

# Little Navmap User Manual



# Table of Contents

Introduction	1.1
Acknowledgments	1.2
Donations	1.3
Features	1.4
Installation	1.5
Quick Overview	1.6
First Start	1.7
General Remarks	1.8
Menus and Toolbars	1.9
Statusbar	1.10
Map Display	1.11
Map Display Legend	1.12
Map Flight Plan Editing	1.13
Search Dock Window - Airports and Navaids	1.14
Search Dock Window - Procedures	1.15
Flight Plan Formats	1.16
Flight Plan Dock Window	1.17
Flight Plan Procedures	1.18
Flight Plan Route Description	1.19
Flight Plan Elevation Profile Dock Window	1.20
Information Dock Window	1.21
Legend Dock Window	1.22
Simulator Aircraft Dock Window	1.23
Weather	1.24
Printing the Map	1.25
Printing the Flight Plan	1.26
Load Scenery Library Dialog	1.27
Connecting to a Flight Simulator	1.28
Checking for Updates	1.29
Options Dialog	1.30
Running without Flight Simulator Installation	1.31
Customize	1.32
Creating or adding Map Themes	1.33
Files	1.34
Tutorials - General	1.35
Tutorial - Building a VFR Flight Plan	1.36
Tutorial - Building an IFR Flight Plan with Approach Procedures	1.37
Tips and Tricks	1.38
Tips for old and slow Computers	1.39

---

Troubleshoot	1.40
Known Problems	1.41
How to report a Bug	1.42
Glossary	1.43
Change log	1.44
License	1.45

---



# Little Navmap User Manual

## Version 1.6

*Little Navmap* is a free open source flight planner, navigation tool, moving map, airport search and airport information system for Flight Simulator X, Flight Simulator - Steam Edition, Prepar3D v2 to v4 and X-Plane 11.

**Do not use this program for real world navigation.**

---

More about my projects at [GitHub](#).

---

Copyright 2015-2017 Alexander Barthel

---

Last updated Fri Sep 22 2017 18:31:48 GMT+0000 (UTC).

## Acknowledgments

A big thank-you for all people supporting me throughout the beta phase, sending me their log files, screen shots, ideas for improvements, friendly messages and more.

A huge Thank you! to Paul Watts for his support, for testing, tips, links to incredible tools and for all his work on the manual.

Plenty of thanks to [Hervé Sors](#) for allowing me to include his updated `magdec1.bg1` file with *Little Navmap*.

A very special thank-you to Roberto S. from Switzerland for his valuable input and also helping with his capability to find the most obscure bugs.

Thanks to Jose from [fsAerodata](#) for his kind support.

Thanks to all beta testers for their effort, patience and ideas: Barry, Brian, Gérard, John, Remi and Sam.

Another big Danke! to Marc from Germany for all his great ideas and endless bug reports.

Thanks to all in the forums who patiently supported me and gave invaluable feedback during the public beta:

[AVSIM](#), [SimOuthouse](#), [FlightX.net](#) and [FSDeveloper.com](#).

This project and my library `atools` would not exist without the fabulous documentation of the `BGL` files in the [FSDeveloper Wiki](#). So, here a huge thank-you to all the contributors.

Also a thank you to Ed Williams for his [Aviation Formulary](#).

Without the open source [Marble](#) widget that allows me to access and display all the maps I would still be busy doing that myself for years.

No [Qt application framework](#) and I could not even draw a simple button.

Let's not forget about all the services that provide us all the online maps for free:

[Stamen Design](#), [MapTiles](#), [OpenTopoMap](#) and [CARTO](#).

A thank-you to the [GIScience / Geoinformatics Research Group](#) of Heidelberg University for kindly giving me permission to use their map [OpenMapSurfer](#).

And last but not least: If there were no [OpenStreetMap](#) and its thousands of contributors none of us would have any maps at all.

## Donations

**Donate to show your appreciation if you like my programs.**

**Spenden Sie, um Ihre Wertschätzung zu zeigen, wenn Ihnen meine Programme gefallen.**

**Donate**



# Features

## General

- Platforms: Windows 7, 8, 10, Linux and macOS.
- Support for Flight Simulator X, Flight Simulator - Steam Edition, Prepar3D v2, v3, v4 and X-Plane 11.
- Modern and easy to use interface: Using a main menu, context menus, toolbars, dock windows, undo, recent file lists and more.
- Data is collected from flight simulator stock and add-on files. No need to buy or download external data like AIRAC cycles.
- Scenery library databases for flight simulators are stored separately and can be changed on the fly.
- Display of METARs or decoded weather data from Flight Simulator, *Active Sky Next*, *AS16*, *Active Sky for P3Dv4*, X-Plane downloaded weather, NOAA and VATSIM in tooltips and information windows.
- The program saves almost all settings including the flight plan, window positions, searches and more and restores everything on start up.
- Most questions or information dialogues can be disabled.
- *Little Navmap* can be run on computers that do not contain any simulator installations at all. Simply copy the [scenery library database](#) from your flight simulator computer.
- The program consumes a low amount of resources and can be run on older computers.
- Information windows and tabs show detailed information about airports, navaids, airways, airspaces, weather, AI aircraft, multiplayer aircraft and more.
- Exhaustive search function for airports and navaids allows filtering by an extensive range of criteria.
- Distance and direction based spatial search for airports or navaids around a center point. Can be combined with all other search options.
- Search for airports or navaids by [BGL \(FSX, P3D\)](#) or [DAT](#) (X-Plane) file name or path to find your preferred add-on airports or debug scenery problems.
- [FSX/P3D](#): Support for navdata updates from [fsAerodata](#) and [FSX/P3D Navaids update](#).
- Third party X-Plane navdata updates supported.
- [FSX/P3D](#) only: Recognizes [VORTAC](#) and [TACAN](#) radio stations from [fsAerodata navaid update](#).
- Units can be changed between nautical, imperial and metric.
- Multiple GUI styles including a night mode. Two styles can be customized in configuration files.
- The program can now check for updates on three different channels (stable, beta and develop) and will show a notification if a new version is available. Configurable in options dialog.

## Flight Plan and Routing

- Can read and write [FSX PLN](#) format, X-Plane [FMS](#) and [FLP](#) format (Aerosoft Airbus and others).
- Can export flight plans in GFP format used by the Flight1 GTN 750/650.
- Other export formats are PMDG RTE and GPX. GPX files include the flown track.
- Import of [FS9](#) flight plans.
- Flight plans can be created from a route description copied from an online flight planner or other sources. This includes speed and altitude elements as well as SIDs and STARs.
- Route descriptions can be generated from a flight plan. The included information can be configured.
- Flight plans can be printed with options to include or exclude extensive detailed information.
- Flight plans can be created or edited using drag and drop on the map display.
- Easy flight plan editing in the table view including moving and deleting waypoints or whole flight plan fragments.
- Names of user defined waypoints can be changed.
- Can save, load and merge flight plans or flight plan snippets.
- Automatic fast flight plan calculation for high/low altitude airways, [VOR/NDB](#) and preset cruise altitude. Flight plan snippets can be calculated between any kind of departure and destination point.
- Can calculate flight plan fragments between any two waypoints of a present flight plan.

- The automatic flight plan calculation is based entirely on flight simulator data. No third party data needed and no slow and unreliable online services used.
- X-Plane: Considers altitude and one-way restrictions when calculating flight plan.
- X-Plane: Airspaces can be copied from a [FSX](#) or [P3D](#) database.
- Elevation profile display for flight plan using GLOBE offline or online data. Shows minimum altitude for flight plan with a configurable altitude buffer.
- Undo/redo for all flight plan changes.
- Robust protection against malformed flight plans. Does not put unknown waypoints far off the route.
- Active flight plan leg is highlighted on flight plan table and on the map.
- Top of descent point is calculated using a configurable rule of thumb and displayed on the map.

## Procedures - Approaches, Transitions, SIDs and STARs

- Uses approaches and transition from [FSX](#) or [P3D](#) stock data. Additionally supports SIDs and STARs from *fsAerodata* navdata updates or future AIRAC updates.
- Uses X-Plane stock and updated nav data for approach, [SID](#) and [STAR](#) procedures including transitions.
- Displays much more information for procedures than the flight simulator GPS.
- [Procedure](#) search dialog with type and runway filters that allows easy selection and preview of procedures.
- Procedures can be easily added and removed from flight plan.
- Information for selected procedures is stored as an annotation in the default simulator [PLN](#)-files and reloaded when the file is opened by *Little Navmap*. No need to deal with an extra file format only used by *Little Navmap*.

## Map

- Uses several free online maps ([OpenStreetMap Mapnik](#), [OpenTopoMap](#), [Stamen Terrain](#) and the [OSM Roads](#) layer provided by [Heidelberg University](#)) and more as well as three simple offline maps. The offline maps are included in the *Little Navmap* download.
- Hill shading option for all *OpenStreetMap* variants. Two map themes feature worldwide hill shading.
- Option for adding additional user defined map themes.
- Two projections: Mercator (flat) and spherical (round globe).
- Can use the offline free [GLOBE](#) elevation data which has world wide coverage or a slower limited online resource.
- Airport display iconography based on real world VFR maps thus combining plenty of information in a small symbol and a few lines of text.
- Detailed airport diagrams displayed in the map (not in a separate window) including [parking](#), taxiways, displaced thresholds, overrun areas and much more. You can see your aircraft in the airport map when taxiing your aircraft.
- [Add-on airport](#) names are shown in italic text for easier recognition. Display settings allow only add-on airports to be shown.
- Distance and course measurement lines and configurable range rings also showing radio [navaid](#) ranges.
- Can load and display Google Earth KML files.
- History of map position and zoom distance like a web browser.
- Map display configuration including detail level on the toolbar.
- Symbol sizes, text sizes, text labels and colors are configurable in options dialog.
- Detailed tooltips on map display for airports, navaids, airways, airspaces, AI aircraft, AI ships, multiplayer aircraft and more.
- Fast and widely configurable display of airspaces.
- Airspaces can be filtered by type and altitude (above or below 10,000 ft or 18,000 ft or at flight plan altitude).
- Map can be printed or saved as image.

## Simulator aircraft

- Can connect directly to [FSX](#), [P3D](#) or X-Plane. Connection to X-Plane needs the included *Little Xpconnect* plugin which is available for Windows, macOS and Linux.
- Autoconnect mode for remote or local connections. Order of program startup is not relevant.

- Shows simulator user aircraft on the map including flight plan progress, ambient parameters like wind, temperature, pressure and more (similar to a flight management computer).
- Shows track of simulator user aircraft.
- Shows AI and multi-player aircraft and ships (ships only in [FSX](#) and [P3D](#)).
- Using *Little Navconnect* as an agent between the simulator and *Little Navmap* running on a remote computer saves the pain of remote [SimConnect](#) setup.

# Installation

Highlighted text is used to denote window, menu, button, file or directory names.

*Little Navmap* for Windows is a 32-bit application and was tested with Windows 7, Windows 8, Windows 10 (32-bit and 64-bit).

The macOS and Linux versions are both 64-bit and were tested with macOS Sierra and Ubuntu Linux.

## Updating

Delete all installed files of a previous *Little Navmap* version before installing a new version. All files from the previous ZIP archive can be deleted since settings are stored in separate directories (except [custom map themes](#)). In any case do not merge the installation directories.

There is no need to delete the old settings directory. The program is written in a way that it can always work with old setting files.

## Windows

The installation of *Little Navmap* does not change any registry entries (in Windows) and involves a simple copy of files therefore an installer or setup program is not required.

Do not extract the archive into the folder `c:\Program Files\` or `c:\Program Files (x86)\` since this requires administrative privileges for some Windows versions. Windows keeps control of these folders, therefore other problems might occur like replaced or deleted files.

Extract the Zip archive into a folder like `c:\Little Navmap`. Then start the program by double-clicking `littlenavmap.exe`. See [First Start](#) for more information on the first start after installation.

In some cases you have to install the [Update for Visual C++ 2013 and Visual C++ Redistributable Package](#). Install both 32 and 64 bit versions. Usually this is already installed since many other programs require it.

*Little Navmap* is a 32-bit application and was tested with Windows 7, Windows 8 and Windows 10 (32-bit & 64-bit). Windows XP is not supported.

## Other Simulators than FSX SP2

This program was compiled using plain [FSX](#) SP2 (no Acceleration) [SimConnect](#) version 10.0.61259.0.

You might have to install an older version of [SimConnect](#) if you use [Prepar3D](#) or [FSX Steam Edition](#). If not sure about this simply try *Little Navmap* out. If it fails with an error message follow the instructions below:

**Prepar3D:** In the same directory as `Prepar3D.exe` is a `redist\Interface` directory (normally `C:\Program Files (x86)\Lockheed Martin\Prepar3D v3\redist\Interface`). There are multiple legacy versions of [SimConnect](#) available. You have to install `FSX-SP2-XPACK.msi` for *Little Navmap*.

**FSX Steam Edition:** The installation adds the folder `C:\Program Files (x86)\Steam\SteamApps\common\FSX\SDK\Core Utilities Kit\SimConnect SDK\LegacyInterfaces` where you can find the legacy [SimConnect](#) interfaces.

## macOS

Extract the ZIP file and copy the `Little Navmap` application to the folder `Applications` or any other folder.

## Linux

Extract the tar archive to any place and use the `littlenavmap.sh` shell script to start the program from a terminal:

```
bash ./littlenavmap.sh
```

## X-Plane

*Little Navmap* can only connect to X-Plane using the *Little Xpconnect* X-Plane plugin which has to be installed as well.

The *Little Xpconnect* plugin is included in the *Little Navmap* archive but can also be downloaded separately. See the included `README.txt` in the `Little Xpconnect` directory for installation instructions.

The plugin 64-bit only and is available for Windows, macOS and Linux.

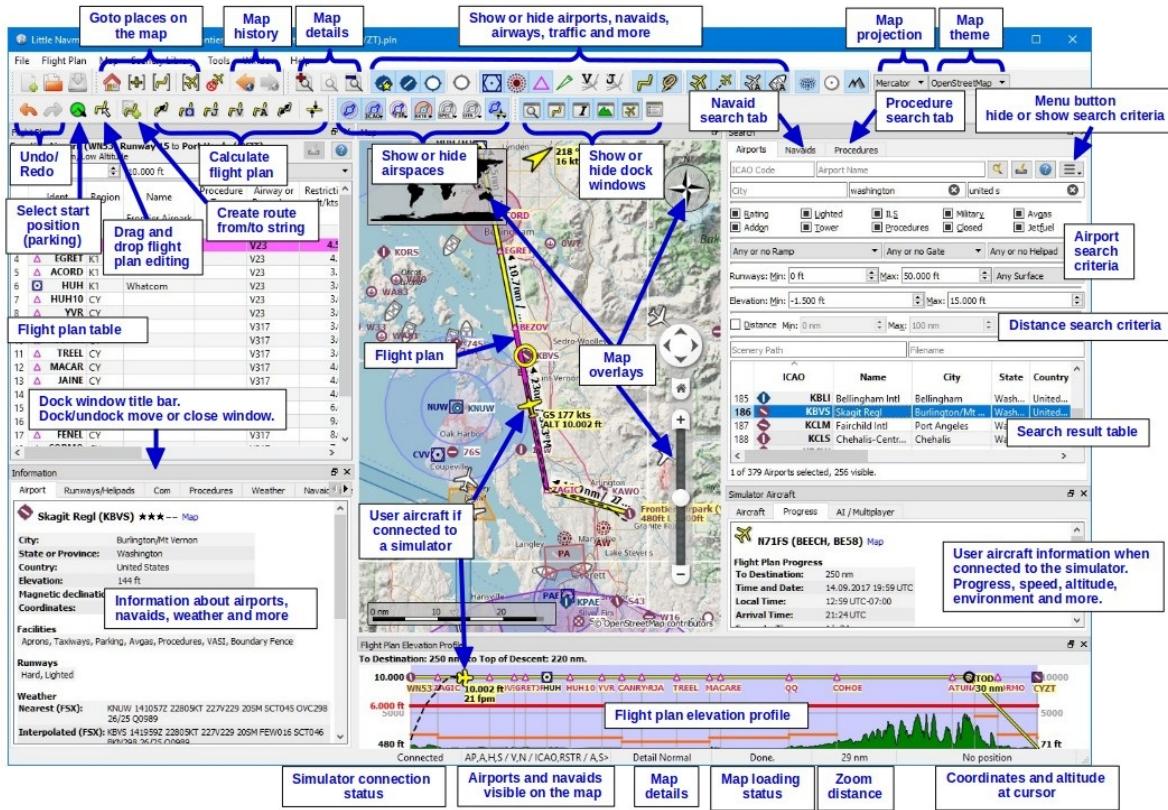
## Additional Programs

The downloaded *Little Navmap* archive contains two additional directories (or applications for macOS):

`Little Navconnect` : A complete copy of the program allowing remote flight simulator connections for [FSX](#), [P3D](#) and X-Plane.

`Little Xpconnect` : This is the 64-bit plugin that is needed for *Little Navmap* or *Little Navconnect* to connect to X-Plane.

# Quick Overview



**Picture above:** A quick overview of Little Navmap showing the most important functions.

## First Start

The [Scenery Library Dialog](#) dialog will be shown when starting *Little Navmap* for the first time. From there you can select all recognized Flight Simulators and load their scenery libraries into *Little Navmap*'s internal database.

**Note that X-Plane cannot be recognized automatically. You have to set the path in the [Scenery Library Dialog](#) before you can load the database or selecting it in the menu.**

One database is kept for each simulator and can be changed on the fly in the [Scenery Library](#) menu.

A warning dialog will be shown when starting *Little Navmap* the first time on a system without any flight simulator installations. See chapter [Running without Flight Simulator Installation](#) for more information on this. You can also go directly to the [Scenery Library Dialog](#) from there if you have X-Plane installed.

One or more scenery library databases may need to be updated when you install a new version of *Little Navmap*. A question dialog will pop up prompting you to erase the now incompatible database. You can reload the scenery in the [Scenery Library Dialog](#) after erasing the databases.

**It is recommended to have a look at the [tutorials](#) if you use the program the first time.**

## General

### User Interface

The user interface of *Little Navmap* consists of a main window and several dock windows which can be detached from the main window or arranged in any order within the main window.

The docked windows can be moved around in their docked position and can be detached from the main window by simply dragging them outside of the main window, by double clicking their title bar or by clicking on the window symbol on the top right.

Double click on the docked window's title bar or click on the window symbol again to move the windows back into their docked position.

All docked windows except the map window can be closed if they are not needed. You can even drop docked windows on each other to create a tabbed view. The tabs will appear at the bottom of the dock stack in this case.

Toolbars are also movable by clicking on the left handle and can also be closed or detached from the main window.

**Use the [Main Menu -> Window](#) menu to bring docked windows or toolbars back.**

**The [Main Menu -> Reset Window Layout](#) menu item can be used to reset the state and positions of all dock windows and toolbars back to their default.**

The program uses tooltips to display more information on buttons and other controls.

A more detailed description is shown on the left side of the statusbar if you hover the mouse over a menu item.

The main window title indicates the currently selected flight simulator database ([FSX](#), [FSXSE](#), [P3DV2](#), [P3DV3](#), [P3DV4](#) or [XP11](#)), the flight plan file name and a trailing \* if the flight plan has changes.

Almost all dialogs, text labels and all information windows in *Little Navmap* support copy and paste. You can select the text using the mouse and then either use [ctrl+c](#) or the context menu to copy it into the clipboard. The information and simulator aircraft windows even support copying of formatted text including the icons. This can be helpful to report errors.

The table views for the flight plan or airport/navaid search results allows copying of the results in CSV format into the clipboard which can be imported into a spreadsheet program like LibreOffice Calc or Microsoft Excel.

## Translation and Locale

*Little Navmap* is currently only available in English. I will happily support anybody who would like to translate the user interface or manual into another language.

Despite using the English language in the user interface the locale settings of the operating system will be used. So, e.g. on a German version of Windows you will see comma as a decimal separator instead of the English dot.

Please note that some screenshots in this manual were taken using German locale, therefore a comma is used as a decimal separator and a dot as a thousands separator.

## Map Legend

The legend explains all the map icons and the `Flight Plan Elevation Profile` icons. It is available in the `Legend dock` window or in this manual: [Legend](#).

## Naming Conventions used in this Manual

`Highlighted text` is used to denote window, menu, button, file or directory names.

See the [glossary](#) for explanations of common terms in this manual.

## Rating

Airports get a zero to five [star rating](#) depending on facilities. Airports that have no [rating](#) are considered boring and will be displayed using a gray symbol below all other airports on the map (`Empty Airport`). This behavior can be switched off in the `options` dialog on the `Map Display` tab.

The criteria below are used to calculate the [rating](#). Each item gives one [star](#):

1. Add-on
2. [Parking](#) positions (ramp or gate)
3. Taxiways
4. Aprons
5. Tower building (only if at least one of the other conditions is met).

## Navdata Updates

### FSX and Prepar3D

The latest navigation data can be installed from [fsAerodata](#) or [FSX/P3D Navaids update](#). This will update the flight simulator stock data and airports which are read into *Little Navmap*'s scenery database.

Certain [navaid](#) and [procedure](#) types are only available through [fsAerodata](#). These are [VORTAC](#) and [TACAN](#) navaids as well as [SID](#) and [STAR](#) procedures.

Note that the [SID](#) and [STAR](#) names are limited to 5 characters in [FSX](#) and [P3D](#) due to a limitation in the [BGL](#) file format. Names are slightly modified therefore.

Navdata updates are optional.

### X-Plane

*Little Navmap* will use any navdata updates that are installed in the directory `Custom Data`. Any older updates installed in the GPS directories are not used.

User defined data from the files `user_fix.dat` and `user_nav.dat` is read and merged into the database if found.

Note that neither ARINC nor the FAACIFP files are supported.

## Magnetic Declination

The calibrated magnetic declination of a [VOR](#) may differ from the actual declination in a region as it does in reality. Therefore, magnetic course values might differ in some cases.

## FSX and Prepar3D

The declination used to calculate the magnetic course is taken from the `magdec.bg1` file in the scenery database.

Updates for this file are available here: [FSX/P3D Navaids update](#).

## X-Plane

The declination values for X-Plane (airports and all navaids except VORs) is calculated based on the included `magdec.bg1` file which is based on the values for the beginning of 2017.

# Menus and Toolbars

This chapter describes all the menu items of *Little Navmap*. You will find most of this functionality on the toolbars as well which are not be described separately. Key combinations can be seen on the menu items and are not listed in this manual.



*Picture above:* Menu and toolbars docked in default positions.

## File Menu



### New Flight Plan

Erases the current flight plan.

You have to use the [Search Result Table View Context Menu](#), the [Map Context Menu](#) or the [Flight Plan Route Description dialog](#) to create a flight plan.



### Open Flight Plan

Opens a [FSX PLN](#), a [FS9 PLN](#), a X-Plane [FMS](#) or a [FLP](#) flight plan file. The type of file is determined by content and not file extension. See [Flight Plan Formats](#) for more information.

An opened flight plan file will be reloaded on start up (reload and centering can be switched off in the `options` dialog on the `startup` and `User Interface` tab).

[Procedure](#) information and ground speed will be added to the flight plan if a [PLN](#) file is saved by *Little Navmap*. The additional information will be ignored by [FSX](#) or [P3D](#) but allows to reload all information by *Little Navmap*.



### Append Flight Plan

Adds departure, destination and all waypoints to the current flight plan.

Using `Append Flight Plan` allows to load or merge complete flight plans or flight plan snippets into a new plan. All waypoints are added at the end of the current flight plan. Then you can use the `Delete selected Legs` and `Move selected Legs up/down` context menu items to arrange the waypoints and airports as required. See [Flight Plan Table View Context Menu](#).

All arrival procedures will be removed when appending a flight plan.



### Save Flight Plan



### Save Flight Plan as PLN

Saves the flight plan to a [FSX/P3D PLN](#) file (XML format). This annotated format allows to save all flight plan attributes of *Little Navmap*.

`Save Flight Plan as PLN` changes the current file type and name in *Little Navmap* which means that all further saves will go into the new [PLN](#) file.

It is recommended to save all flight plans in this format to keep all information of a plan. Even when using the limited [FMS](#) format for X-Plane. See [Flight Plan Formats](#) for more information.

*Little Navmap* will allow flight plans to be created that may be useful as a flight plan snippet but are unusable by the flight simulator. This occurs if a flight plan does not have a departure or destination airport. A warning dialog will be shown when saving a incomplete flight plan.

A warning dialog will also be shown if the departure airport has [parking](#) positions but none is assigned in the flight plan.

Procedures will be saved as an annotation in the flight plan file if the flight plan contains any. This causes no problem for the simulators and most other programs. Use [Export clean Flight Plan](#) if a program has problems reading the [PLN](#) files saved by *Little Navmap*.

Note that the waypoints of a [procedure](#) are not saved with the flight plan. This is not supported by [FSX](#) or [P3D](#). Use the GPS, FMC or other ways to select a [procedure](#) in your aircraft.

The set ground speed is also saved with the flight plan.



## Save Flight Plan as X-Plane FMS

Saves the flight plan as a X-Plane [FMS](#) file. This format is limited so a warning dialog is shown if any unsupported features are detected in the current flight plan.

See [Flight Plan Formats](#) for more information on limitations.

This function changes the current file type and name which means that all further saves will go into the new [FMS](#) file and the file will be reloaded on next start.

Store [FMS](#) files into the `output/FMS plans` directory inside the X-Plane directory if you would like to use the flight plan in the X-Plane GPS or [FMS](#).



## Save Flight Plan as FLP

Exports the current flight plan as a [FLP](#) file usable by the X-Plane [FMS](#), Aerosoft Airbus and other add-on aircraft. This format is limited so a dialog is shown if any unsupported features are detected in the current flight plan.

See [Flight Plan Formats](#) for more information on limitations.

This function changes the current file type and name which means that all further saves will go into the new [FLP](#) file and the file will be reloaded on next start.

Store [FLP](#) files into the `output/FMS plans` directory inside the X-Plane directory if you want to load it into the [FMS](#).



## Export as Clean PLN

Saves a flight plan without any [procedure](#) or speed annotations if programs have problems reading the [PLN](#) files saved by *Little Navmap*. This is rarely needed.

Like any other export function this does not change the current file name and type. Further saves will still use the same file name and format as before.

See also [Flight Plan Formats](#).



## Save Flight Plan as GFP

Exports the flight plan in GFP format used by the *Flight1 GTN 650/750*.

Procedures or their respective waypoints are not included in the exported file.

This function does not change the current file name and type. Further saves will still use the same file name and format as before.

See [Flight Plan Formats](#) for more information about this export format.



## R Export Flight Plan as RTE

Exports the current flight plan as a PMDG RTE file.

Procedures or their respective waypoints are not included in the exported file.



## GPX Export Flight Plan as GPX

Exports the current flight plan into a GPS Exchange Format file which can be read by Google Earth and most other [GIS](#) applications.

The flight plan is exported as a route and the flown aircraft trail as a track including simulator time and altitude.

Procedures or their respective waypoints are not included in the exported route.

This function does not change the current file name and type.



## Add Google Earth KML

Allows addition of one or more Google Earth KML or KMZ files to the map display. All added KML or KMZ files will be reloaded on start up. Reload and centering can be switched off in the `options` dialog on the `Startup` and `User Interface` tab.

Due to the variety of KML files it is not guaranteed that all files will show up properly on the map.



## Clear Google Earth KML from Map

Removes all loaded KML files from the map.



## Work Offline

Stops loading of map data from the Internet. This affects the `OpenStreetMap`, `OpenTopoMap` and all the other online map themes as well as the elevation data.

A red `offline`. indication is shown in the status bar if this mode is enabled.

You should restart the application after going online again.



## Save Map as Image

Saves the current map view as an image file. Allowed formats are JPEG, PNG and BMP.



## Print Map

Allows to print the current map view. See [Printing the Map](#) for more information.



## Print Flight Plan

Opens a print dialog that allows you to select flight plan related information to be printed. See [Map Flight Plan Printing](#) for more information.



## Quit

Exits the application. Will ask for confirmation if there is a changed flight plan.

## Flight Plan Menu



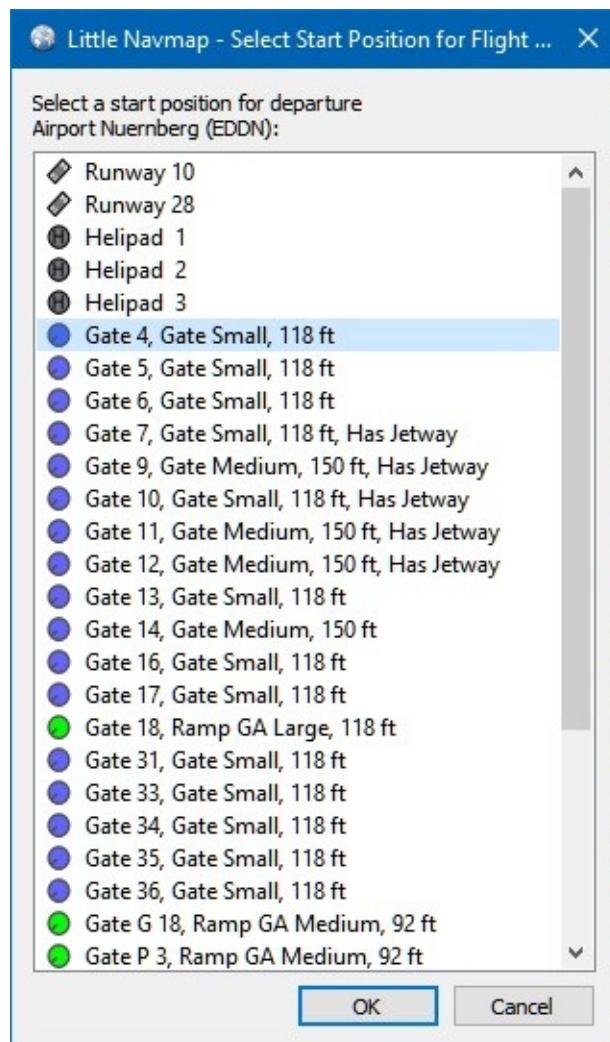
## Undo/Redo

Allows undo and redo of all flight plan changes.



## Select a Start Position for Departure

A [parking](#) spot (gate, ramp or fuel box), runway or helipad can be selected as a [start position](#) at the departure airport. A [parking](#) position can also be selected in the map context menu item [Set as Flight Plan Departure](#) when right clicking on a [parking](#) position. If no position is selected the longest primary runway end is selected automatically as start.



*Picture above:* The [start position](#) selection dialog for EDDN.



## Edit Flight Plan on Map

Toggles the flight plan drag and drop edit mode on the map. See [Flight Plan Editing](#).



## New Flight Plan from Route Description

Opens a dialog with the route description of the current flight plan that also allows to modify the current flight plan or enter a new one.

[Flight Plan from Route Description](#) gives more information about this topic.



## Copy Flight Plan Route to Clipboard

Copies the route description of the current flight plan to the clipboard using the settings from the [Flight Plan from Route Description](#) dialog.



## Calculate Direct

Deletes all intermediate waypoints and connects departure and destination using a great circle line.

You can calculate a flight plan between any kind of waypoints, even user defined waypoints (right click on the map and select `Add Position to Flight plan` to create one). This allows the creation of snippets that can be merged into flight plans. For example you can use this feature for crossing the North Atlantic with varying departures and destinations. This applies to all flight plan calculation modes.



## Calculate Radionav

Creates a flight plan that uses only [VOR](#) and [NDB](#) stations as waypoints and tries to ensure reception of at least one station along the whole flight plan. Note that [VOR](#) stations are preferred before [NDB](#) and [DME](#) only stations are avoided if possible. Calculation will fail if not enough radio navaids can be found between departure and destination. Build the flight plan manually if this is the case.

This calculation can also be used to create a flight plan snippet between any kind of waypoint.



## Calculate high Altitude

Uses Jet airways to create a flight plan.

Calculated flight plans along airways will obey all airway restrictions like minimum and altitude. The program will also adhere to one-way and maximum altitude restrictions for X-Plane based navdata.

The resulting minimum altitude is set into the flight plan altitude field. The flight plan altitude field is not changed if no altitude restrictions were found along the flight plan.

A simplified east/west rule is used to adjust the cruise altitude to odd/even values (this can be switched off in the `options` dialog on the `Flight Plan` tab).

The default behavior is to jump from the departure airport to the next waypoint of a suitable airway and vice versa for the destination. This can be changed in `options` dialog on the `Flight Plan` tab if [VOR](#) or [NDB](#) stations are preferred as transition points to airways.

The airway network of Flight Simulator is not complete (the north Atlantic tracks are missing for example - these change daily), therefore calculation across large ocean areas can fail.

Create the airway manually as a workaround or use an online planning tool to obtain a route string and use the `New Flight Plan from String` option to create the flight plan.

This calculation can also be used to create a flight plan snippet between any kind of waypoint.



## Calculate low Altitude

Uses Victor airways to create a flight plan. Everything else is the same as in `calculate high Altitude`.



## Calculate based on given Altitude

Use the value in the altitude field of the flight plan to find a flight plan along Victor and/or Jet airways. Calculation will fail if the altitude value is too low. Everything else is the same as in `calculate high Altitude`.



## Reverse Flight Plan

Swaps departure and destination and reverses order of all intermediate waypoints. A default runway is assigned for the new departure `start position`.

Note that this function does not consider one-way airways in the X-Plane database and might result in an invalid flight plan.



## Adjust Flight Plan Altitude

Changes the flight plan altitude according to a simplified East/West rule and the current route type (IFR or VFR). Rounds the altitude up to the nearest even 1000 feet (or meter) for westerly flight plans or odd 1000 feet (or meter) for easterly flight plans. Adds 500 feet for VFR flight plans.

## Map Menu



### Goto Home

Goes to the home area that was set using [Set Home](#) using the saved position and zoom distance. The center of the home area is highlighted by a symbol.



### Go to Center for Distance Search

Go to the center point used for distance searches. See [Set Center for Distance Search](#). The center for the distance search is highlighted by a symbol.



### Center Flight Plan

Zooms out the map (if required) to display the whole flight plan on the map.



### Center Aircraft

Zooms to the user aircraft if directly connected to a flight simulator or remotely connected using [Little Navconnect](#) and keeps the aircraft centered on the map.

The centering of the aircraft can be changed in the `Options` dialog on the `Simulator Aircraft` tab.



## Reset Display Settings

Resets all map display settings back to default.



*Picture above: All setting tool buttons highlighted that are affected by Reset Display Settings .*



## Delete Aircraft Trail

Removes the user aircraft trail. It is also deleted when connecting to a flight simulator. The trail is saved and will be reloaded on program startup.



## Map Position Back/Forward

Jumps forward or backward in the map position history. The complete history is saved and restored when starting *Little Navmap*.

## Details



### More Details



### Default Details



### Less Details

Increases or decreases details on the map. More details means more airports, more navaids, more text information and bigger icons.

Note that map information will be truncated if too much detail is chosen. A red warning message will be shown in the statusbar if this is the case.

The detail level is shown in the statusbar. Range is -5 for few details to +5 for most details.

## Projection

### Mercator

A flat projection that gives the most fluid movement and the sharpest map when using picture tile based online maps themes like *OpenStreetMap* or *OpenTopoMap*.

### Spherical

Shows earth as a globe which is the most natural projection. Movement can stutter slightly when using the picture tile based online maps themes like *OpenStreetMap* or *OpenTopoMap*. Use the `Simple`, `Plain` or `Atlas` map themes to prevent this.

Online maps can appear slightly blurred when using this projection. This is a result from converting the flat image tiles to the spherical display.



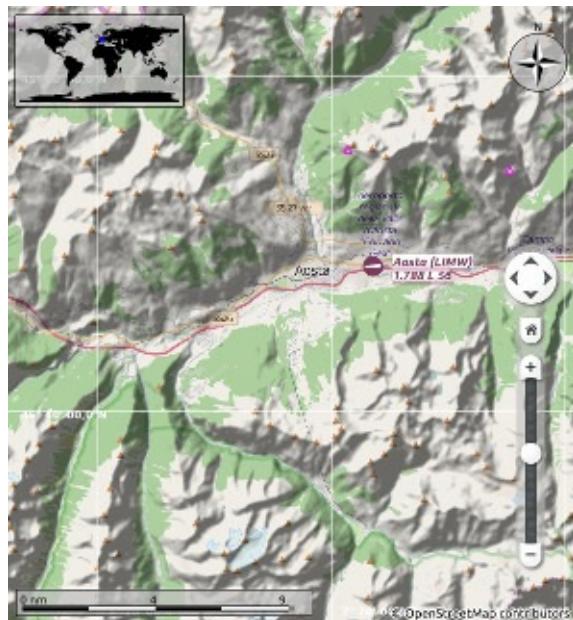
**Picture above:** Spherical map projection with `Simple offline map theme` selected.

## Theme

Please note that all the online maps are delivered from free services therefore fast download speeds and high availability cannot be guaranteed. In any case it is easy to deliver and install a new online map source without creating a new *Little Navmap* release. See [Creating or adding Map Themes](#) for more information.

### OpenStreetMap

This is an online raster (i.e. based on images) map that includes a hill shading option. Note that the *OpenStreetMap* hill shading does not cover the whole globe.



**Picture above:** View at an Italian airport using *OpenStreetMap* theme and hill shading.

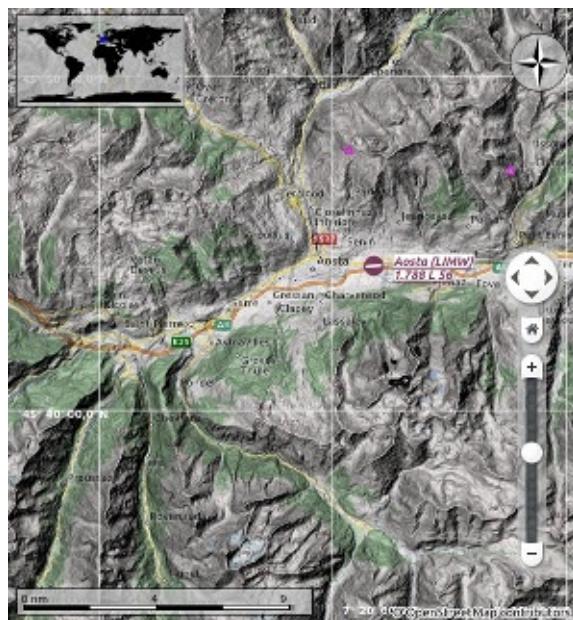
### OpenMapSurfer

The [OSM Roads](#) layer provided by [Heidelberg University](#). This theme includes optional hill shading which is available worldwide.

