MSFS FlightBag V 0.54.0.51

Flight bag providing Shelf, Map, METAR

- Standalone or Part of the MSFS HudBar Windows
- Shelf for image documents either JPG or PNG images for reference
- Airport centric Map display
- METAR retrieval

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

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, 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 and Config. Tabs.
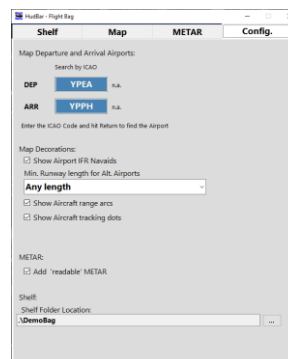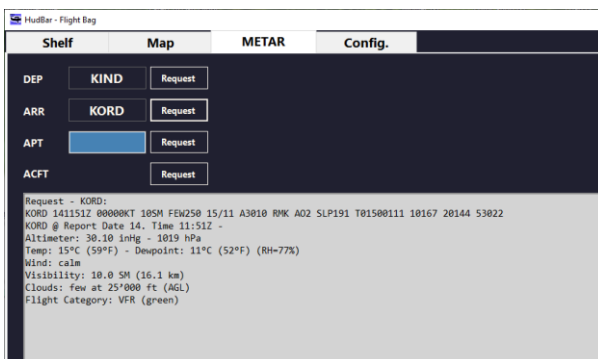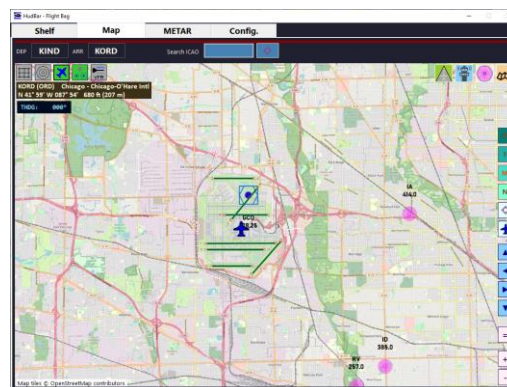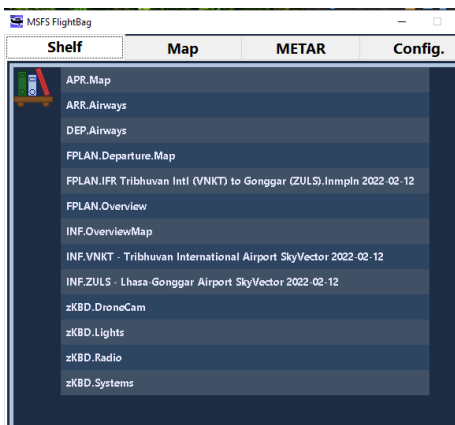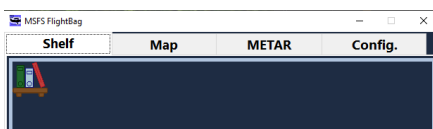
- Shelf provides a list of documents located in the selected folder
- Map shows a static map with various display options
- METAR allows to retrieve METAR information – if selected it translates the METAR string into something more readable.
- Config. Allow to setup some options

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 and JPG

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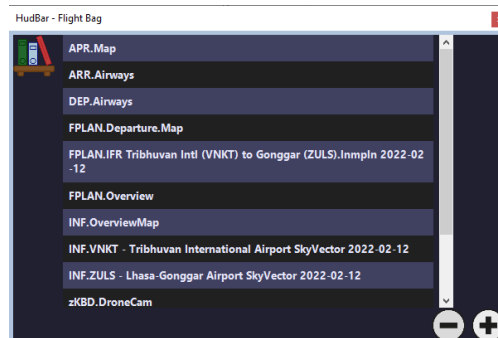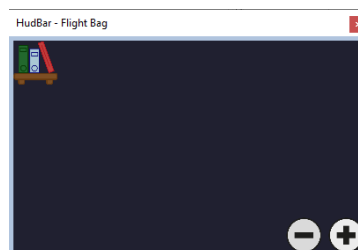
Use the **left mouse click and drag** to move the document in the window.

