

Brief Documentation

“PreFlight 4.0” - Demo

Dipl. Ing. Heinz Lüdert
Im Rosengärtchen 29
61440 Oberursel (Taunus)
Germany

<http://www.preflight.de>
heinz.luedert@preflight.de

Table of Contents

1.	Installation.....	3
1.1.	PC-Installation.....	3
1.2.	Macintosh-Installation.....	3
1.3.	Executing PreFlight 4.0 Demo	3
1.4.	Importing the German Map.....	3
1.5.	Restrictions of the Demo-Version	3
2.	Easy Planning with PreFlight	4
2.1.	Rough Course by Keyboard Entry	4
2.2.	Clearly Arranged Generated Map with Elevation Profile.....	5
2.3.	Bearing by Mouse-Click.....	5
2.4.	By Mouse-Click on the Scanned Map	5
3.	Results.....	6
3.1.	Flight Execution Plan.....	6
3.2.	Consumption.....	6
3.3.	Flight Plan.....	6
4.	Satellite Navigation.....	6
4.1.	Send a Route to GPS.....	6
4.2.	Read a Route from GPS.....	6
4.3.	Read a Track from GPS	6
4.4.	Reading Way Points from GPS.....	6
4.5.	Writing Way Points into GPS	6
5.	Flight Recording and Moving Map	7
5.1.	Simulation	7
5.2.	Moving-Map	7
5.3.	Flight Recorder.....	7

1. Installation

The installation files are made available in an archive. Before you can start the installation, use the appropriate program to open the archive and to expand the installation files.

1.1. PC-Installation

Open the downloaded file "**pf40demo.zip**" with **WinZIP** and extract the files stored in the archive to any directory of your computer.

1.2. Macintosh-Installation

Use the "**Disk Copy**" tool to open the downloaded file "**pf40demo.dmg**". Thus you extract the files, stored in the archive to the folder named "**/Applications/PFDemo**".

1.3. Executing PreFlight 4.0 Demo

For PC, use Windows Explorer to open the target directory and click on "**pf.exe**".

For Mac, use the Macintosh Finder to open the target folder and click on "**PreFlight**".

1.4. Importing the German Map

In "PreFlight" select the "**Miscellaneous – Administration of Maps**" menu option. Thereupon the "Scanned Maps" dialog box appears, where you click on the "**Import...**" button. Then open the "**Calibration.scm**" file. After that, the name of the map ("Germany") appears in the list of the scanned maps.

Close the Scanned Maps dialog box by selecting the "**OK**" button.

1.5. Restrictions of the Demo-Version

Flight planning and the elevation profile (using 1-km-resolution) is limited to the area
from 48 30 00 N to 50 30 00 N and
from 6 30 00 E to 9 30 00 E.

Furthermore it isn't possible to save routes and tracks on disk.

However, the GPS-interface is available to use, so that you can connect your GPS to transfer data.

2. Easy Planning with PreFlight

Before you begin to create a route on the just imported German map, we would like to make you familiar with the basic concept of "PreFlight": First plan the rough course **by keyboard entry**. Then change to the **Generated Map**, to get an overview over the complete route. Finally use **Scanned Maps** to edit the last details of your route. Now we describe the preparation of a VFR-flight from Egelsbach via Aschaffenburg to Mainbullau.

2.1. Rough Course by Keyboard Entry

Use the "**Route – Edit...**" menu option to open the "Flight Route" dialog box. The starting point of your route is already defined by your "Home Airfield", and in the "Name" text input field, the entry "Egelsbach" is selected. In order to add a new way point to the route, you simply begin to write the name of the new way point. Thereby, the old entry ("Egelsbach") will be overwritten by the new entry "**Aschaffenburg**". Type only up to the second "A" of "Aschaffenburg"; because the input assistance will complete the remainder automatically. Now use the **Tab-key** to change to the "Altitude" input field and enter the value "**1500**". This altitude will be used for all following way points, until you change the altitude again. Press the Enter-key in order to add the new way point to your route.

Now the entry "Aschaffenburg" is selected in the "Name" text input field. In order to add the next way point, simply overwrite the current entry with "Mainbullau". Here an input up to the "B" of "**Mainbullau**" is sufficient. Then use the Tab-key to change to the "Altitude" input field and enter the value "**2500**", in order to increase the planned flight altitude to this value. Subsequently press the **Enter-key** in order to add the second way point to your route. Finally click on button "**Done**", to leave the "Flight Route" dialog box.