Note that the hill shading option of this map is marked experimental.

Map data for this map is provided by © OpenStreetMap contributors, rendering by GIScience Research Group @ Heidelberg University and map styling by Maxim Rylow.

SRTM; ASTER GDEM is a product of METI and NASA.

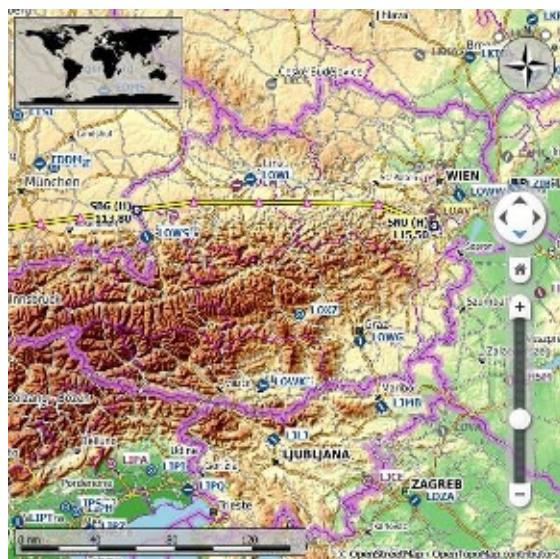


*Picture above:* View at an Italian airport using the OpenMapSurfer theme and hill shading.

### OpenTopoMap

An online raster map that mimics a topographic map. Includes hill shading and elevation contour lines at lower zoom distances.

The tiles for this map are provided by [OpenTopoMap](#).



*Picture above:* View at the eastern Alps using OpenTopoMap theme. A flight plan is shown north of the Alps.

### Stamen Terrain

A terrain map featuring hill shading and natural vegetation colors. The hill shading is available worldwide.

Map tiles by [Stamen Design](#), under [CC BY 3.0](#). Data by [OpenStreetMap](#), under [ODbL](#).



**Picture above:** View showing Stamen Terrain theme.

## **CARTO Light (New in version 1.4.4)**

A very bright map called *Positron* which allows to concentrate on the aviation features on the map display. The map includes the same hill shading option as the *OpenStreetMap*.

Map tiles and style by [CARTO](#). Data by [OpenStreetMap](#), under [ODbL](#).

**CARTO Dark (New in version 1.4.4)**

A dark map called *Dark Matter*. The map includes the same hill shading option as the *OpenStreetMap*.

Map tiles and style by [CARTO](#). Data by [OpenStreetMap](#), under [ODbL](#).

## Simple (Offline)

This is a political map using colored country polygons. Boundaries and water bodies are depicted coarse. The map included in *Little Navmap* has an option to display city and country names.

## Plain (Offline)

A very simple map. The map is included in *Little Navmap* and has an option to display city and country names. Boundaries and water bodies are depicted coarse.

## Atlas (Offline)

A very simple map including coarse hill shading and land colors. The map is included in *Little Navmap* and has an option to display city and country names. Boundaries and water bodies are depicted coarse.

## Airsaces



## Show Airspaces

Allows to enable or disable the display of all airspaces with one click. Use the menu items below this one or the toolbar buttons to display or hide the various airspace types.

The airspaces toolbar contains buttons each having a drop down menu that allows to configure the airspace display like showing or hiding certain airspace types. Each drop down menu also has a `All` and `None` entry to check or deselect all types in the menu.

**ICAO Airspaces**

Allows selection of Class A to Class E airspaces.

**FIR Airspaces**

Allows selection of the Class F and Class G airspaces or flight information regions.

**Restricted Airspaces**

Show or hide MOA (military operations area), restricted, prohibited and danger airspaces.

**Special Airspaces**

Show or hide warning, alert and training airspaces.

**Other Airspaces**

Show or hide center, tower, mode C and other airspaces.

**Airspace Altitude Limitations**

Allows filtering of the airspace display by altitude. Either below or above 10,000 ft or 18,000 ft or only airspaces intersecting with the flight plan altitude.

**Force Show Addon Airports**

Add-on airports are always shown independent of the other airport map settings if this option is selected. This allows viewing only add-on airports by checking this option and disabling the display of hard, soft and empty airports.

**Show Airports with hard Runways**

Show airports that have at least one runway with a hard surface.

**Show Airports with soft Runways**

Show airports that have only soft surfaced runways or only water runways. This type of airport might be hidden on the map depending on zoom distance.

**Show empty Airports**

Shows empty airports. This button or menu item might not be visible depending on settings in the `Options` dialog on the `Map Display` tab. The status of this button is combined with the other airport buttons. This means, for example: You have to enable soft surfaced airport display and empty airports to see empty airports having only soft runways.

An [empty airport](#) is defined as one which has neither [parking](#) nor [taxiways](#) nor [aprons](#) and is not an add-on. These airports are treated differently in *Little Navmap* since they are the most boring of all default airports. Empty airports are drawn gray and behind all other airports on the map.

Airports having only water runways are excluded from this definition to avoid unintentional hiding.



### Show VOR Stations



### Show NDB Stations



### Show Waypoints



### Show ILS Feathers



### Show Jet Airways



### Show Victor Airways

Shows or hides these facilities or navaids on the map. Navaids might be hidden on the map depending on zoom distance.



### Show Flight Plan

Shows or hides the flight plan. The flight plan is shown independent of the zoom distance.



### Show Missed Approaches

Shows or hides the missed approaches of the current flight plan. This does not affect the preview in the search tab [Procedures](#).

**Note that this function changes the active flight plan leg sequencing:** Sequencing the active leg will stop if the destination is reached and missed approaches are not displayed. Otherwise sequencing will continue with the missed approach and the simulator aircraft progress will show the remaining distance to the end of the missed instead.



### Show Aircraft

Shows the user aircraft and keeps it centered on them map if connected to the simulator. The user aircraft is always shown independent of the zoom distance.

A click on the user aircraft shows more information in the [Simulator Aircraft](#) dock window.

The aircraft centering will be switched off when using one of the following functions:

- Double click into a table view or map display to zoom to an airport or a [navaid](#).
- Context menu item [Show on map](#).
- [Goto Home](#) OR [Goto Center for Distance Search](#).
- [Map link in Information](#) dock window.
- [Show Flight Plan](#). Either manually in a menu item or after loading.
- Centering a Google Earth KML/KMZ file after loading

This allows a quick inspection of an airport or [navaid](#) during flight. To display the aircraft again use [Map Position Back](#) and enable [Show Aircraft](#) again.



## Show Aircraft Trail

Shows the user aircraft trail. The trail is always shown independent of the zoom distance. It is saved and will be reloaded on program startup.

The trail is deleted when connecting to a flight simulator or it can be deleted manually by selecting `Main Menu -> Map -> Delete Aircraft Trail`. The trail is also deleted when the user aircraft jumps over large distance when assigning a new airport, for example.

The size of the trail is limited for performance reasons. Points will be removed from the beginning when it gets too long.



## Show AI and Multiplayer Aircraft or Ships

Shows AI and multiplayer aircraft or ships on the map. Multiplayer vehicles can be displayed from e.g. FSCloud, VATSIM or Steam sessions.

Note that ship traffic is not available and AI aircraft information is limited in X-Plane.

A click on the AI aircraft or ship shows more information in the `Simulator Aircraft` dock window in the tab `AI / Multiplayer`.

The displayed vehicles are limited by the used multiplayer system. Multiplayer aircraft will disappear depending on distance to user aircraft. For AI in [FSX](#) or [P3D](#) this is currently about 100 nautical miles or around 200 kilometers.

Smaller ships are only generated by the simulator within a small radius around the user aircraft.

*Little Navmap* limits the display of AI vehicles depending on size. Zoom close to see small aircraft or boats.

On the lowest zoom distance all aircraft and ships are drawn to scale on the map.



## Show Map Grid

Shows a latitude/longitude grid as well as the [meridian](#) and [anti meridian](#) (near the date line) on the map.



## Show Country and City Names

Show county, city and other points of interest. Availability of these options depends on the selected map theme. See [Theme](#).



## Show Hillshading

Shows hill shading on the map. Availability of these options depends on the selected map theme. See [Theme](#).

## Scenery Library Menu

### Flight Simulators

One menu item is created for each Flight Simulator installation or database found. These menu items allow switching of databases on the fly. The menu item is hidden if only one Flight Simulator was found.

**You have to set the base path to the X-Plane directory in the `Load Scenery Library Dialog` first to enable the X-Plane menu item.**

This menu is synchronized with simulator selection in the [Load Scenery Library Dialog](#). Once a database is successfully loaded, the display, flight plan and search will switch over to the newly loaded simulator data.

Note that the program does not keep you from using a X-Plane scenery database while being connected to FSX/Prepar3D or vice versa. You will get unwanted effects like wrong weather information if using such a setup.

The program might change a loaded flight plan if you switch between different databases. This can happen if a departure position is set in the plan which does not exist in the other database. Click `New Flight Plan` before switching to avoid this.

## Show Database Files

This opens *Little Navmap*'s database directory in a file manager. See [Running without Flight Simulator Installation](#) for more information on copying database files between different computers. This allows *Little Navmap* to be run on a remote computer (e.g. Windows, Mac or Linux) using the same database that was created on the computer running the flight simulator.



### Load Scenery Library

Opens the `Load Scenery Library` dialog. See [Load Scenery Library Dialog](#) for more information. This menu item is disabled if no flight simulator installations are found.



### Copy Airspaces to X-Plane Database

This allows to copy airspace information from a [FSX](#) or [P3D](#) database to a X-Plane database. This is needed since X-Plane comes with very limited airspace information.

You have to switch to a [FSX](#) or [P3D](#) simulator database first to enable this menu item.

The airspace information is deleted when reloading the X-Plane database. Therefore you have to copy the airspaces again after reloading.

## Tools Menu



### Flight Simulator Connection

Opens the `Connect` dialog allowing *Little Navmap* to connect directly to a Flight Simulator, the *Little Xpconnect X-Plane* plugin, or remotely using the [Little Navconnect](#) agent. See [Connecting to a Flight Simulator](#) for more information.

### Reset all Messages

This will re-enable all dialogs that were disabled by selecting `Do not show this dialog again` or similar messages.



### Options

Opens the [Options dialog](#).

## Window Menu

### Map Overlays

Allows hiding of the floating map overlays, like the overview on the top left or the compass on the top right corner of the map window.



### Search



## Flight Plan



## Information



## Flight Plan Elevation Profile



## Simulator Aircraft



## Legend

Opens or closes these dock windows. The map dock window cannot be closed.

## Main Toolbar, Map Toolbar, Map Airspaces Toolbar, Map Options Toolbar, Flight Plan Toolbar, Dock Window Toolbar, Statusbar

Shows or hides these toolbars and the statusbar.

## Reset Window Layout

Resets the main window layout back to default. This involves visibility, position and state of all dock windows as well as the toolbars. This function can be helpful if a dock window gets lost on multi monitor setups.

## Help Menu



### Contents (Online)

Shows the online user manual in the default web browser.



### Contents (Offline, PDF)

Shows the included PDF user manual in the default PDF viewer.



### NavMap Legend

Shows the navigation related map legend in the `Legend` dock window. You can also access the legend here: [Navmap Legend](#).



### Map Legend for current Map Theme

Shows the map theme dependent base legend in the `Legend` dock window. Note that the legend is not available for all map themes.



### About Little Navmap

Shows version and revision number for *Little Navmap*, also contains links to the database directory, configuration file, log file and the author's e-mail address.



## About Marble

Information about the [Marble widget](#) that is used to download and show the maps.



## About Qt

Information about the [Qt application framework](#) that is used by *Little Navmap*.



## Donate for this Program

Opens the donation web page in your default browser.

If you would like to show your appreciation you can donate there using PayPal.

Donations are purely optional but greatly appreciated.



## Check for Updates

Allows to manually check for updates. This will also show updates that were recently ignored by pressing the `Ignore this update` on the notification dialog.

See [Checking for Updates](#) for more information.

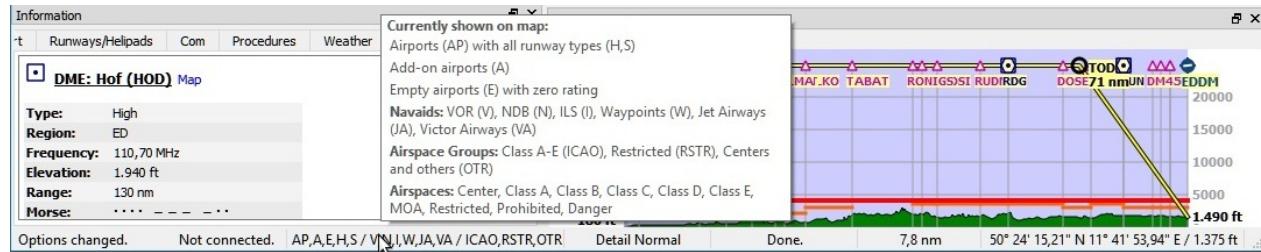
# Statusbar

The statusbar shows various indications (from left to right):

- Last action or short help to explain a menu item or toolbar button.
- Indicator that shows airport types, airspaces, navaids or AI vehicles currently visible on the map. The tooltip gives more details.
  - A red warning message `Too many objects` will be shown if too many objects are displayed on the map due to too high a detail level. The map display will be incomplete if this happens.
  - A red `database empty` message will be shown if the currently selected database has no content and needs to be loaded.
- Connection status for a local or remote connection. The tooltip gives more details about the status like the hostname for remote connections.
  - `Connecting...` : The program is trying to establish a connection which was initiated either manually or automatically.
  - `Connected` : A connection was established.
  - `Disconnected` : The simulator or *Little Navconnect* exited.
- Map detail level. Range is -5 for few details to +5 for most details.
- Online map download progress indicator. This shows the state of the current map download. The text is prefixed with a red `offline`. indication if offline mode is enabled.
  - `Done.` : All map data loaded successfully.
  - `Waiting for Data ...` : Map data is missing in the cache and was requested. Now waiting for reply.
  - `Waiting for Update ...` : Map data is already loaded but expired after two weeks. Waiting for new data after requesting an update.
  - `Incomplete.` : Download failed. Note that the progress indicator can look like it is stuck in the message `Waiting`

for Data . . . if no hill shading is available for a OpenStreetMap region or if you zoom in too close when using certain online maps.

- Zoom distance (viewpoint to earth surface) in nautical miles or kilometers.
- Cursor position on map in degrees/minutes/seconds or decimal degrees latitude and longitude depending on selected unit in the dialog Options . Also shows the ground elevation below the cursor after a short delay if the GLOBE offline elevation data is selected.



**Picture above:** Status bar with message about the last action on the left side ( Options changed. ), the connection status and a tooltip that indicates what is currently shown on the map. All map features are shown. The map detail level is unchanged and the map coordinates are shown on the bottom right. Altitude at cursor is shown too since offline elevation data is installed. The online map download progress indicator shows Done. indicating all map tiles were downloaded. Zoom distance is 7.8 nautical miles.

# Map Display

See the [Nav Map Legend](#) for details about the various symbols shown by the map.

## Moving

Use click and drag to move the map and the mouse wheel to zoom in or out. You can also use the overlay buttons on the right side of the map.

Alternatively use the keyboard to move around the map:

- Cursor keys: Scroll the map
- + and - : Zoom in and out
- Alt+Left and Alt+Right : Go forward or backward in the map position history
- Ctrl++ and Ctrl+- : Increase or decrease details
- Ctrl+Home : Go to home postion
- Ctrl+End : Go to center for distance search

Do not forget to activate the map window by clicking into it before using any keys for movement.

## Mouse Clicks

A single click on an airport, [navaid](#), airway line or airspace shows details in the [Information](#) dock window.

A single click on a user aircraft, AI aircraft or multiplayer aircraft shows details in the [Simulator Aircraft](#) dock window.

A double click zooms in showing either the airport diagram or the [navaid](#) closely and also shows details in the [Information](#) dock window. The same applies for all AI or multiplayer aircraft or ships.

The double and single click functionality does not work for flight plan waypoints or airports if the flight plan edit mode is enabled. The edit mode can be disabled using the toolbar or [Main Menu](#) -> [Flight Plan](#) -> [Edit Flight Plan on Map](#).

The mouse click sensitivity can be adjusted in the [Options](#) dialog on the [Map Display](#) tab.

## Aircraft

The user aircraft and AI or multiplayer aircraft or ships will be shown on the map if the program is connected to a flight simulator. Color indicates user or AI or multiplayer vehicle and the symbol shape indicates if the aircraft is an piston/turboprop, jet, helicopter or a ship. The symbol outline changes to gray if an aircraft is on ground.

Little Navmap limits the display of AI vehicles depending on size. Zoom close to see small aircraft or boats

AI and multiplayer aircraft on ground are shown only on small zoom distances to avoid cluttered airports. This means that an AI aircraft can disappear from the map when landing on an airport.

On the lowest zoom distance all aircraft are drawn to scale as are the [parking](#) spots which means you can easily check if your aircraft fits on an apron, [parking](#) spot or taxiway.

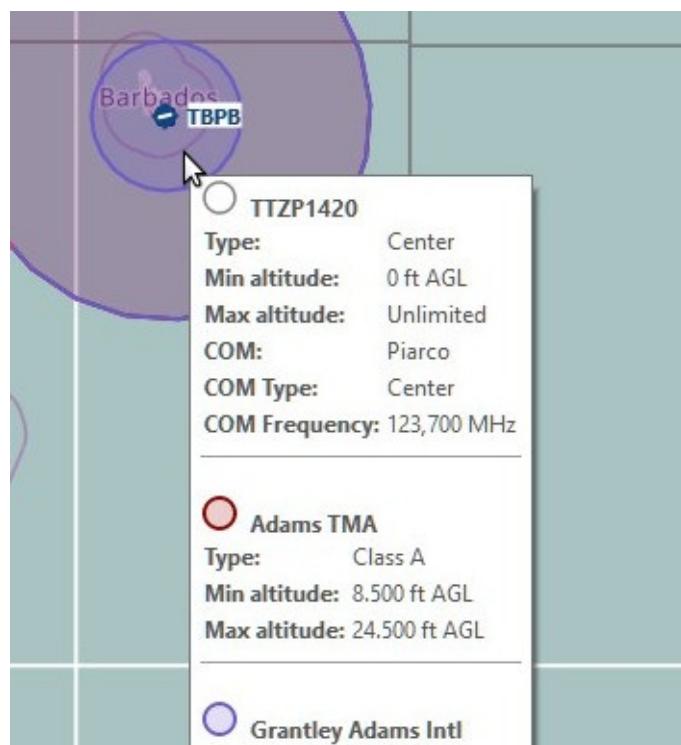
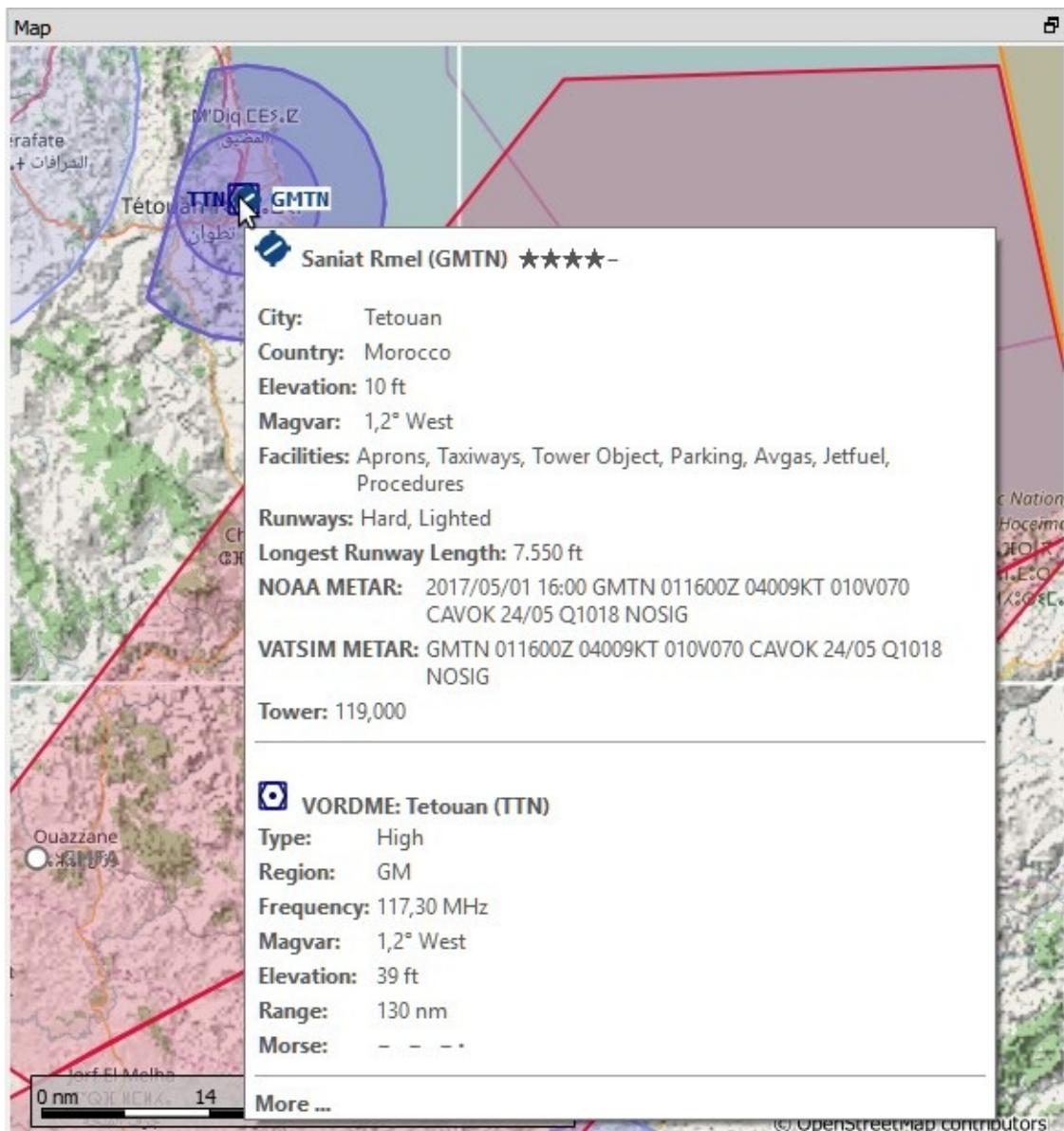
A yellow wind arrow and labels for the situation around the user aircraft can be displayed on the top center of the map. The displayed labels for aircraft can be configured in the dialog [Options](#) on tab [Map Display](#). No labels are shown for ship traffic.

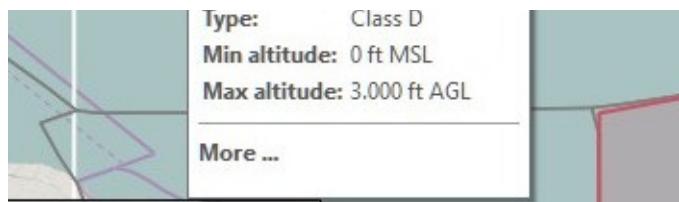
See the [Nav Map Legend](#) for details about the aircraft type.

## Tooltips

Hovering the mouse over the map will show tooltips for all map objects including airports, [VOR](#), [NDB](#), airways, [parking](#), fuel box, towers, aircraft and ships. The tooltip is truncated and shows a message [More...](#) if it gets too long. In that case reduce details or zoom in closer.

The sensitivity for the tooltip display can be adjusted in the [options](#) dialog on the [Map Display](#) tab.





**Pictures above:** Tooltip with information for an airport and a [VOR](#) and a tooltip with information about airspaces.

## Highlights

Airports or navaids that are selected in the flight plan table or in the search result table are highlighted on the map with a green/black or a yellow/black ring respectively.

Waypoints that are selected in the [procedure](#) preview are highlighted with a blue/black ring.

These highlight rings provide all functionality of visible map objects, even if the objects are not shown at the current zoom distance (ring is empty). This allows double click for zoom in, single click for information dock window and all context menu entries.

You can use the button [Clear Selection](#)  on top of the flight plan and search windows to remove any map highlights.

## Airport Diagram

The display will change from a single icon to an airport diagram if you zoom in deep enough to an airport. The diagram shows all taxiways, [parking](#) positions, gates, runways and more.

The airport diagram provides more information through tooltips for [parking](#) and tower positions. A right click on a [parking](#) position opens the context menu and allows to select the [start position](#) for flight plan departure.

See the [Nav Map Legend](#) for details about the airport diagram.



**Picture above:** High level view of the airport diagram of EDDH.



**Picture above:** Detailed view of the airport diagram. Shows blue gates on the right and a few green general aviation ramp parking on the left. Long displaced threshold of runway 33 is visible. Dashed yellow lines indicate taxi paths.

## Map Context Menu

The map context menu can be activated using right click or the menu key. Menu items are enabled or disabled depending on selected object and some menu items contain the name of the selected map object for clarification.

The map context menu contains the following menu entries.



### Show Information

Shows detailed information in the [Information](#) dock window for the nearest airport, one or more airways, one or more airspaces or all navaids near the cursor.

See the [Information Dock Window](#) for details.



### Show Procedures

Opens the [procedure](#) search tab of the search dock window and display all procedures for the airport.

See [Procedure Search](#) for more information.



### Measure GC Distance from here

Starts a measurement line on the first click. Second click ends measuring and keeps the line. All measurement lines are saved and will be restored on next start up.

You can use the keyboard, mouse wheel or the map overlays to scroll and zoom while dragging a line.

Right click, pressing the escape key or any click outside of the map window cancels the measurement line editing.

Measurement lines use nautical miles, kilometers or statute miles as unit. Feet or meter will be added as unit if the lines are short enough. This allows to measure e.g. takeoff distance for crossing takeoffs.

A great circle gives the shortest distance from point to point on earth but does not use a constant course. For that reason the measurement line will show two course values. One for the start and one for the end position.

Course is always indicated in degrees true which is indicated by the suffix  $^{\circ}\text{T}$ . Additional information like ident or frequency will be added to the line if the measurement starts at a [navaid](#) or an airport.

The width of distance measurement lines can be changed in the dialog [Options](#) on the tab [Map Display](#).

See the [Nav Map Legend](#) for details on measurement lines.

## **Measure Rhumb Distance from here**

A rhumb line is a line of constant course and used between the waypoints of an airway or when approaching a [VOR](#) or [NDB](#) station. Distance between points is slightly longer than the great circle route.

The course for a rhumb line is indicated in degrees magnetic and true ( $^{\circ}\text{M}$ ,  $^{\circ}\text{T}$  or  $^{\circ}\text{M/T}$  if both values are equal).

The magnetic declination to calculate the magnetic course will be taken from the global `magdec.bgl` file at the origin of the measurement.

The magnetic declination of an airport or [navaid](#) will be used if the measurement starts at such a point. Additional information like ident and frequency will be added to the line in this case as well.

See [Magnetic Declination](#) for remarks on that topic.

## **Remove Distance measurement**

This menu item is active if you right click at the end of a distance measurement line (small cross). Removes only the selected line.

## **Show Range Rings**

Shows multiple red range rings around the clicked position. The number and distance of the range rings can be changed in the [Options](#) dialog on the [Map Display](#) tab. A label indicates the radius of each ring in nautical miles.

The width of all range rings can be changed in the dialog [Options](#) on the tab [Map Display](#).

## **Show Navaid range**

Shows a ring around the clicked radio [navaid](#) ([VOR](#) or [NDB](#)) indicating the [navaid](#)'s range. A label shows ident and frequency and the ring color indicates the [navaid](#) type.

## **Remove Range Ring**

Menu item is active if you right click at the center point of a range ring (small circle). Removes the rings from the map.

## **Remove all Range Rings and Distance measurements**

Removes all rings and distance measurement lines from the map.



## **Set as Flight Plan Departure**

This is active if the click is at an airport, an airport [parking](#) position or a fuel box. It will either replace the current flight plan departure or add a new departure if the flight plan is empty.

The default runway will be used as starting position if the clicked object is an airport. The airport and [parking](#) position will replace both the current departure and [start position](#) if a [parking](#) position is clicked within an airport diagram.



## **Set as Flight Plan Destination**

This menu item is active if the click is at an airport. It will either replace the flight plan destination or add the airport if the flight plan is empty.



## **Add Position to Flight Plan**

Inserts the clicked object into the nearest flight plan leg. The object will be added before departure or after destination if the clicked position is near the flight plan end points.

The name of the [navaid](#) or airport is shown in the menu item.

A user defined position is added to the flight plan if no airport or [navaid](#) is near the clicked position.



## **Append Position to Flight Plan**

Same as [Add Position to Flight Plan](#) but will always append the selected object or position after the destination or last waypoint of the flight plan.



## **Delete from Flight Plan**

Deletes the clicked airport, [navaid](#) or user position from the flight plan.



## **Edit Name of User Waypoint**

Allows to change the name of a user defined waypoint. The length of the name is limited to 10 characters.



## **Show in Search**

Shows the nearest airport or [navaid](#) in the search dialog. The current search parameters are reset.



## **Set Center for Distance Search**

Sets the center point for the distance search function. See [Distance search](#). The center for the distance search is highlighted by a symbol.



## **Set Home**

Sets currently visible map view as home view. The center of the home area is highlighted by a symbol.



## Legend

All speeds are per default in knots, distances in nautical miles, altitude in feet. The units can be changed to imperial or metric in the dialog `Options` on the tab `Units`.

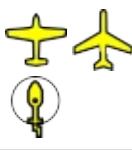
Colors, size and text labels of some map elements can be changed in the dialog `Options` on the tab `Map Display`. This legend shows the default values.

Heading and course are suffixed with `°T` for true course or `°M` for magnetic course.

## Map Marks

Symbol	Description
	Center of the home position.
	Center point that will be used for distance searches.
	Flight plan with distance, direction and magnetic course at each leg.
	Flight plan <b>procedure</b> leg with the same information as above.
	Active flight plan leg
	Flight plan departure position on airport. Either <b>parking</b> , fuel box, helipad, water or runway.
	Top of descent point with distance to destination.
	Range rings labeled with distance.
	VOR or NDB range rings labeled with ident and frequency. Color indicates <b>Navaid</b> type.
	Great <b>circle</b> distance and course measurement line indicating length and true heading at start and destination. The two heading values will be equal for small distances. For shorter distances length is also shown in feet or meters.
	Rhumb <b>line</b> of equal bearing distance measurement indicating distance and true heading. Rhumb lines are used to approach a <b>VOR</b> or <b>NDB</b> or travel along airways. For shorter distances length is also shown in feet.
	Measurement lines starting from an airport or <b>navaid</b> have the same color and additional ident and frequency labels. Course for rhumb lines will be shown in magnetic if the <b>navaid</b> has a magnetic variation attribute.
	A highlighted airport or <b>navaid</b> selected in the search result table.
	A highlighted airport or <b>navaid</b> selected in the flight plan table.
	Highlighted positions of a <b>procedure</b> leg in the preview. Small circle show <i>from</i> and large circle <i>to</i> position.
	Thin circle shows the recommended or related <b>navaid</b> of a <b>procedure</b> leg. This can be a <b>VORDME</b> for a <b>DME</b> arc approach leg for example.

## Aircraft and Ships

Symbol	Description
	Current user vehicle if connected to the flight simulator. Labels vary and can be customized in <a href="#">Options</a> on the tab <a href="#">Map Display</a> . The user aircraft depends on selected aircraft (jet, piston/turboprop or helicopter). Optionally a black needle protruding from the nose can show the current track.
	User aircraft or ship on ground
	Needle showing the current track of the aircraft. Aircraft nose shows heading.
	User aircraft trail if connected to the flight simulator.
	Wind around the user aircraft with direction in degrees magnetic and speed.
	AI or multiplayer aircraft. Labels vary and can be customized in <a href="#">Options</a> on the tab <a href="#">Map Display</a> . The symbol depends on aircraft type (jet, piston/turboprop, helicopter or ship).

## Airports

Airports having control towers are shown in dark blue others in magenta. [Add-on airport](#) names and idents are shown italic and underlined. Airports that are part of the flight plan have a light yellow text background.

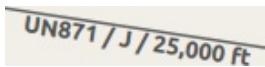
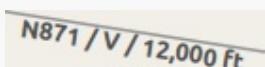
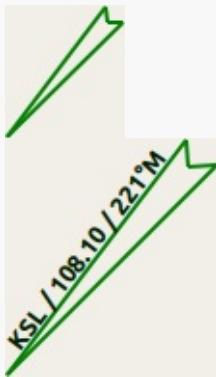
The symbol is shown smaller if an airport has no runways. This is the case for some add-on airports that use another technique like photo scenery to display runways.

Symbol	Description
	Airports with hard surface runways longer than 8,000 ft or 2,400 meters. All runways longer than 4,000 ft or about 1,200 meters are shown. Only for lower zoom distances.
	Airports with hard surface runways. White line shows heading of longest runway.
	Airports with soft surface runways.
	Empty airports shown in gray. No taxiways, no parking spots and no aprons.
	Seaplane base having only water runways.
	Military airport.
	Heliport having only helipads and no runways.
	Abandoned airport. All runways are closed.
	Airports that have fuel available.
 Dresden (EDDC) ATIS 118.875 755ft L 8214ft	Airport label showing name, ident, ATIS frequency, elevation, lighted runways ( L ) and length of longest runway. The text labels for an airport can be changed in the dialog Options on the tab Map Display .

## Navaids

Navaids that are part of the flight plan have a light yellow text background.

Symbol	Description
	VOR DME including ident, type (High, Low or Terminal) and frequency. Compass rose shows magnetic variation on lower zoom distances.
	VOR including ident, type and frequency.
	DME including ident, type and frequency.
	TACAN including ident, type (High, Low or Terminal) and channel. Compass rose shows magnetic variation on lower zoom distances.
	VORTAC including ident, type (High, Low or Terminal) and frequency. Compass rose

	VORTAC including ident, type (High, Low or Terminal) and frequency. Compass rose shows magnetic variation on lower zoom distances.
	NDB including ident, type (HH, H, MH or CL - compass locator) and frequency.
	Waypoint with name.
	User defined waypoint with name.
	Invalid airport, waypoint, VOR or NDB that is part of the flight plan but could not be found in the Scenery Database.
	Marker with type and heading indicated by lens shape.
	Jet airway with label showing name, type (Jet or Both), minimum and maximum altitude. Text depends on zoom distance. A preceding arrow will show the allowed direction if the airway is one-way.
	Victor airway with label showing name, type (Victor or Both), minimum and maximum altitude. Text depends on zoom distance. A preceding arrow will show the allowed direction if the airway is one-way.
	ILS with glideslope. Label shows ident, frequency, magnetic heading, glideslope pitch and DME indication if available.
	Localizer. Label shows ident, frequency, magnetic heading and DME indication if available.

## Procedures

See chapter [Procedures](#) for more detailed information on all the legs.

Symbol	Description
A blue line with arrows at both ends, labeled "3nm/271°M" and "C127 2000ft".	SID, STAR, approach or transition leg in preview with distance, direction and magnetic course at each leg.
An orange line with arrows at both ends, labeled "3nm/271°M" and "C127 2000ft".	SID, STAR, approach or transition leg which is part of the flight plan.
A blue dashed line with arrows at both ends, labeled "2.2nm/266°M".	Missed approach leg in preview.
An orange dashed line with arrows at both ends, labeled "2.2nm/266°M".	Missed approach leg which is a part of the flight plan.
A gray yellow filled circle with "Altitude" and "A1742ft" text.	Gray yellow filled circle indicates a procedure point which is not a navaid but defined by course and/or distance from a navaid, an altitude restriction or manual termination.
A black circle with "ME023" and "B3000ft" text.	A black circle indicates an overfly waypoint. Can be a procedure point or a navaid.
A yellow circle with "Manual" text.	Fly a heading, track or a hold until manually terminated by ATC.
A blue line with arrows at both ends, labeled "Intercept Leg".	Intercept the next approach leg at a course of about 45 degrees.
A yellow circle with "Altitude" and "A2000ft" text.	Procedure leg that is terminated when reaching the given altitude.
A yellow circle with "WIK/8nm/293°M" and "A1800ft" text.	A fix defined by a course or heading and distance to a navaid.
A yellow circle with "Intercept WIK/7nm" text.	This fix is defined by a heading or track which is terminated by reaching a DME distance.
A blue line with arrows at both ends, labeled "Intercept Course to Fix".	Intercept a course to the next fix at an angle of about 45 degrees.

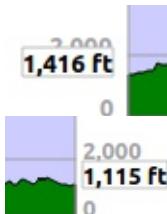
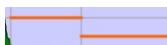
## Airport Diagram

Runway, taxiway, helipad and apron colors indicate surface type. White is used for an unknown or invalid surface type given by an add-on developer.

Symbol	Description
A dark gray rectangle with "5,501 x 98 / L / Asphalt" text.	Runway with length, width, light indicator ( L ) and surface type.
A gray rectangle with "249 °M" and "25L" text.	Runway end with ident and magnetic heading.
A dark gray rectangle with "264 °M" and "26" text.	Displaced threshold. Do not use for landing.
A green rectangle with "05" text.	Overrun area. Do not use for taxi, takeoff or landing.

	Blast pad. Do not use for taxi, takeoff or landing.
	Taxiway with name and center line.
	Closed taxiway.
	Semi transparent dotted aprons and taxiways indicate that no surface is drawn. It might use a photo texture or simply the default background.
	Tower. Red if a tower frequency is available. Otherwise just view position.
	Fuel
	GA ramp with <a href="#">parking</a> number and heading tick mark.
	Gate with number and heading tick mark. Second ring indicates availability of jetway.
	Cargo ramp
	Military combat <a href="#">parking</a> or cargo ramp.
	Helipads. Red text indicates medical helipad. Color indicates surface.

## Elevation Profile Legend

Symbol	Description
 1,416 ft 0 2,000 1,115 ft 0	Ground with departure elevation on the left and destination airport elevation on the right.
 7,000 ft 6,000 LSZH	Flight plan altitude.
 TOD 42 nm	Top of descent with distance to destination.
 10,500 ft	Minimum safe altitude for flight plan. This is altitude plus 1000 feet rounded up to the next 500 ft. The 1000 feet buffer can be changed in the dialog <a href="#">options</a> on the tab <a href="#">Flight Plan</a>
	Minimum safe altitude for a flight plan segment. The same rules apply as to the minimum safe altitude for flight plan.
 11,738 ft 1,943 fpm	User aircraft if connected to the simulator. Labels show actual altitude and climb/sink rate.
	User aircraft trail if connected to the flight simulator.