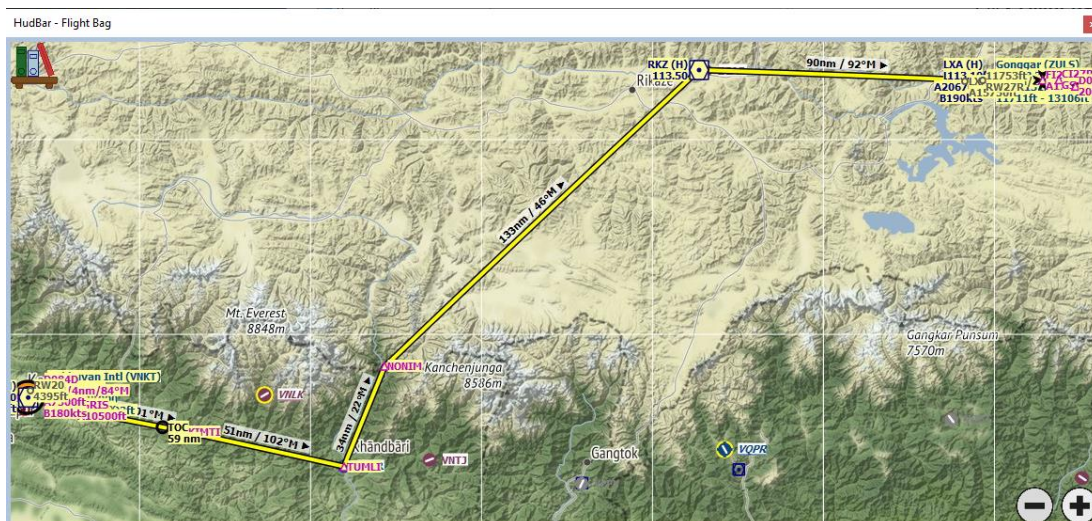**Click right** to reset the zoom and re-center the document.

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

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

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
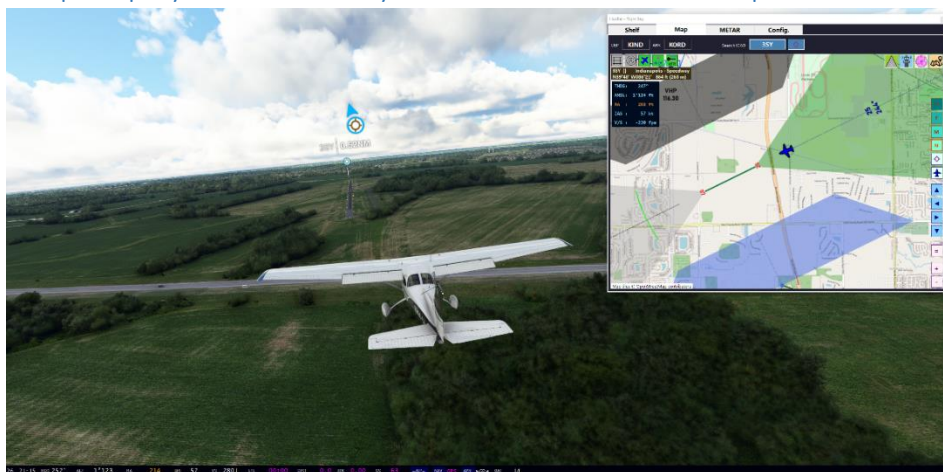
The Map display intends to minimize the performance footprint and will only request tiles on user request.
There are 5 predefined ranges (FF, F, M, N, C) which are loaded on demand and where the user can zoom in and out at discretion.
The map is intentionally NOT a moving map. The user may shift the 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 the aircraft with some predefined essential data

