If digits for Latitude/Longitude are presented on **white background**, the GPS position has an accuracy of within 20 meters.

-If digits for Latitude/Longitude are presented on **red background**, the GPS position is less accurate – with a possible error margin of more than 20 meters.
-If **only dashes** and no digits are presented, it means the app by some reason is not properly feeded with GPS position data (See previous block about GPS).

Other available instruments above chart are; **Track** (sailed distance), reference to active **Mark** as well as to active **Waypoint** in activated Route. Also (in iOS-version) real time wind speed/direction as retrieved from nearest AIS-equipped weather station along coast.

From the app settings ->Display:Instrument, you choose with ON/OFF which of those instruments to show or hide above the chart.

Heading

While COG indicates the course with which you are moving according to the GPS, Heading on the other hand indicates the direction to which the vessel "points" – regardless of whether it moves forward or stays completely still. Heading value therefore requires input (via NMEA) from a fixed mounted direction sensor, such as a gyro compass or a GPS with twin-receivers – calibrated against the vessel's length direction. A compass sensor inside your smartphone or tablet may reveal direction of your device, but since it may differ considerably from the vessel's actual heading, it is not used by Seapilot.

Position format (WGS84)

The position coordinate above the chart, as well as any coordinate shown when e.g. creating a Mark, a route Waypoint etc, may be presented in either of two different versions – both fully correct according to standard WGS84.

- 00°00.000N / 000°00.000E - Lat/Long as Degrees, Minutes, and decimals of a minute.
- 00.00000N / 000.00000E   - Lat/Long as Degrees, and decimals of a degree.

Consider a minute being 1/60 of a degree (not 1/100), rendering totally different digits following the decimal point for respective version. Both versions are still fully correct, representing exactly the same position in chart.
Switch to the format of your choice, in the app Settings ->Display:Units ->"Position format"

Icon showing own position

Whenever the app receives position data from your GPS receiver (separate chapter above), your current position will be presented as Latitude/Longitude coordinate digits above the chart.
In the chart, you will also find a black circle icon, showing your exact position.
Click on "Own vessel" (see below) to quickly fix the chart centered around your own position icon.

The icon consists of a double circle with an arrow. Without any movement, only the arrow head will appear, but as soon as moving forward, the arrow starts stretching out – with the arrow length/direction in direct proportion to your speed and course. This arrow is called "Speed vector".

Speed vector time marks

In app Own vessel ->Symbol you will find "Speed vector time marks" – three squares with values to switch between, in order to show the speed vector in suitable length in the chart.Choosing 60s means that each part of the speed vector shows how far you may reach in 60s seconds at the current speed.

Choose "10s" at higher speed and "60s" at lower speed, or experiment with either value until satisfied.

North up or Head up?

Use Head up = ON/OFF – inside app Settings.

Default is **North up** (Head up = OFF), meaning that the chart will always be presented with north upward and your own course direction in the chart will correspond to your actual course.

Switch to **Head up=ON** if you rather wish to have your course direction always point upwards on the screen, with the chart instead rotating to show surroundings as you see it passing by when looking forwards.

OWN VESSEL

In lower left corner you may click "Own vessel" – to quickly find your own position in the chart. Consequently, this requires the app to receive proper position data from your GPS receiver. Click on:

- **Follow** lock - to quickly center chart around your own GPS position.
- **Follow Lock** – to lock the chart around your position, which then is not allowed to disappear outside the visible chart screen. Instead the chart will move automatically along your track as you proceed.
  With Follow Lock activated, move the chart in any direction and you will find an **orange rectangle** on screen. Drag the chart placing this orange rectangle exactly to an area on screen, in which you wish your own position to remain.
  The rectangle should be placed in the part of the screen that lets you see the most of the chart "in front of the bow", and less of what you have already passed.
- Choose **Follow lock=Off** – to release the lock, allowing the chart to be panned/zoomed to any area or position away from your own.

Track (Past track)

A track keeps being created in your wake, as long as GPS data is fed to your Seapilot app, with accuracy of 100m or better. A GPS with frequency of 1 Hz, creates a track with one coordinate point per second.

The track is written out in the chart if Seapilot app settings for Tracks is set on "Show"=ON. You may anytime tap the Follow icon and then tap "Save". All Track data up until that moment will then be saved to a separate file, auto-named with date and time, in the app. Preferreably you then directly tap on "Clear" to empty the current track. Otherwise the current track keeps growing with at least one GPS-coordinate per second – with eventual risk for problems due to too much Track data. "Clear" doesn't affect the already saved track, only the current one.

Any saved Track may be exported via GPX format, if you have the tool for GPX import/export registered in your user account.

CURSOR MENU – for position-related functions:

Map Cursor – always just above your finger tip

Pressing your finger onto the chart, there appears a map cursor in form of an orange cross. When managing Routes, this cursor instead appears as a red circle as waypoint.
The map cursor always appears just above your finger tip, instead of being hidden under your finger. When editing an already laid out Waypoint, that waypoint – when pressed with a finger – will also "popup" a bit, always to be visible for you when moved to a new position.