# Map Flight Plan Editing

The flight plan drag and drop editing mode is switched on per default but can be disabled using the toolbar or [Main Menu -> Flight Plan -> Edit Flight Plan on Map](#).

You can use the keyboard, the mouse wheel or the map overlays to scroll and zoom while editing the route.

Note that the flight plan drag and drop editing is based on the assumption that a direct connection between departure and destination already exists.

Always select departure and destination first if you would like to build your flight plan manually. This will connect both points with a great circle line. Based on this line you can start to add navaids to your flight plan.

Note that selecting airways is not possible.



The cursor will change into a cross if a new [navaid](#) can be added to a leg. A cursor will be shown if a present [navaid](#) can be replaced by another one or if a user position can be moved.

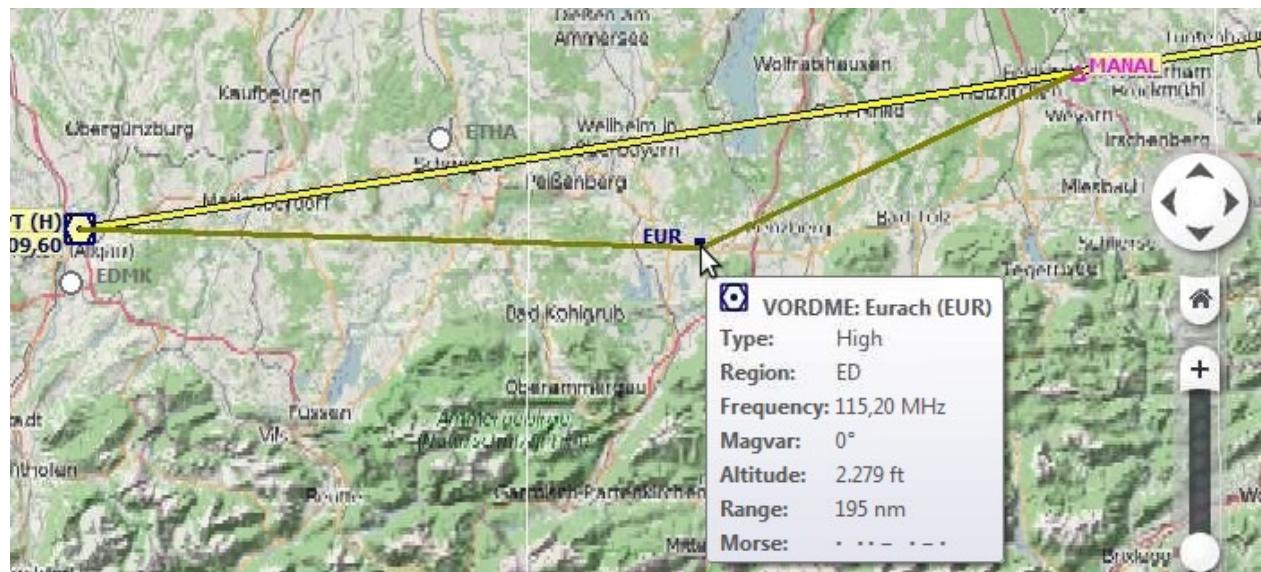
The following functionality is available:

- **Click on a flight plan leg:** Starts editing and adds a new waypoint depending on where the next click is done:
  - **On a single airport and navaid:** Object is inserted into the flight plan segment.
  - **On multiple airports or navaids:** A menu pops up that allows you to select the object to be inserted.
  - **No airport and no navaid:** A user defined position is inserted to the flight plan.
- **Click on waypoint:** Starts editing and replaces the clicked waypoint with an object depending on where the next click is done:
  - **On a single airport and navaid:** Object replaces the clicked waypoint.
  - **On multiple airports or navaids:** A menu pops up that allows to select the object that should replace the clicked waypoint.
  - **No airport and no navaid:** A user defined position replaces the waypoint.
- **Click on departure or destination:** Replaces the departure or destination with an object depending on where the next click is done:
  - **On a single airport:** Airport replaces the departure or destination. A default runway is assigned as [start position](#) if the departure is replaced with a new airport.
  - **On a navaid:** Object replaces departure or destination which results in an invalid flight plan. The flight plan can be saved and loaded (a warning will be shown) but is unusable by Flight Simulator.
  - **On multiple airports or navaids:** A menu pops up that allows to select the object that replaces departure or destination.
  - **No airport and no navaid:** A user defined position replaces the waypoint resulting in an invalid flight plan.
- **Right click, pressing the escape key or any click outside of the map window:** Cancel current operation.

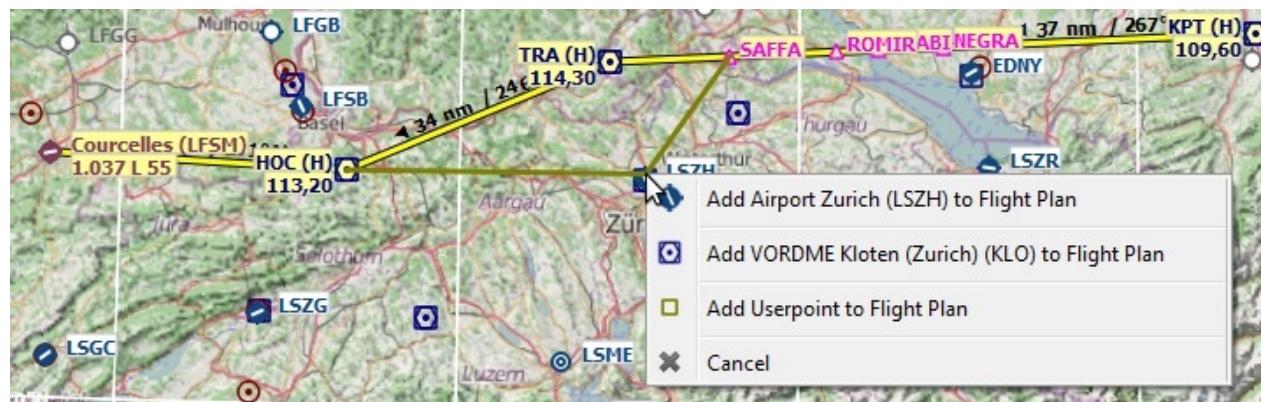
**Limitations if procedures are used:** You can not add navaids in or between procedures neither can you delete [procedure](#) legs. The cursor will not change its shape when you hover over a [procedure](#). The following is not allowed:

- Add a waypoint between departure airport and [SID](#).
- Add a waypoint between [STAR](#) or approach and destination airport.
- Add a waypoint between [STAR](#) and approach or transition.
- Move or remove the first or last waypoint of a [procedure](#).

All departure or destination procedures are removed if the departure or destination airport is moved or replaced. The same applies if waypoints are prepended before or appended after departure or destination.



**Picture above:** Inserting a navaid into a flight plan leg by clicking and moving the leg line. A tool tip for the navaid is shown.



**Picture above:** Replacing VOR TRA in the flight plan with another one by simply clicking and moving the waypoint TRA onto KLO. A selection menu pops up for disambiguation.



# Search Dock Window - Airports and Navaids

The airport and [navaid](#) search tabs contain multiple rows of search filters that can be switched on and off with the drop down menu on the menu button on the top right.

The drop down menu prefixes menu items with a change indicator \* to show that the related filter row has modifications. You can use this to find out why a search does not give the expected results.

**If you do not get the expected results or no results at all use the `Reset Search` menu item or press `Ctrl+R` to clear all search criteria.**

Filters are defined by various controls which are mostly self explaining. Only text filters and the tri-state checkboxes like `Lighted`, `Approach` or `Closed` need a few extra remarks below.

All filters can be used together where all conditions have to be met ( and operator). All filters except the distance search filter are applied immediately. The distance search is applied after a short delay for each change.

A tooltip on the blue help button on the top right shows information about searching.

## Text filters

The standard is to search for entries that start with the entered text.

The placeholder \* stands for any text. Once a \* is included in the term, the standard search (match start of text) is no longer used. In that case you might have to add a \* at the end of the search term as well to get the expected result.

The search is negated (find all entries that do not match) if the first character in a search box is a - .

Note that all of the above does not apply to numeric fields like `Runways: Min` OR `Altitude: Max`.

## Tri state checkboxes

These are used to filter airports by presence of certain facilities or properties.

Below are the states as they are shown in Windows 10:

- **Black Box:** Condition is ignored.
- **Checked:** Condition must match.
- **Empty Box:** Condition must not match.

Colors and look of these checkboxes vary with theme and operation system. So instead of gray another color might be used (red fill on Linux or a - for macOS).

## Distance search

This function allows you to combine all other search options with a simple spatial search.

The checkbox `Distance` has to be selected to enable this search. The result will include only airports or navaids that are within the given minimum and maximum range of nautical miles from the search center. This allows you to quickly search for a destination that is within the range of your aircraft and fulfills other criteria like having lighted runways and fuel.

The center for the distance search is highlighted by a symbol.

To restrict the search further you can select a direction (North, East, South and West).

Check the drop down menu for the change indicator \* and the search fields for any remaining text if the distance search does not give any or unexpected results. Use `Reset Search` in the context menu of the result table or press `ctrl+R` to clear all search criteria.

The screenshot shows a flight planning application with a map of Europe. A large number of yellow circles are overlaid on the map, representing 212 selected airports. The map includes labels for major cities and airport codes. To the right of the map is a search bar with fields for ICAO Code, Airport Name, City, State / Province, and Country. Below the search bar are checkboxes for Rating, Lighted, ILS, Military, Avgas, Addon, Tower, Procedures, Closed, and Jetfuel. There are also dropdowns for Distance (Min: 200 nm, Max: 400 nm) and Any Direction. A table on the right lists the selected airports with columns for Distance (nm), Heading (°T), ICAO, Name, and City. The table contains 17 rows of data.

	Distance nm	Heading °T	ICAO	Name	City
1	241	297	EBAW	Deurne	Antwerp
2	221	292	EBBE	Beauvechain	Beauvechain
3	206	301	EBBL	Kleine Brogel	Kleine Brogel
4	234	293	EBBR	Brussels National	Brussels
5	243	299	EBBT	Brasschaat	Brasschaat
6	228	287	EBCI	Brussels South	Charleroi
7	304	291	EBFN	Koksijde	Koksijde
8	218	284	EBFS	Florennes	Florennes
9	279	289	EBKT	Kortrijk Wevelgem	Kortrijk Wevelg...
10	298	293	EBOS	Oostende	Oostende Brugge
11	302	28	EDAH	Heringsdorf	Heringsdorf
12	233	36	EDAY	Strausberg	Strausberg
13	305	17	EDBH	Barth	Barth
14	222	22	EDBK	Kyritz	Kyritz
15	291	25	EDCA	Anklam	Anklam
16	219	47	EDCD	Cottbus Drewitz	Cottbus Drewitz
17	316	20	EDCG	Bugen	Bugen

**Picture above A complex distance search:** Find all airports within a distance between 200 and 400 nautical miles from Frankfurt (EDDF). Airports should have a rating greater than 0 and should have at least one lighted runway. Military and closed airports are excluded. The resulting airports are highlighted on the map by selecting them in the search result table.

The figure shows a flight planning application interface. On the left is a world map. The main area is a map of New Zealand with several airports marked by yellow circles with blue centers. Labels include Wellington, Christchurch, Dunedin, Invercargill, Oamaru, Queenstown, Timaru, Wigram Air Force Museum, and Westport. A compass rose is in the top right, and a zoom control with a vertical slider is on the right. Below the map is a scale bar from 0 nm to 280 nm. The top right contains search fields for ICAO Code, Airport Name, City, State / Province, and Country, along with checkboxes for Rating, Lighted, ILS, Military, Avgas, Addgn, Tower, Procedures, Closed, and Jetfuel. A table titled "ORBX|FTX\_NZ\*" lists 10 airports with columns for ICAO, Name, City, and State.

	ICAO	Name	City	State
1	NZCH	Christchurch Intl	Christchurch	Canterbury
2	NZDN	Dunedin	Dunedin	Otago
3	NZH	Hokitika	Hokitika	
4	NZNS	Nelson	Nelson	Tasman
5	NZNV	Invercargill	Invercargill	Southland
6	NZOU	Oamaru	Oamaru	Otago
7	NZQN	Queenstown	Queenstown	Otago
8	NZTU	Timaru	Timaru	Canterbury
9	NZWG	Wigram Air Force Museum	Christchurch	Canterbury
10	NZWS	Westport	Westport	West Coast

© OpenStreetMap contributors  
10 of 10 Airports selected, 10 visible.

**Picture above A complex search for scenery:** This example shows how to find specific add-on scenery by using the Scenery Path search field. This shows all airports of the Orbx New Zealand South Island add-on scenery that have lighted runways.

## Search Result Table View

All selected elements in the table view will be highlighted on the map using a black/yellow circle. See [Highlights](#) for more information. Multi selection using `Shift+Click` or `Ctrl+Click` is possible.

## Header

The header of all table views allows the following manipulation:

- Click on the top left corner of the column header:** Select all result rows.
- Click on a column header:** Sort ascending or descending (only for search result tables - not for flight plan table).
- Click and drag on the column header:** Change column order.
- Double click on column border:** Automatically fit column size to content.
- Click and drag on column border:** Change column width.
- Click into the empty space below all rows:** Deselect all entries and remove highlights on the map.

The above applies to all table views in the program and partially also to the tree view of the [procedure](#) search.

The program saves the sort order, column widths and positions until [Reset View](#) is selected in the context menu.

A screenshot of the 'Search' dock window. The 'Airports' tab is selected. The search bar at the top contains 'ICAO Code' and 'Airport Name'. Below the search bar is a dropdown menu with options like 'City', 'State / Province', and 'Country'. The main area is a table with columns: ICAO, Name, City, State, Country, Rating, Elevation ft, Mag. Decl., Tower MHz, Largest Ramp, Largest Gate, Airport country, Runway Length ft, Scenery Paths, and BGL Files. The table lists several airports in Norway, including EN67 Broggerhalvoya, ENAL Vigra, ENAN Andoya, ENAT Alta, ENBL Brønneland, and ENRM Romnes. The table has scroll bars on the right and bottom. A status bar at the bottom left says '1 of 61 Airports selected, 61 visible.'

**Picture above:** Airport search result table. All additional search options are hidden by using the drop down menu of the menu button on the top right.

A screenshot of the 'Search' dock window. The 'Navaids' tab is selected. The search bar at the top contains 'Ident' and 'Name'. Below the search bar is a dropdown menu with options like 'Min Range: 100 nm', 'All Types', 'All VOR/VORTAC/TI', and 'Navaid two-letter code for region'. The main area is a table with columns: ICAO, Navaid Type, Type, Name, Region, Airport ICAO, Frequency kHz/MHz, Channel, Range nm, Mag. Decl., Elevation ft, Scenery Path, and BGL File. The table lists navaids in the ICAO region LI, including AEA, ALB, ALG, ANC, and AVI. The table has scroll bars on the right and bottom. A status bar at the bottom left says '1 of 77 Navaids selected, 77 visible.'

**Picture above:** Navaid search limited to ICAO region [LI](#) (Italy) and VOR, VORTAC and TACAN stations that have a range of more than 100 nautical miles.

## Mouse Clicks

A double click on an entry in the table view shows either an airport diagram or zooms to the [navaid](#). Additionally, details are shown in the [Information](#) dock window. Single click selects an object and highlights it on the map using a black/yellow circle.

## Top Buttons



### Reset Search

Clears search filters and shows all entries again in the search result table view.



### Clear Selection

Deselects all entries in the table and also removes any highlight rings from the map.



## Help

Show a quick help in the tooltip and opens this help chapter in the default browser on click.



## Menu Button

Drop down menu button that allows to hide or show search options.

The drop down menu prefixes menu items with a change indicator  to show that the related filter row has modifications. You can use this to find out why a search does not give the expected results.

## Search Result Table View Context Menu



### Show Information

Same as the [Map Context Menu](#).



### Show Procedures

Opens the [procedure](#) search tab of the search dock window and display all procedures for the airport.

See [Procedure Search](#) for more information.



### Show on Map

Shows either the airport diagram or zooms to the [navaid](#) on the map.



### Filter by Entries including/excluding

Takes the text of the field under the cursor and sets the search filter for an including or an excluding search. This is only enabled for text columns.



### Reset Search

Clears search filters and shows all entries again in the search result table view.



### Show All

The table view does not show all entries initially for performance reasons. This menu item allows to load and show the whole search result. The view switches back to the limited number of entries after a search filter is modified or the sort order is changed. The number of all, visible and selected entries is shown at the bottom of the tab.

Be aware that showing all navaids and airports can take some time especially if they are highlighted on the map when selecting all in the search result. The program does not crash but needs a few seconds to highlight everything on the map.



### Show Range Rings



**Show Navaid range**



**Remove all Range Rings and Distance measurements**



**Set as Flight Plan Departure**



**Set as Flight Plan Destination**



**Add Position to Flight Plan**



**Append Position to Flight Plan**

Same as the [Map Context Menu](#).



**Copy**

Copies the selected entries in CSV format into the clipboard. This will consider changes to the table view like column order and sort order. The CSV includes a header line.

**Select All**

Selects all visible entries. To select all available entries the function `Show All` has to be used first.



**Clear Selection**

Deselects all entries in the table and also removes the highlight rings from the map.



**Reset View**

Resets the sort order, the column order and column widths back to default.



**Set Center for Distance Search**

Same as the [Map Context Menu](#).



## Search Dock Window - Procedures

The tab **Procedures** allows previewing and adding approach and departure procedures to the flight plan. Procedures of a selected airport are arranged in a tree which indicates the dependencies between approaches and transitions.

Note that the **SID** and **STAR** names are limited to 5 characters in **FSX** and **P3D** due to a limitation in the **BGL** file format. Names are slightly modified therefore.

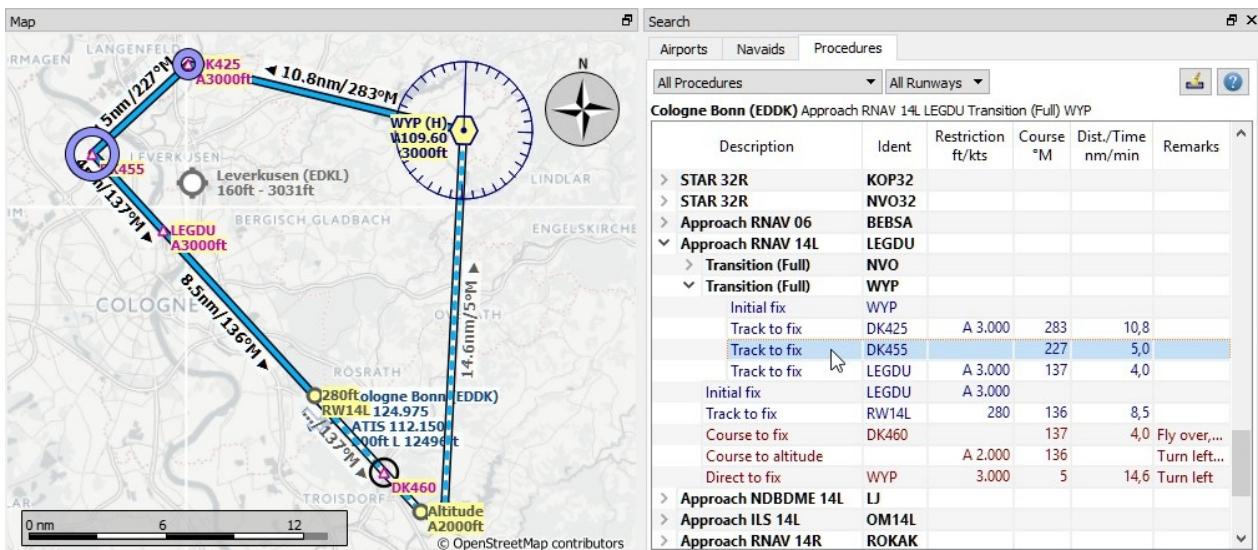
See the [Procedures chapter of this manual for more details](#).

**Procedure** legs are shown when a **procedure** node is expanded in the tree. Procedures can be filtered by runway and type.

Right click on a **procedure** to get more options in the context menu. This allows centering of the map or adding the **procedure** to your flight plan.

Use the context menu of the flight plan table to remove procedures like any other waypoint. See [Delete Selected Legs](#) or [Procedure](#).

**Procedure** legs are highlighted in red if one or more navaids could not be resolved. A warning dialog will be displayed if you try to add this **procedure** to a flight plan.



**Picture above:** Showing a transition and a RNAV approach. Start and endpoint of a transition leg are highlighted on the map.

## Procedure Tree

Legs are shown in dark blue while missed approach legs are shown in dark red color.

Bold red text indicates an error in the leg. The **procedure** is incomplete and should not be used in a flight plan.

- **Description** : Either description of the **procedure** or flight instruction for **procedure** legs.
- **Course °M** : Magnetic course for a leg.
- **Dist./Time** : Distance of flying time for a leg. Holds can have a leg time in minutes or a leg distance in nautical miles.
- **Ident** : Ident of the initial **fix** or name of the **procedure**. **Fix** name for legs.
- **Restriction** : Either minimum altitude for en route airway segment, **procedure** altitude restriction or **procedure** speed limit. A / separates altitude and speed restriction. The following altitude restrictions exist for procedures:
  - **Number only**: Fly at altitude or speed. Example: 5.400 or 210 .
  - **Prefix A** : Fly at or above altitude or speed. Example: A 1.800 .
  - **Prefix B** : Fly at or below altitude or speed. Example: B 10.000 or B 220 .
  - **Range**: Fly at or above altitude one and at or below altitude two. Example: A 8.000, B 10.000 .

- **Altitude and speed limit:** Values separated by `/`. Example: `A 8.000, B 10.000/B220` .
- **Speed limit only:** A prefixed `/` indicates no altitude but a speed restriction. Example: `/B250` .
- `Remarks` : Shows fly-over, turn direction or related [navaid](#) for a [procedure](#) leg.

## Top Buttons

### Type Filter (All Procedures)

The type filter is not available for a [FSX](#) or [P3D](#) stock database. A navdata update is needed to get [SID](#) and [STAR](#) procedures.

This filter is always available for a X-Plane database which contains SIDs and STARs already in the stock data.

The type filter allows the selections below:

- All Procedures : [SID](#), [STAR](#) and approaches
- Departure Procedures : Only [SID](#)
- Arrival Procedures : [STAR](#) and approaches
- Only Approaches and Transitions : No [SID](#) and no [STAR](#)

The respective transitions are always shown.

### Runway Filter (All Runways)

This filter is always available and helps to find procedures for a certain departure or arrival runway.



#### Clear Selection

Deselects all entries in the table and also removes any highlights from the map.



#### Help

Opens this help chapter in the default browser.

### Procedure Tree Context Menu



#### Show on Map

Centers the map on the selected [procedure](#).



Text and functionality of this menu item depends on the selected [procedure](#) type and if the [procedure](#)'s airport is already the departure or destination airport of the current flight plan.

Use the context menu of the flight plan table to remove procedures. See [Delete Selected Legs or Procedure](#).

The corresponding [procedure](#) (approach, [SID](#) and [STAR](#)) is added or replaced too if a transition is selected.

`Insert ... into Flight Plan :`

This menu item will add the selected [procedure](#) to the current flight plan. A [procedure](#) of the same type ([SID](#), [STAR](#) or approach with or without transition) will be replaced if already present in the flight plan.

`Use ... as Destination OR Use ... as Departure :`

This will add or replace the destination or departure airport and add the selected [procedure](#).

The departure or destination airport are added to the flight plan too if the flight plan is empty.

## Expand All / Collapse All

Expands all procedures so that their legs and transitions are shown or collapses the tree.



### Reset Search

Clears search filters and shows all procedures again in the tree.



### Clear Selection

Deselects the currently selected [procedure](#) and also removes the preview from the map.



### Reset View

Resets the the column order and column widths back to default.

# Flight Plan Formats

*Little Navmap* supports several flight plan formats which have all different limitations. Only some of these formats can be loaded and saved.

Using different "Save as" file dialogs instead of just one allows to remember the directory for each file format separately. So there is no need to jump between the [FSX](#) or [P3D](#) flight plan directory and the X-Plane [FMS](#) output directory.

Note the difference between "Save Flight Plan as" and "Export Flight Plan as". Export does not change the current file name while "Save as" does.

## Feature Table

The table below shows the capabilities of *Little Navmap* and the supported flight plan formats (X = supported, 0 = not supported):

Format	Read	Write	Airways	VFR/IFR	User Wpt. Names	Departure <a href="#">Parking</a>	Cruise Alt.	Ground speed	Proc
<a href="#">FSX PLN annot.</a>	X	X	X	X	X	X	X	X	X
<a href="#">FSX PLN</a>	X	X	X	X	X	X	X	0	0
<a href="#">FS9 PLN</a>	X	0	X	X	X	X	X	X	X
<a href="#">X-Plane FMS</a>	X	X	0	0	0	0	X	0	0
<a href="#">FLP</a>	X	X	X	0	0	0	0	0	X
<a href="#">GFP</a>	0	X	X	0	0	0	0	0	0
<a href="#">RTE</a>	0	X	X	0	0	0	0	0	0
<a href="#">GPX</a>	0	X	0	0	0	0	0	0	0

[Procedure](#) waypoints are not included in any file. You have to use the GPS or [FMS](#) in the simulator to select procedures.

A dialog is shown if any unsupported features are detected in the current flight plan when trying to save a plan.

Your current file name and type will change if you save a plan to a format that is read and writable. This does not happen when exporting.

An example shows how the program deals with the limited formats:

1. Create a flight plan including procedures.
2. Save as [PLN](#) - current filename changes to new file name `NAME.pln`.
3. Save as [FMS](#) - a warning is shown and after saving the current filename changes to new `NAME.fms`.
4. Restart program - `NAME.fms` will be reloaded and procedures are lost.
5. Now export as [GFP](#) - Current filename remains `NAME.fms`.



The format [FSX PLN](#) is used as a default format because it supports most features and allows to include additional information in form of annotations which will be ignored by flight simulators and most other tools.



## FS9 PLN

File format of the Flight Simulator 2004. Uses the same [PLN](#) extension as the [FSX PLN](#) format. *Little Navmap* can only read this format. Therefore a warning dialog is shown before overwriting a file with the newer [FSX PLN](#) format.



## Clean PLN

This is the same as the [FSX PLN](#) but without additional annotations which contain information about selected procedures or ground speed. Use this format if a tool cannot deal with the annotated format.



## FMS

X-Plane [FMS](#) format which can be loaded into the stock GPS and [FMS](#) of X-Plane. The format is very limited and basically stores only a list of waypoints.

Store these files into the `output/FMS plans` directory inside the X-Plane directory.



## FLP

A format that can be read by the X-Plane [FMS](#) (not the X-Plane GPS), Aerosoft Airbus and other add-on aircraft. Supports airways and procedures.

You can load these files into the X-Plane [FMS](#) including airway information. Procedures are saved in the [FLP](#) but cannot be loaded yet by the [FMS](#). You have to select these manually after loading the flight plan.

Store these files into the `output/FMS plans` directory inside the X-Plane directory if you want to use them in X-Plane.



## GFP

This is the flight plan format used by the *Flight1 GTN 650/750*.

This file format can only be exported. Reading is not supported.

Note that any missing waypoints will be displayed as locked in the unit which will happen more often if the AIRAC cycles do not match between *Little Navmap* and the GTN.

It is easy to remove locked waypoints within the GTN to enable the flight plan to be activated. Refer to the documentation for the *Flight1 GTN 650/750*.

The default directory to save the flight plans for the GTN units is `C:\Program Files (x86)\Lockheed Martin\Prepar3D v3\F1GTN\FPL`.

You might need to change the user privileges on this directory if your saved flight plans do not show up in the GTN. Give yourself full control on this directory to avoid this.

A typical symptom is that you can save the flight plan in *Little Navmap* and you can also see the saved plan in *Little Navmap*'s open dialogs but it does not show up in the GTN unit. Change the privileges of the export directory as mentioned above if that is the case.



## RTE

Exports the current flight plan as a PMDG RTE file. Location depends on the used aircraft but is usually `PMDG\FLIGHTPLANS` in the simulator base directory.

## GPX

GPX not a flight plan format.

The GPS Exchange Format can be read by Google Earth and most other [GIS](#) applications.

The flight plan is embedded as a route and the flown aircraft trail as a track including simulator time and altitude.

Procedures or their respective waypoints are not included in the exported file.



## Flight Plan Dock Window

### Upper Part

The top shows a label that contains departure, departure position ([parking](#), runway or helipad), destination, flight plan distance, traveling time, used procedures and flight plan type.

Besides the label there are three input fields on top of this dock window:

- **Speed (kts):** Ground speed. The value of this field is used only for calculating traveling times in the table view: [Leg Time](#) and [ETA](#) (estimated time of arrival at a waypoint given 0:00 as start time). It is saved as an annotation with the flight plan and not used for simulator user aircraft calculations.
- **Cruise altitude (ft):** This value is saved with the flight plan and is also used to calculate an airway flight plan based on given altitude. This field receives the minimum altitude for a flight plan if a plan along Victor or Jet airways is calculated and altitude restrictions were found. See [Calculate based on given Altitude](#).
- **Flight Plan Type (IFR or VFR):** This is saved with the flight plan.

### Flight Plan Table

The table view allows the same operations as the search table view except sorting. See [here](#) for more information.

All selected elements in the flight plan table view will be highlighted on the map using a black/green circle. See [Highlights](#) for more information. Multi selection using [Shift+Click](#) or [Ctrl+Click](#) is possible.

The active flight plan leg is highlighted in magenta when *Little Navmap* is connected to a simulator.

[Procedure](#) legs have dark blue color and legs of a missed approach have a dark red color.

If a waypoint of a flight plan cannot be found in the database it will be displayed in red. This can happen if the used AIRAC cycles do no match. The same applies to airways. The position on the map is still correct.

Flight Plan								
Juneau Intl (PAJN) Runway 08 to Sangster Intl (MKJS)								
3.639 nm, 36 h 23 m, Direct								
	100 kts			17.500 ft				
	Ident	Region	Name	Procedure Type	Airway or Procedure	Restriction ft/kts	Type	MHz
7	▲ SODAC	CY			V324	6.800		
8	● YWL	CY	Williams Lake		V324	5.500	VO...	
9	△ ALTAG				V324			
10	▲ MIBTI	CY			V324			

*Picture above: The waypoint ALTAG and parts of the airway v324 could not be found in the database.*

### Table Columns

- **Ident :** ICAO ident of the [navaid](#) or airport.
- **Region :** Two letter region code of a [navaid](#).
- **Name :** Name of airport or radio [navaid](#).
- **Procedure Type :** The type of this leg's [procedure](#). [SID](#) , [SID Transition](#) , [STAR](#) , [STAR Transition](#) , [Transition](#) , [Approach](#) OR [Missed](#) .
- **Airway or Procedure :** Contains the airway name for en route legs or [procedure](#) instruction.
- **Restriction :** Either minimum altitude for en route airway segment, [procedure](#) altitude restriction or [procedure](#) speed limit. A / separates altitude and speed restriction. The following altitude restrictions exist for procedures:
  - **Number only:** Fly at altitude or speed. Example: [5.400](#) or [210](#) .
  - **Prefix A :** Fly at or above altitude or speed. Example: [A 1.800](#) .

- **Prefix B** : Fly at or below altitude or speed. Example: B 10.000 or B 220 .
- **Range**: Fly at or above altitude one and at or below altitude two. Example: A 8.000, B 10.000 .
- **Altitude and speed limit**: Values separated by / . Example: A 8.000, B 10.000/B220 .
- **Speed limit only**: A prefixed / indicates no altitude but a speed restriction. Example: /B250 .
- Type : Type of a radio [navaid](#).
- Freq. : Frequency or channel of a radio [navaid](#).
- Range : Range of a radio [navaid](#).
- Course °M: \*\* This is the start course of the great circle route connecting the two waypoints of the leg. Use this course at departure if you travel long distances without navaids. Be aware that you have to change your course constantly when traveling along a great circle line.
- Direct °M: \*\* This is the constant course of the rhumb line connecting two waypoints of a leg. Depending on route and distance it can differ from the course of the great circle line. Use this course if you travel along airways or towards [VOR](#) or [NDB](#) stations. Opposed to the course shown by the flight simulator GPS unit this will give you the precise radial when approaching a [VOR](#) or [NDB](#) on a flight plan.
- Distance : Distance of the flight plan leg.
- Remaining : Remaining distance to destination airport or [procedure](#) end point (usually the runway).
- Leg Time : Flying time for this leg. Calculated based on the given ground speed.
- ETA : Estimated time of arrival. This is a static value and not updated while flying.
- Remarks : Turn instructions, flyover or related [navaid](#) for [procedure](#) legs.

Flight Plan

Hannover (EDDV) Runway 09L to Munich (EDDM)  
Depart runway 09R via SID POV2H.POVEL . From STAR NAP2A via MUN and RNAV BEGEN to runway 08R  
366 nm, 0 h 54 m, High Altitude

	Ident	Region	Name	Procedure Type	Airway or Procedure	Restriction ft/kts	Type	Freq. MHz/kHz/Ch.	Range nm	Course °M	Direct °M	Distance nm	Remaining nm	Leg Time hh:mm	ETA hh:mm	Remarks
1	EDDV	Hannover		SID Transition	Proceed to runway	180			217	217	0,4	366	0:00	0:00		
2	RW09R			SID Transition	Course to altitude		A 600		91	91	2,0	364	0:00	0:00	Turn left or right	
3	Altitude			SID Transition	Course to fix				91	91	7,5	356	0:01	0:01	Turn left or right, Related: DLE / 12,0 nm / 7°M	
4	DV157 ED			SID Transition	Track to fix				118	118	38	318	0:05	0:07		
5	P0VEL ED			SID Transition	Track to fix				153	153	55	263	0:08	0:15		
6	SUVUT ED				UM736	24.500			175	175	14,0	249	0:02	0:17		
7	RELKO ED				UM736	24.500			175	175	30	219	0:04	0:22		
8	TABAT ED				UM736	24.500			155	155	40	179	0:05	0:28		
9	KONIG ED				UM736	24.500			155	155	6,0	173	0:00	0:28		
10	NIKUS ED				UM736	24.500			155	155	9,5	163	0:01	0:30		
11	AKOSI ED				UM736	24.500			155	155	29	135	0:04	0:34		
12	RUDNO ED				UM736	24.500			139	139						
13	RDG ED	Roding			UM736	24.500	VORDME (H)	114,70	130	179	179	17,8	117	0:02	0:37	
14	DOSEL ED				UM736	24.500			181	181	36	81	0:05	0:42		
15	NAPS4 ED		STAR	Initial fix	B 11.000				195	195	18,5	62	0:02	0:45		
16	MUN ED	Munich	STAR	Track to fix		VORDME (H)	112,30	130	273	273	21	41	0:03	0:48		
17	MUN ED	Munich	TRANSITION	Initial fix		A 5.000 VORDME (H)	112,30	130		357	0,0	41	0:00	0:48		
18	DM451 ED		Transition	Track to fix					276	276	19,0	22	0:02	0:51		
19	DM441 ED		Transition	Track to fix					351	351	5,2	16,9	0:00	0:52		
20	BEGEN ED		Transition	Track to fix		A 5.000			81	81	6,1	10,8	0:00	0:53		
21	BEGEN ED		Approach	Initial fix	A 5.000						0,0	10,8	0:00	0:53		
22	RW08R		Approach	Track to fix		1.536			81	81	10,8	0,0	0:01	0:54		
23	DM561 ED		Missed	Course to fix					81	81	2,1	0:00			Fly over, Turn left or right, Related: MUN / 9,9 nm / 354°M	
24	Altitude		Missed	Course to altitude		A 1.900			81	81	2,0	0:00			Turn left or right	
25	MUN ED	Munich	Missed	Direct to fix		5.000 VORDME (H)	112,30	130	185	185	10,2	0:01			Turn right	
26	EDDM	Munich														

**Picture above:** The Flight Plan dock window. The flight plan uses a [SID](#) for departure and a [STAR](#), transition and an approach for arrival.

## Mouse Clicks

A double click on an entry in the table view shows either an airport diagram or zooms to the [navaid](#). Additionally, details are shown in the [Information](#) dock window. Single click selects an object and highlights it on the map using a black/green circle.

## Top Button



### Clear Selection

Deselects all entries in the table and also removes any highlight rings from the map.

## Flight Plan Table View Context Menu



## Show Information

Same as the [Map Context Menu](#).



## Show on Map

Shows either the airport diagram or zooms to the [navaid](#) on the map. The zoom distance can be changed in the dialog [Options](#) on the tab [Map](#).



## Move Selected Legs up/down

Moves all selected flight plan legs up or down in the list. This works also if multiple legs are selected.

Airway names will be removed when waypoints in the flight plan are moved or deleted because the new flight plan legs will not follow any airway but rather use direct connections.

Procedures or [procedure](#) legs cannot be moved and waypoints cannot be moved into or across procedures.



## Delete Selected Legs or Procedure

Deletes all selected flight plan legs. Use [Undo](#) if you delete legs accidentally.

The whole [procedure](#) is deleted if the selected flight plan leg is a part of a [procedure](#). Deleting a [procedure](#) deletes its transition too.



## Edit Name of User Waypoint

Allows to change the name of a user defined waypoint. The length of the name is limited to 10 characters.

## Calculate for selected Legs

This is a submenu containing entries for flight plan calculation methods as described here:



[Calculate Radionav](#),



[Calculate high Altitude](#),



[Calculate low Altitude](#) and



[Calculate based on given Altitude](#).

This menu is only active when more than one flight plan leg is selected and neither the first nor the last selected row is a [procedure](#).

It will calculate a flight plan fragment between the first and last waypoint in the selected flight plan legs. All legs between the first and last selected one will be deleted and replaced with the calculated flight plan fragment.

You can either select the first and the last leg ([ctrl+click](#)) and start the calculation or you can select a whole range of legs ([shift+click](#) and drag) before calculation.

This function can be useful if you have to cross oceanic legs that are void of airways:

1. Set departure and destination.
2. Find the last waypoint on an airway before entering the ocean. Choose the closest to the flight plan line. Add the waypoint to the flight plan.
3. Select departure and this waypoint and calculate the flight plan fragment.
4. Same as above the the first waypoint on an airway before or when entering the landmass again.
5. Select this waypoint and the destination and calculate the flight plan fragment.

While not entirely realistic, this is a sufficient solution until NAT or PACOT tracks are available.