Map – Ops
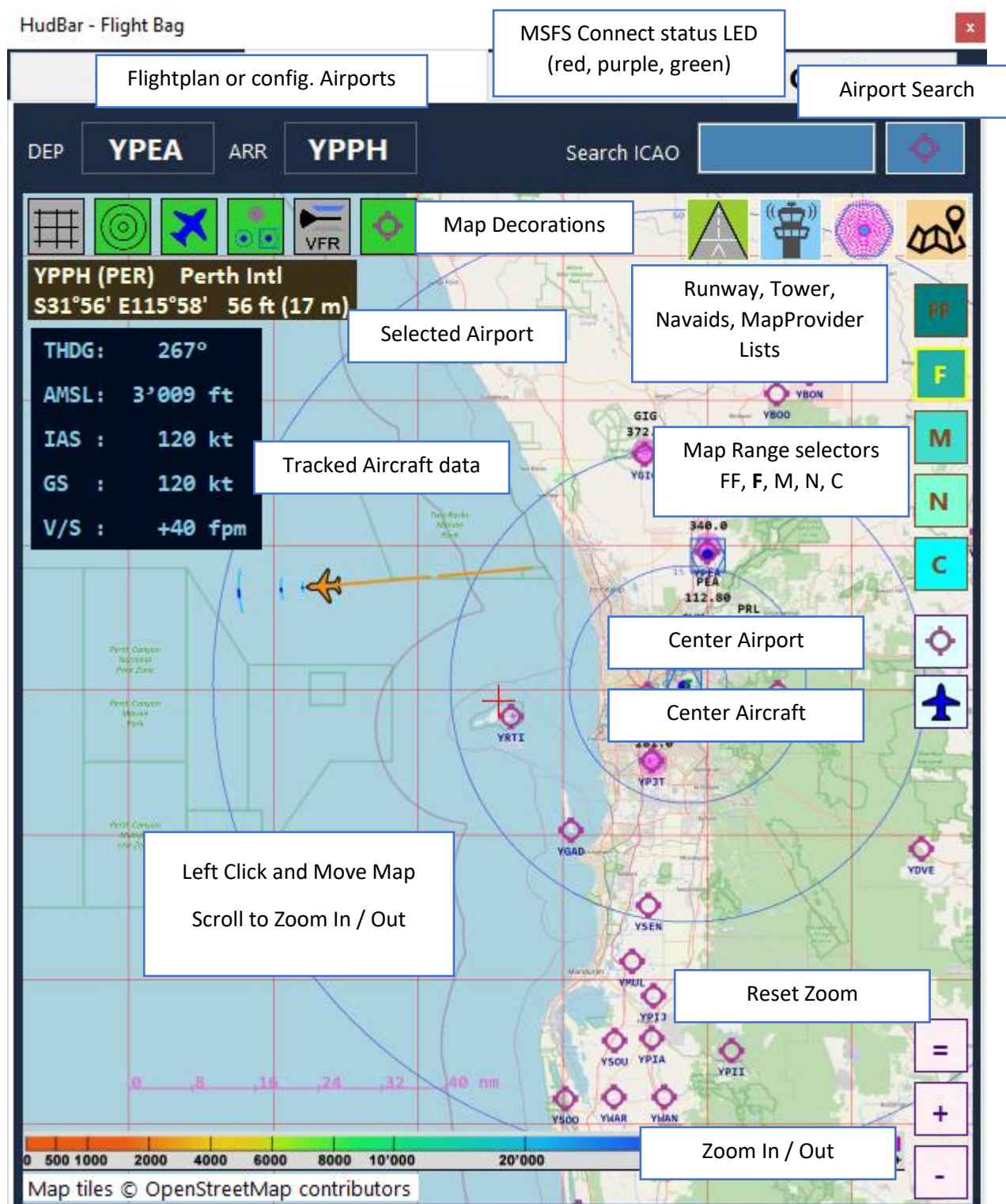
The map is Airport centric – i.e. usually you would have an airport selected.
Use Search Airport or click the DEP, ARR ICAO label to center the view on that airport (above it's YPPH)