Several important functions in Seapilot are found via the Cursor menu. Press a finger onto chart until the map cursor (orange cross) appears just above the finger tip, and drag the cursor to any position or object in the chart.
When the finger is released, the Cursor menu opens.
In the Cursor menu, you read the exact Latitud/Longitud of the marked position.
Below that you find the options **Create Mark**, **Create Route**, **ERBL** (still in iOS-version only), **Chart Information** and **Weather forecast**.
(Please note: some of the features below requires Seapilot Premium)

Create Mark

A Mark is a convenient shortcut or "bookmark" to a favourite position in your chart – a bathing rock, a rich fishing ground, or that perfect mooring bay you wish Seapilot to remember for you. Marks are given auto-numbered names like "001 Mark" which you may rename to something more telling. You can create as many marks as you wish and save them to the list of marks. A marked-up mark is "active" – showing an instrument above the chart with bearing and distance from your current position to that specific mark.
From the app settings ->Display:Chart you may choose to show/hide all saved marks.

Create Route

(Requires Seapilot Premium)

Press a finger onto the chart and drag the cursor-cross to the desired Start position of your intended route. Releasing your finger will open the Cursor menu from which you choose "Create Route". The cursor then changes to a red circle = START point. Press and release the finger on a new position for each new **waypoint** you wish for your route. Press the finger directly onto an existing waypoint to adjust it by dragging it to the desired position.
Each waypoint will show text for bearing/distance to the next waypoint.
Keep creating new waypoints until satisfied, and finalize via the Route menu (icon in the lower border).

The Route menu

The Route menu has different options, depending on your current stage in route management. Click Activate as you start your trip. It shows direct reference in the instruments above the

chart, for bearing, distance from your own GPS position to the next active waypoint. Also shown is XTE - Cross Track Error (lateral deviation from route leg).

When passing an active waypoint in your route, the next waypoint will be shown as "active" with new reference in top instruments.

Edit – to be able to drag, move or delete an already created waypoint, as well as add new ones.

Reverse means changing direction of your route. The Start-point becomes the Finish-point and vice versa.

Auto route will take you to a new menu where it is possible to compute the fastest way from Start to Finish via any Waypoints, considering wind, current, land, shallow water and the properties of the boat. Use of the Auto Route menu is described further down.

Waypoints – to show total length and other properties of the route.

Close – to exit route management, whereafter the map cursor on next finger press reverts to the standard orange cross.

You may create any number of Routes, all saved into a list accessible from the Route menu. Routes are by default given auto-numbered names like "001 Route" – easily renamed to something more describing. Any item in the route list may be deleted by tapping the "**i**" after its name and then in the menu choosing Delete. On iPad/iPhone you may instead swipe to the left over the name and confirm by tapping the red Delete box.

ERBL
(presently only in Seapilot for iOS, app version 3.75 or later)

Electronic Range and Bearing Line – a convenient measuring chart tool for bearing and (linear) distance between two positions in the chart.

1. Either between the own GPS position, and a freely selected point, (requires GPS data input to the app for own position)
2. Or between two freely selected positions.

ERBL is activated via the map cursor menu.

- **ERBL -> "Own position"** - creates an orange circle, fix-centered on your own GPS position, and from there an infinite linear bearing line. The free point is where the bearing line intersects the circle. Black digits present the actual bearing and distance.
  Press a finger onto the intersection point, and drag it to another point of interest whereby both the circle and the bearing line change with new digits.
  -Tap the intersection point, and a menu opens in which you may tap "**Delete**" to finish.
- **ERBL -> "Free"** – creates an orange circle centered on your marked position, and from there a bearing line towards the center of the screen – with the intersection just there.
  Black digits along the line show actual bearing and distance between the two points.
- In the "Free" ERBL, you may press either the center point, or the intersection point – dragging any of them to another desired position in the chart.
  -Tap the circle center or the intersection point, and a menu opens in which you may tap "**Delete**".

ERBL is a temporary tool. Your current ERBL remains cached with the Seapilot app in standby mode, but will disappear whenever you close down and restart you app. No ERBL measurements are saved in any way.

Chart information

In electronic/vectorized charts, presentation of different chart information categories can be controlled via app-settings, current zoom level etc. Thus the chart can be set to focus more on information currently vital for your own navigation and your specific vessel, while hiding data of less interest or value.

Detailed info of e.g. bridge vertical clearance, type of underwater cable etc is therefore not permanently visible.

Instead, you will find such information via the map Cursor menu. Press on the chart until the cursor appears, and when released the cursor menu opens – in which you further down tap on "Chart information". This is a hierarchy of loads of information and data, but you should be able to find exactly what you are looking for.

Weather forecast

(Requires Seapilot Premium)

Choosing Weather forecast gives a 5 days coastal weather forecast (from provider MeteoGroup.com) based on collected data from nearest weather stations along the coast nearest to your chosen position. The forecast therefore is not exactly specific for your marked position.

Each day in the list may be tapped for a 1 hour interval presentation.

Presented weather data are: Cloud conditions, Air temperature, Wind direction and Wind speed.

Weather forecast is reached via the Cursor menu.