## Show Range Rings

Same as the [Map Context Menu](#).



## Show Navaid range

Will show the range rings for all selected radio navaids in the flight plan. You will get a range circle for each radio [navaid](#) on the flight plan if you simply select all legs of the flight plan and use this function.

Otherwise, the same as the [Map Context Menu](#).



## Remove all Range Rings and Distance measurements

Same as the [Map Context Menu](#).



## Copy

Copies the selected entries in CSV format into the clipboard. The CSV will include a header. This will consider changes to the table view like column order.

## Select All

Selects all flight plan legs.



## Clear Selection

Deselects the currently selected flight plan leg and removes the highlight circles from the map.



## Reset View

Resets the column order and column widths back to the default view.



## Set Center for Distance Search

Same as the [Map Context Menu](#).

# Procedures

## General

Departure and arrival procedures will be used when flying an airliner but also smaller aircraft have to use at least an approach [procedure](#) at their destination when flying IFR.

Flight simulator stock data provides only approaches and transitions. SIDs and STARs are not available. These can be added by navdata updates.

An airline flight containing all variations can use the following procedures or segments:

1. Departure airport
2. [SID](#)
3. [SID](#) Transition
4. En route airway system
5. [STAR](#) transition
6. [STAR](#)
7. Transition to approach
8. Approach
9. Destination

A small aircraft IFR flight can use the following procedures or segments:

1. Departure airport
2. En route airway system
3. Transition to approach
4. Approach
5. Destination

Note that transitions make only sense together with an approach, a [SID](#) or a [STAR](#) which will guide you to or from the runway. You can select a transition only together with the respective [procedure](#) (although the [SID](#) may be empty and consist only of a transition). If you delete a [procedure](#) from the flight plan its transition will be deleted too.

[Procedure](#) information is saved together with a flight plan as an annotation in the [PLN](#) file and will be restored by *Little Navmap* when loading the flight plan.

[Procedure](#) waypoints are not saved in the flight plan since the [PLN](#) format does not support all the different leg types and the flight simulator would not be able to display it correctly. Select the approach in your GPS or FMC if you need it there.

## Inserting a Procedure into a Flight Plan

Select `Show Procedures` when you right click on an airport in the map, the airport search table or the flight plan table. This will show the tab `Procedures` in the dock window `Search`.

Inserting a [procedure](#) into a flight plan can be done by simply using the context menu in the [procedure](#) tree view.

See [Procedure Search](#) for more information.

## Deleting a Procedure from a Flight Plan

Deleting a single leg that is part of a [procedure](#) will remove the whole [procedure](#) and its transition. Deleting a leg that is part of a transition will remove only the transition.

Flight Plan

**Hannover (EDDV) Gate 2, Gate Small to Munich (EDDM)**  
Depart runway **09L** via SID **POV2Y.POVEL**. From STAR **NAP2A** via **MUN** and **RNAV BEGEN** to runway **08R**  
367 nm, 1 h 50 m, High Altitude

	Ident	Region	Name	Pr
4	DV105	ED		SID
5	POVEL	ED		SID
6	ABGUS	ED		
7	KENIG	ED		
8	GALMA	ED		
9	SUVUT	ED		
10	RELKO	ED		
11	TABAT	ED		
12	RONIG	ED		
13	NIKUS	ED		
14	AKOSI	ED		
15	RUDNO	ED		
16	RDG	ED	Roding	
17	DOSEL	ED		
18	NAPSA	ED		STA
19	MUN	ED	Munich	STA
20	MUN	ED	Munich	Tran
21	DM451	ED		Tran
22	DM441	ED		Tran
23	BEGEN	ED		Transition
24	BEGEN	ED		Approach
25	RW08R			Approach
26	DM561	ED		Missed
27	Altitude			Missed
28	MUN	ED	Munich	Missed
29	EDDM		Munich	

Contextual menu open over procedure BEGEN:

- Show Information
- Show Procedures
- Show on Map
- Activate Flight Plan Leg
- Move selected Legs Up
- Move selected Legs Down
- Delete selected Legs or Procedure** (highlighted)
- Edit Name of User Waypoint
- Show Range Rings
- Show Navaid Range
- Remove All Range Rings and Distance Measurements
- Copy
- Select All
- Clear Selection
- Reset View
- Set Center for Distance Search

Picture above: About to remove the transition MUN of the approach RNAV BEGEN from the flight plan.

## Limitations when editing a flight plan with procedures

- Deleting a leg of a [procedure](#) will remove the whole [procedure](#) from the flight plan.
- You cannot move a [procedure](#) leg up or down neither can you move or add a flight plan leg into a [procedure](#).
- You cannot add waypoints in between procedures (e.g. a [STAR](#) and an approach). Waypoints can only be added to the route between departure and arrival procedures.
- You cannot add waypoints between [arrival procedure](#) and destination airport.
- You cannot add waypoints between departure airport and a [SID procedure](#).
- If you delete or replace the destination airport all approach and arrival procedures are removed too.
- If you delete or replace the departure airport all [SID](#) procedures are removed too.

## Flying Procedures

[Procedure](#) legs are pre-calculated except holds and [procedure](#) turns. This means you can fly them mostly as they are drawn on the map. If in doubt about how to fly a leg (e.g. if too many lines overlap) look at the [procedure](#) table in the flight plan window.

## Holds

No entry or exit [procedure](#) is shown. You have to find a proper entry [procedure](#) yourself. Holds have a straight leg flying time in minutes or a distance.

If time is given you fly the hold as usual:

1. Enter at the [fix](#) using a proper entry [procedure](#)
2. Do a standard turn
3. Fly the straight leg for the given time (often one minute)
4. Do standard turn
5. Fly to [fix](#)
6. Exit hold when done or instructed by ATC

Do not follow the lines exactly, they are just an indicator for what to fly. An exception are holds where a distance is given for the straight leg. The hold size will match the distance in this case.



**Picture above:** A hold with 2 nautical miles straight segment length. Enter and exit at [ZUNAD](#) and fly at or above 2600 feet. Course is 61° magnetic degrees.

## Exiting a Hold

Little Navmap will detect when a hold is exited and advance the active leg to the next one if one of the two conditions is met:

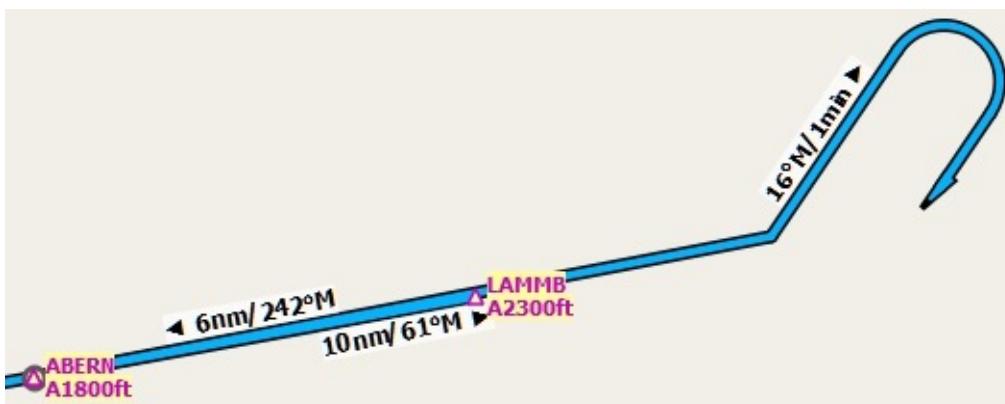
1. **If the next leg continues after or at the hold fix:** When approaching the hold [fix](#) after one circuit continue straight on. The next leg will be activated after half a nautical mile up to one nautical mile.
2. **If the next leg starts before the hold fix:** Exit the hold at its [fix](#). Exit right turn holds to the left and vice versa (i.e. turn outside the hold). Proceed to the [fix](#) of the next leg which will be activated.

You can activate the next leg manually if you do not exit the hold at its [fix](#). Right click in the flight plan table on the next leg and select [Activate Flight Plan Leg](#).

## Procedure turns

The flight simulator data moves the turn point of a [procedure turn](#) 10 nautical miles out from the [fix](#) which is usually too far away.

Fly the [procedure turn](#) as usual: Minimum one minute from the [fix](#). Use more if you need space to catch the next [fix](#) after the course reversal. Then turn using an teardrop or a standard 45/180 degree turn. Again: Follow the procedures and not the lines.



**Picture above:** A [procedure](#) turn. Fly at least one minute outbound  $61^\circ$  from [ABERN](#), turn left to  $16^\circ$ , fly one minute, turn  $180^\circ$  and fly to [LAMMB](#), then  $242^\circ$  to [ABERN](#).

## Distances

Holds and [procedure](#) turns do not count in flying distance while all other legs do. This means the total flight plan distance as well as the top of descent point will change when selecting an approach or a transition.

The top of descent point calculation does not consider altitude restrictions in procedures.

## Special Leg Types

All [procedure](#) leg types ([Track to Fix](#), [Initial Fix](#) and more) that are shown in *Little Navmap* are based on the ARINC 424 path terminator concept. A deeper knowledge of these leg types is not important for the simulator pilot with the exception of two types that are added by *Little Navmap*.

- **Start of Procedure**: This leg is added if a [procedure](#) does not start with an initial [fix](#) but rather with a course, heading or track to a [fix](#). It indicates the first position of the [procedure](#) and is not related to a [fix](#).
- **Proceed to Runway** in a [SID](#): The first leg of a [SID](#) to indicate the [start position](#) on the runway. The program might fall back to the airport center if the runway could not be found. The altitude restriction indicates the elevation of the runway.
- **Proceed to Runway** in an approach: This leg is added to an approach [procedure](#) to show the course line from a missed approach point (MAP) to the runway end. It is added if an approach does not end with a runway [fix](#) and has an altitude restriction 50 feet above the threshold.

## Fix Types in a Procedure

- **Waypoints**: Terminal waypoints or radio navaids. Some are marked as [flyover](#) in the approach table.
- **Radial and distance**: Example: [WIK/7nm/291°M](#). A [fix](#) defined by a course or heading and distance to a [navaid](#).
- **Distance to DME**: Example: [WIK/9nm](#). This [fix](#) is defined by a heading or track which is terminated by reaching a [DME](#) distance.
- **Intercept Course to Fix**: Intercept a course to the next [fix](#) at an angle of about 45 degrees.
- **Intercept Leg**: Intercept the next approach leg at a course of about 45 degrees.
- **Altitude**: A leg or hold that is terminated by reaching a certain altitude and is used mostly on missed approaches. Since the distance depends on the aircraft 2 nautical miles length are used for this leg. You can ignore the line and proceed to the next leg once the altitude criteria is satisfied.
- **Manual**: Fly a heading, track or a hold until manually terminated by ATC.

Runway fixes are prefixed with [RW](#). They usually have an altitude restriction a few feet above the runway. Higher altitude restrictions (i.e. > 500 ft) indicate a circling approach.

## Altitude and Speed Restrictions

Restrictions are shown on the map and in the flight plan table.

- **Number only**: Fly at altitude or speed. Map examples: [5400ft](#) or [210kts](#).
- **Prefix A**: Fly at or above altitude or speed. Map example: [A1800ft](#) or [A200kts](#).
- **Prefix B**: Fly at or below altitude or speed. Map example: [B1000ft](#) or [B240kts](#).
- **Range**: Fly at or above altitude one and at or below altitude two. Map example: [A8000B10000ft](#). Same for speed.

## Related Navaids

Many fixes have a related or recommended [navaid](#). This can be a [VOR](#), [NDB](#), [ILS](#) or a waypoint. The related [navaid](#) comes with radial and distance values that can be used to locate waypoints when flying without GPS or simply for cross checking the position.

## Missed Approaches

Missed approach legs are activated once the simulator aircraft passes the last point of an approach. The display of remaining flight plan distance will switch to display of remaining distance to last missed approach leg.

**No missed approach legs are activated if missed approaches are not shown.**

## Leg Highlights on the Map

Up to three points will be highlighted when clicking on a [procedure](#) leg in the tree in the search window:

- A small blue circle shows the beginning of the leg.
- The beginning of the leg is shown by a large blue circle.
- A thin circle shows the location of the recommended or related [fix](#) if available.

## Invalid Data

A leg entry will drawn red if a [navaid](#) was not resolved during the scenery database loading process. This happens only when the source data is not valid or incomplete. The resulting [procedure](#) is not usable in this case and a warning dialog will be shown if essential navaids are missing.

# Flight Plan Route Description

This dialog allows you to create a flight plan from a route description as they are generated or provided by various online services.

When opened it will show the route description for the current flight plan which also contains information about speed and cruise altitude if enabled.

The upper part of the dialog shows the route description input field and the lower part shows any messages, warnings or errors that occur during reading.



The menu button provides a dropdown menu than can be used to customize the generated route string.

The description parser will try to use as much of the route as possible even if parts of the flight plan like waypoints or airways cannot be found or names are ambiguous. You will see warnings in the lower output field if that is the case.

For long flight plans it can happen that far away waypoints are added if names are not unique. Remove these manually if needed.

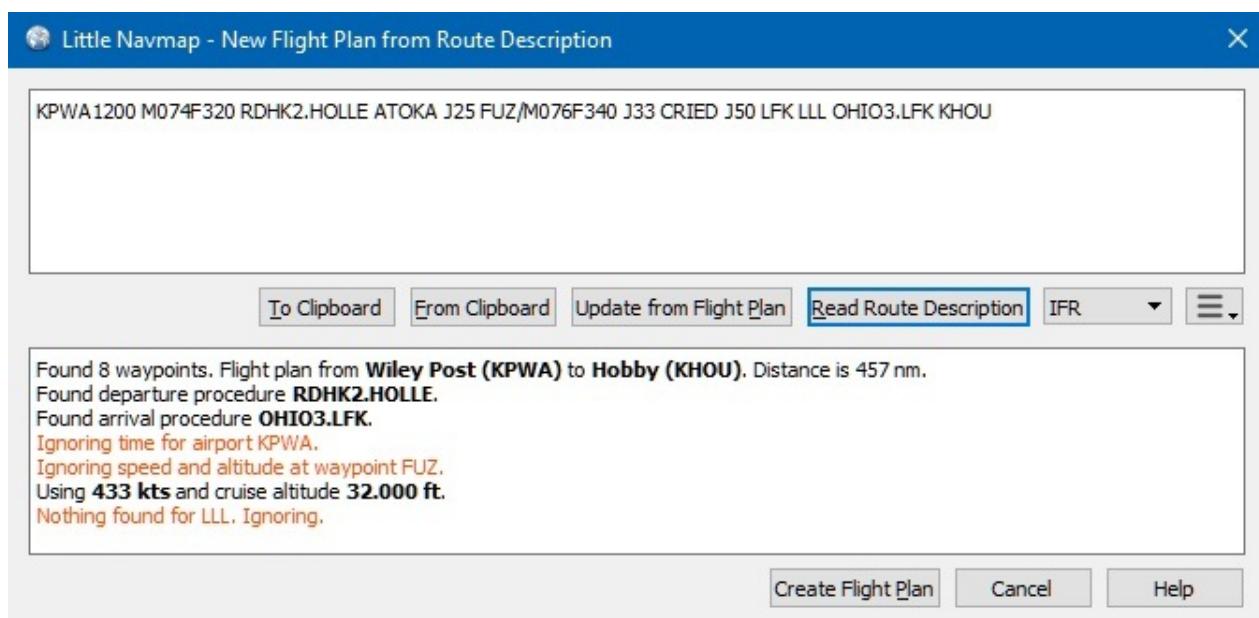
Many waypoints and airways will not be found if route descriptions from the latest AIRAC sources are used together with flight simulator stock data from 2005. It is recommended to use a navigation data update for the stock scenery when reading route descriptions from online sources like [RouteFinder](#), [Online Flight Planner](#), [SimBrief](#) or [SkyVector](#).

Otherwise, use an AIRAC cycle from the online services that is closest to the flight simulator navigation data age at the end of 2005 if a navigation data update is not an option.

Note that even flight plans calculated in *Little Navmap* cannot be converted back exactly in some cases. This happens due to [navaid](#) ambiguities like [NDB](#) and [VOR](#) stations having the same names or errors in the source data.

The cruise speed and altitude are used to create the flight plan if given. Otherwise the cruise altitude is automatically determined by the flight plan type (IFR or VFR) and the minimum altitude of the used airway segments.

[SID](#) and [STAR](#) procedures require a navdata update except for X-Plane which already comes with a complete navigation database.



**Picture above:** A route description that was read successfully with a few warnings about ignored elements. The waypoint [LLL](#) could not be found. Speed, altitude, [SID](#) and [STAR](#) were recognized. The ground speed of 433 knots is calculated based on given mach number 0.74 and standard atmosphere conditions.

## Buttons

- **To Clipboard** : Copies the current description as plain text to the clipboard.
- **From Clipboard** : Inserts text from clipboard to the input field. The inserted text is converted to upper case and all invalid characters are removed from the text.
- **Update from Flight Plan** : Creates the route string from the current flight plan again. Use this after changing settings with drop down menu button.
- **Read Route Description** : Reads the route description and prints any messages, warnings and errors in the lower output field. The current flight plan is not affected by this action.
- **IFR / VFR** : Defines the type of the generated flight plan and the automatically determined cruise altitude.
- **≡**
- **Menu Button**  :

  - Add departure and destination airport : Note that disabling this option will result in a route string which cannot be read back into a flight plan.
  - Add DCT (direct) instructions : Add **DCT** for any direct waypoint connections in the flight plan.
  - Add cruise speed and altitude instruction : Add cruise altitude from flight plan and ground speed as set in the flight plan dock window.
  - Add SID and STAR : Add **SID** and **STAR** names if any are used for departure or arrival.
  - Add generic SID and STAR : Add the generic **SID** and **STAR** keywords if no real **SID** and/or **STAR** were selected.
  - Add Waypoints instead of Airways : Does not insert any airway names but uses waypoints only.
  - Create Flight Plan : Closes the dialog and creates a new flight plan for the parsed route description and replaces the current plan. You have to click **Read Route Description** before creating a flight plan.

## Format

The route description has to follow the format rules below:

```
FROM[ETD] [SPEEDALT] [SID][.TRANS] [ENROUTE] [STAR][.TRANS] TO[ETA] [ALTERNATES]
```

All elements in square brackets are optional.

**FROM** and **TO** : These are the required 3 or 4 letter ident for departure and destination airports.

Examples: **KEAT** , **CYPU** , **S16** .

**ALTERNATES** : Alternate airports are optional and are simply appended to the flight plan. Alternates cannot be used in combination with an approach [procedure](#).

**SPEEDALT** : An optional entry that contains the cruise speed and altitude. See below for a details.

**ENROUTE** : This is a list of either **WAYPOINT** or an **AIRWAYWAYPOINT** forming the actual flight plan. The first entry has to be an airport, waypoint, [VOR](#) or [NDB](#).

**WAYPOINT** : A waypoint, [VOR](#), [NDB](#), airport or user defined coordinates. See below for a details about coordinates. A waypoint can be prefixed with **DCT** to indicate a direct connection not using an airway. Waypoints can be suffixed with an optional **/SPEEDALT** value although this is ignored.

Examples: **TAU** , **BOMBI** , **AST** , **CL** , **EDDF** .

**AIRWAYWAYPOINT** : Airway and end waypoint on the airway separated by a space.

Examples: **V495 CONDI** , **V338 YVR** , **V330 TRENA** .

**SID.TRANS** and **STAR.TRANS** : Either the words **SID** or **STAR** or real **SID**, **STAR** and transition names where the optional transition is separated by a **.**. The generic keywords **SID** and **STAR** create a direct connection to the en route part.

Examples: **RDHK2.HOLLE** , **OHI03.LFK** , **RDHK2** , **OHI03** .

## Features not supported

`ETD` and `ETA` : Four digit departure and arrival time attached to the airport ident are ignored.

`WAYPOINT.SPEEDALT` : For example `BOMBI/N0090A060` . Altitude changes at waypoints are not supported and ignored when reading.

## Speed and Altitude

Cruising ground speed and cruising level not separated by a space.

Speed is prefixed with:

`k` : Kilometers per hour followed by a four digit value.

`n` : Knots followed by a four digit value.

`m` : Mach followed by a three digit value. The mach value is converted to knots ground speed assuming standard atmosphere conditions at the give flight altitude.

Altitude is prefixed with:

`f` : Flight level in three digits.

`s` : Metric flight level in three digits of tens of meters.

`a` : Altitude in hundreds of feet in three digits.

`m` : Altitude in tens of meter in four digits.

Examples:

`N0410F310` 410 knots at flight level 310.

`M071F320` Mach 0.71 at flight level 320.

`K0790M0710` 790 kilometers per hour at 7100 meters.

## Coordinates

Coordinates can be supplied in different formats:

**Degrees** only (7 characters): Two digits and north/south indicator plus three digits and east/west indicator.

Example: `51N010E`

**Degrees and minutes** (11 characters): Two digits degrees, two digits for minutes and north/south indicator. Then three digits for degrees, two digits for minutes and east/west indicator.

Example: `4010N03822W` .

**Degrees, minutes and seconds** (15 characters): Two digits degrees, two digits for minutes, two digits for seconds and north/south indicator. Then three digits for degrees, two digits for minutes, two digits for seconds and east/west indicator. This format is used by [SkyVector](#) for example.

Example: `481200N0112842E` .

**North Atlantic track points (NAT)**. Two digits degrees north and two digits degrees west followed by character `N` .

Example: `5010N` .

**Coordinate waypoint pairs** with degrees and minutes as above and prefixed with north/south and east/west indicator.

Examples: `N4200 W02000` OR `N4200/W02000` .

**Garmin GFP format** (13 characters) north/south indicator, two digits degrees, three digits for minutes by 10. Then east/west indicator, three digits degrees, three digits minutes by 10. This format is used by the *Flight1 GTN 650/750*.

Example: N48194W123096

## Flight Plan Description Examples

Frankfurt Main (EDDF) to Fiumicino (LIRF):

**Direct connection:**

```
EDDF LIRF OR EDDF DCT LIRF .
```

**VOR to VOR:**

```
EDDF FRD KPT BOA CMP LIRF .
```

**Same as above with departure time ( ETD ) and arrival time ( ETA ) which both will be ignored:**

```
EDDF1200 FRD KPT BOA CMP LIRF1300 .
```

**Same as above on flight level 310 at 410 knots:**

```
EDDF N0410F310 DCT FRD DCT KPT DCT BOA DCT CMP DCT LIRF
```

**Using Jet airways:**

```
EDDF ASKIK T844 KOVAN UL608 TEDGO UL607 UTABA UM738 NATAG Y740 LORLO M738 AMTEL M727 TAQ LIRF
```

**Same as above on flight level 310 at mach 0.71 with an additional speed and altitude at NATAG which will be ignored:**

```
EDDF M071F310 SID ASKIK T844 KOVAN UL608 TEDGO UL607 UTABA UM738 NATAG/M069F350 Y740 LORLO M738 AMTEL M727 TAQ STAR  
LIRF
```

**User defined waypoints with degree/minute notation and an alternate airport LIRE :**

```
EDDF N0174F255 4732N00950E 4627N01019E 4450N01103E LIRF LIRE
```

**Flight plan using SID and STAR procedures with transitions:**

```
KPWA RDHK2.HOLLE ATOKA J25 FUZ J33 CRIED J50 LFK OHI03.LFK KHOU
```

**Flight plan using the generic SID and STAR keywords:**

```
KPWA SID ATOKA J25 FUZ J33 CRIED J50 LFK STAR KHOU
```



## Flight Plan Elevation Profile Dock Window

This dock window shows the ground elevation and flight plan cruise altitude together with all flight plan waypoints. It is only available when a flight plan is loaded. The user aircraft will be shown too if *Little Navmap* is connected to the simulator.

Elevation processing is done in the background since data has to be downloaded and computation is CPU intense. Therefore, the update of the elevation display can take from a few seconds up to half a minute. This background update is started after creating or changing the flight plan or when new elevation data was downloaded. The display will be updated accordingly whenever new data is available.

Close the `Flight Plan Elevation Profile` window if you think that it causes performance problems or stutters. All updates will stop once the window is closed.

Be aware that the elevation display covers only the flight plan and will not change the depiction if you get off flight plan with your simulator aircraft.

The flight plan is only shown at cruise level and the descent segment. Although, you will see your user aircraft and trail climbing and descending.

### Online Elevation Data

Note that the online elevation data does not cover all countries and currently ends at 60 degrees north. The data contains multiple known errors.

The calculation of online elevation points is limited to flight plan segments not longer than 2000 nautical miles to avoid overloading. Add more waypoints or calculate a flight plan to avoid this limitation.

### Offline Elevation Data

Using the freely downloadable [GLOBE - Global Land One-km Base Elevation Project](#) elevation data has several advantages:

- Faster updates
- World wide coverage
- No known errors
- Display of altitude below the cursor in the status bar

See the dialog [Cache and Files](#) in the options dialog for instructions how to download and install the GLOBE data.

## Profile Window

Additional information is shown in a label on top of the window if the mouse is hovered over the diagram. The corresponding position within the flight plan is highlighted on the map too.

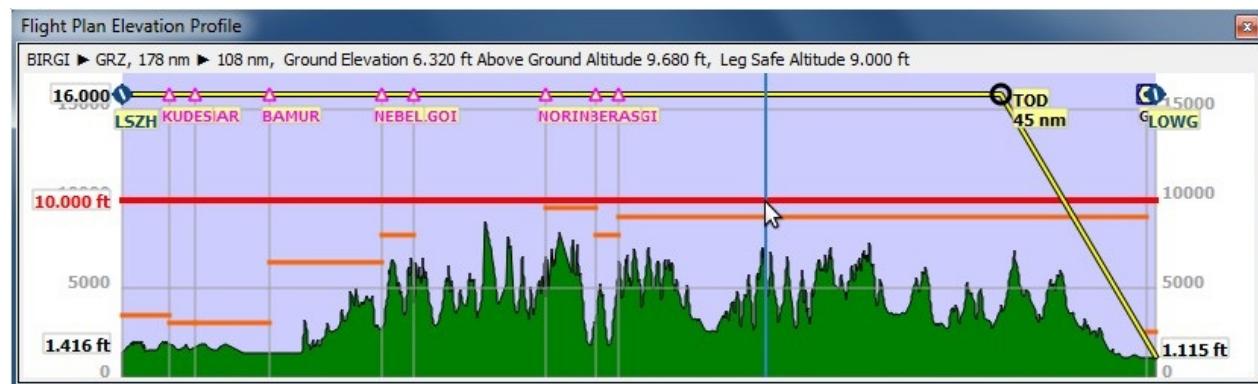
Following information is shown in the top label if connected to flight simulator with an active session:

- Distance from user aircraft to flight plan destination
- Distance to the top of descent

In addition, the information below is shown in the top label when hovering the mouse over the diagram:

- From and to waypoint
- Distance from departure and to destination from the mouse cursor position.
- Ground elevation at cursor position.
- Flight plan cruise altitude above ground.
- Safe altitude for the current flight plan leg at the hovering position.

For more information see the [Navmap](#) tab in the [Legend](#) dock window or the [Nav Map Legend](#) for details.



*Picture above: Flight plan elevation profile with line indicating the mouse hovering position. Orange lines show minimum safe altitude for flight plan segments. Top of descent point is shown on the upper right part of the window.*



## Information Dock Window

This dock window contains text information about airports in several tabs as well as information for one or more navaids, airways in another tab plus an additional tab showing airspace information.

A tab `weather` also includes decoded weather information for the selected airport.

All information can be copied into the clipboard as formatted text. Use the context menu of the text fields or use `ctrl+A` to select all and `ctrl+C` to copy the content to the clipboard.

Information is shown when selecting one of the `show Information for ...` context menu items in the map, flight plan dock window or the search result table.

One airport and all navaids are loaded into the information display if multiple objects are nearby a mouse click

A blue link `Map` allows jumping to the shown airport or `navaid` on the map.

Additional links for helipads are available in the tab `Runways/Helipads`.

An airway is always displayed with all its waypoints that are also linked to their respective map positions.

The display for all airports and navaids contains one or more links besides the title of the flight simulator scenery entry at the bottom of the list in section `Scenery`.

These links point to the respective `BGL` files. A click will open Windows Explorer with the corresponding file selected.

Multiple links can appear for airports since these can be modified by multiple `BGL` files from different add-on sceneries or navdata updates.

Information

Airport	Runways/Helpads	Com	Approaches	Weather	Navaid
---------	-----------------	-----	------------	---------	--------

 **Vancouver Intl (CYVR)** ★★★★ - [Map](#)

**City:** Vancouver  
**State or Province:** British Columbia  
**Country:** Canada  
**Elevation:** 14 ft  
**Magvar:** 19° East  
**Coordinates:** 49,1947° N 123,1839° W

**Facilities**  
Aprons, Taxiways, Tower Object, Parking, Avgas, Jetfuel, Approaches, ILS, VASI, ALS, Boundary Fence

**Runways**  
Hard, Lighted

**Weather**  
**Active Sky:** CYVR 282200Z 30005KT 15SM FEW015 SCT050 BKN070 07/05 A2993 RMK CU1SC2AC3 SLP136  
**NOAA:** 2017/01/01 15:00 CYVR 011500Z 04004KT 15SM FEW010 SCT060 OVC120 01/00 A2975 RMK SF1SC2AC5 SLP077  
**VATSIM:** CYVR 011500Z 04004KT 15SM FEW010 SCT060 OVC120 01/00 A2975 RMK SF1SC2AC5 SLP077

**Longest Runway**  
**Length:** 11,962 ft  
**Width:** 200 ft  
**Heading:** 81°M, 261°M  
**Surface:** Asphalt

**COM Frequencies**  
**Tower:** 118,700  
**ATIS:** 124,600

**Parking**  
**Gates:** 54  
**Jetways:** 50  
**GA Ramp:** 28  
**Largest Ramp:** Large  
**Largest Gate:** Gate Heavy

**Scenery**  
**0101 Base** C:\Games\FSX\Scenery\0101\scenery\APX15140.bgl

*Picture above: Airport information overview. Additional tabs show information for runways, COM frequencies, approaches and weather.*



*Picture above: Navaid information. Two navaids were close to the cursor when clicked.*



## Simulator Aircraft Dock Window

This dock window shows information about the user aircraft and about AI or multiplayer aircraft in several tabs.

*Little Navmap* has to be connected to the simulator to enable this functionality.

See [Connecting to a Flight Simulator](#) for more information on this topic.

### Tab Aircraft

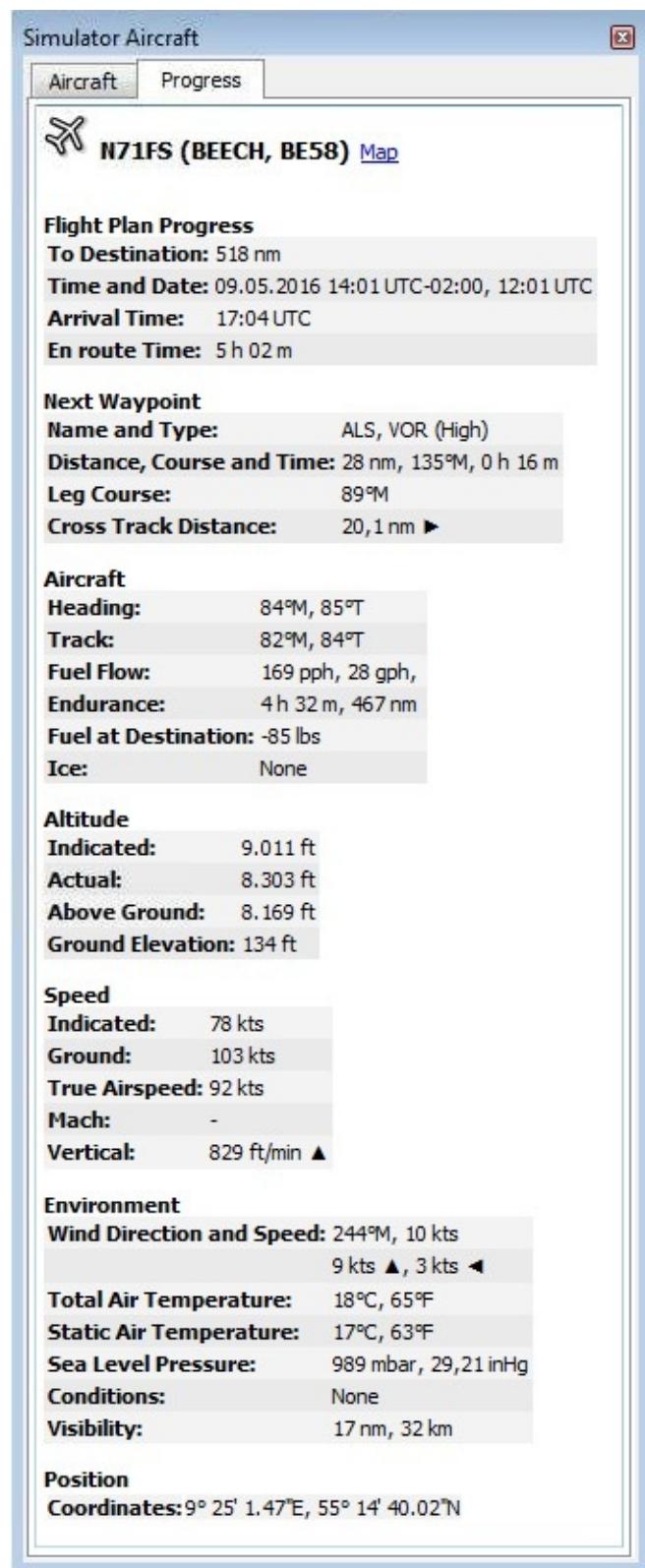
Gives an overview about the user aircraft and shows type, weight and fuel information.



*Picture above: Aircraft information when connected to a Flight Simulator.*

## Tab Progress

Shows information similar to a flight management computer about the user aircraft. This covers flight plan progress, altitude, speed, ambient and environment parameters.



*Picture above: Progress and ambient information of the current flight situation. Some fields or tables like Next Waypoint are only available when a flight plan is loaded.*

## Tab AI / Multiplayer

Information about an AI or multiplayer aircraft or ship is displayed in this tab if a vehicle is clicked on the map.

This also includes departure and destination airports for aircraft that can be shown on the map by clicking on the blue links (only for FSX or P3D and if a flight plan is filed).

Note that information on AI aircraft is limited on X-Plane where only position, altitude and heading can be displayed.



*Picture above: Information about an AI aircraft.*

## Legend Dock Window

Contains two tabs: One tab **Navmap** explaining the various airport and **navaid** symbols and a tab **Map** which shows the general legend for the base map like the *OpenStreetMap* for example.

Note that the general map legend is not available for all map themes.

# Weather

*Little Navmap* can display METARs from several sources:

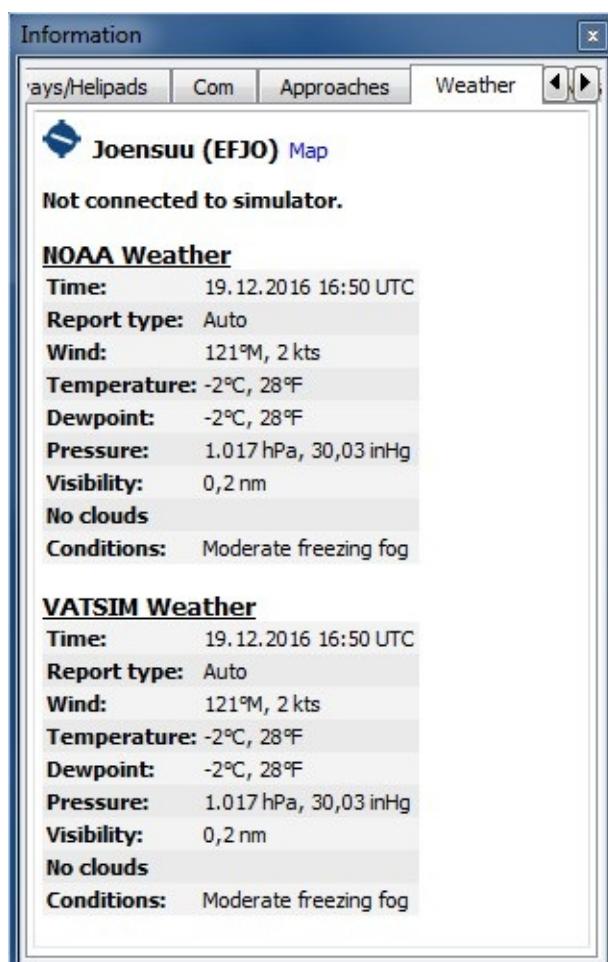
- [FSX](#) or [P3D](#) if connected. This also applies to network setups.
- X-Plane real time weather from the `METAR.rwx` file. Not when using network setups.
- [NOAA](#) online weather service
- [VATSIM](#) network online weather service
- [HiFi Simulation Technologies](#):
  - [Active Sky Next \(ASN\)](#)
  - [AS16](#)
  - [Active Sky for Prepar3D v4 \(ASP4\)](#)

You can define in the `Options` dialog on the `Weather` tab which sources are used to display the METAR information in tooltips or the tab `Weather` in the `Information` dock window.

You have to set the base path for X-Plane in the `Load Scenery Library` dialog to enable reading of the weather file. Certain features like regions of manually created weather files are not supported.

METARs are shown in the airport tooltips and on the `Airport` overview tab. Decoded weather information for all sources is available in the tab `Weather`.

**Notes about X-Plane weather:** *Little Navmap* can only read the X-Plane `METAR.rwx` file which contains downloaded online weather. The program cannot read custom weather situations from X-Plane. *Little Navmap* has only access to the local weather around the aircraft if you use a custom weather situation. This can result in the situation that you use custom weather and *Little Navmap* still displays information from an old downloaded weather file.



**Picture above:** Decoded weather information from two online sources. Flight simulator is not connected.

## Flight Simulator

Weather information from a flight simulator or the X-Plane `METAR.rwx` file can be displayed in three kinds for METARs and decoded weather which depends on the selected airport:

- `Station` : The airport has a weather station. This is the most precise weather indication.
- `Nearest` : The clicked airport has no weather station and the nearest weather was fetched. The ident of the nearest station is shown in the METAR and on the decoded weather tab. Note that the nearest weather station is not necessarily an airport.
- `Interpolated` (Not for X-Plane): The weather is interpolated by the flight simulator using the three nearest stations. This is usually the only option available on airports that are far away from the user aircraft. The ident of the clicked airport is used in the METAR report for this kind of weather report.

