

# MSFS FlightBag V 0.65.0.66

See (new V0.65) indications for updates from the previous version (V0.63)

## Flight bag providing ...

- Standalone or Part of the MSFS HudBar Windows
- Shelf for image documents either JPG, PNG or GIF images for reference
- Airport centric Map display
- METAR retrieval
- Profile Calculator
- Performance and Touchdown data
- Notepad
- Route and document integration with SimBrief and MSFS Route and Flight files

**MSFS\_FlightBag** is a standalone application but also integrated in the **MSFS\_HudBar** application.

Both are the same and share the same settings, data and configuration.

The integrated version attempts to gather the flight plan departure and arrival airports where the standalone version expects those to be entered in the Config. Tab – otherwise they are the same.



### IMPORTANT:

**MSFS\_FlightBag** makes extensive use of airport, runway and navigation data intended for the simulator.

As one cannot distribute MSFS and/or Navigraph data via the application package the user must initiate the data collection and consolidation.

There is a program provided in the application package which does this chore.

→ Below in the Appendix find the chapter **Data Loader** and proceed accordingly

# Content

<b>Flight bag providing</b> .....	1
<b>Standalone Installation and Usage</b> .....	3
<b>Limitations</b> .....	3
<b>What is shown</b> .....	3
<b>Shelf Tab</b> .....	4
<b>Map Tab</b> .....	5
Supported Map Providers.....	5
Map Display – Intentionally a zoomable but static map with decorations.....	6
Map – Ops.....	7
Airport / Area Information (updated V0.63).....	8
Decorating the map .....	9
Aircraft tracking .....	9
Navaids .....	10
Airport VFR Marks.....	11
Selecting a runway for VFR or IFR approach waypoints decoration .....	11
Routes .....	12
<b>METAR Tab</b> .....	13
<b>Perf. Tab</b> .....	13
<b>Profile Tab</b> .....	14
<b>Notes Tab</b> .....	15
<b>SimBrief Integration</b> .....	16
<b>MSFS Flightplan Integration</b> .....	17
<b>METAR Data Retrieval:</b> .....	18
<b>Distributed Contents:</b> .....	18
<b>Appendix:</b> .....	18
File Storage .....	18
Settings Files and Reset Configuration .....	18
Map Data retrieval and storage disclaimer (updated V0.63).....	18
Data Loader .....	19
Instances.....	20
Issue Reporting: .....	21

# Standalone Installation and Usage

- Deploy the release all zip content in a folder (no installer provided or needed)

**Best is to start MSFS first, then the Flight Bag (but the App should connect the sim in any case)**

- Start MSFS2020 first and once the Main Menu is shown
- Start FS20\_FlightBag.exe
- It attempts to connect to the Flight simulator in 5 sec intervals, but shows a red bar while it is not connected to MSFS
- Use the **Tabs** for Shelf, Map, METAR, Perf., Notes, and Config.
- To **Exit** and stop the program click the top right X mark

## Limitations

Some aircraft do not provide or do not synchronize data with the Simulator as expected.

Such aircrafts maintain their own internal models and act properly but do not share or interact well with the generic simulation where the FlightBag takes the data from to track aircraft and selected airports.

## What is shown

At startup there is an empty Shelf, Map, METAR, Perf., Notes, and Config. Tabs.

The screenshots illustrate the application's interface across four tabs:

- Shelf:** Displays a list of documents and files located in the selected folder. Examples include APR.Map, ARRAirways, DEPAirways, FPLAN.Departure.Map, FPLAN.IFR Tribhuvan Intl (VNKT) to Gonggar (ZULS).Impln 2022-02-12, and various INF.VNKT and INF.ZULS logs.
- Map:** Shows a static map of an area around Chicago O'Hare International Airport (KORD). The map includes roads, airports, and various flight paths. A red box highlights the 'Current Leg of flight'.
- METAR:** Provides aircraft performance numbers and touchdown data for a Cessna Skymaster G1000 Ausbo at KORD. Key data points include Total Weight (2,199 lbs), Fuel Weight (0.038), PAYLOAD Weight (0.340), ZF Weight (2,031), CG Ionylat (21.09 % / 0.00 %), Empty Weight (1,691), and MAX Weight (2,558). Last Touchdown Data shows 0 ft and 0.0% Bank.
- Config.:** Allows users to set up flight parameters. It includes fields for Pilot ID (000000), SimBrief, and METAR. There are checkboxes for 'MSFS Flightplan' (Select Load Plan, Request Plan, Download, Load Default Plan) and 'METAR' (Add 'readable' METAR). A 'Shelf' section shows the 'Shelf Folder Location' as 'DemoBag'.

- Shelf provides a list of documents located in the selected folder
- Map shows a static map with various display options
- METAR allows to retrieve METAR information – if selected it translates the METAR string into something more readable.
- Perf. Lists Aircraft Performance numbers and Touchdown Data as reported from the Sim.
- Notes – a simple notepad area,
- Config. Allow to setup some options

See below for some of the items available

## Shelf Tab

- The Window allows to choose from image files contained in a folder.
- An image can be zoomed in or out and dragged within the window.
- Supported image file formats are PNG, JPG and GIF

Tip: scale the image in a way that the resolution is high enough to read it properly at the most used zoom level, usually this is around 1400 pix on the longer side – but you may try and find what works best.

### Configuration:

In order to use the Flight Bag you must select the folder where your images are located – go to **Config. Tab**



Default is the directory **DemoBag** in the App folder – supplied with some demo images in the App distribution.

Click '...' and choose any directory to use.

### Usage:

The first time the window will open empty

– Click the **Book Shelf Icon** in the top left corner to load the documents (images)



From the list of documents **click** the one to display.

**Zoom** the document with the mouse **scroll wheel** or **click the +- icons** in the bottom right corner.

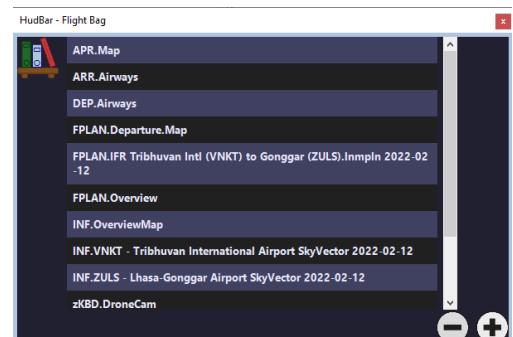
Use the **left mouse click and drag** to move the document in the window.

**Click right** to reset the zoom and re-center the document.

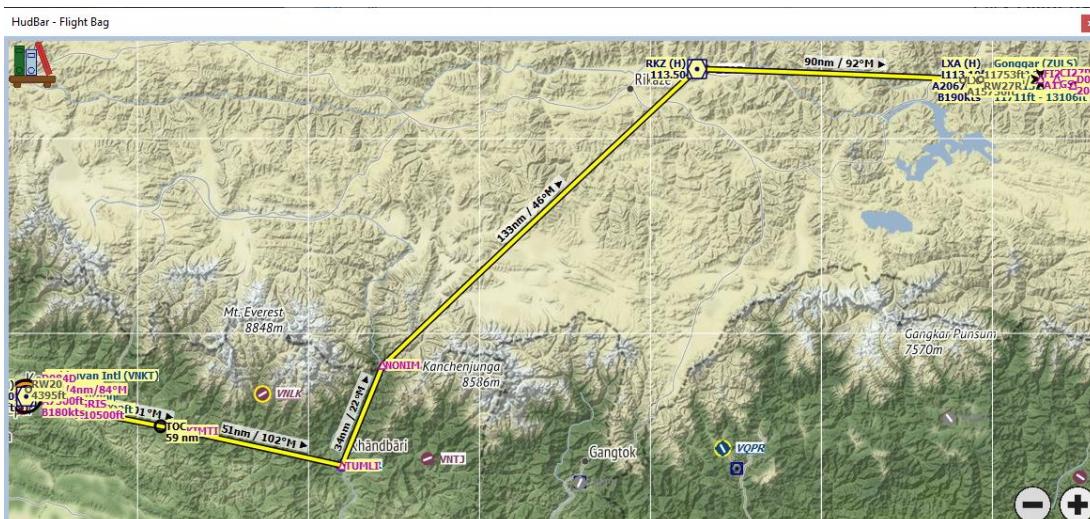
Click the Book Shelf icon to select another document.

**Resize** the window as usual in Windows.

**Hide** the window with Hotkey, Context Menu or the X icon.



### Example from the Demo included



## Map Tab

### Supported Map Providers

**MapLib** supports a fixed number of Map Tile Providers as well as 3 user defined ones.

→ **ALWAYS consider the terms of use for any of the map providers**

**Free and open Tile services are at the time of writing** – enabled by default

OpenStreetMap (OSM) and some derivatives

<https://www.openstreetmap.org>

OpenTopo, a 3d enhanced map from an open source project (usually rather slow to respond...).

<https://opentopomap.org>

Stamen 3d shaped terrain map (remote areas are rather slow to respond)

<http://maps.stamen.com>

**ChartBundle** - for US regions only (FAA provides data at no cost, other countries do not...) – disabled by default

<https://www.chartbundle.com/charts/>

Go for the Appendix MapLib Document – INI File - below to see how to enable them.

**Tile Services which need either a key or are subject to licensing terms** – disabled by default

Bing Maps (Microsoft map service) needs a key and subject to licensing

<https://docs.microsoft.com/en-us/bingmaps/getting-started>

ESRI/ARCGIS Tile Services as part of their offering – subject to license, don't use if not licensed

<https://developers.arcgis.com/documentation/mapping-apis-and-services/data-hosting/services/image-tile-service/>

**Remark:**

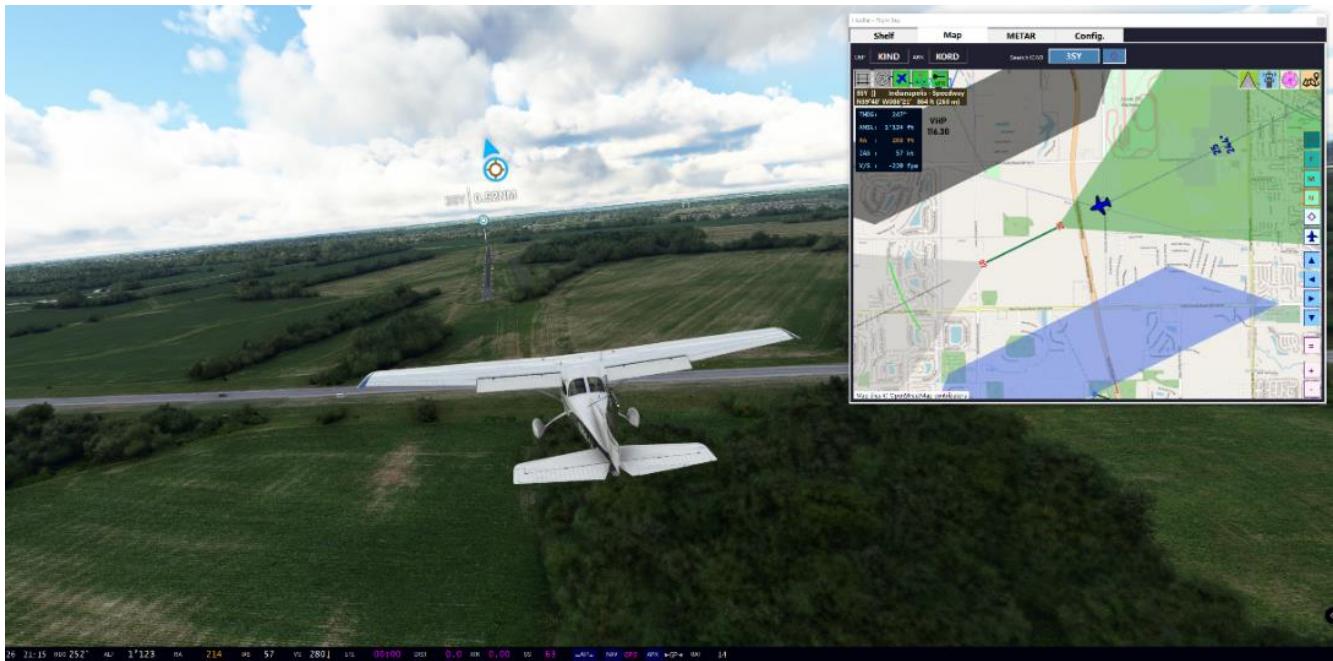
Don't ask for Google Map support – I don't have a key and they are rather complicated to work with...