AUTO ROUTE

Seapilot has a tool to find optimal routes, considering the depth curves of the sea chart, as well as grib and polar files. This will help you as a sailor to find the the fastest way respecting the presence of of land and shallow water, wind and current forecasts, as well as the sailing characteristics of your own boat. When using an engine you will get help to find the shortest way, taking land and shallow water (and any current) into account.

To create an auto route you need to create a Start and Finish point (see Create route). Open the Route menu and choose Aute Route.

Wind Grib is the first choice in the Auto Route menu. There you may choose what wind forecast to use when computing the fastest way. See further down a separate section on GRIB files.

If the wind grib selected does not cover the whole area from start to finish (including any waypoints), Seapilot will issue a warning, but continue computations using the closest of available data where they are missing.

If you want to find the fastest (i e shortest) path at a constant speed, there is no need to select a wind grib.

Current Grib allows you to select a grib file describing currents to be considered by the route computation. If the current grib selected does not cover the whole area from start to finish (and any waypoints), or not the whole time span from start to finish, Seapilot will suppose that there is no current in missing points.

Polar. Tapping Polar will give you the list of polars that you have imported to Seapilot. How to create and use polars is described in a separate section further down in this manual. By tapping the sign "i" following the name of the boat type you will have the possibility to choose factors for assessed performance in relation to the polar. Set the factor Performance Upwind to less than 1.00 if you want to compute the route for a slower boat of the same kind (or the the actual boat sailed under circumstances that are not optimal), or to more than 1.00 for a faster boat of the same kind. Make Performance Downwind be less than 1.00 if you are using less downwind sails than what is assumed in the polar, and so on.

Speed. Instead of choosing a polar you can choose a constant speed. You will then have a computation of the shortest path, considering land, shallow water and any current (if a Current Grib was chosen).

Start. As a default the time now is used as the time of start. But here you can also choose a prescribed starting time, or choose a time where the forecast of the wind grib has a better fit to actual observations.

Create. Tapping Create makes the computation start. This includes big data volumes and may take a while. The computation time varies according to the number of waypoints and the computational capacity of your device. The optimal route is found for what you have set as your start, finish and waypoints (created via Create Route, or fetched via the Route menu). Consideration of shallow water follows your choice of Safety contour (choose 3 or 6 meters).

When computations are ready you will see the auto created route, with any waypoints marked and with red dots for the course changes recommended with respect to land/ground and wind/current. Zooming in (if necessary) will show you course and distance from every breakpoint to the next, and also wind angle (TWA), wind speed (TWS) and speed (SOG, target speed) for every part of the path. Tapping a breakpoint will give you information also on at what time you are assessed to be there (ETA).

If you want to see the wind (or current) forecast along the computed route you go to Settings ->GRIB and mark the grib file you had chosen to use. The actual time will then appear in the top left corner and at the lower border a white bullet, which you can drag along a time scale. You will then see the time stamp change, the wind arrows move och a black dot will show where along the auto route you are supposed to be. The time scale covers the interval where the grib file is valid. If you hold the finger to the screen for a second there will appear a hair cross which you can move around the chart to get also a numerical presentation of the wind or current forecast at different places at the time in question.

At the lower border you will find a clock icon to tap to set time to now. There you also find an X to tap to go back to the normal detailed sea chart display.

Repeating the computation with different wind gribs will give you a conception of the certainty of the computed choice of path. You may (so far only on iPad/iPhone) concurrently show several routes through entering the route menu and marking the routes. This is particularly useful to compare how the computation of an optimal route varies with the choice of wind grib (or polar). First create the route with start, finish and any waypoints as described above. Then tap the route icon, choose Duplicate and then Autoroute (including choice of wind grib and polar) for the route just created. Tap the route icon again, tap the < sign before Route info and then the "i" after the first copy of the route. Do Autoroute also for the second copy (with another wind grib – or another polar). The results of both computations are now shown for comparison.

- Possible reasons if Seapilot does not succeed in finding a route are:There is no path without passing shallow water.
- There is a passage that is too narrow (especially when tacking).
- There is more than allowed detour needed.
- There is no path wihout passing higher wind speeds than set as a maximum
- There is a too strong contra current.
- Sea charts are missing for some part of the area.
- Sea charts with necessary depth curves are missing (for instance it may be difficult to find routes in Finland where charts may have only 10 meter curves).

Advice: Try to add one or more waypoints. Avoid setting Safety contour to 10 meters.

If start, finish or a waypoint is in shallow water (or within a margin of about 1/500 of the distance) Seapilot will try to automatically move that point out into the closest occurrence of water deep enough the be within the selected safety contour.

GRIB

You reach the GRIB menu, where you handle your grib files, via Settings or the Auto Route menu.

A **GRIB file** (GRIdded Binary) contains a wind or current forecast for regular points over an area, at a number of future time instances. The information is stored according to the most common grib 1 format or to the newer grib 2 format. A lot of different techniques are used to compress the files to reduce size without loosing resolution or accuracy.

Seapilot automatically detects whether a file is grib 1 (.grb) or grib 2 (.grb2), what method has been used for compression and whether the file contains wind or current data. When the file has been opened in Seapilot you can visually follow the changes of the wind arrows using a time scale corresponding to the period of the forecast (read more in the Auto Route section). It is also ready to be be used for finding optimal routes.