The flight simulator weather is updated every 15 seconds to catch changes in the weather theme.

*Little Navmap* watches the X-Plane `METAR.rwx` file for changes and will apply updates immediately.

Note that the nearest weather will not necessarily depict the weather at the clicked station due to the interpolation between multiple stations which is done by the simulator.

## Online - NOAA and VATSIM

Online weather from both sources is updated every 10 minutes.

## Active Sky

All *Active Sky* programs are recognized automatically on startup for each simulator. The `current_wx_snapshot.txt` and `activeflightplanwx.txt` files are loaded and monitored for changes. Weather will be reloaded and updated in the information display if necessary.

You can also select the `current_wx_snapshot.txt` file manually. In that case the METARs from this file are displayed for all installed flight simulators. The `activeflightplanwx.txt` will be loaded from the same directory.

Manual file selection can also be useful if a new *Active Sky* version is not supported by *Little Navmap* yet.

Departure and destination weather will be displayed if a flight plan is loaded into one of the *Active Sky* programs. A suffix `Destination` or `Departure` will indicate the usage of Active Sky flight plan weather on the tab `Weather`. This gives *Active Sky* users the most precise weather indication for departure and destination.

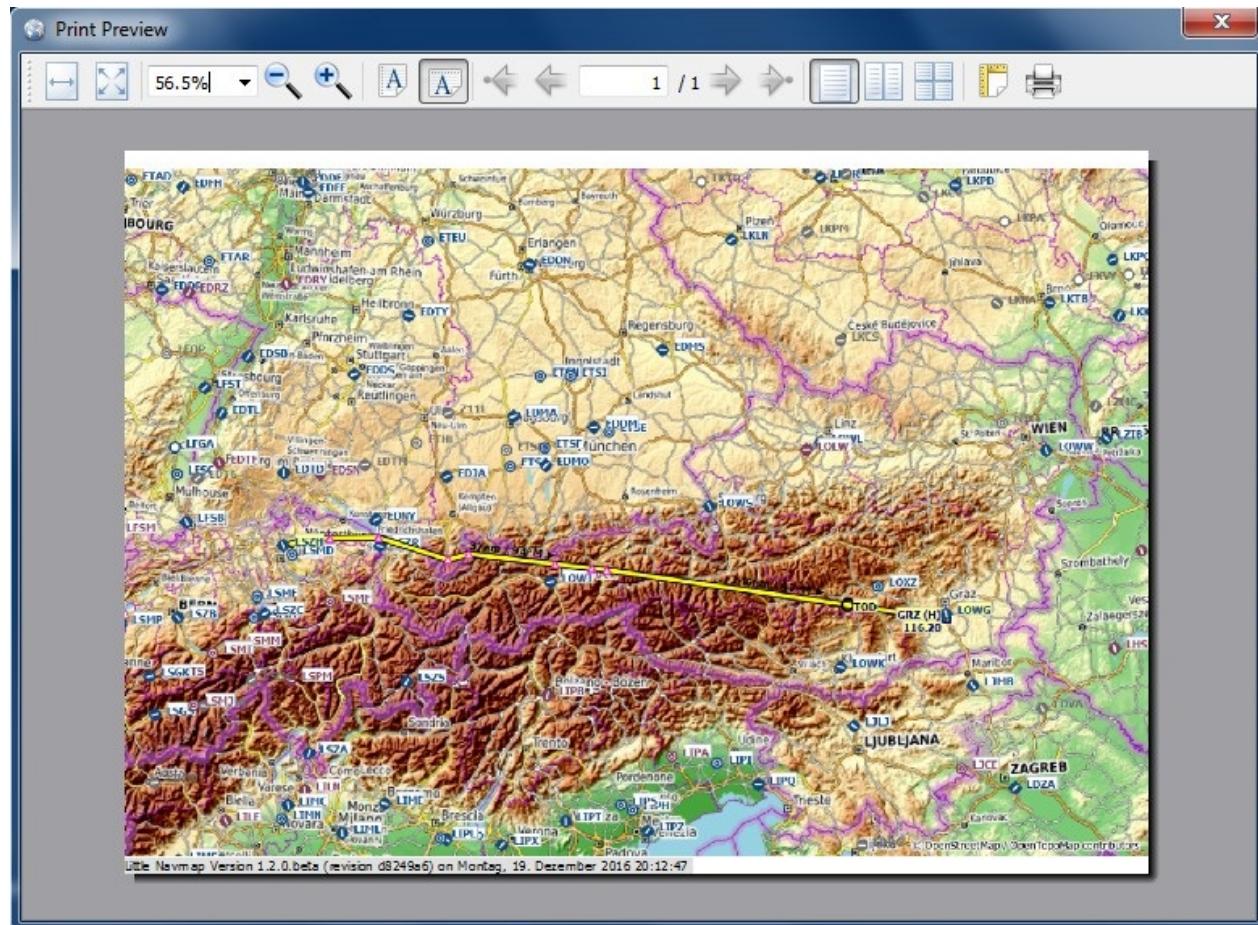
Note that the indication of `Departure` or `Destination` depends entirely on the flight plan loaded into *Active Sky* and not the flight plan in *Little Navmap*.

# Printing

## Print Map

Opens the print preview dialog allowing the current map view to be printed.

Printing is currently limited to the screen resolution of the current map view. To get a less blurry printout enlarge the map window as much as possible. You can undock the map window to achieve this.



*Picture above: Print preview dialog for the current map.*

## Print Flight Plan

Allows printing of the current flight plan together with departure and destination airport information.

## Options for customizing the Flight Plan Table

The printed flight plan table will have the same order of columns as the flight plan table in the dock window. Columns will be omitted from printing if their width is reduced to minimum size. See [Table View](#) for more information.

Flight Plan						
Doncaster Sheffield (EGCN) Parking 6, Ramp GA Large to Zemunik (LDZD)						
890 nm, 8 h 54 m, High Altitude						
100 kts	▼	29.000 ft	▼	IFR	▼	
1	Ident	Region	Procedure Type	Airway or Procedure	Restriction ft	Typ
1	EGCN					
2	ARTIX	EG				
3	OTBED	EG		UL26		
4	SUPEL	EG		UY70	26.000	

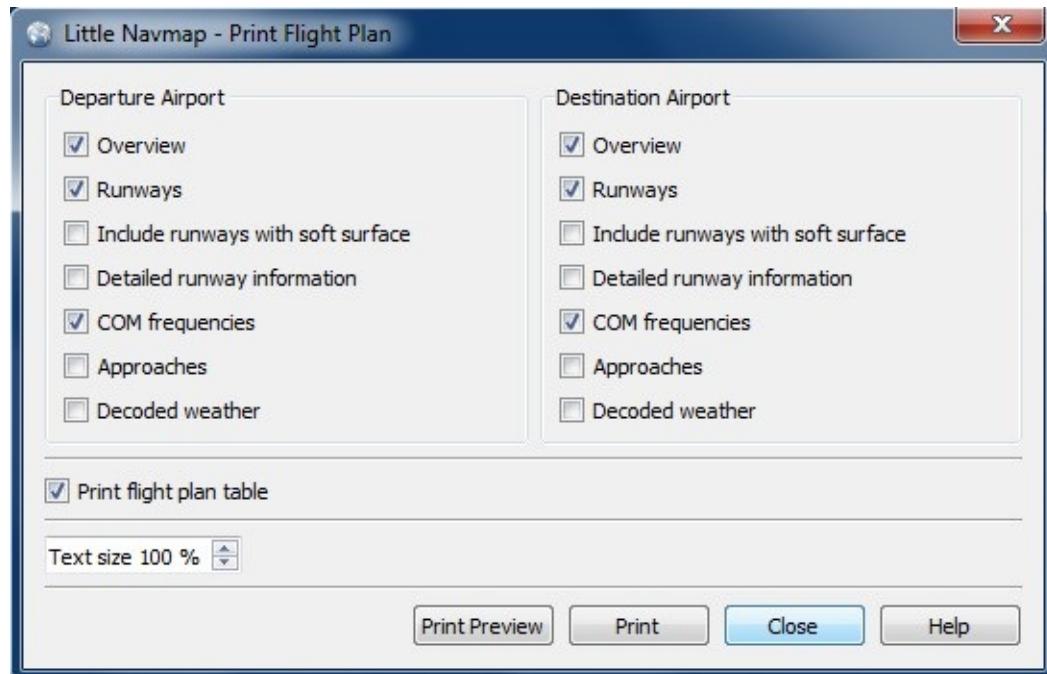
*Picture above: The column Name is collapsed and will not be added to the printed flight plan table.*

## Options for Departure and Destination

- overview : Prints the airport overview as shown in the Information dock window on tab Airport .
- Runways / Helipads : Prints runway and helipad information.
- Include runways with soft surface : Includes runways with soft surfaces like grass, gravel and others.
- Detailed runway information : Include detailed information for the runway ends like approach lighting, VASI types, ILS information and more.
- COM frequencies : Include communication frequencies like tower, ATIS, UNICOM and others.
- weather : Print the decoded weather for all enabled sources as shown on the tab Weather in the Information dock window.

## General options

- Print flight plan table : Print the flight plan as seen in the flight plan table.
- Text size : Make the text size smaller to avoid unnecessary line breaks or increase it for better reading.



*Picture above: Print flight plan options dialog.*



## Load Scenery Library Dialog

This dialog allows loading of the scenery library data from all four supported flight simulators into the *Little Navmap* internal database. The scenery library to load can be selected in the `Simulator:` drop down box.

The dialog shows information about the currently selected database including the number of loaded airports, database version and more.

**FSX and P3D only:** The base path and the `scenery.cfg` path will be shown in two text edit fields for the currently selected simulator. These fields are populated automatically, but can be changed to any other valid location. All values are saved for each flight simulator type.

**X-Plane only:** X-Plane cannot be recognized automatically. You have to select the base path manually. On Windows that can be a path like `C:\Simulators\X-Plane 11` where the executable is `C:\Simulators\X-Plane 11\X-Plane.exe`.

Loading a scenery library can take from 2 to 15 minutes depending on your setup and amount of scenery add-ons. You can speed this up by excluding directories containing neither airport nor navigation data in the `Options` dialog on the `Scenery Library Database` tab.

All airports that are not located in the default `Scenery` directory for **FSX/P3D** or `Custom Scenery` for X-Plane are considered add-on airports and will be highlighted appropriately. Directories can be excluded from this behavior in the `Options` dialog on the `Scenery Library Database` tab. This can be useful if add-ons only correct airport elevation and these airports should not be highlighted on the map using underline and italic text.

See [Options](#) for more information about excluding scenery.

The previous `scenery library database` will be restored immediately if you cancel the loading process or if the loading process fails.

The menu `Scenery Library -> Flight Simulators` is synchronized with the simulator selection in the dialog. Once a database is successfully loaded, the display, flight plan and search will switch over to the newly loaded simulator data.

Note that the number of airports, navaids and other objects shown in the `Load Scenery Library` will differ to the numbers shown in the progress dialog since a separate process removes duplicates after loading.

The progress dialog shows all objects that were found during loading. The `Load Scenery Library` shows the number of objects in the database after removing duplicates and deleting stock airports that were replaced by add-ons.

**FSX or P3D only:** The program tries to find the base paths and `Scenery.cfg` files automatically. The typical locations of the `Scenery.cfg` for Windows 7/8/10 are:

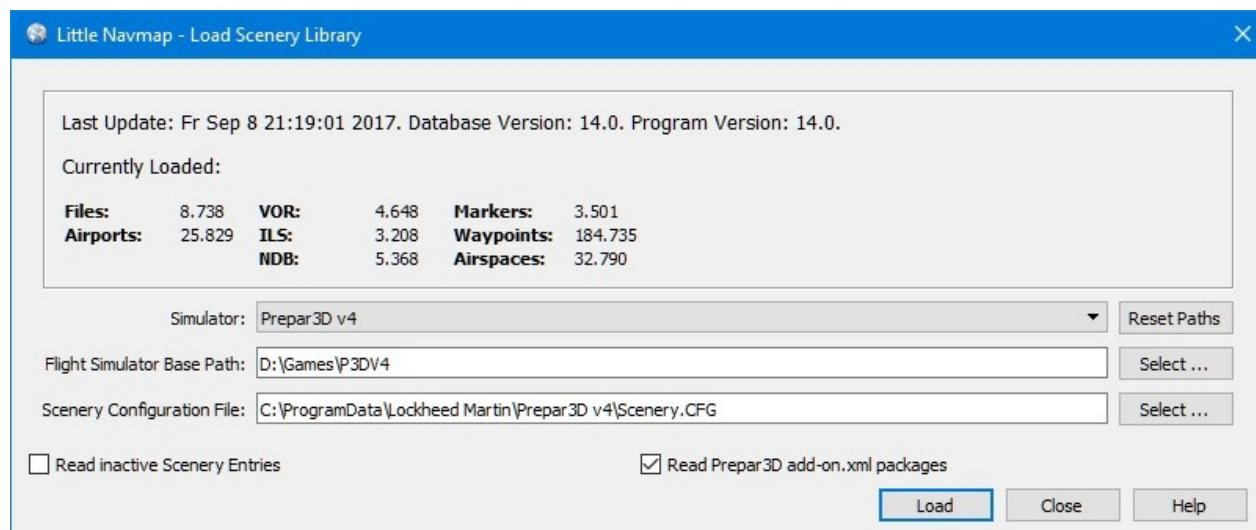
- **Flight Simulator X:** `C:\ProgramData\Microsoft\FSX\Scenery.cfg`
- **Flight Simulator - Steam Edition:** `C:\ProgramData\Microsoft\FSX-SE\Scenery.cfg`
- **Prepar3D v2:** `C:\Users\YOUR_ACCOUNT_NAME\AppData\Roaming\Lockheed Martin\Prepar3D v2\Scenery.cfg`
- **Prepar3D v3:** `C:\ProgramData\Lockheed Martin\Prepar3D v3\Scenery.cfg`
- **Prepar3D v4:** `C:\ProgramData\Lockheed Martin\Prepar3D v4\Scenery.cfg`

An error dialog is shown after loading if any files could not be read or directories were not found. In this case you should check if the airports of the affected sceneries display correctly and show the correct information. The error dialog allows copy and paste of formatted text which is useful for error reporting.

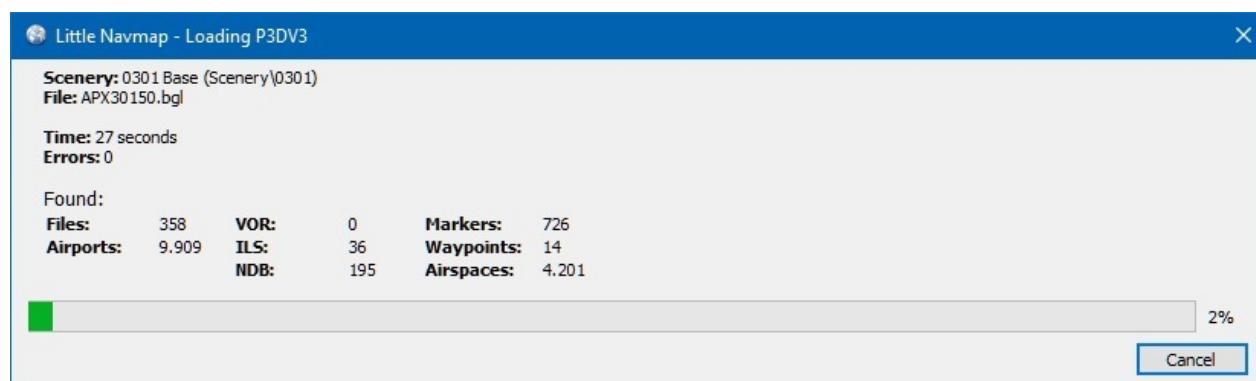
The `Load Scenery Library` dialog shows the last time of loading (`Last update:`), the program and the database version. Major database version differences show incompatible databases. The program will ask if the incompatible databases can be erased on startup before the scenery database can be reloaded. Minor database differences show compatible changes where a reload is recommended but not required.

## Load Scenery Library Dialog Options

- **Simulator** : Selects the simulator to load and show database statistics in the label above.
- **Reset Paths** : Reset all paths back to default values.
- **Flight Simulator Base Path** and **Select ...** : The path to the base directory of the selected flight simulator. This usually the directory containing the **FSX.exe** or **Prepar3D.exe**. This is the base for all relative paths found in the **scenery.cfg** file.
- **Scenery Configuration File** and **Select ...** (only FSX and P3D) : The file **scenery.cfg** of the simulator. You can also create copies of the original file, modify them by removing or adding sceneries and select them here for loading.
- **Read inactive Scenery Entries** (only FSX and P3D) : This will read all scenery entries, also the inactive/disabled ones. This is helpful if you use a tool to disable scenery before flying but still want to see all add-on sceneries in *Little Navmap* without reloading.
- **Read Prepar3D add-on.xml packages** (only P3D v3 and v4) : If enabled, reads P3D v4 or v3 add-on.xml packages. These are read from subdirectories of **C:\Users\YOURUSERNAME\Documents\Prepar3D v4 Files\add-ons** and **C:\Users\YOURUSERNAME\Documents\Prepar3D v4 Add-ons**.
- **Load** : Starts the database loading process. You can stop the loading process at any time and the previous database will be restored. The dialog will be closed and the program will switch to show the loaded database once it is successfully loaded.
- **Close** : Keeps all settings and changes in the dialog and close it without loading anything.



**Picture above:** Load Scenery Dialog. Scenery data is already loaded for FSX.



**Picture above:** Progress dialog shown while loading the scenery library into Little Navmap's internal database.



## Connecting to a Flight Simulator

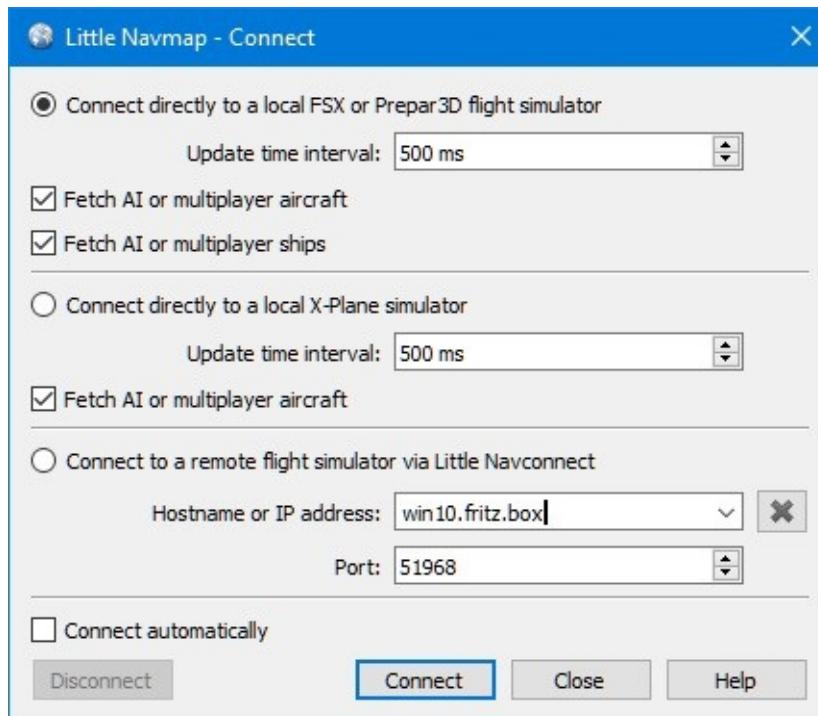
The setup [procedure](#) is different for remote connections and local connections to a flight simulator.

*Little Navmap* can connect directly if all programs are run on the same computer. The *Little Navconnect* agent is needed if *Little Navmap* is run on a remote computer.

The X-Plane plugin is needed in any case.

### Local Connection

Open the connection dialog in *Little Navmap* by selecting `Main Menu -> Tools -> Flight Simulator Connection` and choose the simulator to which the connection should be established.



**Picture above:** Little Navmap connect dialog set up for a local connection to FSX or P3D. The connection will be established manually.

Select `Connect directly to local Flight Simulator`.

Now click `Connect`. The dialog will close and *Little Navmap* will try to establish a connection in the background.

Clicking `Close` keeps all changes and closes the dialog without establishing a connection.

Enable `Connect automatically` if you do not want to connect manually. The start order of programs does not matter if this is checked and *Little Navmap* will find the simulator once it is started or when it is already running. This is the recommended setting.

Deselect `Fetch AI or multiplayer aircraft` or `Fetch AI or multiplayer ships` to disable the transfer of this information to the program. This can be useful for performance reasons if you use large amounts of AI but do not want to see it in *Little Navmap*.

### Remote Connection

User aircraft and weather information is transferred to *Little Navmap* on a remote computer by using the *Little Navconnect* agent on the flying computer which saves the error prone and tedious setup of a remote [SimConnect](#) connection.

Note that weather information cannot be transferred across a remote connection from X-Plane.

You have to extract the ZIP archive that contains `littlenavmap.exe` and `littlenavconnect.exe` on both computers. Then load the scenery database on the flying computer and copy the database over to the remote computer. See [Running without Flight Simulator Installation](#) for details.

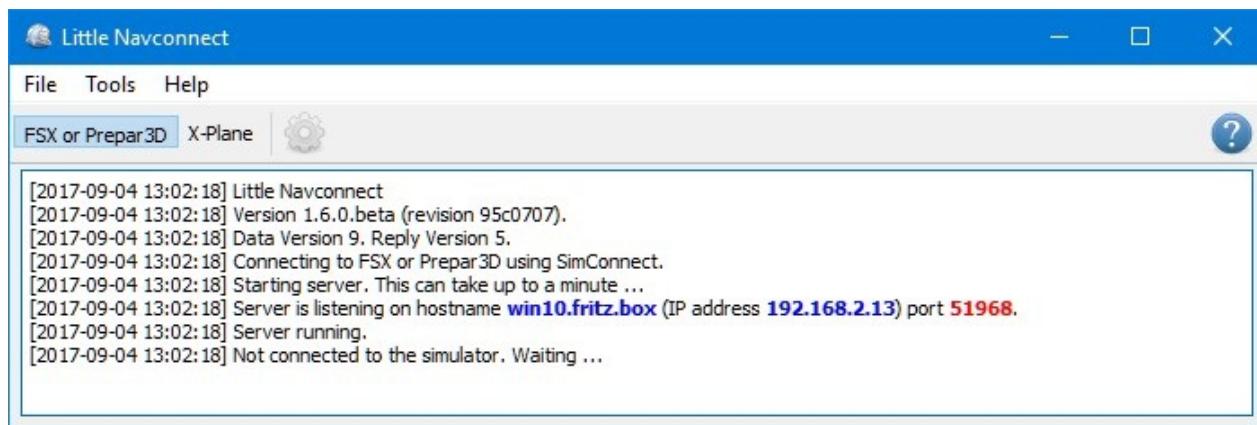
Make sure that the major versions of *Little Navmap* and *Little Navconnect* match, otherwise you might get an error message. *Little Navmap* 1.0.5 is compatible with *Little Navconnect* 1.0.2 but not with 1.2 for example.

For X-Plane you also have to install the *Little Xpconnect* plugin. See the file `README.txt` in directory `Little Xpconnect` for installation instructions.

## Start *Little Navconnect* on the Flying Computer

*Little Navconnect* is bundled together with the *Little Navmap* download archive. Start *Little Navconnect* (`littlenavconnect.exe`) on the flying computer and take note of the message that is printed in the logging window. You only need the colored values which tell you the name and address of the flying computer. You can use the IP address or the hostname.

*Little Navconnect* can print multiple IP addresses or hostnames depending on your network configuration. This can happen if you have Ethernet plugged in and are connected using wireless LAN too, for example. You have to try if you are unsure which one to use. Also make sure to set up the Windows firewall properly to allow communication between `littlenavmap.exe` and `littlenavconnect.exe` on both computers.



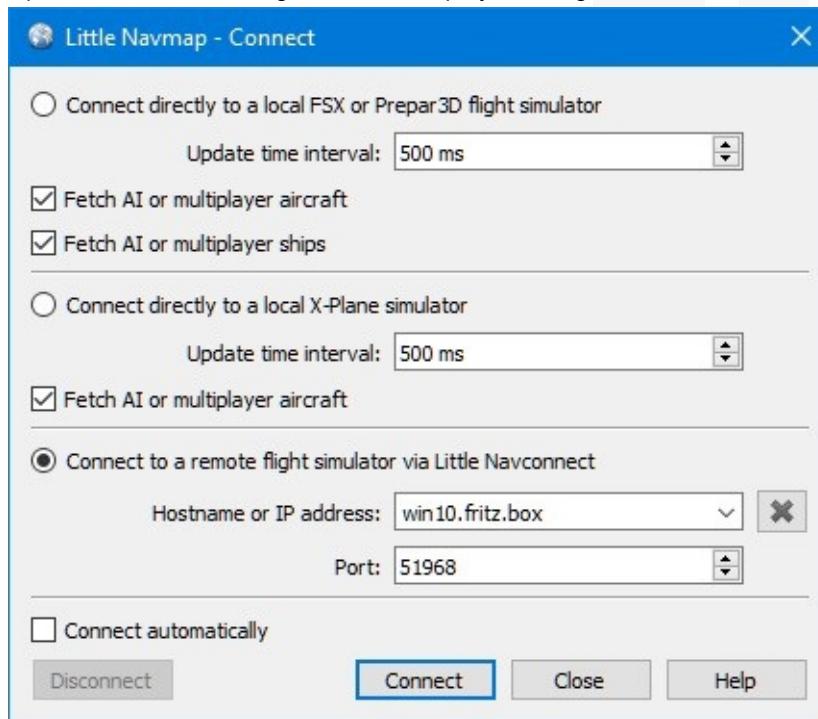
**Picture above:** *Little Navconnect* is running and waiting for a Flight Simulator. It is running on the computer `win10.fritz.box` with the IP address `192.168.2.13`.

Change the port in *Little Navconnect's* Options dialog if you see an error message like shown below:

```
[2016-07-27 16:45:35] Unable to start the server: The bound address is already in use.
```

## Start *Little Navmap* on the Client / Remote Computer

Open the connection dialog in *Little Navmap* by selecting Main Menu -> Tools -> Flight Simulator Connection .



**Picture above:** Connect dialog with correct values to access the flying computer running Little Navconnect as shown above.

Now do the following after opening the dialog:

1. Select Connect to a remote Flight Simulator .
2. Add the value for hostname. This can be either the hostname or the IP address printed by Little Navconnect.
3. Check the value for the port. 51968 is the default value and does not need to be changed usually.
4. Click connect. The dialog will close and Little Navmap will try to establish a connection in the background.

Establishing a connection can take some time, depending on your network. The aircraft will show up on the map and on the Simulator Aircraft dock window once a flight is set up and loaded on the simulator. You will see the message Connected. Waiting for update. in the Simulator Aircraft dock window if no flight is loaded yet (i.e. the simulator still shows the opening screen).

Note that it sometimes can take a while until an error is shown if you used the wrong values for hostname or port.

Selecting Connect automatically is recommended. The start order of all three programs (simulator, Little Navconnect and Little Navmap) does not matter if this is checked and the programs will find each other.

Deselect Fetch AI or multiplayer aircraft OR Fetch AI or multiplayer ships in Tools -> options of Little Navconnect to disable the transfer of this information across the network. This can be useful for performance reasons if you use large amounts of AI but do not want to see it in Little Navmap.

## Connect Dialog Options

- Disconnect : Disconnects the current session and stops automatic reconnect.
- Connect : Tries to connect. An error dialog will be shown if no connection can be established. Little Navmap will constantly try again if connect automatically is enabled.
- Close : Closes the dialog without any changes to the current connection status.
- Connect automatically : Little Navmap will try to connect constantly if this is enabled. This is the recommended setting.
  - All connection attempts will stop immediately if you deselect this button.
  - You have to click Connect to start the automatic connection attempts after checking this button.
- Update Time Interval : Allowed range is 50 milliseconds up to 1 second. Little Navmap fetches data from a simulator using this time interval. Increase this value if you experience stutters or lag in the simulator. A lower value will result in

more fluid map updates in *Little Navmap*.

- `Fetch AI or multiplayer aircraft` and `Fetch AI or multiplayer ships` : Disables fetching of AI vehicles. These settings are applied immediately. Note that ship traffic is not available for X-Plane.



## Checking for Updates

*Little Navmap* will automatically check its [home page](#) for available updates on startup. Frequency and update channels are configurable. See below for configuration options.

You can always check manually for updates by selecting `Main Menu -> Help -> Check for Updates`.

Note that the installation still has to be done manually.

### Notification

The dialog showing available updates contains a change log, various other messages and one or more download links.

#### Ignore this Update

Pressing this button will put the shown version on a black list. You will not see any reminders for this version again but for newer versions.

This button is not visible when checking manually.

Note that manually checking for updates ignore the black listed updates.

#### Remind me Later

Dismisses the dialog. You will be notified again on next startup depending on selected frequency. You can also press `Esc` to trigger this action.

This button is not visible when checking manually.



**Picture above:** Update notification dialog showing an available beta version including change log and download link.

### Options

#### Check for Updates:

`Daily` , `Weekly` OR `Manual` .

Select `Main Menu -> Help -> Check for Updates` to search manually for new versions.

Note that the daily or weekly check is only done when starting the program.

#### Update Channels:

**Stable Versions only** : This will show only notifications for tested and stable versions also containing a complete manual.

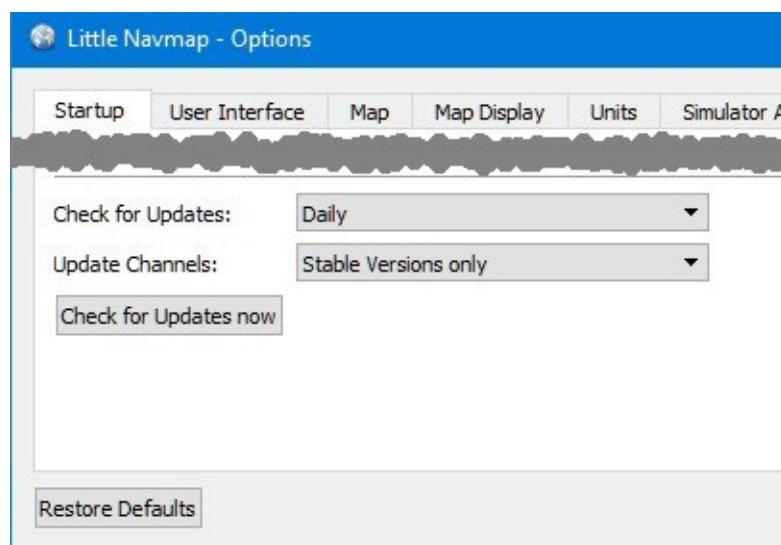
**Stable and Beta Versions** : Will additionally check for beta/test versions. Beta versions are program releases that already contain all planned features for a stable release but are still not tested carefully. The manual might be incomplete.

**Stable, Beta and Development Versions** : *Little Navmap* will also show notifications for development releases. These are neither complete nor well tested. Features might change over time and the manual is not updated for new functionality.

A backup of all settings is recommended before running a development version.

## Check for Updates now

Checks for updates immediately. This will use the current settings as shown in the dialog. It will also show notifications for updates that were ignored by pressing the `Ignore this update` on the notification dialog.



*Picture above: Update notification settings in dialog Options .*



## Options Dialog

Most options are self explaining and tooltips contain more detailed explanations if applicable.

You can immediately check the effect of your changes on the map display by moving the dialog `options` to the side and pressing `Apply`.

The button `Restore Defaults` only restores the options of this dialog back to default. Other settings like map display, table views or dock window positions are not affected. To reset all saved settings completely see [Troubleshoot](#).

### Startup

Allows to customize what should be loaded and shown on startup of *Little Navmap*.

You can also configure the frequency of the automatic update check and channels. See [Checking for Updates](#) for more information.

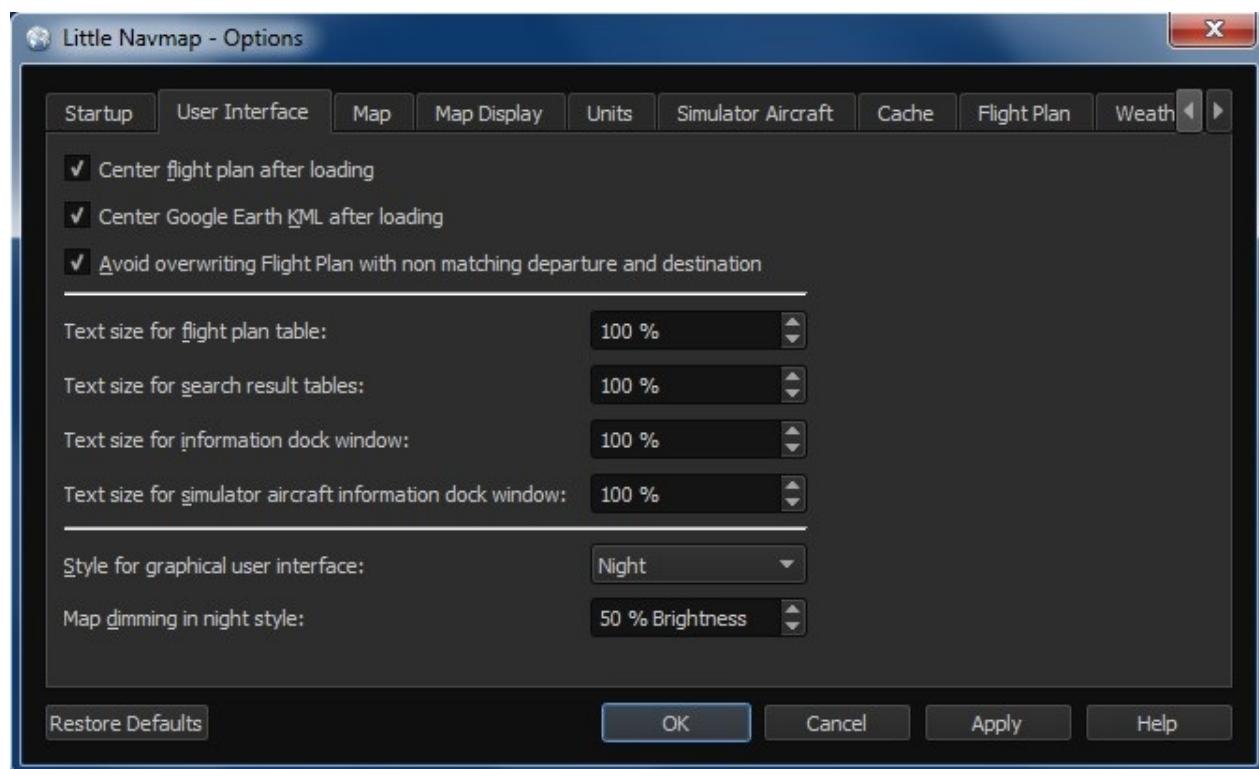
### User Interface

Has options for text sizes in information windows and flight plan as well as the search result table.

You can also change the overall style for the graphical user interface. The user interface styles contain a `Night` mode that can be used for night flights in dark rooms. You can also dim the map and elevation profile display.

A restart is not needed but recommended after changing a style.

The colors for the styles `Fusion` and `Night` can be changed by editing configuration files. See [Customize](#) for more information.



**Picture above:** Tab `User Interface` using the style `Night`.

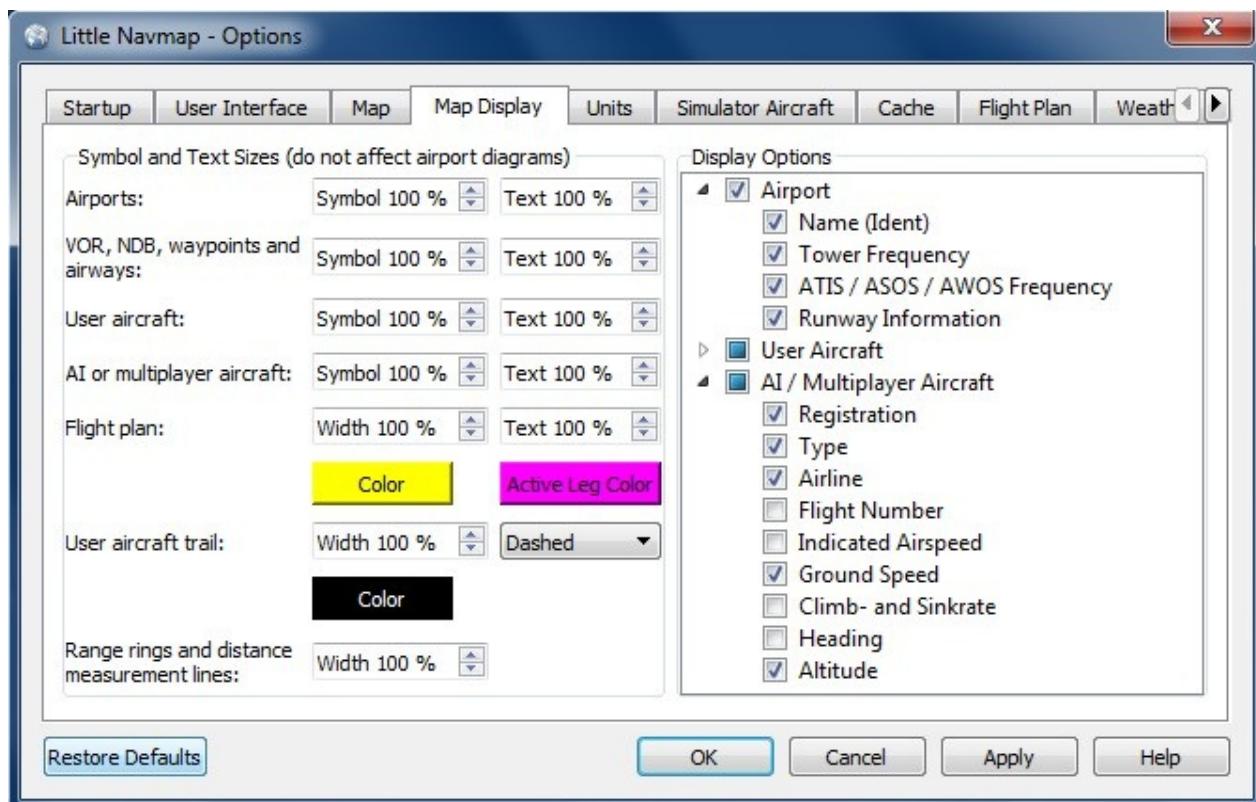
### Map

Has map related customization options. Allows to set the click sensitivity, zoom distances and more.