### User defined tile services 1..6

You may have an own tile service running on your NAS or know a tile service you like to use.

**Provider Configuration** → Check the guide for MapLib (MapLib-Doc.pdf)

## Map Display – Intentionally a zoomable but static map with decorations



The Map display intends to minimize the performance footprint and will only request tiles on user request.

There are 5 predefined ranges (XF=7, FF, F, M, N, C=15) which are loaded on demand and where the user can zoom in and out at discretion. *Note: decorations except the Route will be hidden above range FF.*

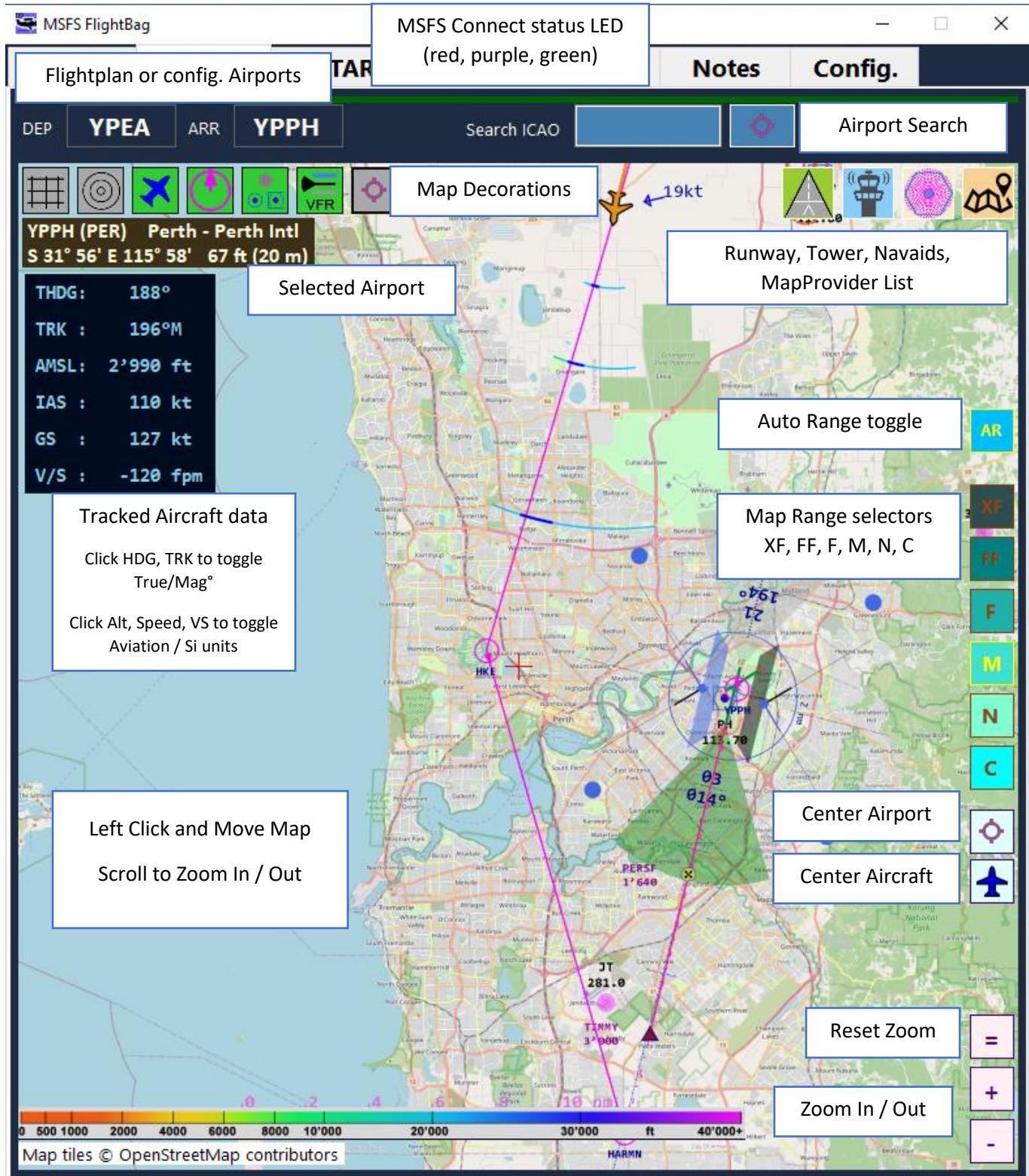
When in **AutoRange (AR) mode** it will zoom seamlessly between Z5 and Z15 levels of the map provider when zooming in or out.



When not in AutoRange mode (default) it will just zoom into the drawn image up to 20x magnification without switching to a more or less detailed map.

- The map is intentionally NOT a moving map. The user may shift the mapped area if desired.
- The map draws the selected airport runways if in sight and can be decorated with Navaids, VFR patterns, Aircraft
- The map displays and tracks the aircraft with some predefined essential data

## Map – Ops



The map is Airport centric – i.e. usually you would have an airport selected.

Use Search Airport or click the DEP, ARR ICAO label to center the view on that airport (above it's YPPH)

While in flight you may move the shown map area using the mouse with left click or use the 'center aircraft' button once in a while to re-locate the map.

For the selected airport one can list runways, tower frequencies as well as the area navaids.

*NOTE: for the time being the map may be a bit jumpy when moving it around rather fast. In the end it should show the expected area – if a yellow border remains, try to do a small move with the mouse.*  
*(Work in progress to clean it up)*

## Airport / Area Information

Runway 22R - Approaches

ILS (NOLEN)	RWY 22R
LOC (NOLEN)	RWY 22R
RNAV (NOLEN)	RWY 22R

Airport - Runways

04L (039°)	2284x46 m - ASPHALT
22R (219°)	IRXZ 111.30 GS(3.0° 27 nm) 2284x46 m - ASPHALT
04R (041°)	IFJU 110.10 GS(3.0° 27 nm) 2458x46 m - ASPHALT
22L (221°)	ILQQ 110.10 GS(3.0° 27 nm) 2458x46 m - ASPHALT
09L (090°)	ISAJ 111.75 GS(3.0° 27 nm) 2284x46 m - ASPHALT
27R (270°)	IABU 111.75 GS(3.0° 27 nm) 2284x46 m - ASPHALT
09R (090°)	IJAV 110.50 GS(3.0° 27 nm) 3525x46 m - ASPHALT
27L (270°)	IIAC 110.50 GS(3.0° 27 nm) 3525x46 m - ASPHALT
10C (090°)	ISXH 108.95 GS(3.0° 27 nm) 3288x59 m - ASPHALT
28C (270°)	IVZE 108.95 GS(3.0° 27 nm) 3288x59 m - ASPHALT
10L (090°)	IMED 111.10 GS(3.0° 27 nm) 3960x46 m - ASPHALT
28R (270°)	ITSL 111.10 GS(3.0° 27 nm) 3960x46 m - ASPHALT
10R (090°)	IBYW 110.90 GS(3.0° 27 nm) 2279x53 m - ASPHALT
28L (270°)	IVQX 110.75 GS(3.0° 27 nm) 2279x53 m - ASPHALT
27C (270°)	IUYJ 111.90 GS(3.0° 27 nm) 3420x61 m - CEMENT
09C (090°)	IOYG 111.90 GS(3.0° 27 nm) 3420x61 m - CEMENT

Map tiles © OpenStreetMap contributors

Runway 22R - Approaches		
ILS (NOLEN)	RWY 22R	
LOC (NOLEN)	RWY 22R	
RNAV (NOLEN)	RWY 22R	

Approaches are shown as above, where the quote indicates that the data is from the Navigraph source. Such data is sometimes different or not available in the Sim. Above the LOC approach is from MS data and may not be available as separate chart in the Navigraph App.

Runway 22R
ILS OR LOC RWY 22R
21-11
RNAV (GPS) RWY 22R
22-11
Runway 27L

Clicking the Runway Icon will show/hide the list of airport runways found in the database.

If there is an ILS located for the runway the ILS ID, Frequency, GS angle and range is shown.

If there are **Approaches** for the selected runway found in the database it will show them above the runway panel as soon as you select (click) a runway.

Selecting (click) an Approach will show the Approach as Waypoint/Line decoration in the map

Selected items are highlighted (inverse coloring).

Airport - Frequencies

124.350 - CHICAGO (APPROACH)
125.700 - CHICAGO (APPROACH)
119.250 - OHARE (CLEARANCE)
119.250 - OHARE (CLEARANCE_PRE_TAXI)
121.600 - CHICAGO/OHAREINTL (CLEARANCE_PRE_TAXI)
119.000 - CHICAGO (APPROACH)
133.625 - CHICAGO (APPROACH)
135.400 - KORD (ATIS)
121.600 - OHARE (CLEARANCE)
120.550 - CHICAGO (DEPARTURE)
125.000 - CHICAGO (DEPARTURE)
126.625 - CHICAGO (DEPARTURE)
128.200 - CHICAGO (DEPARTURE)
133.500 - CHICAGO (DEPARTURE)
118.850 - OHARESOUTH (GROUND)
121.675 - OHAREMETTERING (GROUND)
121.750 - OHARE (GROUND)
121.900 - OHARE (GROUND)
124.125 - OHARENORTH (GROUND)
128.900 - OHARE (GROUND)
128.975 - OHARE (GROUND)
129.050 - OHARE (GROUND)
129.075 - OHARE (GROUND)
129.675 - OHARE (GROUND)
130.375 - OHARE (GROUND)
131.300 - OHARE (GROUND)
131.700 - OHARE (GROUND)

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Clicking the Tower Icon will show/hide the list of airport communication frequencies found in the database.

When there are many like at KORD it will turn into a scrollable list.

Area - Navaids

NDB GY 236.0 kHz ( 23 nm) GARIE
NDB IA 414.0 kHz ( 23 nm) CHICAGO OHA TAFFS
NDB ID 385.0 kHz ( 23 nm) CHICAGO OHA INDOY
NDB IK 272.0 kHz ( 23 nm) LUKON
NDB OS 394.0 kHz ( 23 nm) CHSTR
NDB RV 257.0 kHz ( 23 nm) CHICAGO OHA JOCKY
NDB US 379.0 kHz ( 23 nm) WAUKE
NDB VP 212.0 kHz ( 38 nm) SEDLY
NDB VYS 230.0 kHz ( 38 nm) VALLEY
VOR DME BUU 114.50 MHz ( 38 nm) BURBUN
VOR DME CGT 114.20 MHz ( 60 nm) CHICAGO HEIGHTS
VOR DME DPA 108.40 MHz ( 60 nm) DUPAGE
VOR DME ENW 109.20 MHz ( 38 nm) KENOSHA
VOR DME EON 113.20 MHz ( 60 nm) PEOTONE
VOR DME GCO 108.25 MHz ( 60 nm) CHICAGO
VOR DME HRK 117.70 MHz ( 38 nm) HORLICK
VOR DME IKK 111.60 MHz ( 60 nm) KANKAKEE
VOR DME JOT 112.30 MHz (395 nm) JOLLET
VOR DME JVL 114.30 MHz ( 60 nm) JANEVILLE
VOR DME OKK 113.00 MHz (395 nm) NORTHBROOK
VOR DME OXT 115.60 MHz (395 nm) KNOX
VOR DME RFD 110.80 MHz ( 60 nm) ROCKFORD

Map tiles © OpenStreetMap contributors



Clicking the Navaids Icon will show/hide the list of the mapped FF Area VOR/NDBs and frequencies found in the database.

Note: Whether or not showing the Navaids on the map is part of decoration selection.