A general grib file type for global use is GFS (Global Forecast System), offered by American National Weather Service NWS. In Seapilot you may on the GRIB menu choose files from GFS

with different forecast intervals (12, 48 or 168 hours). Tap the plus sign, choose GFS and the time interval. A file will automatically download with a wind grib covering the area which is currently shown on the Seapilot screen. It is adviceable to change the name to denote which area it covers, since you may want to have many GFS grib files for different areas. The forecast for the same area may anytime be updated by tapping the "i" after the file name and then choosing Update.

Grib files may also be downloaded or ordered from several weather services. At the first occasion you have to (after tapping the plus sign in the upper right corner of the GRIB menu) give the url (web address) and give it a name (or accept Seapilot´s proposal). To update the grib file (i e download and open the latest update) you tap the "i" after the name in the GRIB menu and then tap Update.

Examples of grib files available for free:

High resolution wind forecasts for the Baltic, Skagerrak och Kattegatt, produced by Swedish SMHI (uppdated at 03, 09, 15 and 21 UTC):
http://static2.weatherpal.se/files/maps/grib/Gotland.grb
http://static2.weatherpal.se/files/maps/grib/Baltic.grb
http://static2.weatherpal.se/files/maps/grib/Westcoast.grb
GRIB files for (among others) Skagerrak, the Oslo bay and the North sea are available from Norwegian yr.no (see a list on http://om.yr.no/verdata/grib/), for instance winds for Skagerrak in
http://api.met.no/weatherapi/gribfiles/1.1/?area=skagerrak;content=weather
and a forecast for the currents in the same area in
http://api.met.no/weatherapi/gribfiles/1.1/?area=skagerrak;content=current

Current gribs for the Baltic are available in
ftp://ftp.bsh.de/Stroemungsvorhersagen/grib2/fixname/Current_ba_today.grb2
for the Swedish West coast in
ftp://ftp.bsh.de/Stroemungsvorhersagen/grib2/fixname/Current_wb_today.grb2
and for the North Sea in
ftp://ftp.bsh.de/Stroemungsvorhersagen/grib2/fixname/Current_no_today.grb2

GMN Marine Weather Service offers worlsd wide "FREE GRIB Files" on
http://www.globalmarinenet.com/free-grib-file-downloads/

If you in some other way have downloaded a grib file to your Seapilot unit, you can tap to open it and choose Seapilot as the goal for the import. For a GRIB file downloaded and imported this way "Update" does not work, since Seapilot cannot know from where to fetch the uppdate. Such a GRIB file must be downloaded and imported again.

Beware that grib files are perishable. Use Update as described above to always have the latest forecast.

Grib symbols

Wind speed and wind direction are shown in Seapilot as arrows with barbs. A short line corresponds to 2.5 m/s (5 knots), a long to 5 m/s (10 knots) and a triangle to 26 m/s (50 knop).

[14]
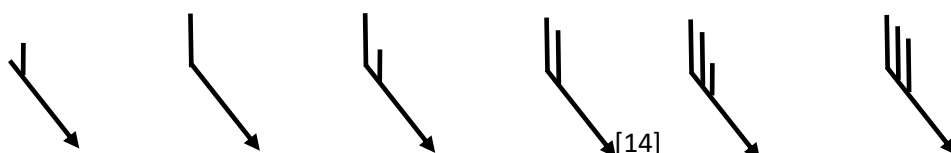
NW 5kn NW 10kn   NW 15kn   NW 20kn   NW 25kn   NW 30kn   etc.

Polars

A polar diagram describes how fast a sailing boat may go at different wind speeds (TWS) and in different angles to the wind (TWA). Every type of boat has its polar diagram (or VPP, velocity prediction program), computed from hull shape, weight, rigging and a sail setup. Seapilot uses the polar diagram to compute the fastest choice of path at a given forecast for wind (and current).

The polar diagram is imported to Seapilot as a polar file in text format (.txt, .csv or .pol). The name of the boat type or the specific boat is suitable to use as a name of the file (for instance J80.txt). On the homepage seapilot.com you can get access to polar diagrams for more than three hundred boat types. More are coming with time. You may also find polar diagrams at manufacturers, vendors, class associations and others.

POLAR file import

To provide polar data for Seapilot may be simple, and it may be complicated. Choose an alternative in the following order until you find one that is working.

A. If you have a polar file (with file type .txt, .csv or .pol)
  1. Send the file as an e-mail attachment to yourself.
  2. Open the e-maíl on your seapilot unit and tap on the attachment. (On iPad/iPhone furthermore: tap the share symbol in the upper right corner and choose Seapilot as the target for the import.)
  3. Check to see the message "Import saved OK" meaning that the file format and the data were correct.
  4. If the import did not succeed you need to reformat the file (see next section).

B. You find your boat type among more than 300 polars on seapilot.com
  1. Open a web browser on a PC or Mac and go to seapilot.com.
  2. Choose Features / Polars and Download polar files.
  3. Click the desired polar/boat type.
  4. Open an e-mail agent on the same unit.
  5. Send an e-mail to yourself with the downloaded polar file as an attachment (you find it in Downloads on both PC and Mac).
  6. Open the e-mail on your iPad/iPhone/Android unit(s) and continue as described i A 2-4.