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


```
Airport - Runways
09R (090°)  IJAV  110.50 GS(3.0° 20 nm) 2427x46  m  - ASPHALT
27L (270°)  IIAC  110.50 GS(3.0° 27 nm) 2427x46  m  - ASPHALT
04R (041°)  IFJU  110.10 GS(3.0° 20 nm) 2458x46  m  - ASPHALT
22L (221°)  ILQQ  110.10 GS(3.0° 20 nm) 2458x46  m  - ASPHALT
09L (090°)  ISAJ  111.75 GS(3.0° 20 nm) 2284x46  m  - ASPHALT
27R (270°)  IABU  111.75 GS(3.0° 20 nm) 2284x46  m  - ASPHALT
04L (039°)                               2284x46  m  - ASPHALT
22R (219°)  IRXZ  111.30 GS(3.0° 20 nm) 2284x46  m  - ASPHALT
10L (090°)  IMED  111.10 GS(3.0° 20 nm) 3960x46  m  - ASPHALT
28R (270°)  ITSL  111.10 GS(3.0° 20 nm) 3960x46  m  - ASPHALT
10C (090°)  ISXH  108.95 GS(3.0° 20 nm) 3288x59  m  - ASPHALT
28C (270°)  IVZE  108.95 GS(3.0° 20 nm) 3288x59  m  - ASPHALT
10R (090°)  IBYW  110.90 GS(3.0° 20 nm) 2279x53  m  - ASPHALT
28L (270°)  IVQX  110.75 GS(3.0° 20 nm) 2279x53  m  - ASPHALT
Airport - Navaids
VOR DME    GCO    108.25 MHz ( 60 nm) CHICAGO
NDB        OR     394.0  kHz ( 23 nm) CHSTR
```

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.


```
Airport - Frequencies
124.350 - CHICAGO             (APPROACH)
125.700 - CHICAGO             (APPROACH)
119.250 - OHARE               (CLEARANCE)
119.250 - OHARE               (CLEARANCE_PRE_TAXI)
121.600 - CHICAGOO'HAREINTL   (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)
118.050 - OHARESOUTH          (GROUND)
121.675 - OHAREMETERING       (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)
```
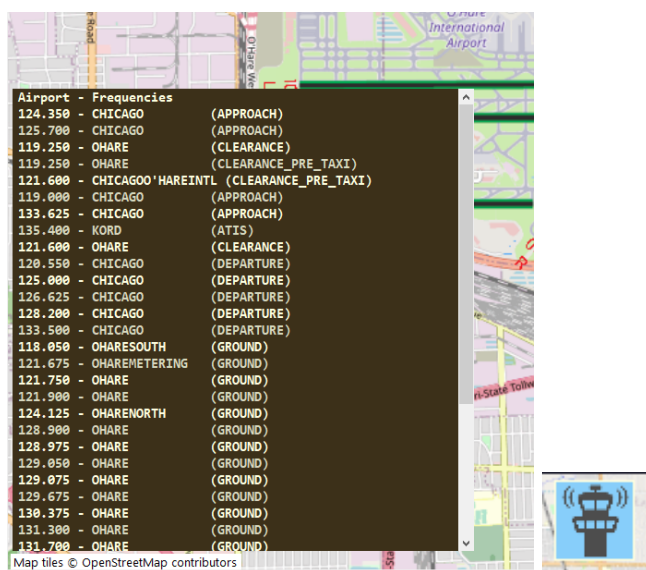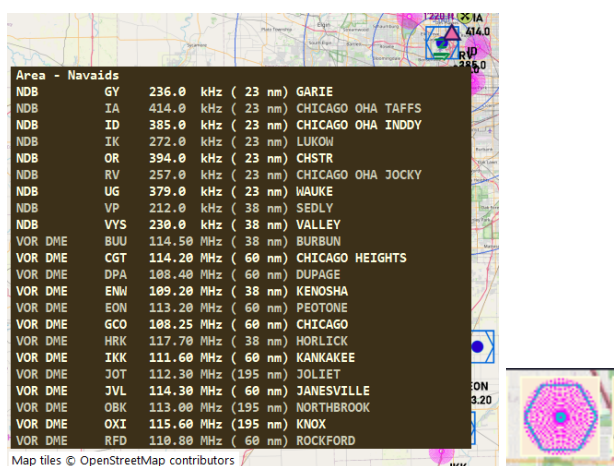
Clicking the Tower Icon will show/hide the list of airport communication frequencies found in the database.