Note:

Surely you have noticed, that in each case you have to overwrite an "old" entry of the "Name" field, in order to define a new entry. This "rule" applies, even if you like to add way points to your route, which are not registered in PreFlight's database. If you press the **Enter-Key** after that, "PreFlight" will ask you for the missing data automatically.

In order to define way points via "**Distance + Course**" or via directly typing the "**Co-ordinates**", please always specify the name of that new way point first. Then click the appropriate button in the "Flight Route" dialog box and enter the missing data into the "Determine location" dialog box. After that dialog box is closed, click the "**Add**" button of the "Flight Route" dialog box.

2.2. Clearly Arranged Generated Map with Elevation Profile

By keyboard entry you now have created a simple route, on which you can continue to work by mouse clicks. Therefore select PreFlight's "View – Route Map – Generated" menu option. If you haven't changed the colour setting, you will see the first leg of your route in green colour and the second in red. "PreFlight" uses the green colour to indicate, that these elements are activated to be changed. For a better understanding, move the mouse between the way points "Aschaffenburg" and "Mainbullau" and click the left mouse key. Thus both, the second leg of the route and the way point "Aschaffenburg" will be activated (green). To activate a leg, it's sufficient to click approximately into the vicinity of the desired leg. Now activate again the first leg by clicking (with the left mouse button) e.g. two centimetres south of the compulsory reporting point "S", which is located south-east of Egelsbach. Depending upon the shape of your route, substantially larger inaccuracies may be tolerated for activating a leg.

However, we now like to insert the exit point "EDFE-E" located between Egelsbach and Aschaffenburg by mouse click.. For that, we ensure, that the first leg is activated (green) and then we click

for PC using the right mouse button,
for Mac using Shift-Key and mouse button

into the vicinity of the exit point "E", located east of Egelsbach. On the map, a popup menu with the "Insert", "Append", "Bearing", "Delete" and "Activate" options appears. If you now select "Insert", a second menu with co-ordinates and location names appears. The co-ordinates represent the position, at which you pointed with the mouse while pressing the mouse button. The further location names originate from PreFlight's database and are sorted by their distance from the mouse position just mentioned. That means, the way point to insert ("EDFE-E") should be listed on the second or third row, depending upon, how exactly you had positioned the mouse before. Now select the desired way point ("EDFE-E"). The "Way point" dialog box appears, where you could modify the planned flight altitude. We let it here unchanged on 1500 feet and close the dialog box again.

2.3. Bearing by Mouse-Click

In order to safely find the compulsory reporting point "EDFE-E" during the flight, we can now compute a bearing to "Charlie DVOR". First mark the "EDFE-E" way point, by activating the leg between "EDFE-E" and Aschaffenburg. Thus also the label "EDFE-E" will get the green background colour. Now move the mouse pointer approximately into the vicinity of "Charlie DVOR" and open again (like before) the small popup menu.

However, instead of selecting "Insert", now select "Bearing". Again, a second menu appears, where you can select the desired radio navigation facility "Charlie DVOR". "PreFlight" represents the computed radial as a thin red line, which extends from the VOR to the compulsory reporting point. Later, you will find more exact data of the computed bearing in the flight execution plan below the way point "EDFE-E".

Note:

When planning on scanned maps, follow exactly the same steps just described. All changes, which we just made on the map view, you also could make by keyboard in the "Flight Route" dialog box. It is up to you, which method you prefer.

2.4. By Mouse-Click on the Scanned Map

Now select the "View - Route map – Scanned" menu option, in order to edit your route on the map "Germany". Shift the map somewhat upward, until your route becomes visible. Contrary to scanned ICAO maps, this simple Germany map isn't really suitable for detailed planning. Nevertheless, to demonstrate the possibilities, we extend here the last leg of our route. It is to lead across a "Main"-river loop, which you will find on the map scarcely a centimetre north east of "Mainbullau". Therefore you please first ensure, that the last leg of the route appears in green colour. Subsequently, you move the pointer of mouse **exactly** over the desired point (the "Main"-river loop) and then you select both, "Insert" and the co-ordinates, displayed in the first row of the second popup menu. In the "Way point" dialog box you increase the planned altitude to 2500 feet.

Thus we have completed the route. Let's have a look on the results now.

3. Results

After you have created your route, please select your aeroplane and specify the payload. For that, open the "Planes" menu option and select the "**Cessna 150**". Then open the "Planes – Payload" menu option and enter the value "**160**" into the "Row of seats: 1" field and the value "**5**" into the "Baggage area: 1" field. That means, pilot and co-pilot together do weigh 160 kg, and the luggage weighs 5 kg. Via the "View" menu option, "PreFlight" then presents the results of the flight planning.