C. If you have polar data as a table on paper
  1. Write these data into one of the Excel templates available om seapilot.com and follow the instructions found there.

D. If you have polar data as a table in .pdf format or the like
  1. Do as in case C; or copy, paste and edit the data using for instance Word or Excel into a format as described in the next section.
  2. Save as .txt and go on as in case A.

E. If you have polar data only as a diagram
  1. Use a ruler and do readings in the diagram for a number of TWSs and TWAs.
  2. Use for instance Excel to do scaling and save in a template as in case C.

F. If you have polar data for a closely resembling boat

1. Do as in case A.
2. Correct your polar using the parameters Performance upwind and Performance downwind (see the description of the Auto route menu above).

G. You have none of those alternatives above and cannot get data from the designer, the boat builder, a vendor or the class association

1. Download iPolar from App store (at a cost of about 12 USD; Seapilot takes no responsibility for ths app),
2. Choose the Boat tab and give a name to the boat.
3. Under Parameters, record boat's length, displacement and sail areas.
4. Check the polar data created by the program under Polars and Values.
5. Tap the letter symbol and send data (will be as a .txt file) to your own e-mail address.
6. If you want a spinnaker to be included in your sail setup you must use the two files Main+Jib.txt and Main+Spin.txt to create a new .txt which in every position contains the maximum of the corresponding values in the two other files.
7. Continue as in case A.

POLAR file format

Polar data should be described in one of two file formats (each with its variants). The first connects to the format in ORC certificates and the other is also very common. Abbreviations: TWS=true wind speed, TWA=true wind angle, VMG=velocity in the direction of the wind, BSP=boat speed.

FORMAT 1
In the first line set the TWSs (knots) that are valid for the whole table.
Then there may follow two lines with optimal tack angles in the first, and tack VMGs (nb VMG, not BSP) in the second line, at all given TWSs.
Then there should be any number of lines with one TWA followed by a BSP for every TWS. Finally there may be two lines with gybe/run angles and run VMGs, respectively.
The lines which give BSPs at different TWSs should start with a number (=the TWA valid for that line). The first item of other lines should be some text (not a number). The first line may not start with an exclamation sign.

An example of a polar file in format 1:
WindVelocity 6 8 10 12 14 16 20
BeatAngles 43.7° 42.3° 41.9° 40.5° 39.3° 38.5° 38.3°
BeatVMG 3.33 4.06 4.63 5.10 5.33 5.45 5.52
52° 5.13 6.16 6.94 7.38 7.57 7.66 7.72
60° 5.46 6.52 7.20 7.56 7.78 7.89 7.97
75° 5.74 6.79 7.37 7.70 7.99 8.25 8.49
90° 5.80 6.97 7.55 7.74 7.98 8.25 8.87
110° 5.76 6.99 7.61 8.04 8.47 8.71 9.11
120° 5.60 6.81 7.50 7.93 8.39 8.90 9.46
135° 5.02 6.20 7.10 7.60 7.99 8.44 9.47
150° 4.20 5.30 6.29 7.11 7.59 7.97 8.84
GybeAngles 139.9° 148.9° 151.9° 160.2° 174.0° 178.3° 178.1°
RunVMG 3.64 4.59 5.45 6.26 6.99 7.49 8.26

FORMAT 2
The first line must have an exclamation sign in its first position. The rest is ignored.

All the following lines should start with a number (TWS in knots) and then a number of pairs of numbers (TWA1,BSP1 TWA2,BSP2 TWA3,BSP3 ...).
There must be the same number of pairs in all lines, but the set of TWAs need not be the same.

An example of a polar file in format 2:
!
8 30 4.0 43.71 5.40 60 6.20 75 6.40 90 6.5 105 6.40 120 6.0 135 5.3 150 4.4 163.90 4.03 180 3.70
10 30 4.5 42.72 5.82 60 6.65 75 6.90 90 7.0 105 6.95 120 6.6 135 6.2 150 5.3 164.77 4.91 180 4.50
12 30 4.9 41.38 6.03 60 6.90 75 7.25 90 7.4 105 7.35 120 7.1 135 6.6 150 6.2 163.42 5.85 180 5.30
16 30 5.0 41.83 6.25 60 7.15 75 7.55 90 7.8 105 8.00 120 8.0 135 7.5 150 7.1 168.89 6.72 180 6.50
20 30 5.1 41.62 6.33 60 7.25 75 7.80 90 8.1 105 8.40 120 8.7 135 8.3 150 7.9 168.73 7.51 180 7.25
25 30 5.2 41.41 6.42 60 7.35 75 8.05 90 8.3 105 8.75 120 9.2 135 9.0 150 8.6 168.56 8.21 180 7.90

In both formats all characters except digits, letters (a/A-z/Z), dot, hyphen, underscore, slash och backslash are interpreted as delimiters between items (values). All zero values are ignored.

In both formats both TWSs and TWAs must be in increasing order.