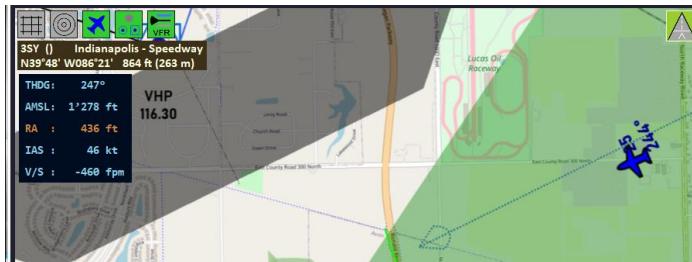
## Decorating the map

- Map Lat/Lon Grid – toggles the grid
- Airport range circles (5, 15, 30, 60 nm radius)
- Aircraft tracking with some data points
- Route from SimBrief or MSFS Plans
- Navaids
- Airport VFR Markings
- Airports within the shown area (use Config. to select a minimum runway length)



Click to toggle visibility of the items

## Aircraft tracking



When visible it will show the aircraft on the map if in the shown area, else it says 'aircraft out of sight'.

Data points are: (click an item to toggle either True/Mag or toggle Av/SI units

- True Heading (THDG) / Mag Heading (HDG)
- True Track (TTRK) / Mag Track (TRK)
- Altitude above MSL in ft / m
- RA in ft / m (<1500)
- IAS in kt / km/h
- GS in kt / km/h
- V/S in fpm / m/s

HDG : 320°	THDG: 320°
TTRK: 328°	TRK : 328°M
AMSL: 25'993 ft	AMSL: 7'923 m
IAS : 298 kt	IAS : 551 km/h
GS : 365 kt	GS : 675 km/h
V/S : +20 fpm	V/S : -0.1 m/s

The aircraft has a range feature which either shows 30° arcs at 2.5, 5, 10 nm out in light blue, the true ground track is marked with a 6° dark blue segment. These are TRUE degrees on the true north oriented map.

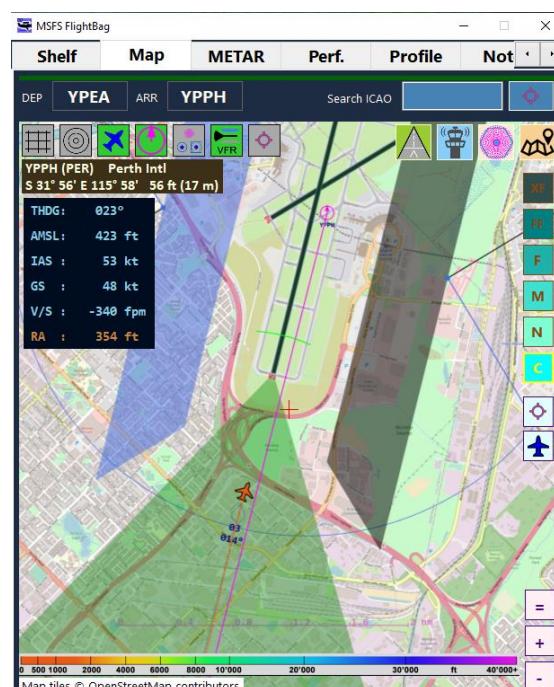


Under approach conditions the range marker changes to the expected ground contact at current IAS, VS and altitude which is shown as a green 20° arc (at the time of writing this feature needs some improvement...)

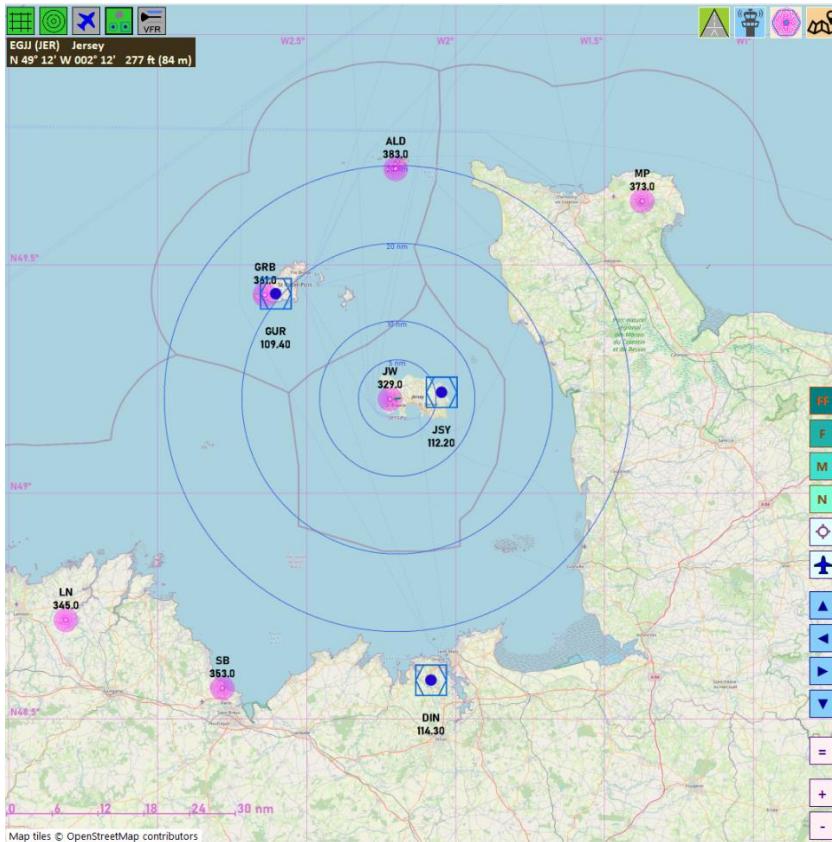


Wind speed and direction is shown as arrow with the speed label

The wind speed is default in kt but when changing units to SI it will be m/s



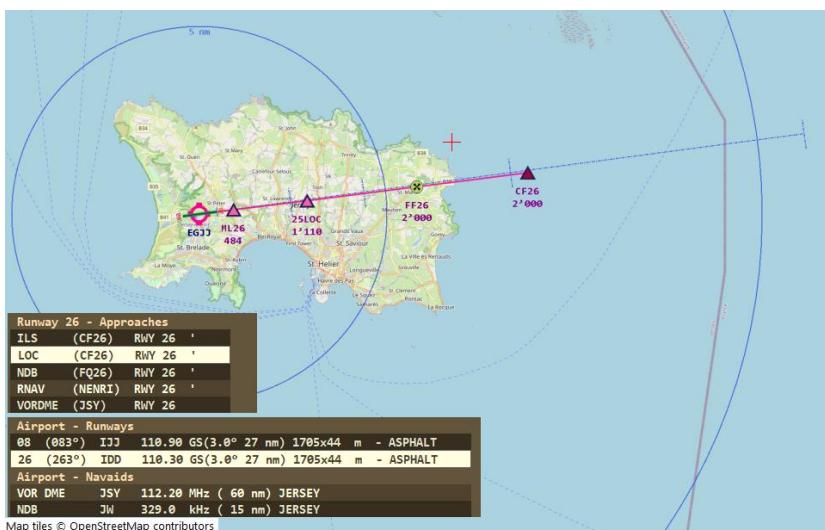
## Navaids



**VOR, DME, and NDB** navaids are shown with ID and frequency at their location.

There is no further interaction available.

**Waypoints** for runway approaches can be shown if a runway **AND approach** is selected from the runway list.



Above the runway 26 and the LOC approach was selected (clicked), Approach waypoints with their assigned altitude found in the database are placed on the map.

Since V0.63 only the waypoints for the selected approach are shown also when Navaids are disabled (it allows for less clutter and more readable labels)

Also when selecting a runway a blue dotted line towards the runway is shown with steps at 2, 4, 8 and 16nm from the runway start.

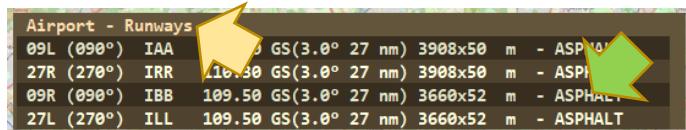
## Airport VFR Marks

Note: this feature may or may not please all kind of pilots – please let me know ...

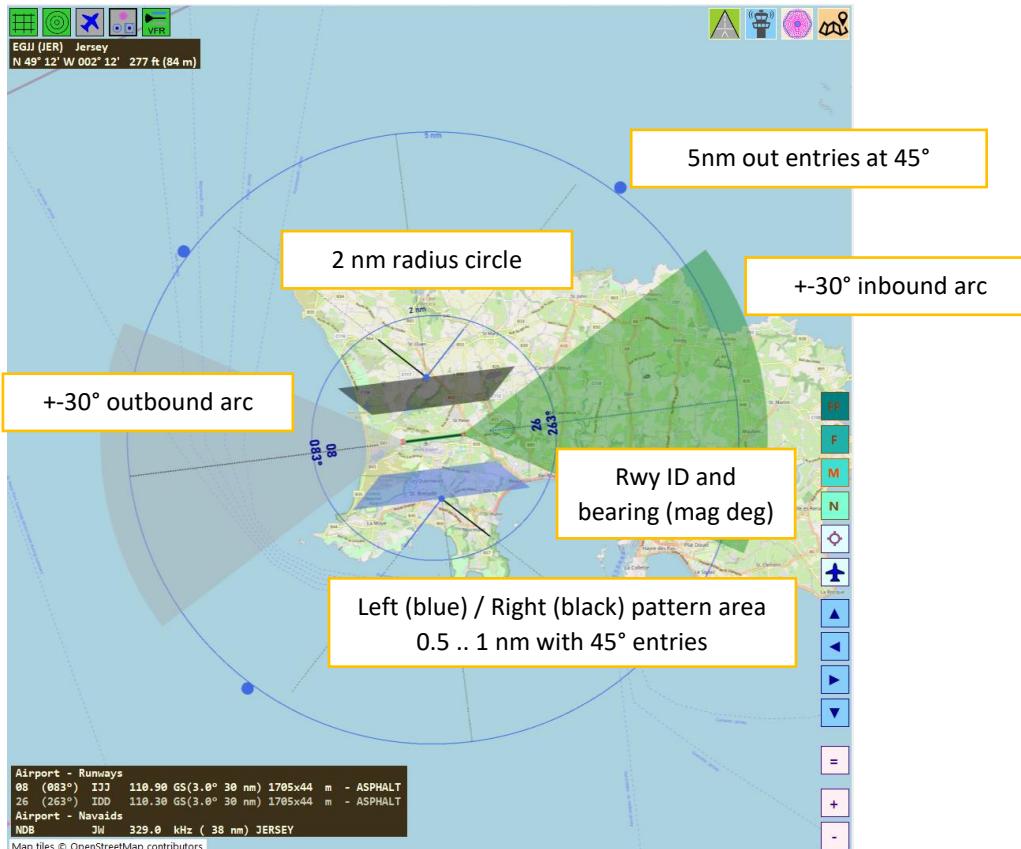
Selecting a runway for VFR or IFR approach waypoints decoration

To **select** a runway get the Runway list and **click** one of the runways.

To **clear** the selection, click the 'Airports – Runways' text (hand appears) and the decorations will go away.



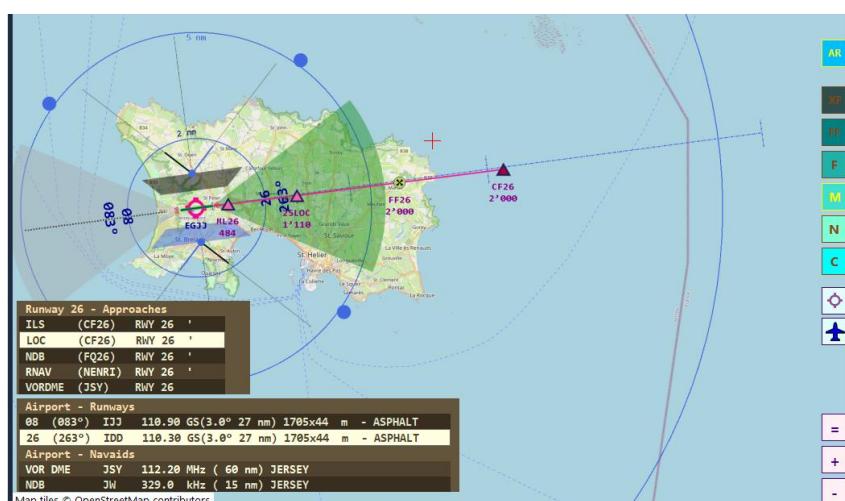
For a selected runway VFR marks are shown.



Above the runway 26 was selected (clicked)

To **select** an **approach** click the line item.

To **clear** the approach selection, click the 'Runway xy – Approaches' text (hand appears) and the decorations will go away.