## Map Display

This tab contains options for symbol and text sizes, flight plan and aircraft trail colors and more.

The right side of the tab contains a tree that allows to select the text labels that should be shown at airports, user aircraft and AI/multiplayer aircraft.



**Picture above:** Tab `Map Display`.

## Units

You can change all units that are used by *Little Navmap* on this tab between nautical, imperial and metric. Mixed settings like meter for altitude and nautical miles for distance are possible.

Note that any numbers used in the program are not converted when changing units. That means that you will have a minimum altitude buffer of 1000 meter after changing the setting `Altitude and Elevation` from feet to meter. This also applies to flight plan altitude. Therefore, do not forget to adapt these numbers after changing units.

## Simulator Aircraft

Allows to change various aspects around the display of the user aircraft. All settings resulting in a more fluid aircraft display will use more CPU and can potentially induce stutters in the simulator.

## Cache and Files

### Map Display

Here you can change the cache size in RAM and on disk. These caches are used to store the downloaded images tiles from the online maps like the *OpenStreetMap*, *OpenMapSurfer* or *OpenTopoMap*.

All image tiles expire after two weeks and will be reloaded from the online services then.

Note that a reduction of size or erasing the disk cache is done in background and can take a while.

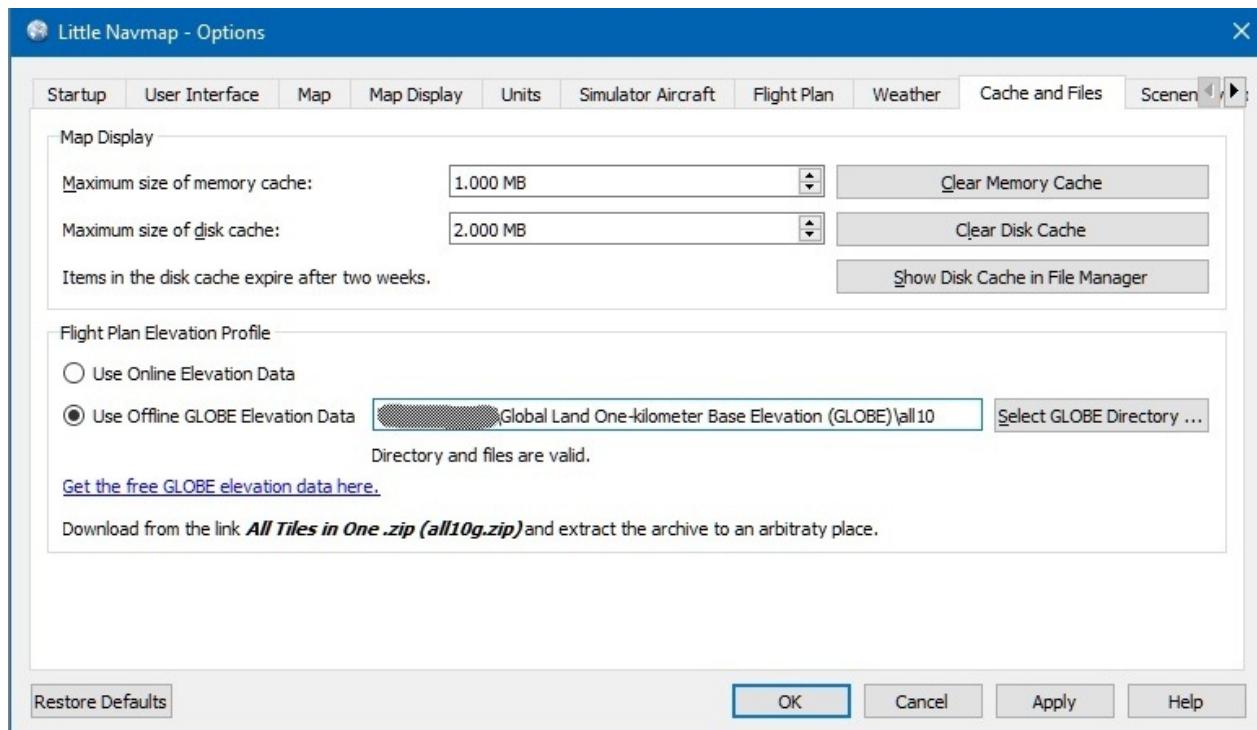
The RAM cache has a minimum size of 100 MB and a maximum size of 2 GB.

The disk cache has a minimum size of 500 MB and a maximum size of 8 GB.

## Flight Plan Elevation Profile

The lower part of this tab allows to install the freely downloadable [GLOBE - Global Land One-km Base Elevation Project](#) elevation data.

Download the ZIP archive from the link in the dialog and extract it. Select the extracted directory using [Select GLOBE Directory ...](#), so, that it points to the files `a10g` to `p10g`. The label in the dialog will show an error if the path is invalid.



**Picture above:** Tab `Cache and Files` with properly selected GLOBE elevation data.

## Flight Plan

Here you can set preferences for flight plan calculation or adjust the rule of thumb for the top of descent display.

## Weather

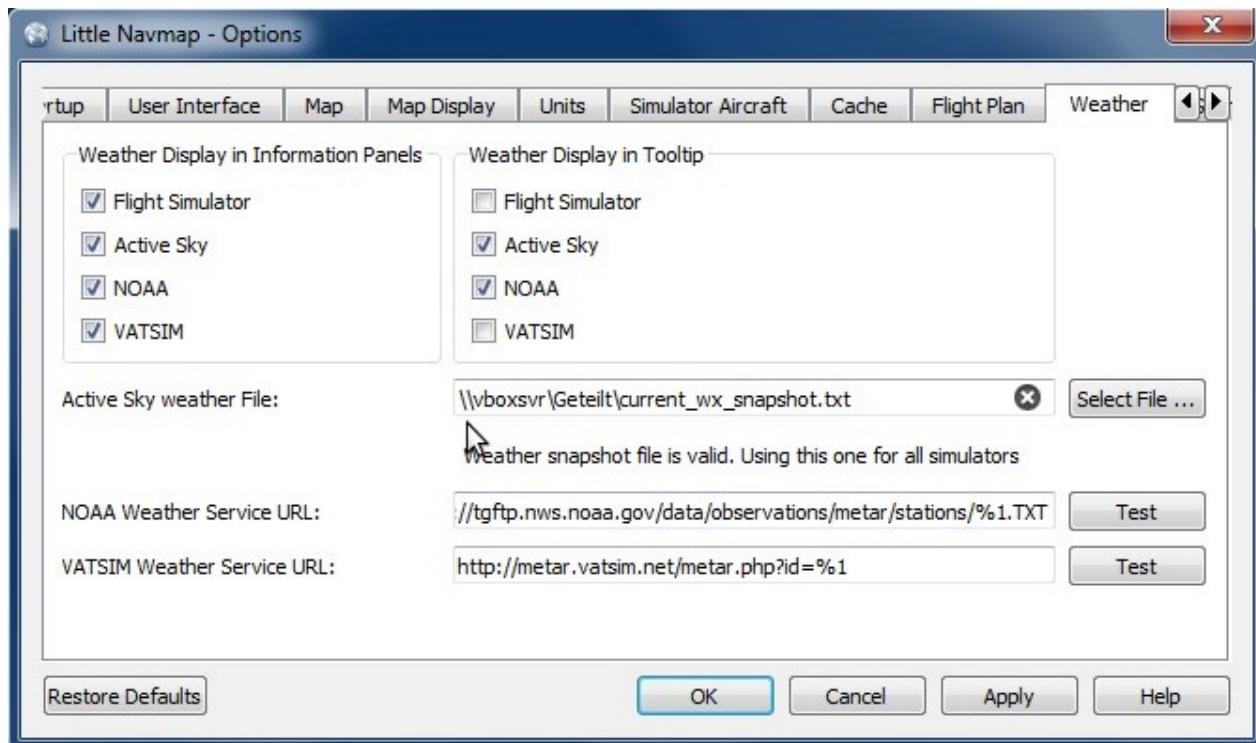
You can select the various weather sources that should be shown in the `Information` dock window or in the map tooltips.

The weather type `Flight Simulator` will either display weather from the [FSX](#) or [P3D](#) connection or from X-Planes `METAR.rwx` weather file.

`Active Sky` can only be selected if either `Active Sky Next`, `AS16` or `Active Sky for Prepar3D v4` are installed or the weather file is selected directly. Selecting the `Active Sky` weather file directly can be useful if you run a networked setup. Use Windows shares or a cloud service to get access to the file on the remote computer.

The URLs of the NOAA and VATSIM weather can be modified if you like to use another source or the services change the URLs.

The test buttons for the online weather services can also be used to find out if *Little Navmap* can connect to Internet. Check your firewall settings if these fail.



*Picture above: Tab Weather with manually selected Active Sky weather file on a network share.*

## Scenery Library Database

Allows to configure the loading of the [scenery library database](#).

Note that these paths apply to all Flight Simulators, [FSX](#), [P3D](#) and X-Plane.

You have to reload the scenery database in order for the changes to take effect.

### Select Paths to exclude from loading

All directories including sub-directories in this list will be omitted when loading the scenery library into the *Little Navmap* database. You can also use this list to speed up database loading if you exclude directories that do not contain airports or navaids (landclass, elevation data and others).

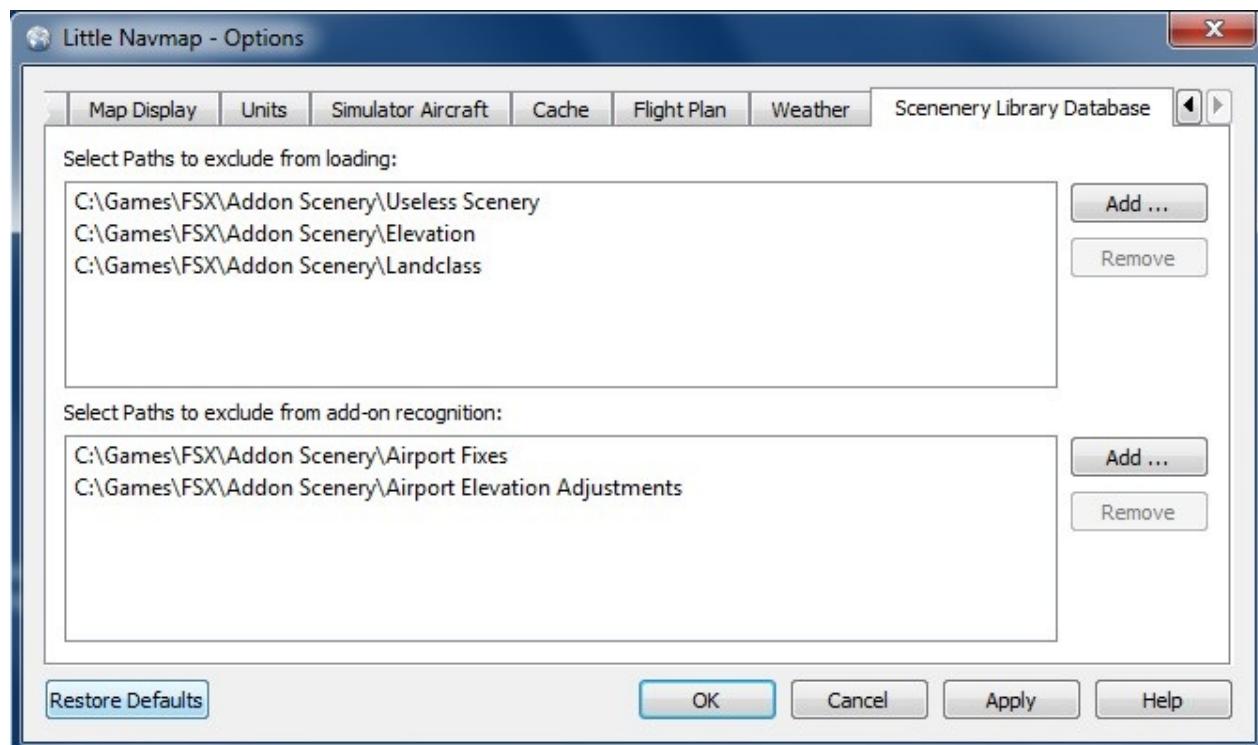
### Select Paths to exclude add-on recognition

All scenery data that is found outside of the base flight simulator [Scenery](#) directory is considered an add-on and will be highlighted on the map and also considered during search for add-ons.

You can use this list to modify this behavior.

Add-ons, like *Orbx FTX Vector* or *fsAerodata* add scenery files that correct certain aspects of airports like elevation, magnetic variance or others. All these airports will be recognized as add-on airports since all their files are not stored in the base flight simulator [Scenery](#) directory.

Insert the corresponding directory into this list to avoid unwanted highlighting of these airports as add-ons.



**Picture above:** Tab `Scenery Library Database` with three directories excluded from loading and two directories excluded from add-on recognition.

## Examples

Provided your simulator is installed in `C:\Games\FSX`.

### ORBX Vector

Exclude the directories below from add-on recognition. Do not exclude them from loading since you will see wrong airport altitudes.

- `C:\Games\FSX\ORBX\FTX_VECTOR\FTX_VECTOR_AEC`
- `C:\Games\FSX\ORBX\FTX_VECTOR\FTX_VECTOR_APT`

### Flight1 Ultimate Terrain Europe

Exclude these directories from loading to speed up the process:

- `C:\Games\FSX\Scenery\UtEurAirports`
- `C:\Games\FSX\Scenery\UtEurGP`
- `C:\Games\FSX\Scenery\UtEurLights`
- `C:\Games\FSX\Scenery\UtEurRail`
- `C:\Games\FSX\Scenery\UtEurStream`
- `C:\Games\FSX\Scenery\UtEurWater`

### ORBX Regions

Exclude these directories from loading:

- `C:\Games\FSX\ORBX\FTX_NZ\FTX_NZSI_07_MESH`
- `C:\Games\FSX\ORBX\FTX_NA\FTX_NA_CRM07_MESH`
- `C:\Games\FSX\ORBX\FTX_NA\FTX_NA_NRM07_MESH`
- `C:\Games\FSX\ORBX\FTX_NA\FTX_NA_PNW07_MESH`
- `C:\Games\FSX\ORBX\FTX_NA\FTX_NA_PFJ07_MESH`



## Running without Flight Simulator Installation

You can use `littlenavmap.exe` on all computers no matter if [SimConnect](#) or a flight simulator are installed or not.

Follow these steps if you want to install *Little Navmap* on a computer not containing any flight simulator installation for a networked setup, for example. No functionality is affected except direct connect capability which are not needed in this case.

This scenario is typically used when connecting to the flight simulator to watch the progress of a flight remotely.

Flight plans can be created, loaded and saved on the client computer. You only have to make sure that these are transferred to the flight simulator computer using Windows shares or by other means.

These instructions apply to Windows, macOS and Linux computers equally.

1. Install *Little Navmap* on both your flying computer and the client computer without simulator.
2. Start it on the flying computer and generate the scenery library databases. See [Load Scenery Library Dialog](#) above for more information.
3. Select `Main Menu -> Scenery Library -> Show Database Files` on the flying computer. This will open the directory containing the database files in a file manager like Windows Explorer or Apple Finder. You will find one or more database file like `little_navmap_fsx.sqlite`, `little_navmap_p3dv3.sqlite` or `little_navmap_xp11.sqlite`.
4. Exit *Little Navmap* on the flying computer.
5. Start *Little Navmap* on the client/remote computer and select `Scenery Library -> Show Database Files`.
6. Exit *Little Navmap* on the client computer so you can copy the database files.
7. Copy the database files to your client computer using network shares, USB sticks or whatever you like. Use the file manager windows opened by the procedures above.
8. Start *Little Navmap* on the client computer. The menu `Scenery Library` should contain an entry for each copied database file or no entry at all if only one database file was copied. Airport icons should be visible on the map in either case. **There is no need to reload the `scenery library database` now since you just copied a fully populated database file.**

See the [Connecting to a Flight Simulator](#) for information about networked setups.

## Customizing General

*Little Navmap* creates multiple configuration files in the directory `C:\Users\YOURUSERNAME\AppData\Roaming\ABarthel` when started. These allow extended customization of the program.

The files use the Windows- `INI` style that has groups in square brackets and `key=value` lines. See [here](#) for more information about this type of configuration files.

Note that you have to restart *Little Navmap* to see any changes.

To undo all changes simply delete a file. It will be created again containing the default values when *Little Navmap* is started.

Single lines can also be deleted and will be restored with the default value when *Little Navmap* is started.

Keys and values are case sensitive. Order in the files is not important if the keys remain in their respective sections. The program might reorder the keys when saving or updating the files.

## GUI

Only two user interface styles can be customized. These are `Fusion` and `Night` and can be found in the dialog [User Interface](#) tab of the options dialog. These two styles are available on all operating systems.

Two files are generated that allow the customization for all window, button and dialog colors. These are:

- `C:\Users\YOURUSERNAME\AppData\Roaming\ABarthel\little_navmap_fusionstyle.ini`
- `C:\Users\YOURUSERNAME\AppData\Roaming\ABarthel\little_navmap_nightstyle.ini`

The key names in these files are derived from the `Qt` palette options. Each key consists of the group and role name separated by an underscore. See below for more information on the color formats used.

See [here](#) for more information about [groups](#) and [roles](#).

## Map Display

The file `C:\Users\YOURUSERNAME\AppData\Roaming\ABarthel\little_navmap_mapstyle.ini` allows to customize various aspects of the map display and is currently limited to colors and pens. Most key names are self explaining. See below for more information about color values.

### Color Format

Color can be in one of these formats which are commonly used in web design:

- `#RRGGBB` each of R, G, B and A is a single hex digit. Each color value ranges from 00 - FF (decimal 0-255)
- `#AARRGGBB` first two digits contain the alpha/transparency value. `00` equals to fully transparent and `FF` (decimal 255) to opaque.
- SVG color name

SVG color name is one of the colors defined in the list of [SVG color keyword names](#) provided by the World Wide Web Consortium; for example, `steelblue` or `gainsboro`. Note that you cannot enter an alpha channel value if you use a color name.

You can use the [w3schools color picker](#) to get the hex values for a color.

#### Examples:

```
Active_Highlight=#308cc6
```

`AlertFillColor=darkred``ApproachFillColor=#3060808a`

## Pen Format

A pen contains the following values in a comma separated list:

- Color as described above
- Pen width as a floating point value measured in pixels. You have to use `.` as decimal separator no matter what your locale defines.
- Pen style. One of the following values: `Solid`, `Dash`, `Dot`, `DashDot` and `DashDotDot`.

### Examples:

`RestrictedPen=#fd8c00, 2, DashDotDot``ModecPen=#509090, 2, Solid``NationalParkPen=#509090, 2.1, Solid`

## User, AI and Multiplayer Aircraft Icons

All icons for user, AI/multiplayer aircraft, helicopters and ships are stored in the program but can be overloaded by the user.

The format is limited to SVG ([Scalable Vector Graphics \(SVG\) Tiny 1.2 Specification](#)) where advanced graphics effects like textures will not work.

Note that the icons will only be used on the map and not in the information windows.

The icons are:

`aircraft_boat_ground_user.svg``aircraft_boat_ground.svg``aircraft_boat_user.svg``aircraft_boat.svg``aircraft_helicopter_ground_user.svg``aircraft_helicopter_ground.svg``aircraft_helicopter_user.svg``aircraft_helicopter.svg``aircraft_jet_ground_user.svg``aircraft_jet_ground.svg``aircraft_jet_user.svg``aircraft_jet.svg``aircraft_small_ground_user.svg``aircraft_small_ground.svg``aircraft_small_user.svg``aircraft_small.svg`

The suffixes are chosen by vehicle type, status (ground or airborne) and user or AI/multiplayer. The icon is for airborne vehicles if `ground` is missing and for AI/multiplayer vehicles if `user` is missing. For historical reasons all icons are prefixed with `aircraft`.

To change an icon download it from the Github source repository [Icon Resources](#) and save it into the settings directory

`C:\Users\YOURUSERNAME\AppData\Roaming\ABarthel\`

You can use the free vector drawing program [Inkscape](#) to edit the icons. Restart *Little Navmap* to see the changes.



## Creating or adding Map Themes

To add an arbitrary online or an offline map to *Little Navmap* simply add the map directory from a downloaded or self created map theme to the `data\maps\earth` directory.

The full path to the DGML file (see links below for more details about DGML) describing the map must be `c:\own Programs\Little Navmap\data\maps\earth\opencyclemap\opencyclemap.dgml` if you like to add the [OpenCycleMap](#) for example. The DGML file can refer to an online map service or included offline map data. Usually a map theme contains many more files than only the DGML.

The menu `Main Menu -> Map -> Theme` and the toolbar drop down box will receive an entry for each additional map theme.

The options `Show Country and City Names` and `Show Hillshading` are enabled for all additional map themes but might not work depending on properties defined in the map's DGML file.

More maps and information about map configuration and DGML files can be found here on the Marble/KDE pages:

- Download more maps for the Marble widget (only Earth maps are supported in *Little Navmap*): [Additional Maps](#)
- A tutorial that shows how to create a map theme based on tiled images: [Marble/CustomMaps](#)
- A tutorial showing how to create a map theme based on OSM Slippy Maps: [How to create map themes based on OSM slippy maps](#)
- How to create a historical map for Marble: [Historical Maps for Marble](#)

## Files

Log files of *Little Navmap* for Windows 7/8/10 are typically stored in the directory:

C:\Users\YOURUSERNAME\AppData\Local\Temp

The program keeps three log files and rotates these on each startup. So you may find up to three logs:

abarthe1-little\_navmap.log , abarthe1-little\_navmap.log.1 and abarthe1-little\_navmap.log.2 .

All configuration files for my programs for Windows 7/8/10 are typically stored in the directory:

C:\Users\YOURUSERNAME\AppData\Roaming\ABarthel

There are three configuration files for this program:

- little\_navmap.ini : INI style configuration file. Text file.
- little\_navmap.history : The map position history. Binary file.
- little\_navmap.track : The user aircraft track. Binary file.

Three more configuration files are created for customization of colors and styles:

- little\_navmap\_fusionstyle.ini : INI style configuration file for customizing the GUI colors of the style Fusion .
- little\_navmap\_nightstyle.ini : INI style configuration file for customizing the GUI colors of the style Night .
- little\_navmap\_mapstyle.ini : INI style configuration file. Text file. Used for customization of the map display.

See [Customization](#) for more information.

The disk cache that is used to store all the downloaded online map tile images can be found here:

C:\Users\YOURUSERNAME\AppData\Local\.marble\data

The scenery library databases are stored in the directory:

C:\Users\YOURUSERNAME\AppData\Roaming\ABarthel\little\_navmap\_db

There can be up to five files depending which simulators you have installed and which scenery libraries you've loaded.

All these databases are [SQLite](#) files which can be viewed with e.g. [DB Browser for SQLite](#) if you're interested in relational databases.

The files are:

- little\_navmap\_.sqlite : An empty dummy database.
- little\_navmap\_fsx.sqlite : Flight Simulator X
- little\_navmap\_fsxse.sqlite : Flight Simulator - Steam Edition
- little\_navmap\_p3dv2.sqlite : Prepar3D v2
- little\_navmap\_p3dv3.sqlite : Prepar3D v3
- little\_navmap\_p3dv4.sqlite : Prepar3D v4
- little\_navmap\_xp11.sqlite : X-Plane 11

Additional files like

- little\_navmap\_compiling.sqlite ,
- little\_navmap\_compiling.sqlite-journal ,
- little\_navmap\_temp.sqlite and
- little\_navmap\_temp.sqlite-journal

are remains of temporary processes like the database compilation and can be ignored.



# Tutorials

## General

The tutorials are based on:

- FSX or P3D scenery but can be easily adapted to X-Plane.
- An already loaded scenery database which normally happens right after the first startup.
- The stock navigation data of FSX or P3D. Differences might appear if you use navdata updates or airport scenery add-ons.

All functions will be referred by the names in the main menu by using `Menu Name` → `Menu Item`. The icons are shown too so you can find the buttons on one of the toolbars. Screenshots will provide more help.

## Quick Start

To have a clean common base I recommend the following:

- Select `Window` → `Reset Window Layout` to get all the dock windows back into their default place.
- Use the map theme `OpenStreetMap` with hill shading  enabled.
- Reset the map display settings in `Map` → `Reset Display Settings` to make sure that all needed features are shown on the map.
- Select `File` → `New Flight Plan`  to start with a clean flight plan.

## Tutorials

1. [Building a VFR Flight Plan](#) This tutorial will show how to create a simple flight plan based on the map and its context menus.
2. [Building an IFR Flight Plan with Approach Procedures](#) This long tutorial will show you how to create a more complex IFR flight plan including approach procedures. It introduces the advanced airport search functionality, the spatial search and the automatic flight plan calculation.

# Building a VFR Flight Plan

## General

This tutorial will show how to create a simple flight plan based on the map and its context menus.

The flight will take us through the lovely valleys of the French alps. You can use this flight plan for any small aircraft like the free [Flight1 Cessna 162 SkyCatcher](#) or the default Cessna 172.

The flight will only go through Class E airspace. There is no need to contact ATC.

The flight plan is: *Meyhet (LFPL) Parking 11, Ramp GA Small to Challes-les-Eaux (LFLE), 41 nm, 0 h 24 m, Direct*

## Departure Airport

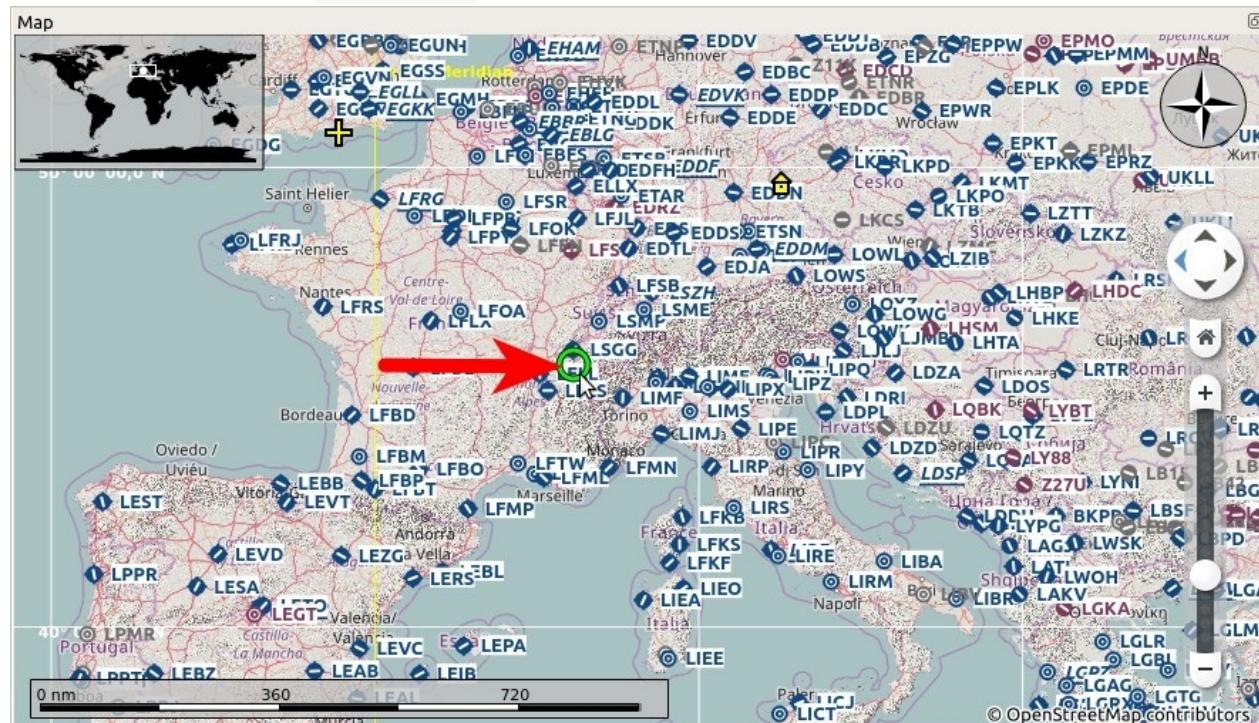
Find the departure airport: Click into the map and zoom to the French Alps. You can use the following functions to navigate:

- The map overlay on the left.
- The mouse (click and drag) to move and the mousewheel to zoom.
- The cursor keys to move and the keys + and - for zooming in and out (click into the map window to activate it before using the keys).

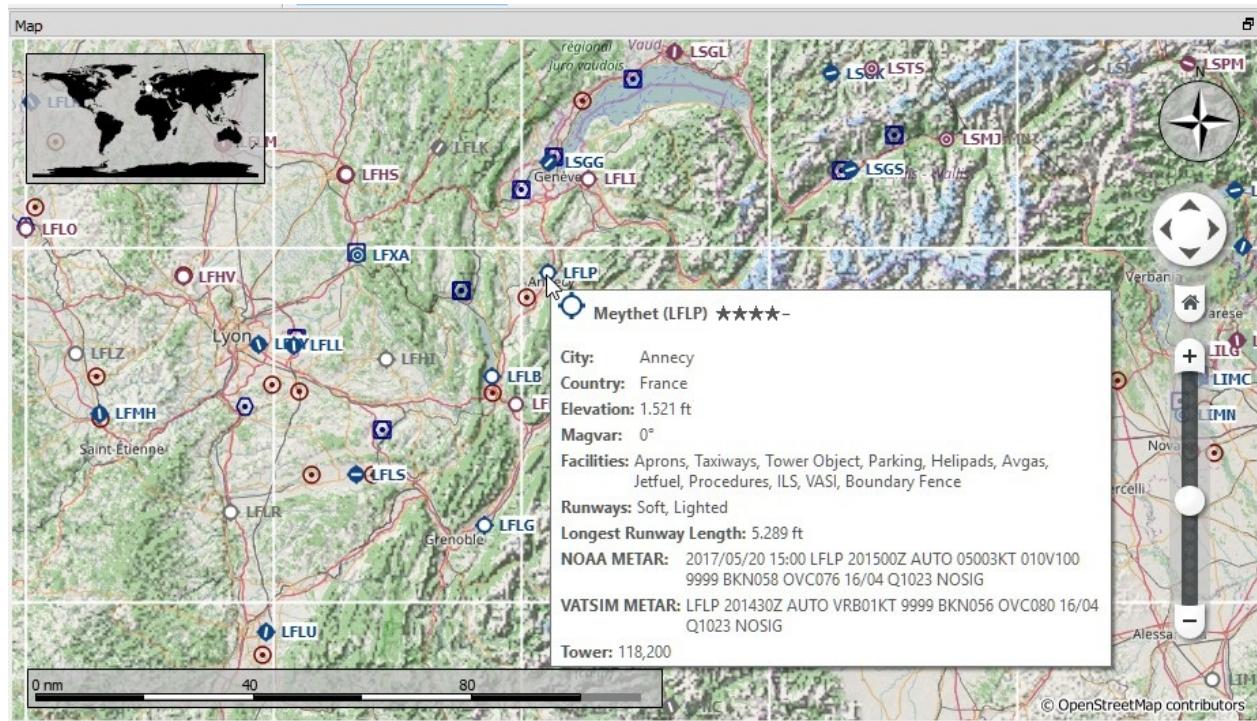
Use the back  and forward  buttons to jump in the position history like a web browser.

See also [Map Display](#).

Look for the departure airport Meyhet (LFPL) around here:

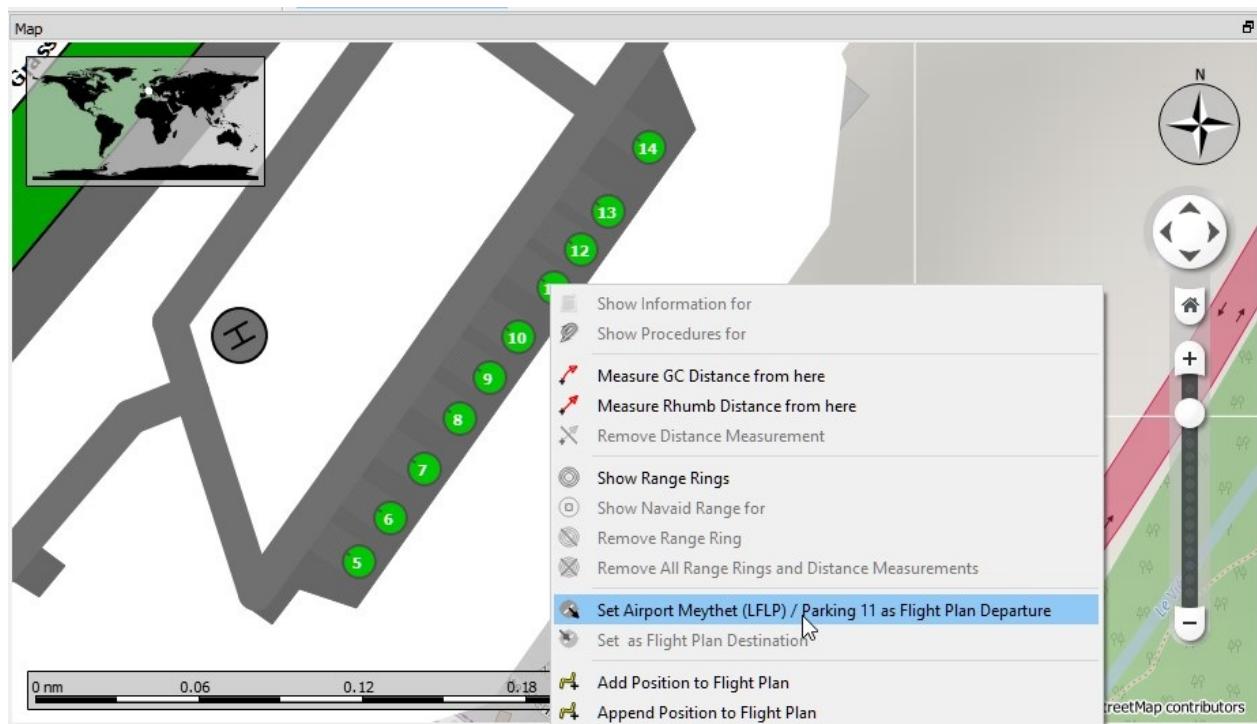


Closer with tooltip:



Now:

- Zoom in until you see the airport diagram showing taxiways, runway details, [parking](#) positions and more.
- Zoom in further until you see the white [parking](#) numbers.
- Right click on the center of one of the green ramp [parking](#) spots (11 is used here).
- Choose [Select Airport Meythet \(LFLP\) / Parking 11 as Flight Plan Departure](#) in the context menu.



This will select your departure [parking](#) position which will be highlighted by a black/yellow circle. The airport will be added to the flight plan as departure too.

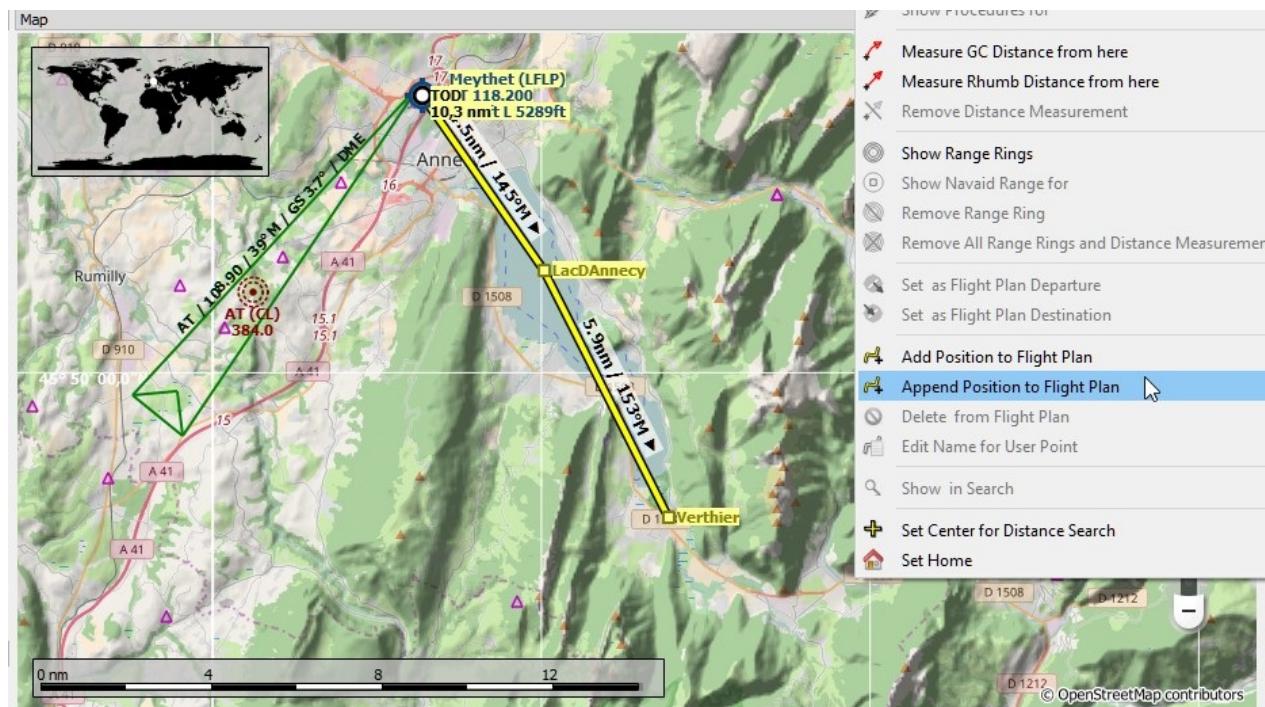
You can also click on the airport icon and select it for departure. A runway will be automatically assigned as departure position.

## En Route Waypoints

We add the waypoints now:

- Scroll along the valley to the south east across the lake Lac d'Annecy.
- Click **Append Position to Flight Plan** . The clicked position will be added as an user defined waypoint to the end of your plan.

Click undo  or redo  if you don't like what you just added.