OTHER SEAPILOT-FUNCTIONS

Export/Import via GPX - of Marks, Routes and pastTracks
(Requires Seapilot Premium)
> All created and saved Marks, Routes and Tracks may be exported as a GPX data file for use in another Seapilot app, or any other navigation program supporting the same standard file format GPX. We recommend exporting on a regular basis as a backup of your saved items. Otherwise they might disappear if your Seapilot device is lost, or the app needs to be re-installed.

> **Export:**
> • Open Settings ->Export/Import
> • Select those Marks/Routes/Tracks you wish to include in your export file.
> • Choose target for the GPX-export file (as email attachment addressed to yourself, or other app installed - e.g. DropBox, capable of managing user files.)
> • The file will be given an automatic timestamp-name such as "seapilot-YYYYMMDD-hhmmss.gpx"

> **Import into target Seapilot app:**
> • Click to open the .gpx-file where you have it saved (email attachment, DropBox etc, in the same device as the target Seapilot app)
> • Among presented options shown – choose: Seapilot

• When Seapilot opens with dialogue for import, click OK to confirm,
-and your selected Marks/Routes/Tracks will be available in respective list in your Seapilot app.

An exported GPX file may be used in another nav application supporting GPX. And vice versa - any GPX file created according to standard in any other nav application, may be imported into your Seapilot app.

Internet-AIS:

(Requires Seapilot Premium)

Each vessel with an active AIS transponder onboard, transmits AIS data (position, speed, course and more) on a specific VHF frequency. The same data being received by surrounding vessels, are also received by land based coast radio networks. Thanks to our access to those networks, we can forward AIS data streams to your Seapilot app via internet.

With "Internet-AIS" activated in your app and your device being connected to internet, all vessels **with active AIS transponder** will be presented as blue icons in your Seapilot chart. The icons appear as dark blue triangles together with its vessel name.

Tap any AIS icon in chart to present data about name, MMSI-number, course/speed, length/beam, destination etc.

Many countries have started implementing AIS transponders on series of weather stations along the coast. Such AIS weather stations are presented in the chart with icons in the form of a dark blue circle. Tapping such a weather station will present real time information about e.g. mean wind speed/direction, gusts, visibility conditions, wave height etc. The kind of transmitted information differs from station to station.

NB: AIS information in the chart may on any given occasion reflect only parts of the real situation. Many vesssels lack AIS transmitter, and even if equipped, the transmitter may be turned off by different reasons.

You are by international maritime regulations always obliged to keep "proper lookout at all times using all available means".

NMEA:

(Requires Premium registered in your Seapilot user account)

NMEA (National Marine Electronics Association) is a US-based organization stipulating international standards for data communication between marine electronics.

Seapilot supports NMEA(-0183) for incoming GPS- and AIS-data from TCP(WiFi)-connected external devices such as AIS transponder/receiver or GPS compass.

With your Seapilot-tablet/smartphone directly WiFi connected to a GPS/AIS receiver, open the app Settings ->NMEA ->Use NMEA, submit Host (IP-number) and Port as specified in your WiFi-connected device. Then click "Connect" and activate "Use position data", "Use AIS data etc according to what data is relevant from your external GPS/AIS device.

In the future we plan to extend the NMEA functionality in Seapilot, admitting data from other kinds of electronic devices onboard, e.g. echo sounder, wind index, radar etc.

Possibly even to allow for output data, from your Seapilot route to your auto-pilot onboard. But till then, only input of AIS/GPS-data is routed via Seapilot's NMEA interface.

NB: "Use NMEA" must be switched OFF, if no external WiFi-connected GPS/AIS is involved. Built-in (or Bluetooth-connected) GPS in your tablet/smartphone, does NOT use NMEA.

Incorrectly activated NMEA is a common reason for "no own position in Seapilot's chart".

MOB – Man Over Board

A simple (GPS dependent) "shortcut function", to temporarily and conveniently save Latitude and Longitude of an "emergency position" where someone or something was lost over board. If "MOB" is clicked instantly, or as soon as ever possible, an instrument in red above chart will guide you with bearing and distance back to that exact position. This facilitates in conditions with poor visibility, rough seas or a chaotic situation onboard, when a floating object is soon lost out of sight.

The MOB position is static, i.e. without any sorts of calculated drift due to wind, current etc. Another click on "MOB" and the reference is deleted, not saved anywhere for other purposes.

MMSI (own ship) - filter

MMSI (Maritime Mobile Service Identity) is a 9-digit ID number, or digital radio callsign, unique for each vessel with license for digital radio equipment onboard.

If you have a AIS transponder transmitting onboard, and experience that the AIS icon for your own vessel in chart blurs the circle icon for your own GPS position, then you may filter away the AIS icon for your own vessel, by simply entering your MMSI-number in the field. Go to Settings ->Display:AIS where you can state your own MMSI-number. The filter does not in any way affect your AIS-transponder's transmission and how it is perceived onboard surrounding shipping, it is only a filter in your Seapilot chart.

The filter may also be used to hide away any other vessel's AIS icon from your chart, by entering that vessel's MMSI – if the need for this ever occurs.

Just keep in mind deleting the MMSI digits after use. Otherwise it is easy to forget and then start wondering why the actual AIS-icon never appears in your chart.

Search – AIS/Chart

There are two different Search facilities in the Seapilot app, reached from the magnifying glass icon.