When VFR marks is on and an approach is selected it looks like above.

## Routes

Routes derived from SimBrief or MSFS Plan- or Flight files are shown when the Route icon is clicked.



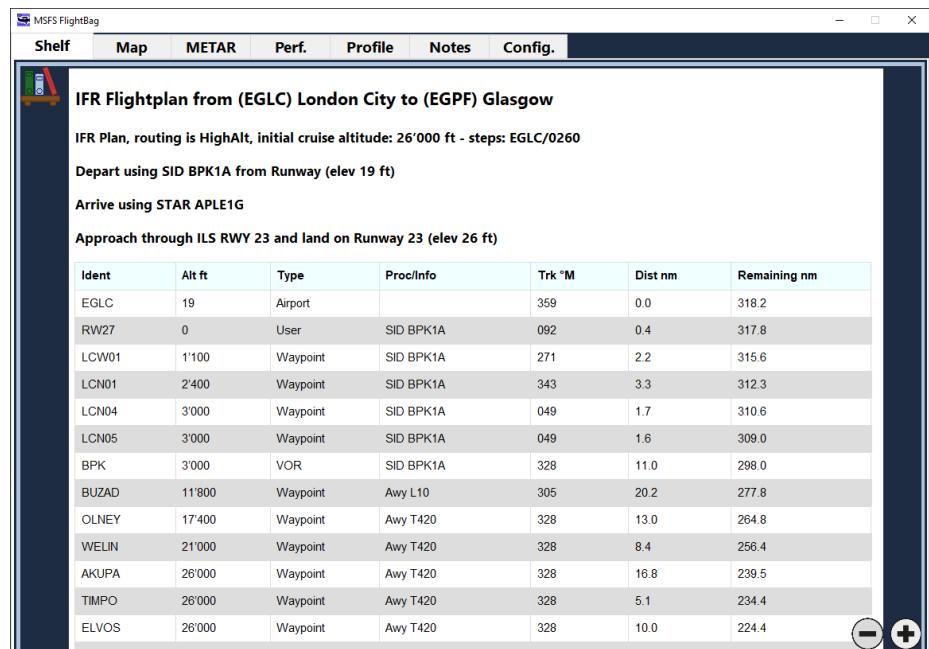
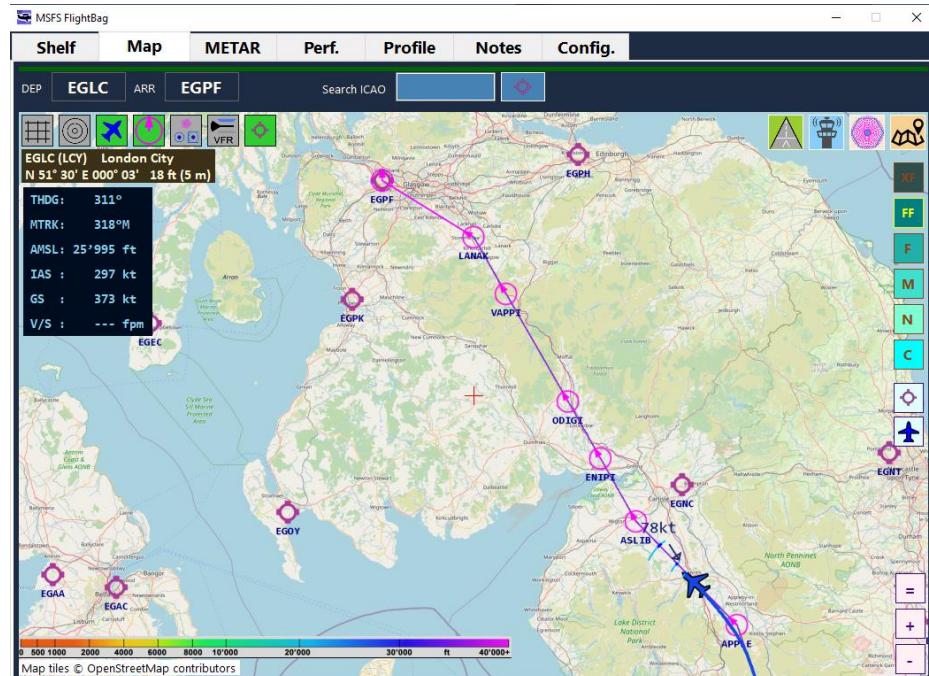
A route is marked with magenta lines and circles, where legs belonging to a SID or STAR are shown in a darker magenta color as in the example right from waypoint APPLE to LANAK.

As long as there is no Approach information in a plan the last leg ends at the airport (ex. LANAK-> EGPF)

Requested plans from the Sim may eventually contain Approach information. Such data is created by the Sim ATC/Planner and the validity is sometimes questionable...



*It is also dependent of the aircraft flown, some FMS do not share plans with the Sim internal systems and will therefore not provide any meaningful information in MSFS derived plans.*



For any plan a flight table document is created in the Shelf (@.FlightTable). The table contains a row for each waypoint found in the plan together with some helpful information about the plan.

For SimBrief downloads the plan document @.FlightPlan is created and the images contained in the plan are downloaded if available and stored in Shelf.

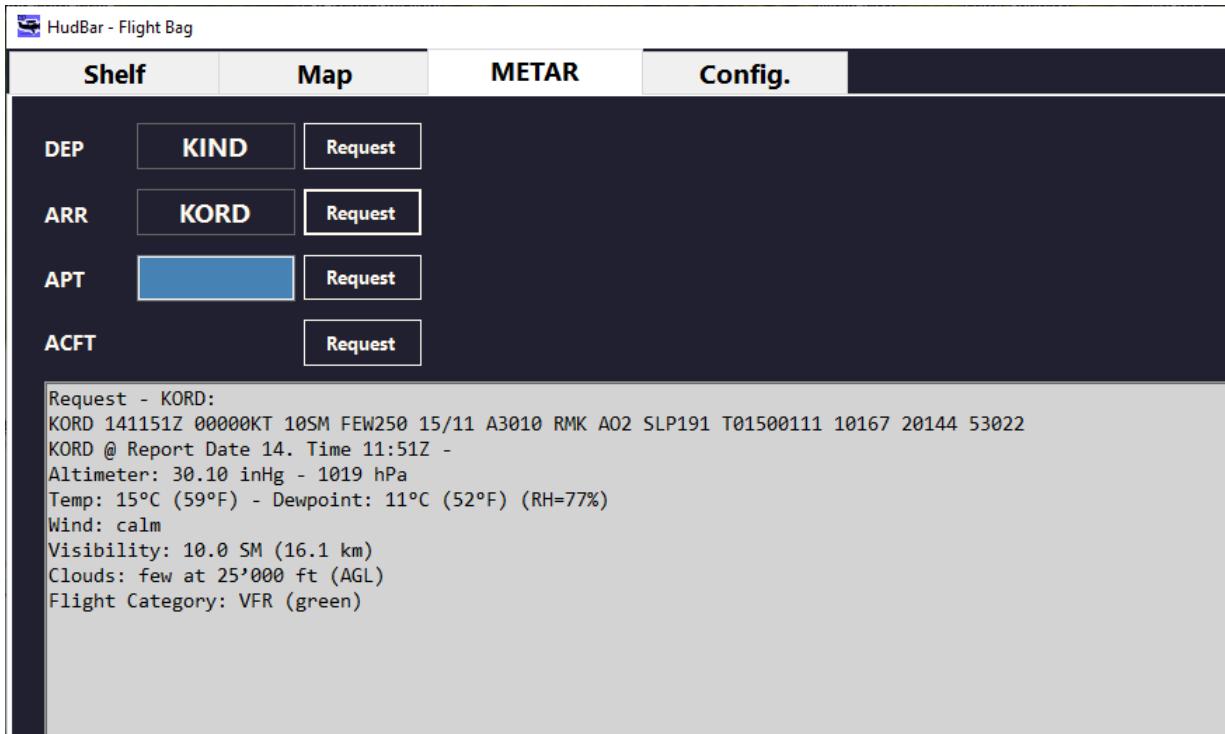
To the right is the list of docs for a SimBrief download.

**Note: plan documents are overwritten as soon as a new one is created or downloaded. But the currently viewed document does not change – select it again to view the most recent version.**

@.FlightPlan
@.FlightTable
@.Route
@.SigWx 1 of 4
@.SigWx 2 of 4
@.SigWx 3 of 4
@.SigWx 4 of 4
@.UAD 1 of 3
@.UAD 2 of 3
@.UAD 3 of 3
@.Vertical profile

## METAR Tab

This Tab will return METAR information for the station where the **Request** button was clicked.



Request - KORD:  
KORD 141151Z 00000KT 10SM FEW250 15/11 A3010 RMK A02 SLP191 T01500111 10167 20144 53022  
KORD @ Report Date 14. Time 11:51Z -  
Altimeter: 30.10 inHg - 1019 hPa  
Temp: 15°C (59°F) - Dewpoint: 11°C (52°F) (RH=77%)  
Wind: calm  
Visibility: 10.0 SM (16.1 km)  
Clouds: few at 25'000 ft (AGL)  
Flight Category: VFR (green)

If set in Config it will ‘translate’ the telegram into a more readable version as shown above.

If METAR does not provide data it might be that the service does not respond (try again in a few seconds) or the station is not available at all.

**The ACFT** will ask for a station based on the aircrafts LAT/LON position from the nearest weather station found within max. 500 Statute miles in direction of flight, the returned station is sometimes not really what one expects, but what the Metar server provides... (Cannot change it though).

**The Metar is real weather information at the location i.e. suitable when using Live Weather.**

– MSFS Sim weather cannot be retrieved outside the sim.

## Perf. Tab

Performance data as reported from the Simulator.

Touchdown data as reported from the Simulator.

There is a Touchdown log saved (MyDocuments\MSFS\_HudBarSave\TouchDownLog.csv) when using the FlightBag

	Aircraft	Callsign	Date_Time	VRate_fpm	Pitch_deg	Bank_deg	Hdg_deg_m	RwyLatDev_ft	RwyLonDev_ft
2	Cessna Skyhawk G1000 Asobo	BM98-CH	2022-10-16T18:25:06	4.8	0	0	274	NaN	NaN
3	Cessna Skyhawk G1000 Asobo	BM98-CH	2022-10-16T18:28:33	88.6	-2.7	-1.2	78	NaN	NaN
4	Cessna Skyhawk G1000 Asobo	BM98-CH	2022-10-18T01:09:36	5.7	0	0	274	2664.9	-15406.1
5	Cessna Skyhawk G1000 Asobo	BM98-CH	2022-10-18T01:11:49	144.8	-1.7	0.7	78	3.7	199.2
5	Cessna CJ4 Citation Asobo	BM98-CH	2022-10-18T01:33:04	8	-3.6	-0.3	152	NaN	NaN
7	Cessna CJ4 Citation Asobo	BM98-CH	2022-10-18T01:47:34	306.9	-2.7	0.6	94	-1.4	-909
3	Cessna CJ4 Citation Asobo	BM98-CH	2022-10-18T02:00:39	200.2	-2.4	-1.3	96	5.8	-848
9	Cessna Skyhawk G1000 Asobo	BM98-CH	2022-10-19T14:10:34	6	0	0	274	3307.9	-15702.9
0	HJET HA420 Dark Blue Stripes	BM98-CH	2022-10-19T14:50:42	0	0	0	318	2952.7	-15285.4

You may find Runway Deviation sometimes NaN or off by miles. The deviation is derived from the ATC assumed runway – which sometimes is just not set (NaN) or is still the starting runway (number is far off).

Also when you bump at the takeoff (happens...) you see most likely a separate line with a small number for the VRate (e.g. line 2)

## Profile Tab

An interactive profile table – using the “Rule of 3” as base.