3.1. Flight Execution Plan

Select the "View – Heading + Time" menu option, in order to view the document containing the most important data for the execution of a visual flight. The last three entries in the line "EDFE-E" have the following meaning: Fly 6 minutes in an altitude of 1500 feet and hold the magnetic heading of 94 degrees, in order to proceed from Egelsbach to the compulsory reporting point "E".

3.2. Consumption

Select the "View – Consumption" menu option and examine, whether your intended flight is feasible at all. With the settings you made above, you can use only 77% of your tank capacity. Otherwise your aeroplane would be overloaded. With the available fuel quantity of 62.4 litres, after subtraction of a safety reserve of 30 minutes, a **safe flying time** of 114 minutes remains for you. In Egelsbach you need a **take-off distance** (over 15 metres obstacle) of 441 metres and in Aschaffenburg a **landing distance** of 427 metres is required. If you had planned the flight for the 6.4.2003 and if you do not intend to conduct a night flight, you should arrive in Aschaffenburg not later than 18:00 UTC, the **sunset time**.

3.3. Flight Plan

Select the "View - Flight Plan" menu option, if you need a completely filled in flight plan form for the air traffic control.

4. Satellite Navigation

You can automatically transfer your route into a **Garmin** GPS device or into a **Magellan** 315/320. First select the "**Miscellaneous - GPS Selection**" menu option, in order to choose both, the protocol, your GPS communicates with and the port you have connected the device.

For devices, talking the "**Garmin Portable**" protocol, beside the **COM**-ports, the **USB**-interface is also available on the PC!

For the Mac select the USB port, at which you have connected an adapter (e.g. Keyspan's "USA-19QW") to connect your GPS.

4.1. Send a Route to GPS

Select the "Route - Write into GPS" menu option, in order to transfer your route into the GPS selected.

4.2. Read a Route from GPS

Select the "Route - Read from GPS" menu option, in order to transfer all routes or only one route from the GPS to "PreFlight".

4.3. Read a Track from GPS

Select the "Route - Read Track from GPS" menu option, in order to transfer all tracks or only one track from the GPS to "PreFlight".

To evaluate a track, change either to "Track Map - Generated (or Scanned)" view, to the "Track Speed" view or to the "Track Altitude" view.

4.4. Reading Way Points from GPS

Select the "Locations - Read from GPS" menu option, in order to transfer GPS user way points into the location database of your current region.

4.5. Writing Way Points into GPS

Select the "Locations – Write to GPS" menu option, in order to transfer user way points of your current location database into your GPS.

5. Flight Recording and Moving Map

"PreFlight" uses the NMEA interface of your GPS device to record the track, the speed and the altitude of your flight. Open the "Mainbullau" example track, by using the "Route - Track - Open..." menu option, in order to open the file "**Mainbull**", which is available in the "WAY" directory, together with the example routes.

In the "View" menu you will find

- the recorded track, via the "Track Map – Generated" (or "Scanned") option,
- the recorded flight altitude, via the "Track Altitude" option and
- the recorded speed, via the "Track Speed" option .

5.1. Simulation

You can play back a recorded track. Therefore open the "Route - Track – Preferences" menu option and select "**Actual Track**" as data source for "Moving Map". Afterwards start the moving map mode by selecting the "Route - Track - Moving Map" menu or via the appropriate symbol bar icon (with a small yellow aeroplane).

5.2. Moving-Map

In the "Preferences" dialog box, again select "**GPS (NMEA 0183)**" as data source for Moving Map and connect your GPS to your computer. Don't forget to activate the **NMEA output mode** in your GPS and - if you do not change your position – activate the **simulation mode**, too. Now start the moving map mode and see, how PreFlight converts the GPS position signals. During the moving map mode, the track will be recorded in your computer.

If you currently have selected the "Track Map – **Scanned**" view, then "PreFlight" looks for a suitable (ICAO) chart, in order to mark your current position on it. If no map should be available, or if you have selected the "Track Map – **Generated**" view, then "PreFlight" displays a generated map, where you can see your current position on the elevation profile! Depending upon which colour table you have activated in the "Graphics – Preferences" dialog box, you see a static elevation relief or a dynamic one, where the colour representation depends on your flight altitude. Thus, "PreFlight" displays all **elevations**, which lie **above your current flight altitude**, in **reddish colours**.

5.3. Flight Recorder

If you are interested in a track only (no moving map), you can choose the "Route - Track – Flight Recorder" menu option, to open the "Track" dialog box. There you can use the "Start" and "Stop" buttons, to record a flight.