SHIP-search

Allows you to search through an internet database containing vessels with AIS transponders. Presented names are the very names programmed into the respective vessel's transponder (which in some cases may differ somewhat from the vessel's name found in other contexts.)

Mark a name in the search hit list, and the chart will center onto that specific AIS object. Zoom if necessary and repeat search for better resolution. The AIS-objects are the dark blue triangle-icons with ship name beside. When zoomed in closer, this triangle changes to a a ship icon with proper proportions of length/beam based on values programmed into the vessel's transponder.

Tap the blue AIS icon in chart, and you are presented an info box with transmitted data about name, vessel category, MMSI-number, position, speed/course, length/beam/depth, destination etc – all depending on actual data transmitted. You will not find any national flag, photos or links to ship owner etc. After all, Seapilot is foremost a navigational tool focusing on what is relevant for your navigational safety, not primarily a smart information service for general interest in shipping. There are plenty other apps or services online for that purpose.

If a searched AIS-vessel turns up on chart crossed over (presenting no further data)**,** this indicates the vessel is not "online" for the moment and the icon just shows "last known position" when data from the vessel was last captured.

CHART-search

Allows you to search for names of islands, cities etc as coded into chart data – in the charts you have actually installed in the app. A common name listed in duplicate/triplicate in the hit list are sorted ascending based on distance from screen center. Sometimes the same name for one single island or city turns up more than once in the list. That means the same name is for different reasons coded into the chart data in different layers, although the name only appears once as visible in chart.

CHARTS IN SEAPILOT

All national charts (normally one per country) are purchased as 12 months subscriptions in your user account. The subscription allows for 2 or more distributed packets of chart corrections to your Seapilot app. (Each country's chart license agreement stipulate different policy and conditions – some granting just 2 correction packages per year, some granting more)

Swedish special charts from Hydrographica AB are at the moment purchased as one-off price, no subscription. The agreement is however subject to changes in a near future.

The charts in Seapilot are not our own production, but consist of vectorized S-57 chart data licensed from hydrographic offices in the respective country. All charts in S-57 format, are presented according to another standard S-52 (Read more below on S52/S57 specifications).

Chart scale

(See above chapter "How to use Seapilot")

Chart format

Electronic charts may be produced in several different formats, of which Raster format and Vector format can be considered the two overarching options (although there are other hybrid formats as well).

Vector charts

In a vector chart (which is what Seapilot solely utilizes) everything from dots, texts, lines and other objects, consist of coordinates bound together by vectors of a defined color, thickness, length and style – all collected into a database. Different categories of chart objects are placed in different data layers and can thus be switched on/off via application settings, or controlled for show/hide depending on current zoom-level in the chart.

No matter how much you zoom into and enlarge the chart view, a certain dot or line will maintain its thickness and color without loosing sharpness.

With too close zooming-in, always consider the risk for over-estimation of what the chart view actually represents. After all, the chart cannot contain and present more rocks, shoals or other details, than the producer once coded into the chart data.

Raster charts (not used in Seapilot)
Raster charts is a simpler way of producing electronic charts. It basically consists of a scanned image of a paper chart, with or without special finishing. Just as other scanned images, a raster chart consists of pixels, thus less suitable for zooming/enlargement since the chart cannot be more detailed, only more "coarse-grained". Raster charts also lack data objects to control in categories via application settings or zoom-level.

S-52 and S-57 = chart specifications from IHO

S-52 and S-57 are two publications from IHO, International Hydrographic Organization. S-57 specifies transfer and storage of electronic vectorized chart data. S-52 specifies how these data are to be properly presented on screen.

These IHO specifications are requirements for approval of onboard ECDIS-systems (Electronic Chart and Display Information System) in professional shipping.
For Seapilot it has been decided to adhere to the same requirements as for professional ECDIS systems. By this the user is not free to define personal varieties of colorful icons for different objects in chart.
However, this professional "ECDIS-standard" provides for good quality, reliability and predictable international standard, and not the least – a smooth process for updating charts with chart corrections directly from the original and official chart producing authority.

Filter chart data for "cleaner" view

In the app Settings ->Display:Chart – you find a number of ON/OFF switches.
Use them to turn off chart object categories not relevant for your own vessel, in your actual situation of navigating. This facilitates for you focusing on what actually is relevant for you.
Keep in mind what you have turned off and reset in time. Otherwise easy to forget and later begin to worry about why "this and that doesn't show up in chart".

Safety Contour

If you are used to paper chart navigation, you are probably also used to static color representation of different depth areas in chart, e.g. dark blue for 0-3 meter, lighter blue for 3-6 meters.
In the electronic, vectorized chart these values are not static. The depth contours are there, but they allow for more dynamic presentation.
In Seapilot Settings ->Display:Chart, you find a setting bar for "Safety contour":
2m / 3m / 6m / 10m / 15m   (or, if depth units are set to feet: 6ft / 9ft / 19ft / 32ft / 49ft)
-these values correspond to commonly appearing depth contours in chart, although you may in charts from different countries find different divisions of depth contours.
In professional ECDIS systems you may of course also define a deeper safety contour more corresponding to the needs of a fully loaded container ship or oil tanker, but for Seapilot 15m/49ft is considered enough.