FPA	IAS	TAS	GS	VS	Altitude	Dist [nm]
3.3	242	348	347	1980	23434	
0.4	0.7	40	600	2500	45'000	57
0.6	1.0	60	580	4'450	40'000	45
0.8	1.3	80	560	2'450	38'000	41
1.0	1.7	100	540	2'150	36'000	38
1.2	2.1	120	520	1'900	34'000	32
1.4	2.4	140	500	32'000	27	
1.6	2.8	160	480	1'700	30'000	23
1.8	3.1	180	460	1'550	28'000	18
2.0	3.5	200	440	1'400	26'000	14
2.2	3.8	220	420	1'250	24'000	9
2.4	4.2	240	400	1'100	22'000	5
2.6	4.5	260	380	950	20'000	0
2.8	4.9	280	360	800	18'000	5
3.0	5.2	300	340	650	16'000	9
3.2	5.6	320	320	500	15'000	11
3.4	5.9	340	300	350	14'000	14
3.6	6.3	360	280	200	13'000	10
3.8	6.6	380	260	150	12'000	18
4.0	7.0	400	240	100	11'000	20
4.2	7.3	420	220	50	10'000	23
4.4	7.7	440	200	150	9'000	25
4.6	8.0	460	180	400	8'000	27
4.8	8.4	480	160	350	7'000	29
5.0	8.7	500	140	300	6'000	33
5.2	9.1	520	120	250	5'000	34
5.4	9.5	540	100	200	4'000	36
5.6	9.8	560	80	150	3'000	39
5.8	10.2	580	60	100	2'000	41
6.0	10.5	600	40	50	1'000	43
					0	45

Above the tables are the current numbers as reported from the Simulator:

*FPA is the current flight path angle then IAS, TAS, GS, VS, and Altitude (in kts and Alt in ft)*

The current FPA, GS, and Altitude values are highlighted in the respective tables with a greenish color (for values in between row values for GS and Alt the higher one is marked in order to provide a safety margin).

**Click** a flight profile row in the left table - it will recalculate the 2<sup>nd</sup> and 3<sup>rd</sup> table.

The middle table shows the required vertical speed at a given **ground speed** (GS) in order to maintain the profile. E.g. above to maintain a 4.4° profile at GS of 260 kts it asks for 2000 ft/min vertical rate.

**Clicking** a row in the middle table serves only as mark or reminder and will not change any value.

The right table shows the distance which is flown to get to a certain altitude at the selected profile angle. E.g. starting from FL200 with a 4.4° profile it needs 23nm to get either down to FL100 or up to FL300.

**Note: add a safety margin to the calculated distances!**

**Clicking** a row in the right table will set this altitude as zero distance and calculate from there up and down.

There are no signed numbers in the tables, it's meant as either climb or descend.

**Example:**

We are at 26'000 ft with a GS of 480 as the greenish marks are showing, above the table are the real-time values from the Sim.

The plane is heading down at 2.4° and this profile is currently selected - showing a VS of ~2000 ft/min is required and flown.

Below the left screen has 26'000 ft selected as starting point and the distances are calculated up and down. To get down to 7'000 ft it shows we need about 79nm.

In the middle screen the new target altitude of 7'000 ft is selected and it shows the remaining distance as the green mark walks down while we descend. Also showing the needed distance to the airfield which is at about 1'000ft – it would be 25nm when flying at 2.4°.

In the right screen the approach profile of 3° is selected and now the VS has changed but also the distance from 7000 to 1000ft is back to 20nm for the steeper approach (now we only need to get our speed back in time and maintain the profiles..)

FPA	IAS	TAS	GS	VS	Altitude	Dist [nm]
-2.4	331	471	472	1980	24'622	
0.4	0.7	40	600	2500	45'000	158
0.6	1.0	60	580	2'450	40'000	138
0.8	1.4	80	560	2'350	38'000	129
1.0	1.7	100	540	2'250	36'000	121
1.2	2.1	120	520	2'200	34'000	113
1.4	2.4	140	500	2'100	32'000	104
1.6	2.8	160	480	2'000	30'000	96
1.8	3.1	180	460	1'950	28'000	88
2.0	3.5	200	440	1'950	26'000	79
2.2	3.8	220	420	1'750	24'000	71
2.4	4.2	240	400	1'700	22'000	63
2.6	4.5	260	380	1'600	20'000	54
2.8	4.9	280	360	1'500	18'000	46
3.0	5.2	300	280	1'450	16'000	38
3.2	5.6	320	320	1'350	15'000	33
3.4	5.9	340	300	1'250	14'000	29
3.6	6.3	360	280	1'150	13'000	25
3.8	6.6	380	260	1'100	12'000	21
4.0	7.0	400	240	1'000	11'000	17
4.2	7.3	420	220	900	10'000	13
4.4	7.7	440	200	850	9'000	8
4.6	8.0	460	180	750	8'000	4
4.8	8.4	480	160	650	7'000	0
5.0	8.7	500	140	600	6'000	4
5.2	9.1	520	120	500	5'000	8
5.4	9.5	540	100	400	4'000	13
5.6	9.8	560	80	350	3'000	17
5.8	10.2	580	60	250	2'000	25
6.0	10.5	600	40	150	1'000	0
					0	29

FPA	IAS	TAS	GS	VS	Altitude	Dist [nm]
-2.4	331	469	472	2'000	24'361	
0.4	0.7	40	600	2'500	45'000	158
0.6	1.0	60	580	2'450	40'000	138
0.8	1.4	80	560	2'350	38'000	129
1.0	1.7	100	540	2'250	36'000	121
1.2	2.1	120	520	2'200	34'000	113
1.4	2.4	140	500	2'100	32'000	104
1.6	2.8	160	480	2'000	30'000	96
1.8	3.1	180	460	1'950	28'000	88
2.0	3.5	200	440	1'950	26'000	79
2.2	3.8	220	420	1'750	24'000	71
2.4	4.2	240	400	1'700	22'000	63
2.6	4.5	260	380	1'600	20'000	54
2.8	4.9	280	360	1'500	18'000	46
3.0	5.2	300	280	1'450	16'000	38
3.2	5.6	320	320	1'350	15'000	33
3.4	5.9	340	300	1'250	14'000	29
3.6	6.3	360	280	1'150	13'000	25
3.8	6.6	380	260	1'100	12'000	21
4.0	7.0	400	240	1'000	11'000	17
4.2	7.3	420	220	900	10'000	13
4.4	7.7	440	200	850	9'000	8
4.6	8.0	460	180	750	8'000	4
4.8	8.4	480	160	650	7'000	0
5.0	8.7	500	140	600	6'000	4
5.2	9.1	520	120	500	5'000	8
5.4	9.5	540	100	400	4'000	13
5.6	9.8	560	80	350	3'000	17
5.8	10.2	580	60	250	2'000	25
6.0	10.5	600	40	150	1'000	0
					0	29

FPA	IAS	TAS	GS	VS	Altitude	Dist [nm]
-2.4	330	466	467	-2'020	24'005	
0.4	0.7	40	600	3'150	45'000	127
0.6	1.0	60	580	3'050	40'000	110
0.8	1.4	80	560	2'950	38'000	103
1.0	1.7	100	540	2'900	36'000	97
1.2	2.1	120	520	2'750	34'000	88
1.4	2.4	140	500	2'600	32'000	83
1.6	2.8	160	480	2'500	30'000	77
1.8	3.1	180	460	2'400	28'000	70
2.0	3.5	200	440	2'300	26'000	63
2.2	3.8	220	420	2'200	24'000	57
2.4	4.2	240	400	2'100	22'000	50
2.6	4.5	260	380	2'000	20'000	43
2.8	4.9	280	360	1'900	18'000	37
3.0	5.2	300	340	1'800	16'000	30
3.2	5.6	320	320	1'700	15'000	27
3.4	5.9	340	300	1'600	14'000	23
3.6	6.3	360	280	1'450	13'000	20
3.8	6.6	380	260	1'350	12'000	17
4.0	7.0	400	240	1'250	11'000	13
4.2	7.3	420	220	1'150	10'000	10
4.4	7.7	440	200	1'050	9'000	7
4.6	8.0	460	180	850	8'000	3
4.8	8.4	480	160	850	7'000	0
5.0	8.7	500	140	750	6'000	3
5.2	9.1	520	120	650	5'000	7
5.4	9.5	540	100	500	4'000	10
5.6	9.8	560	80	350	3'000	13
5.8	10.2	580	60	250	2'000	17
6.0	10.5	600	40	150	1'000	25
					0	23

Can be used to estimate the TOD or to check if a constraint can be made with the current profile.

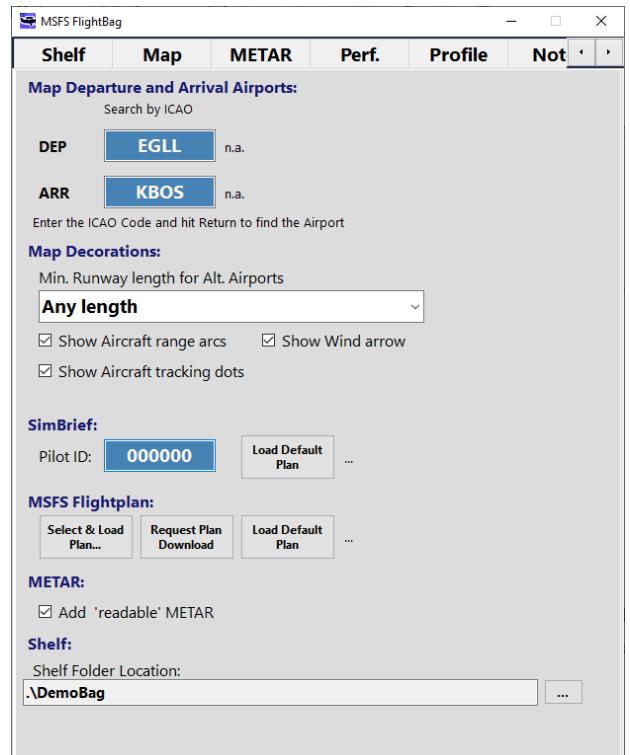
## Notes Tab

just a notepad which is saved when closing the App

## Config Tab

### Set the desired **Departure and Arrival Airports**

Enter the ICAO code and hit the Enter key – if the airport is found it will turn green and the common name is shown right to it, else it will turn red, indicating that ICAO code was not found in the database.



### Map Decorations:

**Min. Runway length for Alt. Airports**' lets you select the minimum length for any runway an airport must have in order to be shown when Airports decoration is ON. Choose a min length from the drop down.

Checked 'Show Aircraft range arcs' will show the leading arcs of the tracked aircraft when Aircraft decoration is ON.

Checked 'Show Aircraft tracking dots' will show the trailing dots of the current tracked aircraft when Aircraft decoration is ON.

Checked 'Show Aircraft Wind arrow' will show an arrow of wind direction and the speed of the wind around the aircraft.

### SimBrief:

Enter your SimBrief PilotID (a 2..7 digit number), hit Return to validate it (once – it will be stored in Settings)

Then click "Load Plan" to retrieve your latest Flight Plan – it will reply the Departure and Arrival Airport and also fill in the corresponding fields above.

### MSFS Flightplan:

Select a PLN or FLT file from the disk, request the ATC plan from the Sim or load the default plan from MS to load a route and create a Plan Table document in the Shelf.

### METAR:

Checked 'Add 'readable' METAR will show the more readable METAR information along with the received telegram.

### Shelf:

**Shelf Folder Location:** click the button <...> to select a folder where the images for the Shelf Tab can be found.

→ The Configuration is shared for the standalone and the HudBar version of the FlightBag.