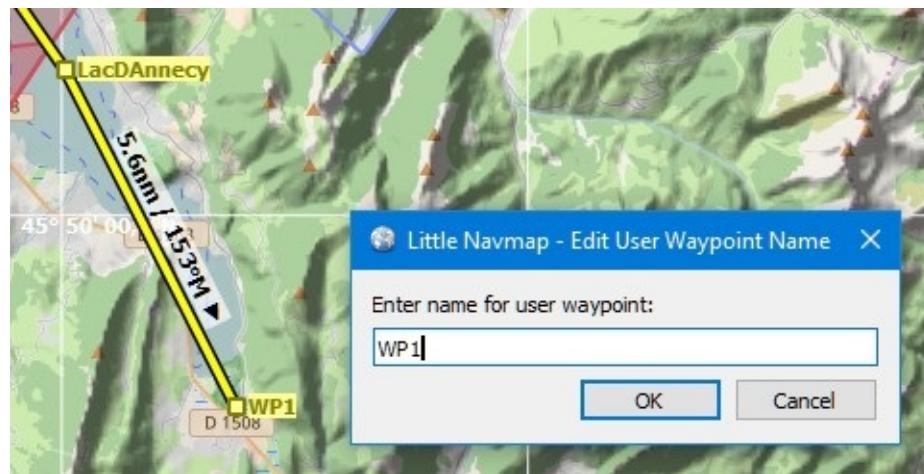


Another function is **Add Position to Flight Plan**  which will insert the clicked position to the nearest flight plan leg. You can use this to add user defined positions, airports or navaids in the middle of a flight plan. The nearest leg will be chosen automatically by *Little Navmap*.

*Little Navmap* will automatically assign names to the user defined waypoints. You can leave these as they are or replace them with a more meaningful name.

To change a waypoint name right click on the user waypoint and select **Edit Name for User Waypoint** . Use nearby villages, mountains, lakes or other points of interest.

The flight simulator limits the name to a certain length and to certain characters. Nothing will be added to the name if it is too long or if you type the wrong characters.

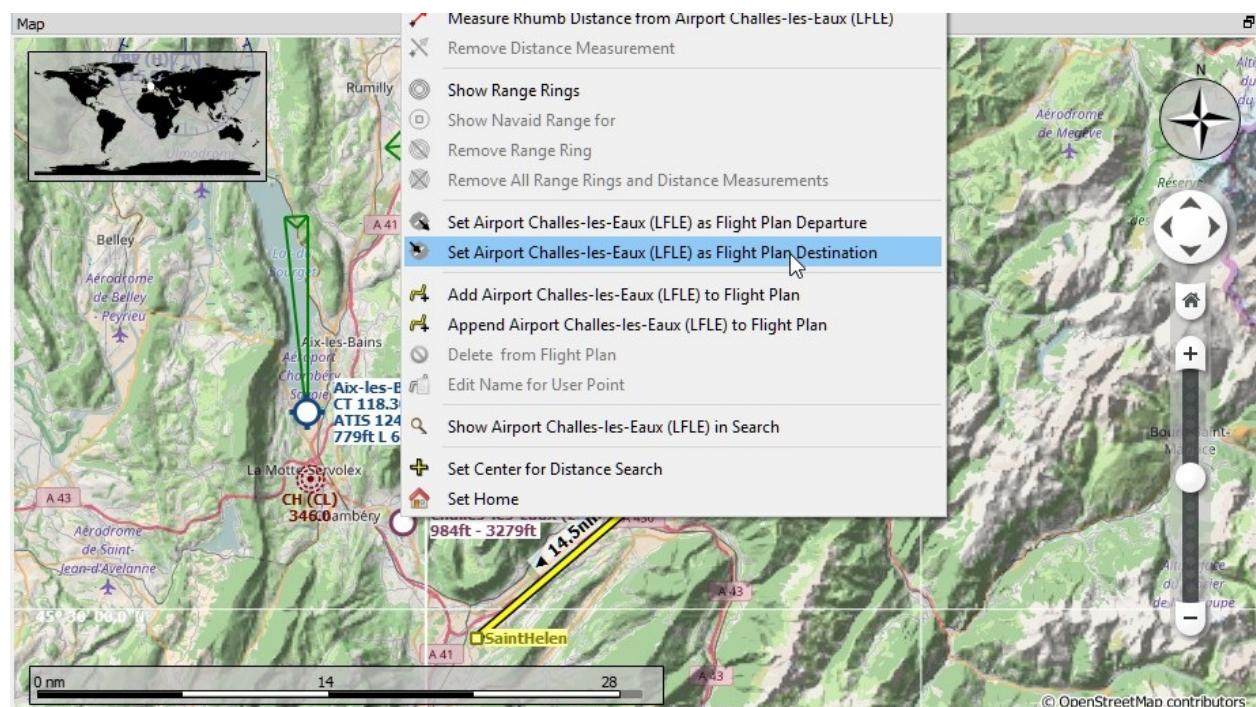


Keep adding points and stay away from the mountains until you're at Challes-les-Eaux (LFLE).

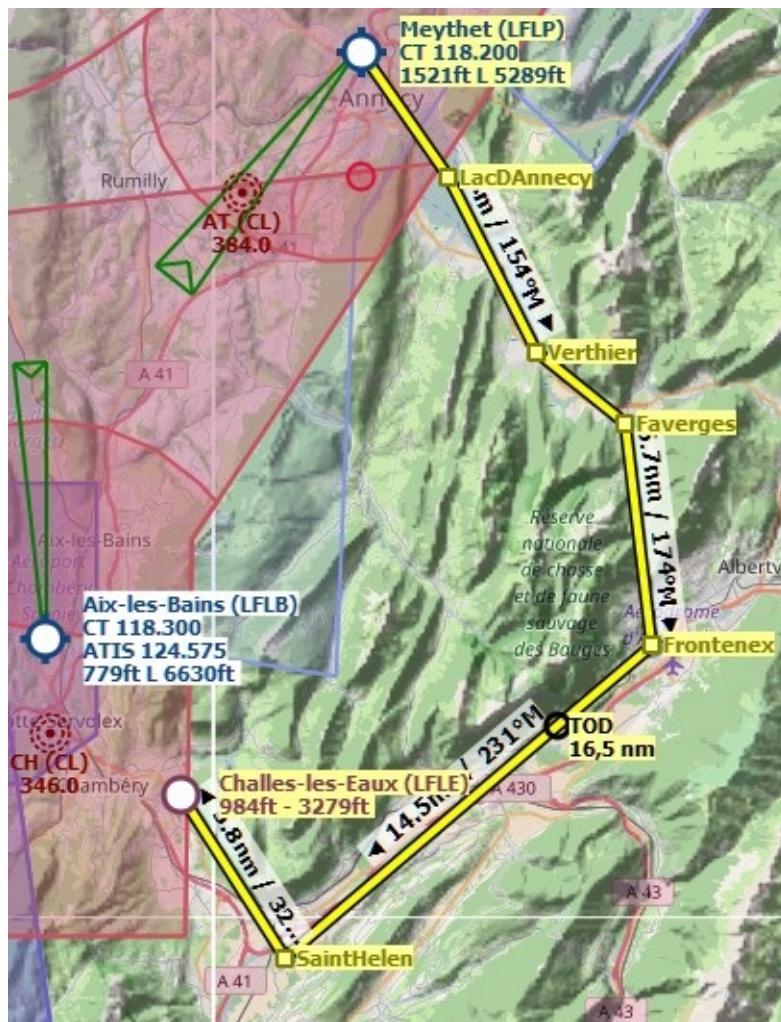
## Destination Airport

To add the destination:

- Right click on Challes-les-Eaux (LFLE)
- Select Set Airport as Flight Plan Destination



Now there is a flight plan. Yours might look a bit different.



You can also use the drag and drop feature to move points or add new ones. Enable it by checking `Flight Plan -> Edit`

 and click on a flight plan waypoint to move it. Click on a flight plan leg to add a new waypoint into this leg.

See [Map Flight Plan Editing](#) for more information.

## Cruise Altitude

Change the flight plan type to `VFR` if not already done.

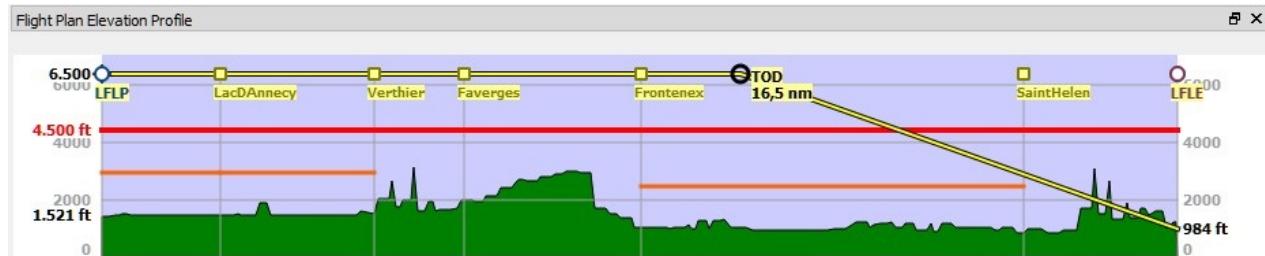
Flight Plan									
<b>Meyhet (LFLP) Parking 11, Ramp GA Small to Challes-les-Eaux (LFLE)</b>									
41 nm, 0 h 24 m, Direct									
100 kts		6.500 ft		VFR					
Ident	Region	Name	Course °M	Direct °M	Distance nm	Remaining nm	Leg Time hh:mm	ETA hh:mm	
1	LFLP	Meyhet			0,0	41			0:00
2	LacDAnnecy		146	146	4,5	36	0:02		0:02
3	Verthier		154	154	5,9	30	0:03		0:06
4	Faverges		130	130	3,4	27	0:02		0:08
5	Frontenex		174	174	6,7	20	0:04		0:12
6	SaintHelen		231	231	14,5	5,8	0:08		0:20
7	LFLE	Challes-les-Eaux	328	328	5,8	0,0	0:03		0:24

Now check the cruise altitude:

- Look at the flight plan elevation profile. There is a red line indicating the minimum safe altitude.

- Adjust the flight plan cruise altitude until you're above the red line.
- Select `Flight Plan -> Adjust Flight Plan Altitude`  to get the correct altitude adjusted by the hemispherical rule.

Note that the default hemispherical rule is not correct for France until you change it in the options dialog, but I'll avoid this for the sake of simplicity now.



You probably noticed that you will get close to ground near the destination. Be prepared to circumvent some mountains there.

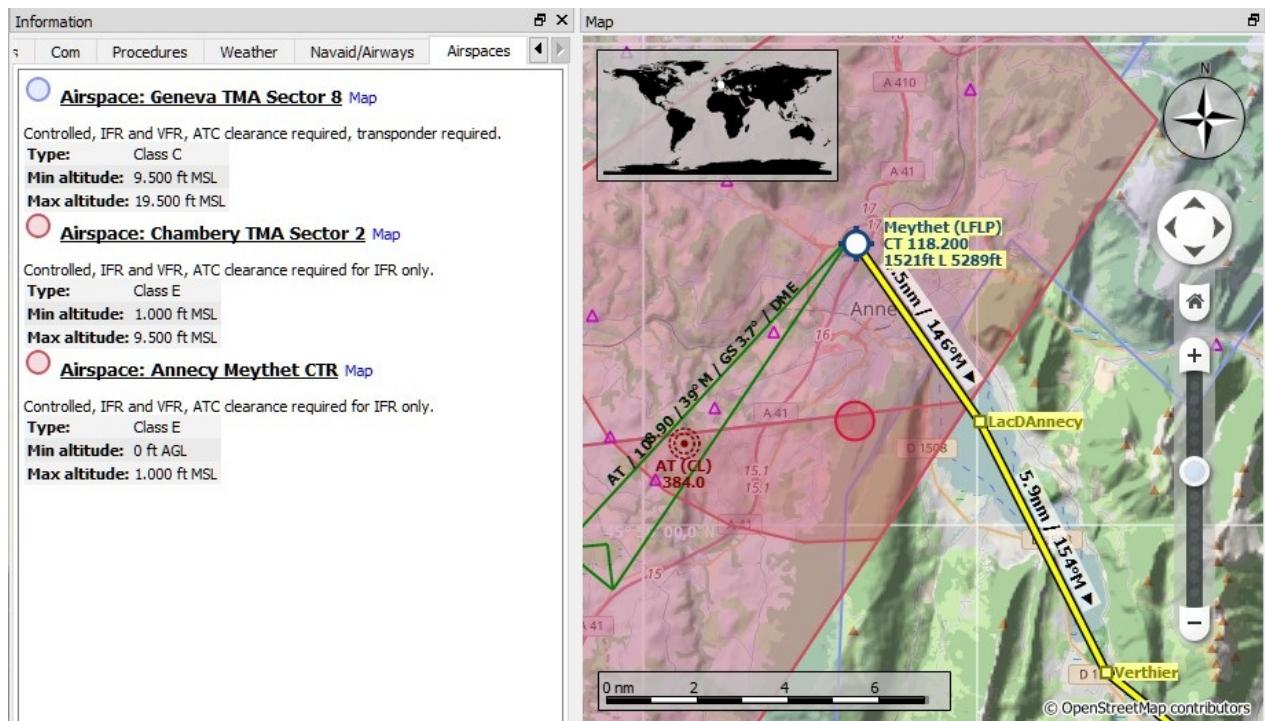
## Airsaces

Now look if your flight plan touches any airspaces.

Click into one of the airspaces nearby start and destination and have a look at the information dock window. There are several airspaces:

- Geneva TMA Sector 8 which starts at 9,500 feet above mean sea level (MSL). This is higher than our cruise altitude and won't affect us.
- Two Class E airspaces. The information window notes for these: controlled, IFR and VFR, ATC clearance required for IFR only. No problem because we will fly using VFR.

The situation is similar at the destination.



## Groundspeed

Now adjust the speed to your expected ground speed. This allows the program to estimate flying time for the whole plan and for the legs.

The speed is saved as an annotation in the [PLN](#) file. So when you load the plan into *Little Navmap* it will restore the given speed. The speed value has no effect in the simulator.

Note that the plan is static and will not change during flight.

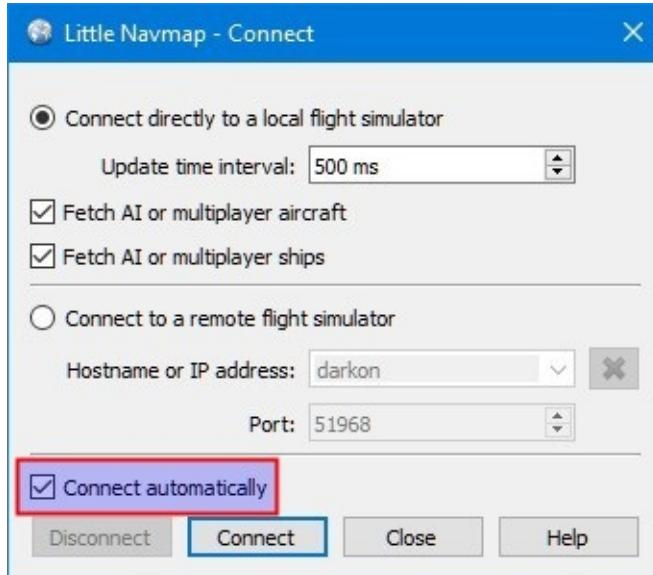
Estimated ground speed for the flight plan that will be used to calculate travelling times								Time	ET
Ident	Region	Name	°M	°M	nm	nm	hh:mm	hh:mm	
1	LFLP	Meyhet			0,0		41	0:00	
2	LacDAnnecy		146	146	4,5	36	0:03	0:03	
3	Monthey		154	154	5,0	30	0:05	0:05	

Save the plan using [File](#) → [Save Flight Plan](#) . The program usually finds the right directory for the flight plans and gives a sensible name by default.

## Flying

Follow the steps below to get a moving map and see your aircraft in *Little Navmap*:

- Open the dialog [Connect](#) using [Tools](#) → [Flight Simulator Connection](#) and check if [Connect automatically](#) is selected. Enable it if not. *Little Navmap* will find the simulator no matter if it is already started or will be started later.



- Click [Connect](#) which will close the dialog.
- Enable [Map](#) → [Center Aircraft](#) . The map will jump to the simulator aircraft and keep it centered if an active flight is loaded, i.e. the simulator is not in the opening screen.
- Start the simulator if not already done, load the flight plan and go flying.

See also [Connecting to a Flight Simulator](#).

## Looking at Places while Flying

The program will stop following your aircraft if you start any action that zooms in to an airport or [navaid](#) (double click, toolbar button or link in the information window):

- Double click on the destination airport for example to zoom to the airport diagram.
- When done click the back button  until you are back at your aircraft.
- Then enable `Map -> Center Aircraft`  again to keep the aircraft centered.

# Building an IFR Flight Plan with Approach Procedures

This tutorial will show you how to create a more complex IFR flight plan including approach procedures. It introduces the advanced airport search functionality and the automatic flight plan calculation.

While this tutorial looks quite lengthy it is normally a matter of half a minute to get a flight plan if you know where to go. The planning effort shown here is bigger to highlight some of the more advanced features of the program.

You should at least read through the VFR tutorial [Building a VFR Flight Plan](#).

The flight plan will go across the UK using an IFR capable aircraft. Its maximum range should be more than 600 nautical miles including reserves and a cruise altitude of 10,000 feet.

I will not go into detailed fuel planning procedures in this tutorial. That is another story for another time.

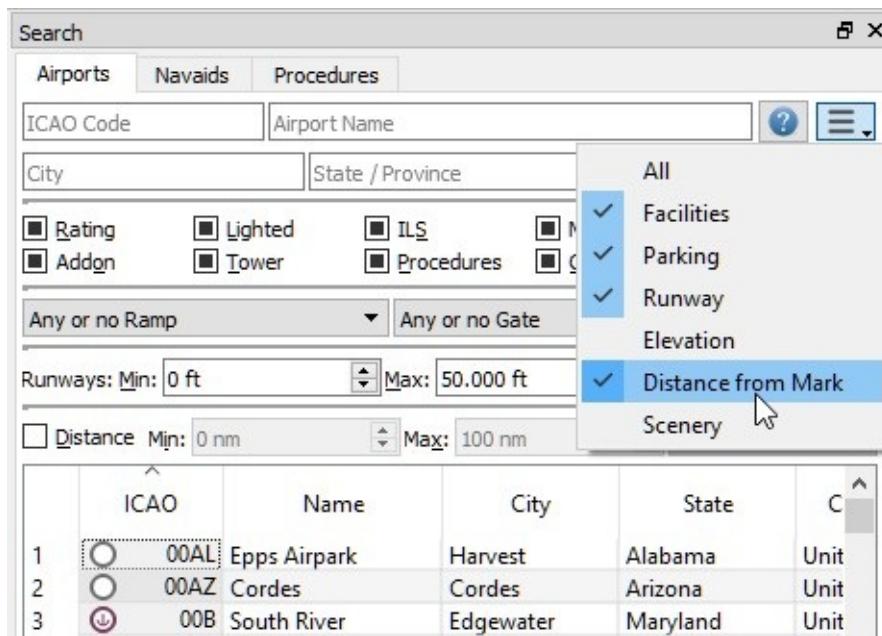
The tutorial assumes the following preconditions:

- You left your aircraft at `Bembridge (EGHJ)` at the end of the last flight or treat this as your home base.
- You don't know where you want to fly today.
- You know the requirements for your aircraft:
  - Range
  - Minimum runway length
  - Hard runways
  - Need a [parking](#) spot at the destination
  - Fuel for flying back

## Cleanup Search

Go to the dock window `Search` and follow the steps below:

- Right click into the result table and select `Reset Search`  to get rid of all search criteria that may affect the query.
- Click the menu button  and make sure that the search groups `Facilities`, `Runway`, `Parking` and `Distance from Mark` are checked. Deselect all others you don't need.



The screenshot shows the 'Search' dock window. At the top, there are tabs for 'Airports', 'Navaids', and 'Procedures'. Below the tabs are input fields for 'ICAO Code' and 'Airport Name', and buttons for 'Reset Search' and 'Help'. A menu icon (three horizontal lines) is visible. A dropdown menu is open, showing several search categories with checkboxes. The categories and their checked status are: All (checked), Facilities (checked), Parking (checked), Runway (checked), Elevation (unchecked), Distance from Mark (checked), and Scenery (unchecked). Below the dropdown is a table with columns 'ICAO', 'Name', 'City', 'State', and 'C'. The table contains three rows of data: 1. ICAO: 00AL, Name: Epps Airpark, City: Harvest, State: Alabama, C: Unit. 2. ICAO: 00AZ, Name: Cordes, City: Cordes, State: Arizona, C: Unit. 3. ICAO: 00B, Name: South River, City: Edgewater, State: Maryland, C: Unit.

## Assign Departure

Now look for the departure airport:

- Enter `EGHJ` in the `ICAO Code` search field on the top left (case does not matter).
- Right click on the airport in the result table.

- Choose `Set as Flight Plan Departure`. This will assign a default runway as a `start position`.

ICAO	Name	City	State	Country	Rating	Elevation ft	Mag Var°	Tower MHz
1 EGHJ	Bembridge	Bembridge						

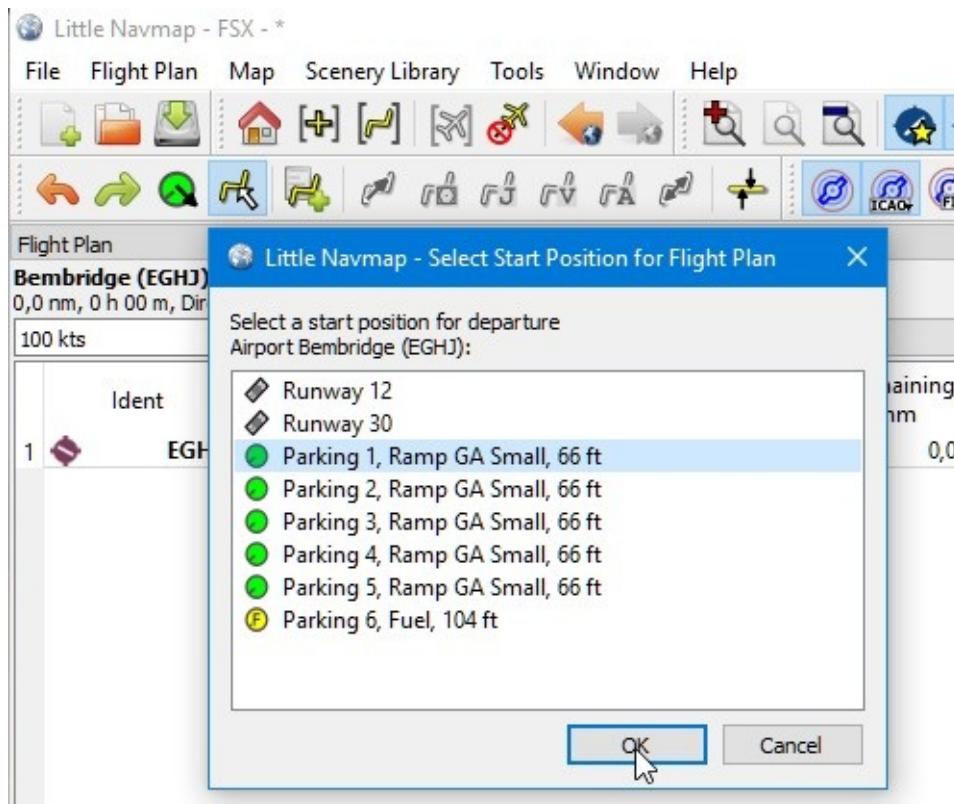
Context menu options for the selected entry:

- Show Information (Ctrl+I)
- Show Procedures
- Show on Map (Ctrl+M)
- Filter by Entries including "Bembridge"
- Filter by Entries excluding "Bembridge"
- Reset Search (Ctrl+R)
- Show All (Ctrl+Shift+A)
- Show Range Rings
- Show Navaid Range
- Remove All Range Rings and Distance Measurements
- Set as Flight Plan Departure** (highlighted)
- Set as Flight Plan Destination

Your flight plan has one entry now. This is already sufficient if you want to fly a pattern and like to see distance, speed and time information to the airport.

Starting from a runway is not quite realistic. Let's select a `parking` position:

- Go to `Flight Plan -> Select a Start Position for Departure`.
- Choose one of the GA small ramp positions.
- Click `ok` and the position will be highlighted on the map.



Alternatively you can also select the [start position directly on the map's context menu](#) as described in the [VFR tutorial](#).

See also [Set as Flight Plan Departure](#)

## Search for Destination

Now look for a suitable destination airport:

- Right click on `EGHJ` in the search result again.
- Select `Set Center for Distance Search` . You can also do this in the map. This is the center point for the spatial search.
- Clear the `ICAO code` search field now (it is a common mistake to leave the text fields filled when doing distance searches which will give you an empty result table).

We will now look for airports that are in range of the aircraft but not too close. Also, certain criteria have to be fulfilled, like having [parking](#) spots that fit the aircraft and a runway which is long enough.

You can also find airports in aircraft range by using the range rings where you can right click into the map on your departure

airport and select `Show Range Rings` , although this function does not allow the detailed airport filters.

We will use the spatial search instead of range rings since we'd like to see only suitable airports for our aircraft.

Check the following in the airport search tab:

- `Rating`: We'd like to get airports that are either add-ons or have basic scenery requirements, like taxiways, [parking](#) spots and more. Everything else is boring.
- `Procedures`: Show only airports that have procedures to spice up the approach a bit.
- Deselect `Military` and `Closed` (click the checkboxes twice): This will return only civilian airports and avoid airports that have all runways closed.
- Also check `Avgas` so we can fill up for our return trip and don't have to beg for fuel at a nearby road.
- In the combo box `Any or no Ramp` select `At least Ramp GA small`. This will include only airports in the result that have suitable [parking](#) spots.

6. In the combo box Any Surface select Any is Hard to avoid airports having only soft surfaced runways.
7. Select a minimum runway length of 2,500 feet for your aircraft in the field Runways: Min: .

See also [Search Dock Window - Airports and Navaids](#).

You can also limit the maximum runway length if you are looking for a short landing challenge, but not now.

The search result changes on the fly while doing all these adjustments, though we are not there yet:

- Check Distance: to activate the spatial search.
- Change the maximum distance to 600 and the minimum to 400 nautical miles (to avoid short hops). The result table will now update with a small delay since the distance search is more complex.
- To find only airports north of your position select North in the combo box Any Direction . Note that the search result is sorted by distance with the closest airport first.
- Choose an airport for your trip. We use Wick (EGPC) for this tutorial.

	Distance nm	Heading °T	ICAO	Name	City	Country	Rating
1	425	347	EGPE	Inverness	Inverness	United Kingdom	★★
2	426	50	EDXW	Westerland/Sylt	Westerland/Sylt	Germany	★★
3	445	62	EDDH	Hamburg	Hamburg	Germany	★★
4	453	46	EKEB	Esbjerg	Esbjerg	Denmark	★★
5	464	334	EGPL	Benbecula	Benbecula	United Kingdom	★★
6	465	43	EKVJ	Stauning	Stauning	Denmark	★★
7	467	57	EDHK	Holtenau	Kiel	Germany	★★
8	471	53	EKS8	Sonderborg	Sonderborg	Denmark	★★
9	472	352	EGPC	Wick	Wick	United Kingdom	★★
10	473	62	EDHL	Blankensee	Lubeck	Germany	★★
11	477	46	EKBI	Billund	Billund	Denmark	★★
12	487	340	EGPO	Stornoway	Stornoway	United Kingdom	★★
13	501	354	EGPA	Kirkwall	Kirkwall	United Kingdom	★★

1 of 30 Airports selected, 30 visible.

- Right click on Wick in the result table.
- Select Show Information . This will fill the tabs in the dock window Information .
- Select the tab Weather and look for the wind direction to get an idea of the expected landing runway. Start AS16 or Active Sky Next if you are using these.

For this tutorial we assume that the winds favor runway 13.

See also [Weather](#).

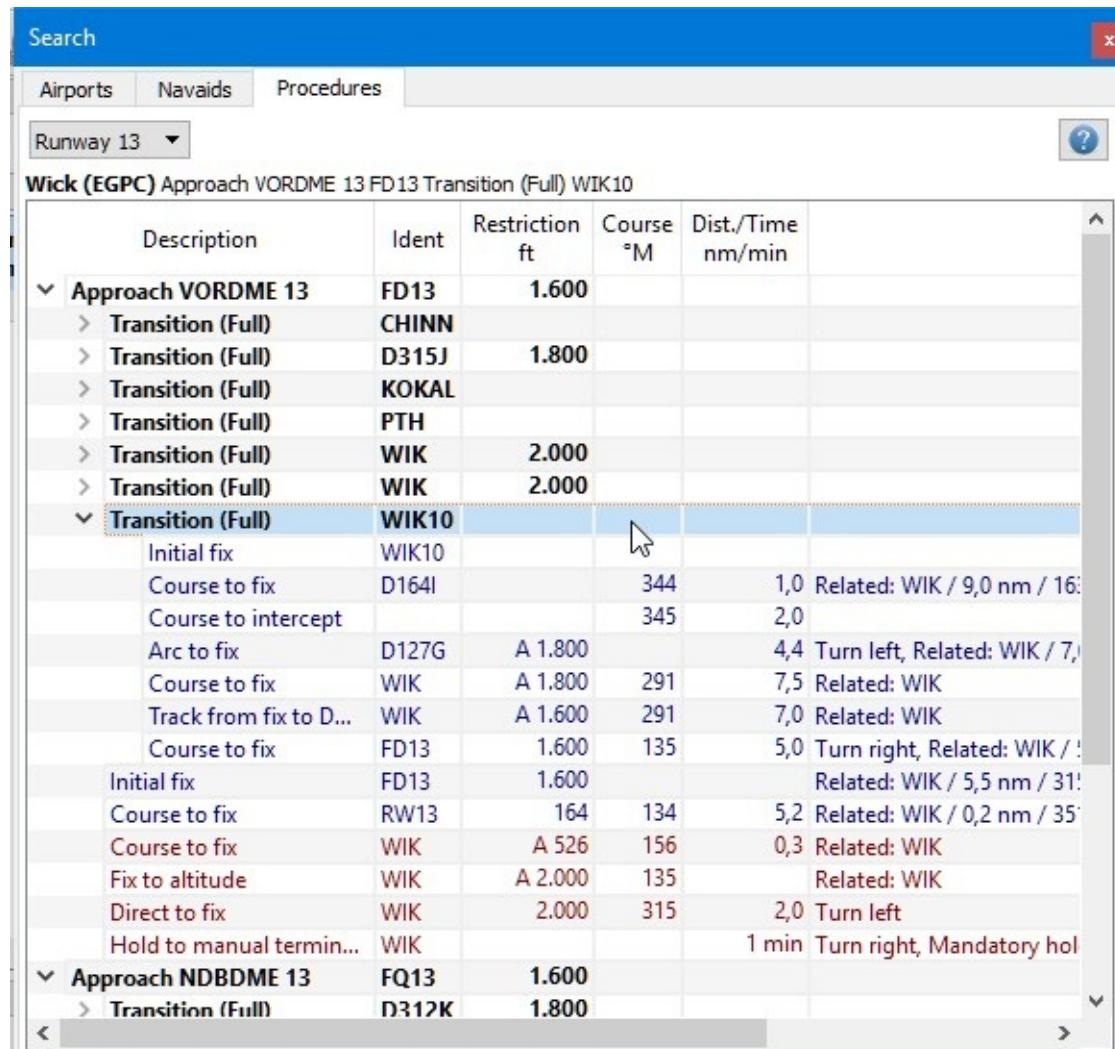
## Select an Approach Procedure

We'll select an approach [procedure](#) now:

- Go back to the search result.

- Right click on the airport Wick again. Select [Show Procedures](#) . This will pop up the [procedure](#) search tab.
- Choose [Runway 13](#) in the [All Runways](#) combo box to see only approaches for 13.
- Select [Expand All](#) in the context menu to see also the transitions for each approach.
- Choose [Approach VORDME 13 FD13](#) using [Transition \(Full\) WIK10](#) since we expect to land on runway 13 and arrive from south.

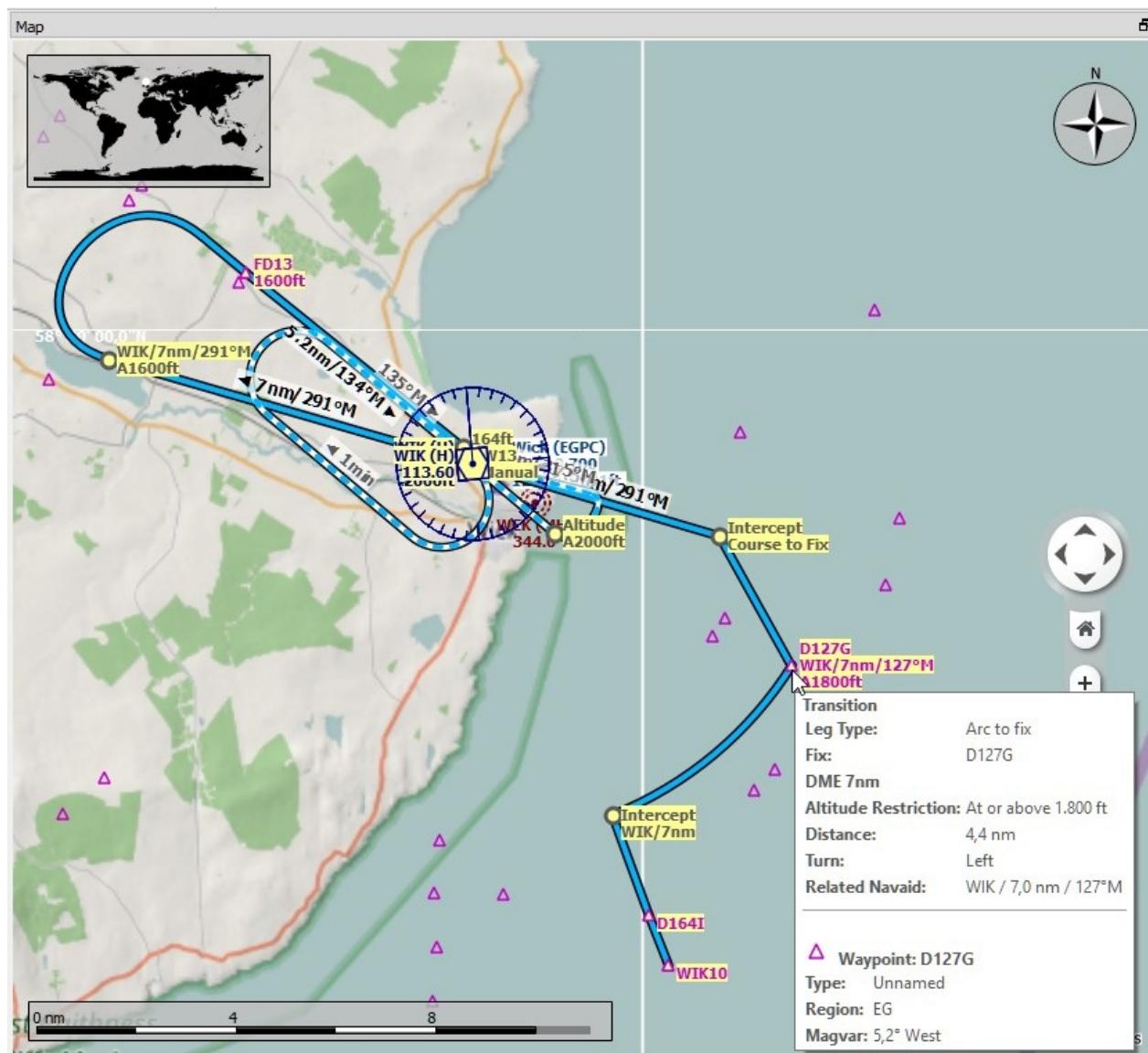
The top label in the [procedure](#) search shows [Wick \(EGPC\) Approach VORDME 13 FD13 Transition \(Full\) WIK10](#) for the selected approach and/or transition. You can also see a preview on the map.



The screenshot shows a software interface for searching flight procedures. The top bar has tabs for 'Airports', 'Navaids', and 'Procedures'. The 'Procedures' tab is selected, and a dropdown menu shows 'Runway 13'. Below the tabs, the title is 'Wick (EGPC) Approach VORDME 13 FD13 Transition (Full) WIK10'. The main area is a table with columns: Description, Ident, Restriction ft, Course °M, and Dist./Time nm/min. The table contains several rows for the approach and transition segments, with some rows expanded to show detailed information like waypoints and courses.

Description	Ident	Restriction ft	Course °M	Dist./Time nm/min
<b>Approach VORDME 13</b>	FD13	<b>1.600</b>		
> Transition (Full)	CHINN			
> Transition (Full)	D315J	<b>1.800</b>		
> Transition (Full)	KOKAL			
> Transition (Full)	PTH			
> Transition (Full)	WIK	<b>2.000</b>		
> Transition (Full)	WIK	<b>2.000</b>		
<b>Transition (Full)</b>	WIK10			
Initial fix	WIK10			
Course to fix	D164I		344	1,0 Related: WIK / 9,0 nm / 16:
Course to intercept			345	2,0
Arc to fix	D127G	A 1.800		4,4 Turn left, Related: WIK / 7,
Course to fix	WIK	A 1.800	291	7,5 Related: WIK
Track from fix to D...	WIK	A 1.600	291	7,0 Related: WIK
Course to fix	FD13	1.600	135	5,0 Turn right, Related: WIK / !
Initial fix	FD13	1.600		Related: WIK / 5,5 nm / 31:
Course to fix	RW13	164	134	5,2 Related: WIK / 0,2 nm / 35:
Course to fix	WIK	A 526	156	0,3 Related: WIK
Fix to altitude	WIK	A 2.000	135	Related: WIK
Direct to fix	WIK	2.000	315	2,0 Turn left
Hold to manual termin...	WIK			1 min Turn right, Mandatory hol
<b>Approach NDBDME 13</b>	FQ13	<b>1.600</b>		
> Transition (Full)	D312K	<b>1.800</b>		

Right click on the transition and select [Show Approach and Transition on Map](#) . This will center the [procedure](#) on the map. You can hover the mouse over the waypoints of the approach to see more information in a tooltip. You can also click on the legs in the [procedure](#) tree to see the respective start and end points.



The [procedure](#) looks sufficiently complicated to make an interesting approach.

More information on [procedure](#) search: [Search Dock Window - Procedures](#). Also see [Procedures](#) for general information on procedures.

If you like what you see right click again on the transition and select [Use EGPC and Approach and Transition as Destination](#)



This will do two things:

1. Add Wick as the destination airport to the flight plan. Any previous destination in the flight plan will be replaced.
2. Add the approach and its transition to the flight plan. The [procedure](#) legs use a dark blue color and the missed approach legs use a dark red color in the flight plan table. Flight plan en route legs are black. Again, any previous [procedure](#) is replaced with this new one.

**About adding transition and approaches:** Approaches and transitions are closely related which is already indicated by the tree structure in the [procedure](#) search tab. You can add an approach alone but a transition always belongs to an approach.