Preferably you set "Safety contour" to a value corresponding to your own vessels's draft, plus some safety margin.

The set value for "Safety contour" will make the closest corresponding depth contour in chart appear thicker (more conspicuous), with shallower areas darker blue, and deeper safe areas lighter.

Changing value for "Safety contour" will change which depth contour is more conspicuous instead, while the adjacent depth areas will adapt with other blue color nuances.

Deep soundings/rocks

Among the app Display-setting "filters" there are two switches directly related to Safety contour above: "Deep soundings"=ON/OFF and "Deep rocks"=ON/OFF.

If you turn e.g. "Deep soundings" to OFF, all soundings figures will disappear from areas deeper than your defined Safety contour – since the Safety countour is your defined boundary delimiting the safe deeper area considered not affecting the safety of your vessel. Consequently, those soundings figures will appear again, for each deeper step you define as "Safety contour".

Isolated danger

Finally, it is worth mentioning a special depth-related chart symbol according to "ECDIS-standard" – a symbol not recognized from paper charts: A purple/pink circle with a white cross inside.

This symbol is defined as "Isolated danger of depth less than Safety contour".

It is an extra visual warning of individual demarcated objects (often wrecks or steep underwater rocks) protruding up shallower than your defined Safety contour, but still from within the deeper safe sea area delimited by that same Safety contour.

If you temporarily change "Safety contour" to a deeper level, the purple/pink warning will disappear, substituted by ordinary symbol for the wreck or underwater rock. This because it then resides in the unsafe shallower sea area according to your changed Safety contour, with no need of further visual warning.

Reset to your previous Safety contour. The warning symbol has a purpose – to warn you of an anomaly – an "Isolated danger" in otherwise safe sea area.

In professional ECDIS-systems, and also in some other chart applications for personal use, this Safety contour setting may be utilized together with different kinds of alarms, light or sound, and also with Auto route features which may be set not to allow the route passing into areas more shallow than your defined Safety contour.

Presently there is no such alarm feature in Seapilot, but in future it is likely to be implemented in some form.

List of Symbols in S-57 charts

The "ECDIS standard", based on specifications from, deviates in certain details from what you may be used to in paper charts. Since the Seapilot charts are not our own production, and also follows international standards, we have not dedicated resources in creating any Seapilot specific list of symbols.

Instead we refer to public sources on the internet:

A comprehensive list according to "ECDIS standard", including comparisons with older symbols, is provided by the American NOAA:
http://www.nauticalcharts.noaa.gov/mcd/chart1/ChartNo1.pdf

A more techical specification of different chart objects and how to implement those in electronic vectorized charts according to S-52 standard, is the "user manual" from IHO:
http://www.iho.int/iho_pubs/standard/S-52/PresLib_e3.4_Part_I_Addendum.pdf

Copyright/disclaimers and other chart license notices from each country's hydrographic authority

Belgium

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Finland

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Italy

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include: "Istituto Idrografico della Marina, Italia"

Latvia

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Poland

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UK and Ireland

USA

See EULA disclaimer in app

Accronyms

AIS	Automatic Identification System, maritime transponder based "anti-collision system"
COG	Course Over Ground
ECDIS	Electronic Chart Display and Information System, chart system approved for professional use
ENC	Electronic Navigational Chart, official chart database for use in ECDIS-system
ERBL	Electronic Range and Bearing Line
GB	GigaByte (data size)
GLONASS	Globalnaja navigatsionnaja sputnikovaja sistema, Russian system - equivalent to GPS
GNSS	Global Navigation Satellite System, umbrella term for systems like GPS, GLONASS, Galileo, BeiDou etc
GPS	Global Positioning System, US-controlled satellite positioning system
GPX	GPS eXchange format, data file format for exchange of Routes, Tracks etc
GRIB	GRIdded Binary, data format for wind forecast matrix in charts/maps
IHO	International Hydrographic Organization, cooperation body for e.g. chart standards and formats
iOS	Apple's operating system for iPhone/iPad
M / NM	Mile(Nautical) = 1852 meters = 6076 feet
MB	MegaByte (data size)
MMSI	Maritime Mobile Service Identity
MOB	Man Over Board, in Seapilot a function assisting in finding back to a passed "emergency position"
NMEA	National Marine Electronics Association, establishes standards for data communication between marine electronics, e.g. NMEA0183
NOAA	National Oceanic and Atmospheric Administration (USA)
POLAR	Table or a graph for an areas optimal wind angles in different wind speeds, for sailing/glide flight etc
S-52	Publication from IHO, specifying standard for presentation on screen of electronic chart data(ENC)
S-57	Publication from IHO, specifying standard for transfer and storage of electronic chart data (ENC)
SOG	Speed Over Ground
TCP	Transmission Control Protocol, the data protocol used by Seapilot for NMEA-connected GPS/AIS
WGS84	World Geodetic System 1984, global geodetic reference system for position format
VHF	Very High Frequency, 30-300MHz, used in short range communication at sea between 155-174MHz
WiFi	Technology for wireless data networks
Wpt	Waypoint in a planned route
XTE	Cross Track Error, lateral deviation from current leg in a route

Seapilot support

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