## SimBrief Integration

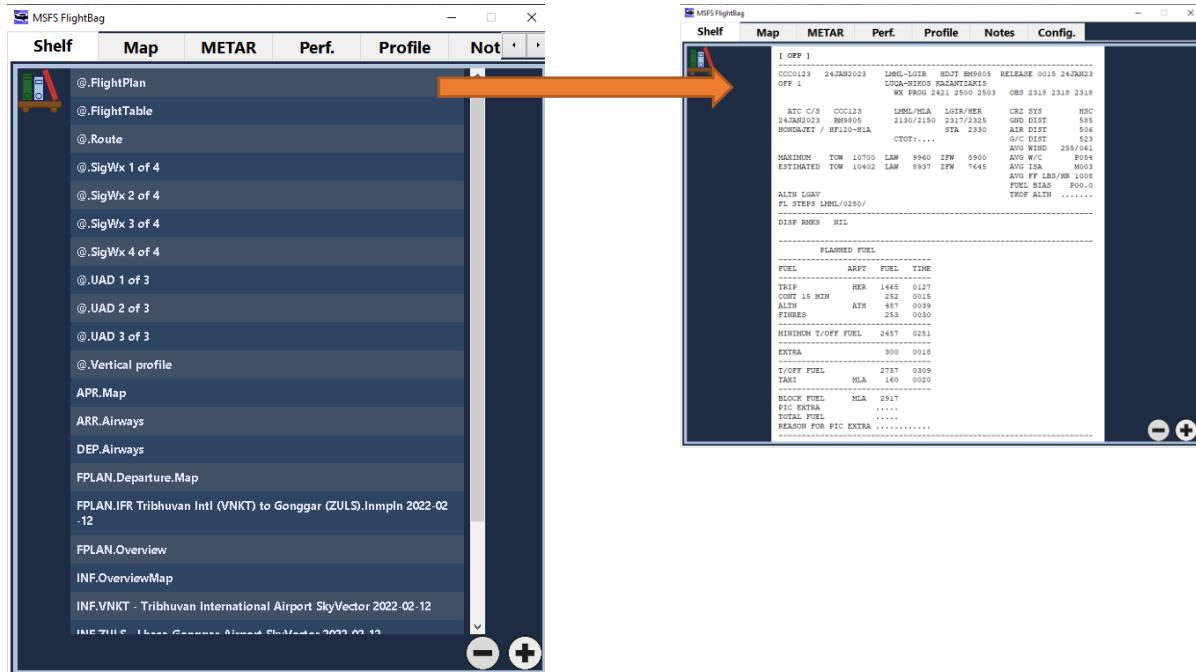
If you are using SimBrief for your flight planning you may retrieve the latest plan and some documents now.



First provide your Pilot ID (a 2..7 digit number) in Configuration, it will be stored in Settings.

Use “Load Plan” in Configuration to retrieve the last plan data.

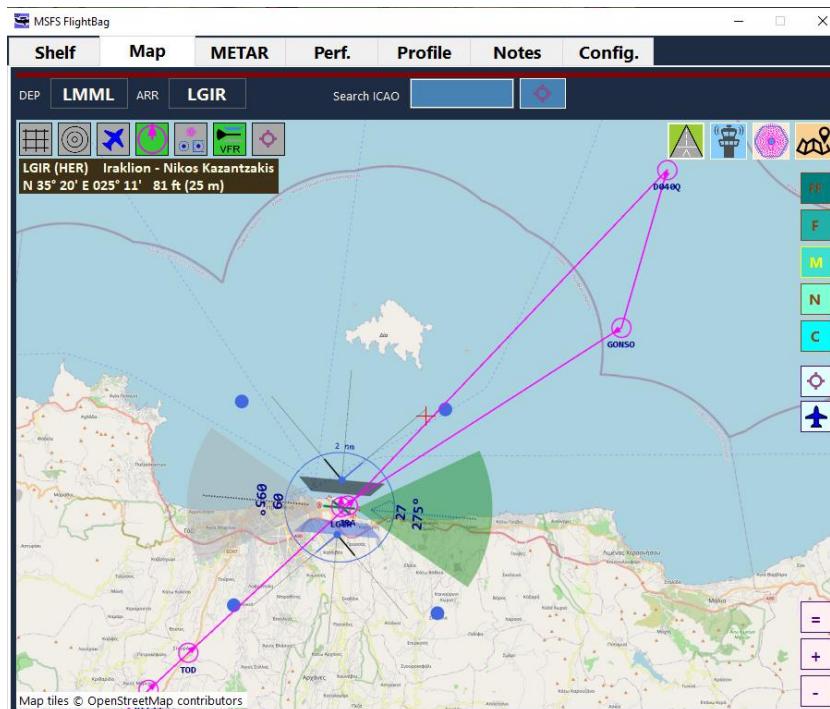
Once successful a Flight Plan document is stored in the Shelf together with the pictures created by SimBrief.



In Shelf you will find the documents starting with @. ... (e.g. @.FlightPlan, @.FlightTable, etc)

@.FlightPlan is the main plan where the long NOTAM and image sections have been stripped from. It is stored as one Image document and can be read, zoomed and scrolled like any other doc.

For the Map display the planned route is shown (can be toggled on and off) using this button:



While the route is shown as magenta line the waypoints are circles with the ID below.

Note:

The plan does not include approaches and therefore the last segment is usually pointing at the airport, rather than the approach path.

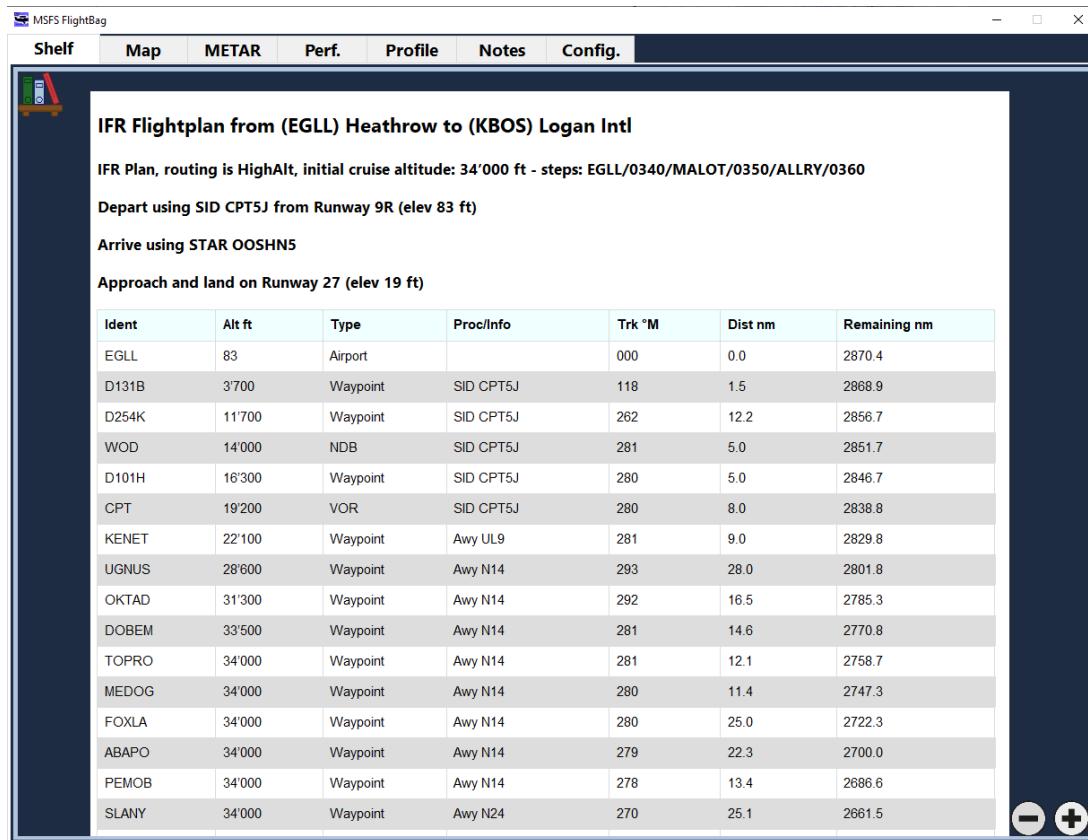
In the example the plan is to land on runway 27. With the VFR runway display one has at least a rough overview of the approach pattern needed.

*Note: There are some settings in SimBrief which may disable the availability of images in the download, check SimBrief Settings for details.*

## MSFS Flightplan Integration

In Config you may load either the default MSFS Plan (CUSTOMFLIGHT.PLN in the MISSIONS folder) or request the most current Simulation ATC FLT plan or select a PLN or FLT Flightplan file from any location on the computer.

MS Plans will load the route and also a flight plan in table format is created and saved in the Shelf the name is: **@.FlightTable**



MSFS FlightBag

Shelf Map METAR Perf. Profile Notes Config.

**IFR Flightplan from (EGLL) Heathrow to (KBOS) Logan Intl**

IFR Plan, routing is HighAlt, initial cruise altitude: 34'000 ft - steps: EGLL/0340/MALOT/0350/ALLRY/0360

Depart using SID CPT5J from Runway 9R (elev 83 ft)

Arrive using STAR OOSHNS

Approach and land on Runway 27 (elev 19 ft)

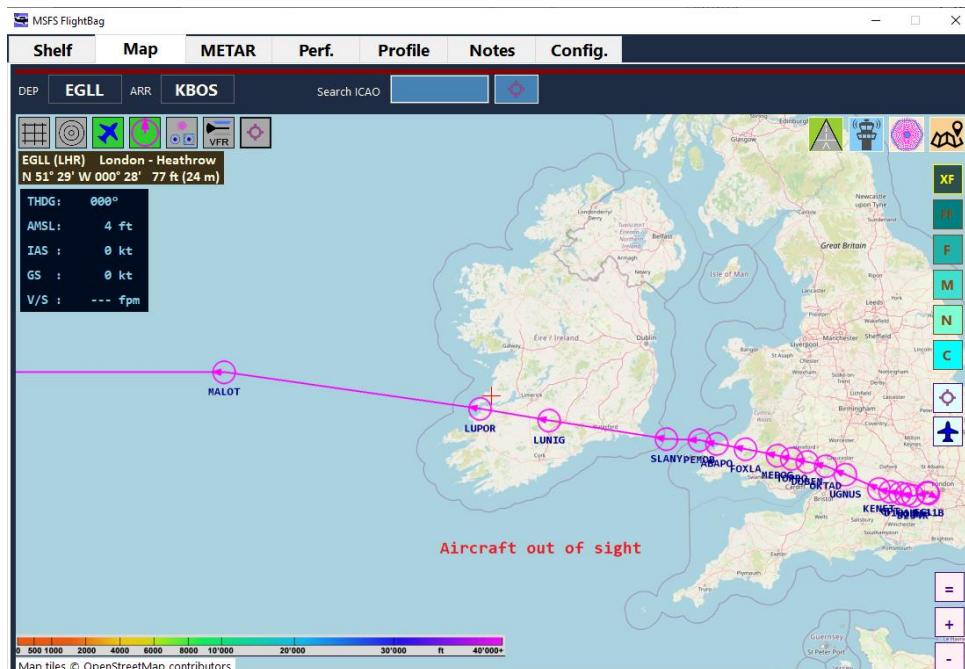
Ident	Alt ft	Type	Proc/Info	Trk °M	Dist nm	Remaining nm
EGLL	83	Airport		000	0.0	2870.4
D131B	3'700	Waypoint	SID CPT5J	118	1.5	2868.9
D254K	11'700	Waypoint	SID CPT5J	262	12.2	2856.7
WOD	14'000	NDB	SID CPT5J	281	5.0	2851.7
D101H	16'300	Waypoint	SID CPT5J	280	5.0	2846.7
CPT	19'200	VOR	SID CPT5J	280	8.0	2838.8
KENET	22'100	Waypoint	Awy UL9	281	9.0	2829.8
UGNUS	28'600	Waypoint	Awy N14	293	28.0	2801.8
OKTAD	31'300	Waypoint	Awy N14	292	16.5	2785.3
DOBEM	33'500	Waypoint	Awy N14	281	14.6	2770.8
TOPRO	34'000	Waypoint	Awy N14	281	12.1	2758.7
MEDOG	34'000	Waypoint	Awy N14	280	11.4	2747.3
FOXLA	34'000	Waypoint	Awy N14	280	25.0	2722.3
ABAPO	34'000	Waypoint	Awy N14	279	22.3	2700.0
PEMOB	34'000	Waypoint	Awy N14	278	13.4	2686.6
SLANY	34'000	Waypoint	Awy N24	270	25.1	2661.5

– +

The above is from a flight planned in SimBrief where the MSFS2000 (PLN) file was downloaded and loaded in Config Select & Load Plan...

MSFS Flightplan:  
Select & Load Plan...

The new XF Range allows a larger overview of such a plan.



MSFS FlightBag

Shelf Map METAR Perf. Profile Notes Config.

DEP EGLL ARR KBOS search ICAO

EGLL (LHR) London - Heathrow N 51° 29' W 000° 28' 77 ft (24 m)

THDG: 000°  
AMSL: 4 ft  
IAS : 0 kt  
GS : 0 kt  
V/S : --- fpm

Map tiles © OpenStreetMap contributors

Aircraft out of sight

0 500 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000 13000 14000 15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000 29000 30000 31000 32000 33000 34000 35000 36000 37000 38000 39000 40000 ft

*Note: You may use both SimBrief and MSFS Plan loading without having the Simulator running.*

## METAR Data Retrieval:

Please note that the program will issue HTTP Requests to an external server to retrieve the latest METAR information.