You have to select the transition to add or show both, approach and transition.

## Calculate a Flight Plan

Now we have the departure airport, an approach [procedure](#) and the destination all connected by a line. Next is the en route part of the flight plan:

- Set [IFR](#) as the flight plan type in the dock window [Flight Plan](#). This allows the automatic flight plan calculation to adjust the cruise altitude.

- Click [Flight Plan](#) -> [Calculate low Altitude](#)  to start the automatic flight plan calculation for Victor airways. The calculation will create a route from your departure airport to the initial [fix](#) of the transition.

The flight plan cruise altitude is automatically adjusted according to the hemispherical rule (the rule can be changed in

[Tools](#) -> [Options](#)  on the tab [Flight Plan](#) ), the altitude restrictions of the airways and the flight plan type ( [VFR](#) or [IFR](#) ). You can see the minimum altitude for each airway segment in the flight plan table in the column [Restriction](#) .

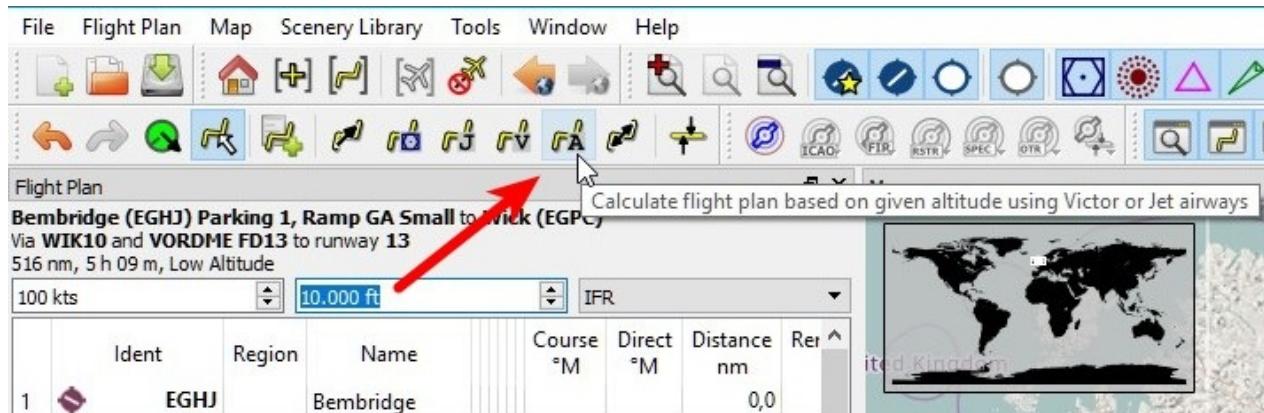
The altitude can also be adjusted according to the hemispherical rule by clicking [Flight Plan](#) -> [Adjust Flight Plan](#)



Now the minimum altitude of 16,000 feet is a bit too high.

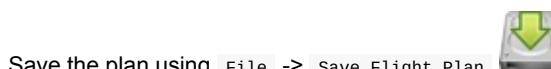
Therefore, try an alternate calculation method which limits your cruise altitude:

- Enter 10,000 feet in the [Flight plan altitude](#) field.
- Click on [Flight Plan](#) -> [Calculate based on given Altitude](#)  . This will result in a flight plan that uses only airways having a minimum altitude below or equal to 10,000 feet. Note that you can get a mix of Victor and Jet airways depending on used altitude. The calculation might also fail if you set the cruise altitude too low.



The screenshot shows the FlightPlan software interface. The top menu bar includes File, Flight Plan, Map, Scenery Library, Tools, Window, and Help. The Flight Plan dock window is open, displaying a flight plan for "Bembridge (EGHJ) Parking 1, Ramp GA Small to Wick (EGPC)" via "WIK10 and VORDME FD13 to runway 13". The distance is listed as "516 nm, 5 h 09 m, Low Altitude". Below the text, there are input fields for "100 kts" and "10.000 ft" (cruise altitude), and a dropdown for "IFR". A table lists waypoints: "1 EGHJ Bembridge". To the right of the dock window is a world map. A red arrow points to the "Calculate based on given Altitude" button in the toolbar.

Use this flight plan for now.



Save the plan using [File](#) -> [Save Flight Plan](#)  . The program usually finds the right directory for the flight plans and gives a sensible name by default.

The waypoints of the approach [procedure](#) are not saved in the flight plan. You have to select the approach in your GPS or FMC in the simulator or fly it by radio navaids and a stopwatch.

What *Little Navmap* saves in the [PLN](#) are the [procedure](#) names which allows the program to restore the approach when loading the [PLN](#) file.

The top label in the flight plan dock window reads now:

```
Bembridge (EGHJ) Parking 1, Ramp GA Small to Wick (EGPC)
Via WIK10 and VORDME FD13 to runway 13
517 nm, 5 h 10 m, Low Altitude
```

Adjust the ground speed in the flight plan dock window according to the used aircraft to get a better time estimate.

The plan might look different, depending if you use stock navaids or navdata updates.



Now you can check if you pass through any airspaces:

- Enable airspaces by selecting **Map** -> **Airsaces** -> **Show Airspaces**  if not already done.
- Check **Map** -> **Airsaces** -> **At flight plan cruise altitude**  in the menu or the toolbar menu button.

File   Flight Plan   Map   Scenery Library   Tools   Window   Help



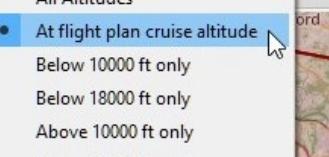
Flight Plan      Map      All Altitudes

Bembridge (EGHJ) Parking 1, Ramp GA Small to Wick (EGPC)  
Via WIK10 and VORDME FD13 to runway 13  
516 nm, 5 h 09 m, Low Altitude

Ident	Region	Name	Course °M	Direct °M	Distance nm	Ref

100 kts      10.000 ft      IFR





This will display only airspaces on the map that are relevant for your cruise altitude. You can also select `Below 10000 ft only` to see all relevant airspaces in the climb or descent phase. Use the tooltips on the map to get information about airspaces like type, minimum and maximum altitude.



## Flying

Open the dialog `Connect` using `Tools -> Flight Simulator Connection`  and check if `connect automatically` is selected. Enable, if not.

*Lite Navmap* will find the simulator no matter if it is already started or if it is started later. Click `connect`.

See also [Connecting to a Flight Simulator](#).



Enable `Map -> Center Aircraft` . The map will jump to the simulator aircraft and keep it centered. This will happen only if an active flight is loaded, i.e. the simulator is not in the opening screen.

Start the simulator if not already done, load the flight plan and go flying.

## Top of Descent

A top of descent indication is displayed on the map and in the elevation profile which also shows the distance from top of descent to the destination. This number includes the distance of approach procedures (excluding holds).

Note that altitude restrictions are not considered yet in the top of descent calculation.



You can change the descent rule in `Tools -> Options` on the tab `Flight Plan`. The default is 3 nautical miles for 1,000 feet.



The tab `Progress` in the dock window `Simulator Aircraft` will show the distance to the top of descent in the `Flight Plan Progress` section:

<b>Flight Plan Progress</b>	
To Destination:	74 nm
Time and Date:	21.05.17 12:33 UTC
Local Time:	14:33 CEST
<b>TOD to Destination:</b>	<b>64 nm</b>
<b>To Top of Descent:</b>	<b>10,1 nm</b>

The section `Altitude` will show the vertical path deviation after passing the top of descent:

<b>Altitude</b>	
Indicated:	5,090 ft
Actual:	5,051 ft
Above Ground:	5,051 ft
Ground Elevation:	0 ft
<b>Vertical Path Dev.:</b>	<b>-511 ft below ▲</b>

## Changing Procedures

Now the weather has changed requiring an approach to runway 31:

- Right click on the destination airport at the bottom of the flight plan table.
- Choose `Show Procedures`.
- Then change the runway filter to `Runway 31`.
- Expand the approach `VORDME 31` to see the transition.
- Select the transition.

The label on top of the window shows now `Approach VORDME 31 FD31 Transition (Full) CHINN`.

- Right click on the selected transition.
- Choose `Use EGPC and Approach and Transition as Destination` from the context menu which will replace the current `procedure` in your flight plan with the new one.

The top label in the flight plan dock window reads now:

```
Bembridge (EGHJ) Parking 1, Ramp GA Small to Wick (EGPC)
Via CHINN and VORDME FD31 to runway 31
526 nm, 5 h 15 m, Low Altitude
```

To completely get rid of a `procedure`:

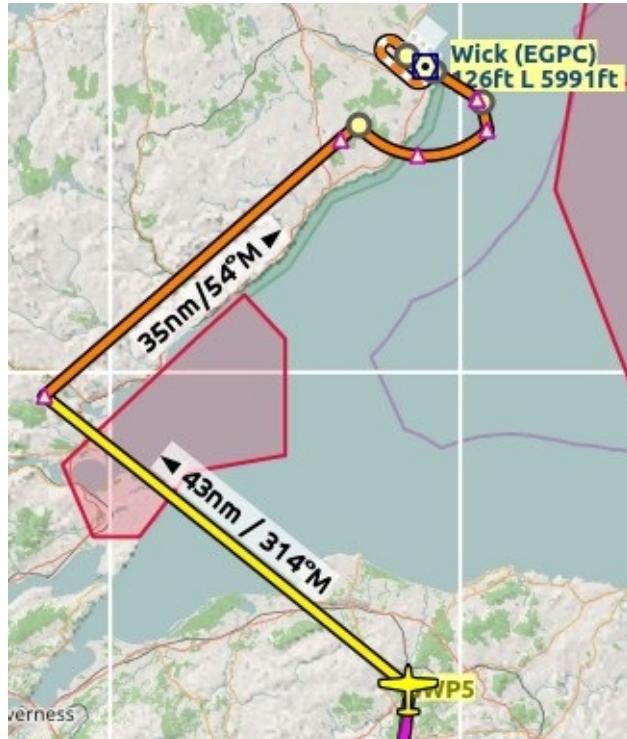
- Select any leg of the [procedure](#) in the flight plan table.
- Right click and choose [Delete selected Leg or Procedure](#)  to remove the whole [procedure](#). Alternatively press the [Del](#) key.

If ATC clears you to the initial [fix](#) of the [procedure](#):

1. Delete any intermediate waypoints between your current aircraft position and the initial [fix](#) of the [procedure](#): Right click in the flight plan table and select [Delete selected Leg or Procedure](#)  for all waypoints between your current aircraft position and the initial [fix](#) or start of the [procedure](#). Avoid deleting your approach (you can also right click on a flight plan waypoint on the map and delete it from the context menu).
2. Then right click on your aircraft on the map and select [Add Position to Flight Plan](#) .

This will give a direct connection from your current aircraft position to the start of the [procedure](#) which you can use to get course and distance to the intial [fix](#).

Below: After changing the approach [procedure](#) and adding a user defined waypoint at the aircraft position to the flight plan. Now we get course and altitude indications for a direct leg to the start of the transition (43 nm and 314 degrees magnetic course).



## Going Missed

I recommend hiding the missed approaches on the map by unchecking [Map -> Show Missed Approaches](#) . This helps uncluttering the map display.

- **If the missed approach is not shown:** The progress window shows distance and time to destination. Activating the next leg (shown in magenta color) will stop if the destination (i.e. the runway threshold) is reached, even when passing the threshold.
- **If the missed is shown and the aircraft passes the runway threshold:** The first leg of the missed approach is activated and simulator aircraft progress will display the remaining distance to the end of the missed [procedure](#).



## Tips and Tricks

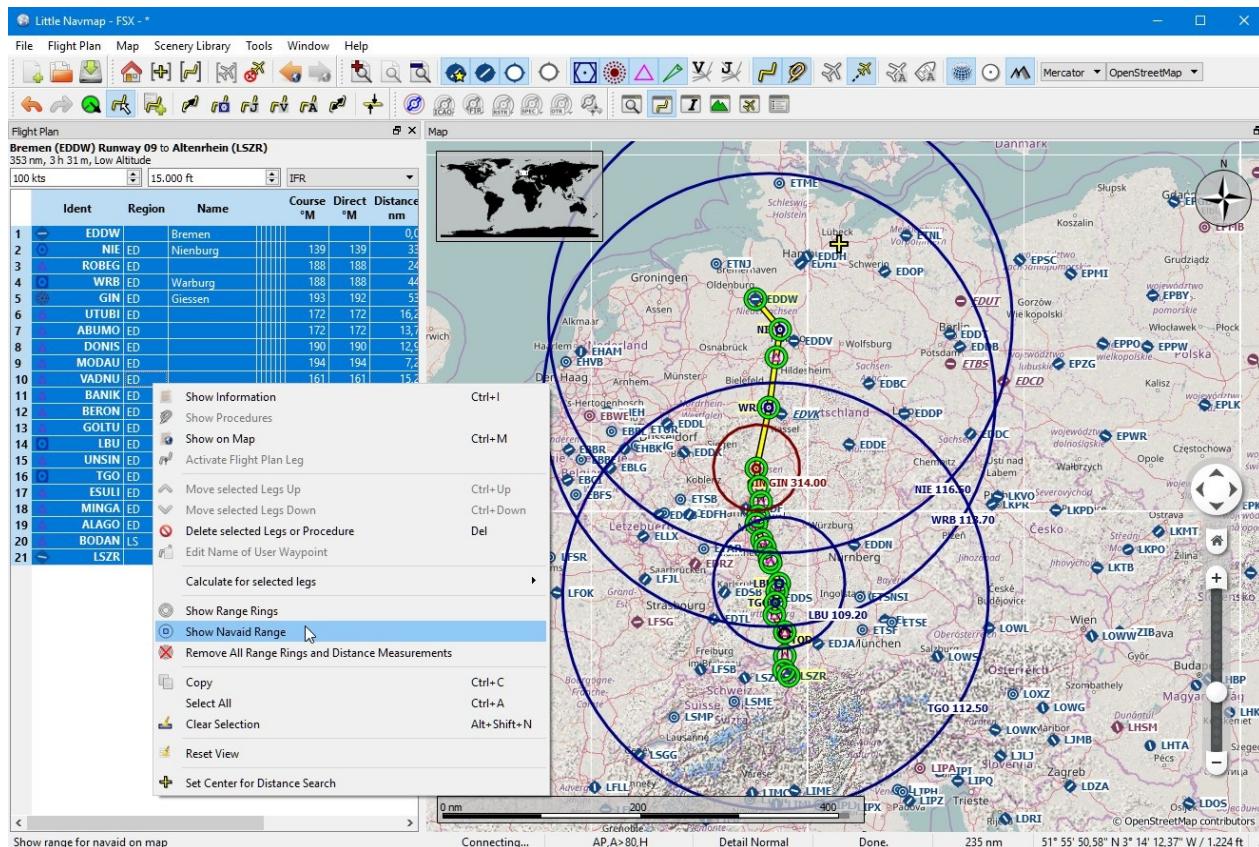
### Show all Navaid Ranges of a Flight Plan

Select all legs in the flight plan table, then right click on any leg and select [Show Navaid Range](#). This will place a range ring around every radio navaid in the flight plan.

See also [Show Navaid range](#).



Remove the range rings by selecting [Remove all Range Rings and Distance Measurements](#).

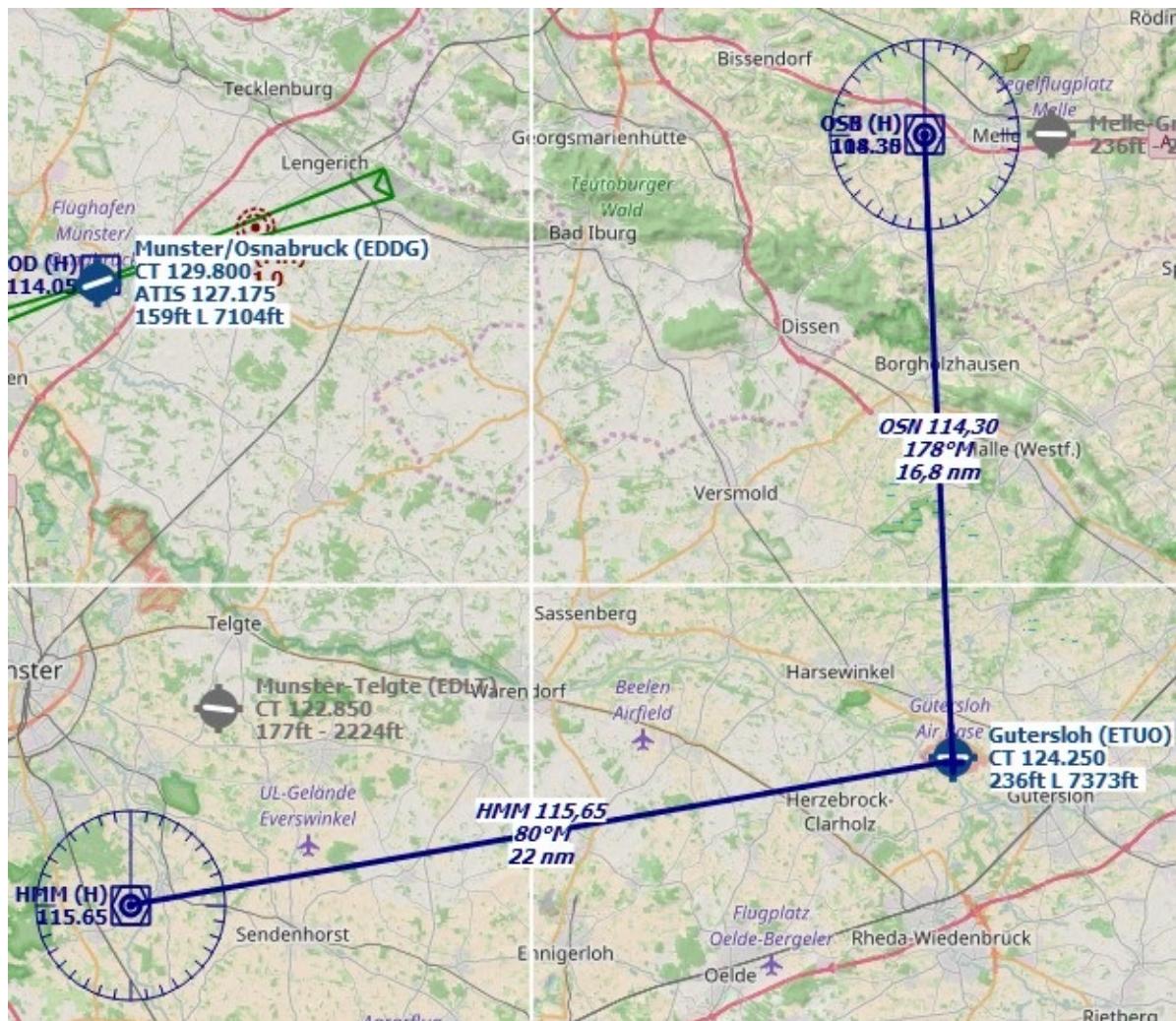


### Use the measurement lines to get a VOR Radial Intersection

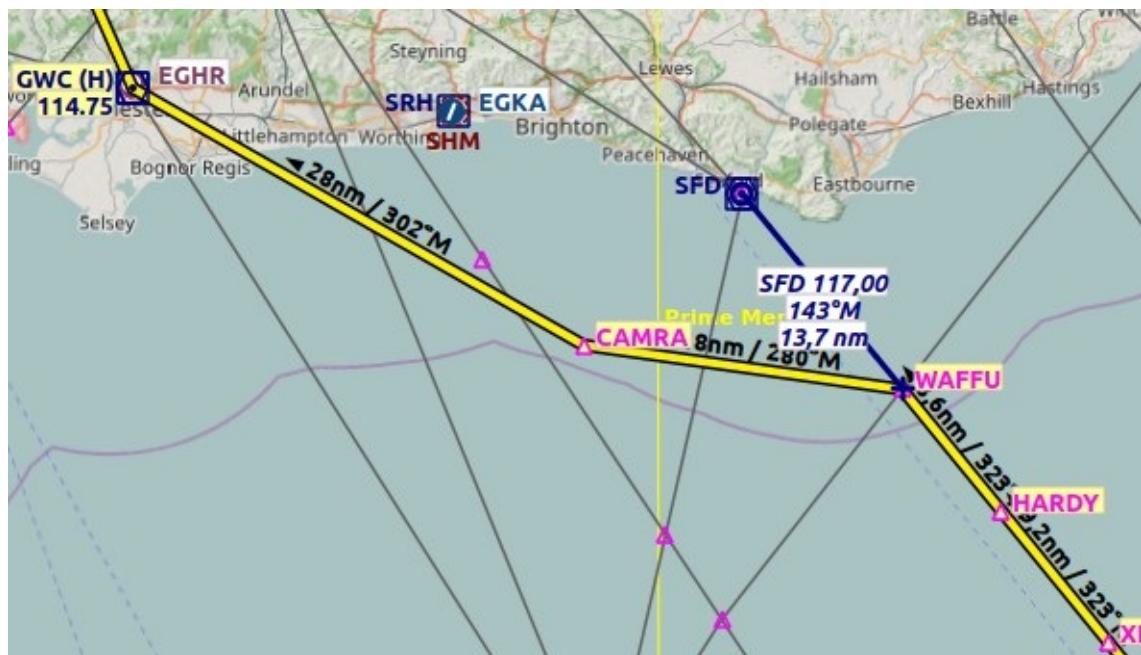
Measurement lines can start at airports or navaids where they use the magnetic variation if available. You can use them to find an airport by radial and distance if you like to navigate the old fashioned way.

Below is an example that gets radial and distance from two VORs for [ETUO](#). Measurement lines can also start at NDBs or waypoints. Note the suffix [M](#) which indicates magnetic course.

See also [Measure GC Distance from here](#) and [Measure Rhumb Distance from here](#).



The same can be used when flying airways without GPS. In the example below fly 323 degrees magnetic to VOR SFD (radial 143). You are at WAFFU when the DME shows 13.7 nautical miles. Then turn left to 280°M until you intercept 302° to GWC .



**Use the measurement lines for Approach Guidance**

Right click on the airport and choose **Measure Rhumb Distance from here** . Pull the line using the opposing course to 3 nautical miles out to get guidance for the final approach.



## Search for Add-On Airports

You can use the scenery path to look for add-on airports of a certain developer. Click on one of the add-on airports from the information window. Insert this path fragment into the **Scenery Path** input field in the airports tab of the search dock window. Add **\*** at the beginning and at the end since it only a path fragment.

See also [Text Filters](#).

Select all in the result table to get all airports highlighted on the map.

## Use the Search Function to plan a Round the World Trip

The spatial search function is useful to plan a round the world tour. Assume you'd like to go east:

1. Got to the dock window **Search**, right click into the result table and select **Reset Search** to get rid of all search criteria that may affect the query.

2. Set your departure airport.
3. Right click on your departure airport in the search or on the map and select **Set Center for Distance Search**. This is the center point for the spatial search.
4. Add any additional criteria in the search like lighted runways, procedures, fuel, minimum runway length and more.
5. Adjust the minimum and maximum distance, set direction to **East** and click the checkbox before **Distance**.
6. Select all in the result table to see the airports on the map.
7. Choose your next destination airport.
8. Add as destination.
9. Calculate plan.
10. Fly.
11. Back to 2. until you are done around the world.



Picture below shows a query result for airports in the east. Note that the black/yellow highlight circles have tooltips too no matter if the airport is visible or not.

Distance nm	Heading °T	ICAO	Name	City	Country		
1	600	EVLA	Liepaja Intl	Liepaja	Latvia		
2	603	EPBP	Biala Podlaska	Biala Podlaska	Poland		
3	603	LHDC	Debrecen	Debrecen	Hungary		
4	616	ESSG	Ludvika	Ludvika	Sweden		
5	621	LQSA	Sarajevo	Sarajevo	Bosnia and Her...		
6	621	EFCN	Tullinge	Tullinge	Stockholm	Sweden	
7	628	LRAR	Arad	Arad	Romania		
8	629	ESSB	Bromma	Bromma	Stockholm	Sweden	
		EVVA	Ventspils Intl	Ventspils	Latvia		
		LYBE	Belgrade	Belgrade	Serbia and Mo...		
		ESSA	Arlanda	Arlanda	Stockholm	Sweden	
		EYKA	Kaunas Intl	Kaunas	Lithuania		
		LYVR	Vrsac	Vrsac	Serbia and Mo...		
		ESSK	Gavle-Sandviken	Gavle-Sandviken	Croatia	Sweden	
		LDDU	Cilipli	Cilipli	Estonia		
		EEKE	Kuressaare	Kuressaare	Riga	Estonia	
		EVRA	Riga Intl	Riga	Riga		
		LRCL	Cluj Napoca	Cluj-Napoca	Cluj-Napoca	Romania	
		EFCM	Marihamn	Marihamn	Marihamn	Finland	
		ESNY	Soderhamn	Soderhamn	Soderhamn	Sweden	
		EEKA	Kardla	Kardla	Hudiksvall	Estonia	
		ESNH	Hudiksvall	Hudiksvall	Nis	Hudiksvall	Sweden
		LYNI	Nis	Nis	Finnair	Sweden	
		EFPF	Parnu	Parnu	Turku	Finnair	Estonia
		EFTU	Turku	Turku	Turku	Finnair	

# Tips for old and slow Computers

## Save CPU Cycles

- Dialog Options -> Map -> Details while scrolling ... : Use Normal ...
  - Dialog Options -> Simulator Aircraft -> Simulator Aircraft scroll box size ... : Use a higher value to reduce map updates.
  - Close the window Flight Plan Elevation Profile . It will stop all background processing when closed.
- 
- Avoid airspaces. Switch them off using the button on the airspaces toolbar.
  - Switch off all AI traffic in the dialog Connect . See [here](#).
  - Use the map projection Mercator . It consumes less resources since it can use the downloaded image tiles as is and does not transform them to the spherical format.

## Reduce Memory Consumption

Replace the complete section [Settings] in the little\_navmap.ini with the section below to reduce cache sizes.

```
[Settings]
DatabaseCacheKb=5000
InfoQueryAirportCache=100
InfoQueryAirportSceneryCache=100
InfoQueryAirwayCache=100
InfoQueryApproachCache=100
InfoQueryComCache=100
InfoQueryHelipadCache=100
InfoQueryIlsCache=100
InfoQueryNdbCache=100
InfoQueryRunwayCache=100
InfoQueryRunwayEndCache=100
InfoQueryStartCache=100
InfoQueryTransitionCache=100
InfoQueryVorCache=100
InfoQueryWaypointCache=100
MapQueryAirscapeLineCache=100
MapQueryApronCache=100
MapQueryHelipadCache=100
MapQueryParkingCache=100
MapQueryRunwayCache=100
MapQueryRunwayOverwiewCache=100
MapQueryStartCache=100
MapQueryTaxipathCache=100
```

## Troubleshoot

- **Program crashes on start up:** Delete the settings and the database files. In Windows 7, 8 or 10 these can be found in c:\Users\YOURUSERNAME\AppData\Roaming\ABarthel . Delete (or better: rename or move) the files little\_navmap.ini , little\_navmap.track , little\_navmap.history and the directory little\_navmap\_db . Try to delete the database first if these cause the problem. Then try to delete the settings files if removing databases did not help.
- **Program starts slowly:** This can happen if a distance search is enabled in one of the search tabs. The search is executed at each start. Simply disable the distance search or reset the search options to avoid the slow startup.
- **Online maps do not load or update:** Check your firewall settings if Windows blocks any outgoing connections. Also check if the offline mode was not enabled accidentally in menu File . Check if Little Navmap can connect to the internet by going to the options dialog on tab Weather . Use one of the buttons Test for NOAA or VATSIM weather. Little Navmap cannot reach the internet if these fail.
- **Zoom can be too fast when using a touchpad** with OpenStreetMap, OpenTopoMap or one of the other online map themes. Use the Plain , Simple OR Atlas map themes or use the overlay zoom buttons or the keyboard ( + and - )

- ).
- **side-by-side configuration error:** You are running *Little Navmap* on a computer without simulator (i.e. no **SimConnect**) installation if you get this error. Use `littlenavmap-nosimconnect.exe` instead which provides all functionality except direct connection and scenery database loading. **Note:** `littlenavmap-nosimconnect.exe` **is not used anymore as of Little Navmap version 1.4.4. You can use littlenavmap.exe on all computers no matter if SimConnect is installed or not.**
- **Search shows no result or unexpected results:** Check the drop down menu for the change indicator \* and the search fields for any remaining text if the distance search does not give any or unexpected results. Use `Reset Search` in the context menu of the result table or press `Ctrl+R` to clear all search criteria.
- **Search or flight plan tables shows strange column names like airport\_id or others:** This can happen if the program is updated. Use `Reset View` in the context menu of the result table.
- **Online maps like OpenStreetMap or OpenTopoMap maps can end up blurred** when using functionality like `Center Flight Plan` or `Go to Home`. Zoom once in and out using the mouse wheel, overlay zoom buttons or keyboard to fix this.
- **The flight plan elevation profile has errors or invalid elevation data:** The online elevation data contains several known errors. Use the recommended GLOBE offline elevation data. See [here](#) for information how to install the offline data.
- **OpenStreetMap shows a dark gray background** on some places without hill shading coverage (for example New Zealand). Use another map theme or switch off hill shading for the *OpenStreetMap*.
- **Loading of the scenery database takes too long:** Exclude scenery directories containing only landclass, elevation data or other for *Little Navmap* irrelevant data. You can do that in the `Options` dialog on the `Scenery Library Database` tab. See [Options](#).
- **Crash while loading the scenery library database:** You can exclude scenery directories in the `Options` dialog on the `Scenery Library Database` tab if loading of an add-on **BGL** causes the program to crash. Do not restart the program after it shows the crash dialog and instead load the log file which is typically `C:\Users\YOURUSERNAME\AppData\Local\Temp\abarthe1-little_navmap.log`. The path may vary depending on your Windows installation. Search for the last line in the log-file that looks like:

```
[2016-10-14 22:58:21.903 default INFO ] unknown: === "404 of 521 (77 %)" "APX41080.bgl"
```

Now search for `APX41080.bgl` and exclude its directory from loading in the `Options` dialog.

## Known Problems

- Some airport add-ons do not modify the stock airports but only add new scenery and buildings. These add-ons will not be recognized as such and are therefore not highlighted on the map (italic and underlined text).
- Add-on developers have to use all kind of workarounds to avoid **FSX** or **P3D** limitations which means the display and information given for add-on airports is not always correct. A lot of these changes are also done to make AI behave properly. Typical examples are: Airports without runways, airports with runway dimensions 0 by 0 ft or 0 ft runway width, taxiways with 0 ft width, seemingly closed taxiways, duplicate airports, duplicate runways in water, taxiways in water, military gates at civilian airports and more.
- Route description parsing can skip waypoints in rare cases even for previously calculated flight plans. This can happen due to fragmented airways, errors in the source data or ambiguities between navaids.
- Some KML/KMZ files do not show up on the map. Adding a center point pushpin to the KML/KMZ file can fix this.
- Coverage for online elevation and *OpenStreetMap* hill shading data is limited and currently ends at 60 degree north. Use the *OpenTopoMap*, *OpenMapSurfer* or *Stamen Terrain* map themes which have world wide coverage for hill shading.
- There are errors in the online elevation source data (like in northern Italy, Po Valley or Lake Titicaca in Peru and Bolivia) which will show up in the flight plan elevation profile.
- The Mercator projection shows occasional display problems depending on zoom distance like horizontal lines near the anti meridian or missing flight plan segments.
- The Marble floating map overlays on the map can be configured but do not save all settings except their visibility.
- Flight plan and airways are drawn using great circle lines instead of rhumb lines. Distance and course are not affected

by this.

- Magnetic variance is partially not set (for example [VORDME](#) Cambridge Bay YCB) or inconsistent between airports and adjacent navaids. This is an error in the source.
- Airports are misplaced (for example Cabo San Lucas, MM15 in Mexico) compared to the background maps. This is an error in the source data and cannot be fixed.
- Map printouts can be fuzzy since they depend on screen resolution. As a workaround increase the size of the visible map window.
- Very long route legs can disappear from the map when zooming in. The label is still visible though.

## How to report a Bug

If something goes wrong send me any involved files like KML, [PLN](#) or [BGL](#) (if copyright permits), *Little Navmap*'s log file and configuration file which both can be located in the about dialog. My e-mail addresses are shown in the about dialog of *Little Navmap* as well.

Please add all steps that are necessary to reproduce the error.

When an error occurs during loading of the scenery library send me the offending [BGL](#) file if possible. The full name and path of the file is shown on top of the error dialog if a specific [BGL](#) is the cause.

If you're concerned about privacy when sending log files: The log files will contain all system paths (like your `Documents` directory) which will also include your username as a part of the path. They might also contain your computer's name and IP address in your network.

In no case are file names from anything other than flight simulator paths/files or configuration files are included. No names or content of personal files is included in the log files.

I would suggest to remove this information if you're concerned about it.

I strongly recommend sending the log files by private forum message or by email and not attach them to forum posts where they are publicly visible.

## Add-on airport

This is an airport that was found outside the Flight Simulator default scenery folder when loading the database.

## Arrival Procedure

Approach, transition or [STAR procedure](#).

## BGL

A binary file with the extension `BGL` which is part of a flight simulator scenery containing airport, [navaid](#) or airway information. These files can also contain traffic, landclass, elevation or other information which is not relevant for *Little Navmap*.

## DAT

A text file format used by X-Plane to store airport, [navaid](#) and [procedure](#) information.

## Departure Procedure

[SID procedure](#).

## DME

Distance measuring equipment or a radio [navaid](#).

## Empty airport

An airport that has no taxiways, no [parking](#) positions or gates, no aprons and is not an [add-on airport](#) and is not a water airport.

## Fix

This term refers to a waypoint, radio [navaid](#) or an calculated point on a [procedure](#).

## FLP

Flight plan format used by the X-Plane [FMS](#), Aerosoft Airbus and other add-on aircraft.

## FMS

X-Plane flight plan format.

## FS9

Flight Simulator 2004.

## FSX

Flight Simulator X or Flight Simulator - Steam Edition.

## GIS

A geographical information system like Google Earth for example.

## Initial Fix

This is the first [fix](#) of a [procedure](#).

## Navaid

[VOR](#), [VORTAC](#), [TACAN](#), [NDB](#) or waypoint/intersection.

## NDB

Non directional beacon - radio [navaid](#).

## P3D

Prepar3D v2 to v4.

## Parking

GA ramp, cargo ramp, fuel box or gate.

## PLN

[FSX](#) and [P3D](#) flight plan format. Can save all information in flight plans using annotations.

## Procedure

Approach, transition, [SID](#) or [STAR](#).

## Radio navaid

[VOR](#), [VORTAC](#), [TACAN](#) or [NDB](#).

## Rating

Airport zero to five [star rating](#) depending on facilities.

## Scenery Library Database

This is an internal database ([SQLite](#)) that is created by *Little Navmap* when reading all the flight simulator [BGL](#) or [DAT](#) files. It allows fast complex searches and map display.

## SID

Standard instrument departure.

## SimConnect

A programming interface that allows applications to read and write flight simulator parameters.

## STAR

Standard terminal [arrival procedure](#). Usually followed by a transition and an approach.

## Start position

Used for departure in flight plans. Either runway, helipad, GA ramp, cargo ramp, fuel box or gate.

## TACAN

Tactical air navigation system - radio [navaid](#) used by military aircraft.

## VOR

VHF Omni Directional Radio Range - radio [navaid](#).

## VORDME

VHF Omni Directional Radio Range with distance measuring equipment- radio [navaid](#).

## VORTAC

Co-located VHF omnidirectional range ([VOR](#)) beacon and tactical air navigation system ([TACAN](#)) beacon.

## Changes from Release 1.6.3 to 1.6.4

- Fixed crashes when reading X-Plane CIPP files with unknown approach type.
- Fixed crash with older X-Plane `apt.dat` files where runway name for VASI is missing.
- Fixed error where altitude restrictions were not recognized when given as flight levels.
- Enabled support for older `apt.dat` files with version down to 850.
- Added support for all altitude restriction types in procedures.
- Improved error reporting reading X-Plane `dat` files to avoid crash to desktop.
- Added error collection for X-Plane compiler. Now only stops reading the current file on error.
- Added workaround for P3D v4 add-on.xml files with inconsistent encoding.
- Fixed inconsistencies around context menus and `procedure` restriction display.
- Moved hidden URL to top in update notification dialog.
- Updated included PDF manual.

## Changes from Release 1.4.4 to 1.6.3

The scenery database format has changed and the program will ask to erase its own databases if started.

### Enhancements

#### X-Plane 11

- Can read full X-Plane scenery database: Airports, aprons, taxiways, navaids, airways, procedures (including speed limits). Also add-on overrides and path exclusions in the options dialog.
- Supports navdata updates.
- Display of AI aircraft on map and in information window.
- Weather from X-Plane downloaded weather file `METAR.rwx` (station or nearest station).
- Copy airspaces from FSX or P3D to X-Plane database.
- FMS and FLP flight plan file loading and saving.
- Moving map. Needs the *Little XpConnect* X-Plane plugin which is included in the download archive.
- Altitude and one-way restrictions for airways are considered when calculating flight plans.
- Supported platforms are Windows, macOS and Linux for all programs.

### General

- Automatic update check on startup (daily, weekly or manual) with settings in options dialog on tab `startup`.
- Added push buttons in flight plan and `procedure` search top area to remove selection and map highlights.
- Rhumb line measurement now shows both magnetic and true course where declination is based on origin.
- Can now load and save FMS and FLP flight plan formats.
- Can load FS9 flight plan format.
- Route string generation is now more robust for malformed and incomplete flight plans.
- Now erasing wrong airway entries at departure and destination when loading flight plan to avoid problems with malformed flight plans from other tools.
- Shows startup positions in the information window now.
- Added donation link to help menu and about dialog.

### Bug Fixes and Improvements

- Improved weather display for nearest station: Added name, distance and map link to reporting station if that is an airport.
- FSX and P3D: Fixed several problems with magnetic declination by using `magdec.bg1` file now.

- Fixed issues when loading P3D v4 add-on.xml.
- Fixed crash when loading older FSX/P3D scenery.
- Fixed handling and display of helipads. Now using name as an identifier.
- Improved detection of military and closed airports.
- Database loading dialog now pops up after erasing incompatible databases.
- Fixed missing encoding in saved FSX PLN files causing problems with other tools.

**See the include file `CHANGELOG.txt` for a detailed list of all changes across all versions.**

## License

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program. If not, see <http://www.gnu.org/licenses>.