The data for METAR is retrieved from: <https://aviationweather.gov>

**Please make sure to comply with their terms and conditions when retrieving METAR data with this program.**

See also: <https://aviationweather.gov/dataserver/example?datatype=metar>

## Distributed Contents:

My FlightSim Libraries (included in the release package)

**SEE README.TXT FOR THE LIST**

CoordLib is based on: <https://github.com/chrisveness/geodesy>

Translated to C# and partially modified

Original code license: The MIT License (MIT)

## Appendix:

### File Storage

Files are generally stored in the “<MyDocuments>\MSFS\_HudBarSave” folder

### Settings Files and Reset Configuration

The configuration is stored in using a Json AppSettings Library.

The configuration can be found here: <MyDocuments>\MSFS\_HudBarSave\settings\<APP>

For the Flight Bag, the settings file is: **FShelfAppSettings.json**

This file stores your configuration but I suggest to not edit it – unless you know what to change, it may prevent the program from starting if done wrongly.

If you find something really wrong – you may backup and delete the settings file and the program will use the defaults to start with.

### Map Data retrieval and storage disclaimer

Map cache files:

The map cache files can be found here: <MyDocuments>\MSFS\_HudBarSave\cache\<Provider>.dblite

**MapLib** retrieves tiles only for the user requested location and zoom level.

The visualization WinForms UserControl **bm98\_Map** requests tiles as a matrix of 8x8 tiles at zoom levels for the 6 different ranges: XF=7, FF= 9, F=11, M= 12, N=13, C=15

With **AutoRange** enabled it will load tiles from zoom level 5 to 15 when zooming the Map



**MapLib** stores tiles per provider in a computer local disk cache and will clean up tiles older than 100 days or when the providers cache exceeds ~128MB / ~5120 tiles at startup of the application.

**MapLib** maintains a memory cache for 800 tiles (about 20MB RAM) while an application is running.

→ If you encounter incorrect tiles or other oddities – first delete the cache files and try again.

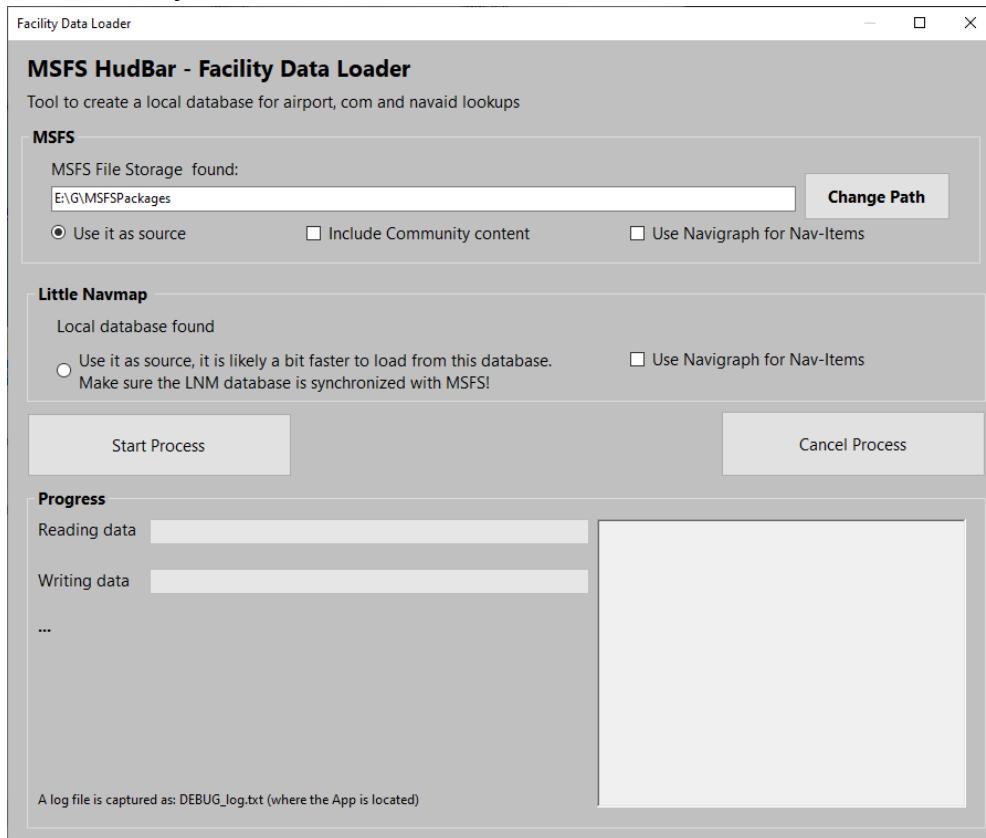
**Provider Configuration** → Check the guide for MapLib (MapLib-Doc.pdf – at the end of this document)

**V0.65** updated the download task to comply with OSM policy i.e. only 2 concurrent threads.

## Data Loader

Go for the application folder and then into the subfolder \dataLoader

Run FacilityDataLoader.exe:



First check if the program finds the MSFS data path.

It does follow the MS specs for Store and Steam but...

If not you may need to use Change Path.. to point it to the folder (where Community and Official folders can be found)

If the LittleNavMap database is found it will show it as well.

You may choose the source for the data, either collecting from the MS files where you may include Community content and/or Navigraph (if installed)

Or from the LittleNavMap database which is usually faster.

Check one of the sources.

Then hit Start Process and have some patience.

The program will report progress and once it finished its data collection it will tell you.

The database is stored at MyDocuments\MSFS\_HudBarSave\db\fs2020genApt.dbLite and is around 200MB.

**REDO this process when either a new Navigraph version is out and when MS provides substantial updates.**

## Instances

You may want to start the FlightBag more than once or get independent configurations and therefore programs running.

However they share the same Settings i.e. the location is saved from the last movement on any of the instances. In order to have truly independent instances with their own settings (all settings in Config and locations etc.) an Instance Name can be added to the Command Line when starting the FlightBag.

No command line parameter is considered and referred to as 'Default'

If you provide an Instance name to start the FlightBag it will be shown in the Window Title (Window Bar and Configuration)

You may start instances the easy way by creating a **Desktop Shortcut** and then modify the **Properties** of the **Shortcut** (right click) by adding an Instance name to the **Target** field:

This is the command line; add a space and the name at the end of the text field

Then may be rename the **Shortcut** in order to recognize it later.

## Issue Reporting:

In case you encounter a problem please include as much information as possible. Sometimes it is also relevant which aircraft you were using.

Issues can be reported directly via GitHub (or a Message in Flightsim.to)

[https://github.com/bm98/FS20\\_HudBar/issues](https://github.com/bm98/FS20_HudBar/issues)

<https://flightsim.to/file/41426/msfs-flightbag>

For issues with a flight plans – the App stores the most recent version in

MyDocuments\MSFS\_HudBarSave as file with the name **LastPlanDownload** and the ending **.FLT**, **.PLN** or **.json**

PLEASE trigger the request again and then immediately save and include the files when reporting errors.

## Known Issues:

### ***Stutter when requesting a Plan from Sim***

The Simulator may stutter for a moment when requesting a plan download- seems to be an ASOBO/MS issue since long ago. Cannot do anything about it...

### ***Settings are not stored or runtime exceptions***

We have seen issues when Windows Protected Folders are enabled.

(<https://www.tenforums.com/tutorials/87858-add-protected-folders-controlled-folder-access-windows-10-a.html>)

In such a case Windows may deny programs which are not installed via MSI Installer access to write or delete files in some places, among them is the MyDocuments folder.

There is a check at the very beginning of the App which is trying to elaborate if such protection exists or not. If yes there is a MessageBox popping up related to Access Permission Error and the reason should be reported in the box.

In such a case first try to find out if protected folders are enabled and then add the FlightBag App to the list of allowed programs and start the program again to see if the problem persists – if it is still there head for Issue Reporting above.

(<https://support.microsoft.com/en-us/windows/allow-an-app-to-access-controlled-folders-b5b6627a-b008-2ca2-7931-7e51e912b034>)

# MapLib – Map tile retrieval library

© 2022 - M.Burri

Aug 2023 Update see notes below marked with [Aug23](#)

Feb 2023 Update see notes below marked with [Feb23](#)

## Supported Map Providers

MapLib supports a fixed number of Map Tile Providers as well as 6 ([Feb23](#)) user defined ones.

→ **ALWAYS consider the terms of use for any of the map providers**

**Free and open Tile services are at the time of writing** – enabled by default

OpenStreetMap (OSM) and some derivatives

<https://www.openstreetmap.org>

OpenTopo, a 3d enhanced map from an open source project.

<https://opentopomap.org>

Stamen 3D shaped terrain map

<http://maps.stamen.com>

**ChartBundle.com** – disabled by default ([New Feb23](#))

<https://www.chartbundle.com/charts/>

Free aviation charts with limited coverage (FAA airspace)

**Tile Services which need either a key or are subject to licensing terms** – disabled by default

Bing Maps (Microsoft map service) needs a key and subject to licensing

<https://docs.microsoft.com/en-us/bingmaps/getting-started>

ESRI/ARCGIS Tile Services as part of their offering – subject to license, don't use if not licensed

<https://developers.arcgis.com/documentation/mapping-apis-and-services/data-hosting/services/image-tile-service/>

**Remark:**

Don't ask for Google Map support – I don't have a key and they are rather complicated to work with...

**User defined tile services 1..6** ([Updated Feb23](#))

You may have an own tile service running on your NAS or know a tile service you like to use.

The URL to be provided looks like:

`Http=https://ip_or_address/route/{z}/{y}/{x}.imageformat`

Where the {z} {y} {x} parts will be replaced by the requested zoom and coordinates.

The library expects a Mercator Tile Set with 0/0 top left tile number and 256x256 sized tiles – PNG and JPG image formats are supported.

Example:

`Http=https://myNas:23356/tiles/{z}/{y}/{x}.jpg`

## Data retrieval and storage disclaimer (Updated Feb23)

**MapLib** retrieves tiles only for the user requested location and zoom level.

The visualization WinForms UserControl **bm98\_Map** requests tiles as a matrix of 8x8 tiles at zoom levels for the 5 different ranges: XF=7, FF= 9, F=11, M= 12, N=13, C=15

**New** With AutoRange enabled it will load tiles from zoom level 6 to 15 when zooming the Map

**MapLib** stores tiles per provider in a computer local disk cache and will clean up tiles older than 100 days or when the providers cache exceeds ~128MB / ~5120 tiles at startup of the application.

**MapLib** maintains a memory cache for 800 tiles (about 20 MB RAM) while an application is running.

→ If you encounter incorrect tiles or other oddities – first delete the cache files and try again.

Aug23 updated the download task to comply with OSM policy i.e. only 2 concurrent threads.

## INI File

Configuration goes via an **INI File** (`MapLibProvider.ini`) located per default in the **Applications directory**.

IF the Library finds a `MapLibProvider.ini` file in a user folder (`MyDocuments\MSFS_HudBarsSave`) it takes preference over the default one.

**I.e. if you change INI settings, first copy the original file to this folder and make changes there, else it will be overwritten when extracting a new version from the Zip file**

- The INI file consists of the Main section + a number of Provider sections
- INI files consists of lines where everything after a semicolon `<;>` is considered as comment.
- INI files do have a Keyword and a content in the form of: Keyword=Content
- INI files do have sections which start with a bracketed Name: [Section]
- The part of the INI file which is not lead by a section name is the Main Section

→ INI files are text files, use **only** Notepad or similar editors, never Word or other text processing programs to edit it's content

### Main Section

`DefaultProvider= . .` → Default Provider and tiles the Map starts with

Use any of the enabled [ProviderNames] found in the later sections Use the exact name, or uncomment the template ones, only the first entry in the file is considered.

Example:

`DefaultProvider=OSM_OpenStreetMap`

`BingKey= . .` → A Key to use Bing Maps (see remark below)

A rather large number of characters provided by BING Maps in order to access their map services, visit URLs below at Microsoft

<https://docs.microsoft.com/en-us/bingmaps/getting-started>

<https://docs.microsoft.com/en-us/bingmaps/getting-started/bing-maps-dev-center-help/getting-a-bing-maps-key>

### Provider Sections:

`[ProviderName]` → Provider name – **don't change**, the library expects those names

`Name=...` → The name shown in the selection list (new Feb23)

`Enabled=...` → True if the provider is enabled else False

To enable a provider set this entry to True, to disable use False

Enabled providers will show up in the map selection to choose from.

The free providers are enabled in the INI file, not so free ones and chartbundle disabled.

Example:

`Enabled=True`

`Http=...` → The map tile server address, most don't need an entry and are listed as comment for reference.

For OSM one could use a variety of specialized servers in order to get e.g. names in another language than OSM provides them, e.g. the .de server will supply translated city names for parts of Asia.

For the User Entries see below.

`Http=https://ip_or_address/route/{z}/{x}/{y}.imageformat`

Where the {z} {x} {y} parts will be replaced by the requested zoom and coordinates.

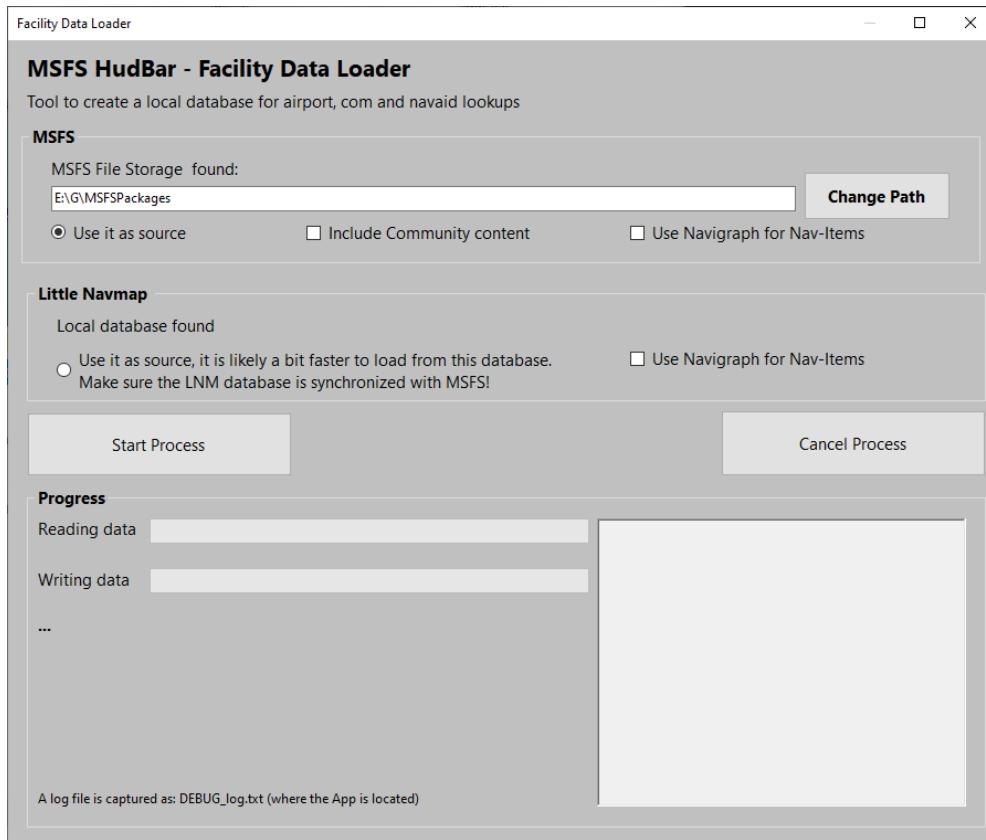
The library expects a Mercator Tile Set with 0/0 top left tile number and 256x256 sized tiles – PNG and JPG image formats are supported.

Example: see above

## Data Loader

Go for the application folder and then into the subfolder \dataLoader

Run FacilityDataLoader.exe:



First check if the program finds the MSFS data path.

It does follow the MS specs for Store and Steam but...

If not you may need to use Change Path.. to point it to the folder (where Community and Official folders can be found)

If the LittleNavMap database is found it will show it as well.

You may choose the source for the data, either collecting from the MS files where you may include Community content and/or Navigraph (if installed)

Or from the LittleNavMap database which is usually faster.

Check one of the sources.

Then hit Start Process and have some patience.

The program will report progress and once it finished its data collection it will tell you.

The database is stored at `MyDocuments\MSFS_HudBarSave\db\fs2020genApt.dbLite` and is about **200MB**.

**REDO this process when either a new Navigraph version is out and when MS provides substantial updates.**

## APPENDIX (default INI File):

```
; MapLib Provider Overrides
;
; Format:
; /// DefaultProvider=PROVIDER
; /// BingKey=KEY
; ///
; /// [PROVIDER]
; /// Name=a name
; /// Enabled=true / false
; /// Http=URL
;
; Text after a semicolon is treated as comment
;
;=> File name must be 'MapLibProvider.ini'
;
; Define the DefaultProvider from the [PROVIDER] names
;
; In each providers section:
; Set 'Enabled=true' to be able to use it
; Change Name=new name if you don't like it
;
; Uncomment 'Http=http....' to override the URL used to retrieve map tiles
; -> If unsure, leave it alone (The App may break or not respond any longer)
;
; For URLs:
; There are 3 placeholders for {x},{y},{z} (xy tile coords + zoom)
; When multiple server subdomains are available - {s} can be used
; For some you need an access key (personal, subscription etc)
; Key=sadfsdfsdf
;
; NOTE there is no privacy or protection when typing the key here
; the key is only used in the tile loading HTTP request as per provider guidance
;
;
; Default Provider to use => one of the Provider Chapter IDs ([NAME] from below)
DefaultProvider=OSM_OpenStreetMap ; OSM_OpenStreetMap is the free default provider

;DefaultProvider=OpenTopo
;DefaultProvider=Stamen_Terrain

; Here comes your Bing Map Key if you want to use Bing Maps
BingKey=<YOUR KEY>

; PROVIDER SECTIONS

[OSM_OpenStreetMap]
; OpenStreetMap (see terms of use before using it)
Name=OSM OpenStreetMap
Enabled=true ; should never be disabled
;Http=https://(s).tile.openstreetmap.org/{z}/{x}/{y}.png ; default, labeled according to the region (e.g. Japanese etc)
;Http=https://(s).tile.openstreetmap.de/{z}/{x}/{y}.png ; adds translated names to the local ones
;Http=https://(s).tile.openstreetmap.fr/osmfr/{z}/{x}/{y}.png ; focus on french translation; international items are partly translated

[OpenTopo]
; Street Map 3D enhanced
; OpenTopo (see terms of use before using it)
Name=OpenTopo
Enabled=true
;Http=https://(s).tile.opentopomap.org/{z}/{x}/{y}.png ; default
;Http=https://a.tile.opentopomap.org/{z}/{x}/{y}.png ; without subdomain

[Stamen_Terrain]
; Street Map 3D shaped
; Stamen.com (see terms of use before using it)
Name=Stamen 3D Street Map
Enabled=true
;Http=https://stamen-tiles-(s).a.ssl.fastly.net/terrain/{z}/{x}/{y}.jpg ; default
;Http=https://stamen-tiles.a.ssl.fastly.net/terrain/{z}/{x}/{y}.jpg ; without subdomain

; ****
; From http://www.chartbundle.com/charts/ see terms of use
; For US regions only (FAA provides data at no cost, other countries do not...)
; Disabled per default - change: Enabled=true to get the ones you need
; ****
[CB_SEC]
; Sectional Charts
Name=CB Sectional Charts
Enabled=false
;Http=https://wms.chartbundle.com/tms/1.0.0/sec/{z}/{x}/{y}.png?origin=nw ; default

[CB_TAC]
; Terminal Area Charts
Name=CB Terminal Area Charts
Enabled=false
;Http=https://wms.chartbundle.com/tms/1.0.0/tac/{z}/{x}/{y}.png?origin=nw ; default

[CB_ENRA]
```

```

; IFR Area Charts
Name=CB IFR Area Charts
Enabled=false
;Http=https://wms.chartbundle.com/tms/1.0.0/enra/{z}/{x}/{y}.png?origin=nw ; default

[CB_ENRL]
; IFR Enroute Low Charts
Name=CB IFR Enroute Low Charts
Enabled=false
;Http=https://wms.chartbundle.com/tms/1.0.0/enrl/{z}/{x}/{y}.png?origin=nw ; default

[CB_ENRH]
; IFR Enroute High Charts
Name=CB IFR Enroute High Charts
Enabled=false
;Http=https://wms.chartbundle.com/tms/1.0.0/enrh/{z}/{x}/{y}.png?origin=nw ; default

; ****
; Microsoft Bing MAPS (needs a Key to access -> https://www.microsoft.com/en-us/maps/create-a-bing-maps-key)
; ****
; Note: Bing URLs are retrieved dynamically and changing the Provider here has no effect (for reference only)

[Bing_Imagery]
; Satellite Imagery
Name=Bing Satellite Imagery
Enabled=false
;Http=https://ecn.{subdomain}.tiles.virtualearth.net/tiles/a{quadkey}.jpeg?g=12552 ; not used, for reference only

[Bing_ImageryLabels]
; Satellite Imagery with road labels
Name=Bing Satellite Imagery w. Labels
Enabled=false
;Http=https://ecn.{subdomain}.tiles.virtualearth.net/tiles/h{quadkey}.jpeg?g=12552&mkt={culture} ; not used, for reference only

[Bing_OStreetMap]
; Street Map
Name=Bing OSM StreetMap
Enabled=false
;Http=https://ecn.{subdomain}.tiles.virtualearth.net/tiles/r{quadkey}.jpeg?g=12552&mkt={culture}&shading=hill ; not used, for reference only

; ****
; ESRI/ARCGIS Maps (subject to terms of use - your at your own here...)
; ****

[ESRI_Imagery]
; Satellite Imagery
; ESRI/ARCGIS World Imagery (see terms of use before using it)
Name=ESRI/ARCGIS World Imagery
Enabled=false
;Http=https://services.arcgisonline.com/arcgis/rest/services/World_Imagery/MapServer/tile/{z}/{y}/{x} ; default

[ESRI_StreetMap]
; Street Map
; ESRI/ARCGIS StreetMap (see terms of use before using it)
Name=ESRI/ARCGIS StreetMap
Enabled=false
;Http=https://services.arcgisonline.com/arcgis/rest/services/World_Street_Map/MapServer/tile/{z}/{y}/{x} ; default

[ESRI_WorldTopo]
; Street Map 3D shaped
; ESRI/ARCGIS WorldTopo (see terms of use before using it)
Name=ESRI/ARCGIS WorldTopo
Enabled=false
;Http=https://services.arcgisonline.com/arcgis/rest/services/World_Topo_Map/MapServer/tile/{z}/{y}/{x} ; default

; ****
; USER Maps (your at your own here...)
; ****

[USER_TILES_1]
; User defines Tile Server No 1
Name=User Tiles 1
Enabled=false
;Http=https://ip_or_address/route/{z}/{x}/{y}.imageformat ; MUST be changed to something meaningful

[USER_TILES_2]
; User defines Tile Server No 2
Name=User Tiles 2
Enabled=false
;Http=https://ip_or_address/route/{z}/{x}/{y}.imageformat ; MUST be changed to something meaningful

[USER_TILES_3]
; User defines Tile Server No 3
Name=User Tiles 3
Enabled=false
;Http=https://ip_or_address/route/{z}/{x}/{y}.imageformat ; MUST be changed to something meaningful

[USER_TILES_4]

```

```
; User defines Tile Server No 4
Name=User Tiles 4
Enabled=false
;Http=https://ip_or_address/route/{z}/{x}/{y}.imageformat ; MUST be changed to something meaningful

[USER_TILES_5]
; User defines Tile Server No 5
Name=User Tiles 5
Enabled=false
;Http=https://ip_or_address/route/{z}/{x}/{y}.imageformat ; MUST be changed to something meaningful

[USER_TILES_6]
; User defines Tile Server No 6
Name=User Tiles 6
Enabled=false
;Http=https://ip_or_address/route/{z}/{x}/{y}.imageformat ; MUST be changed to something meaningful
```