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 INDDY
NDB        IK     272.0  kHz ( 23 nm) LUKOW
NDB        OR     394.0  kHz ( 23 nm) CHSTR
NDB        RV     257.0  kHz ( 23 nm) CHICAGO OHA JOCKY
NDB        UG     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 (195 nm) JOLIET
VOR DME    JVL    114.30 MHz ( 60 nm) JANESVILLE
VOR DME    OBK    113.00 MHz (195 nm) NORTHBROOK
VOR DME    OXI    115.60 MHz (195 nm) KNOX
VOR DME    RFD    110.80 MHz ( 60 nm) ROCKFORD
```

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.
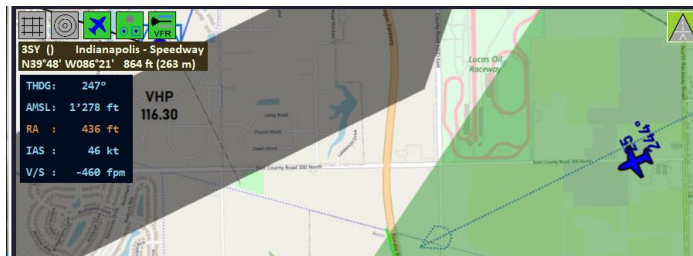
Decorating the map

- Map Lat/Lon Grid – toggles the grid
- Airport range circles (5, 10, 30, 60 nm radius)
- Aircraft tracking with some data points
- 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:

- True Heading (THDG)
- Altitude above MSL in ft
- RA in ft (<1500)
- IAS in kt
- GS in kt
- V/S in fpm

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.
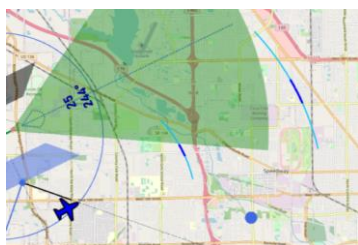
Under approach conditions the range marker changes to the expected ground contact at current IAS, VS and altitude which is shown as a green 20° arc (at the time of writing this feature needs some improvement…)
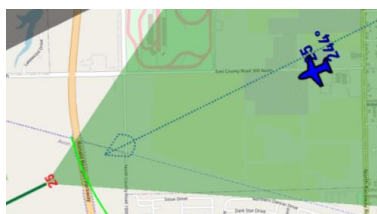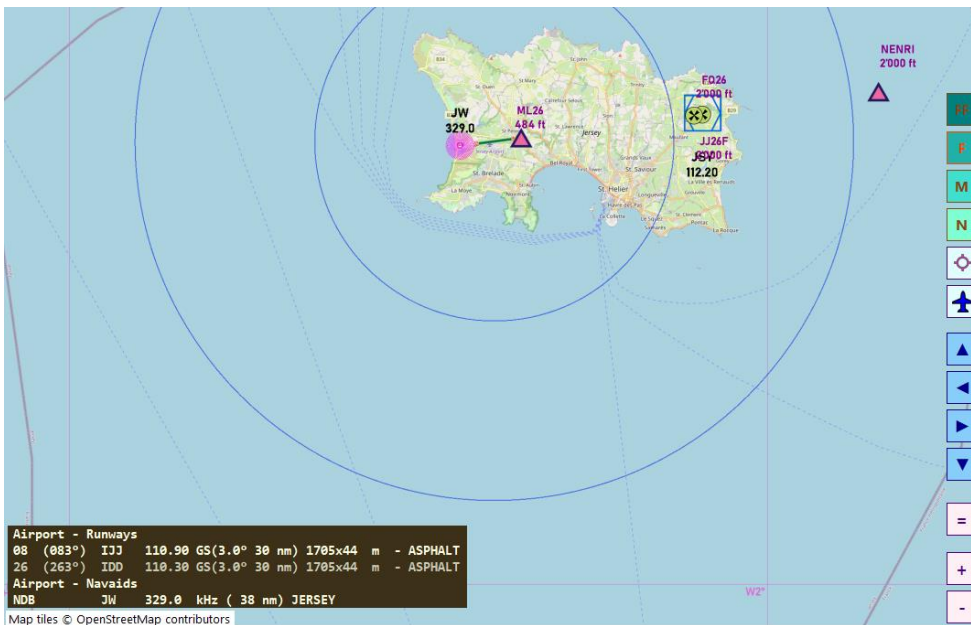
Navaids
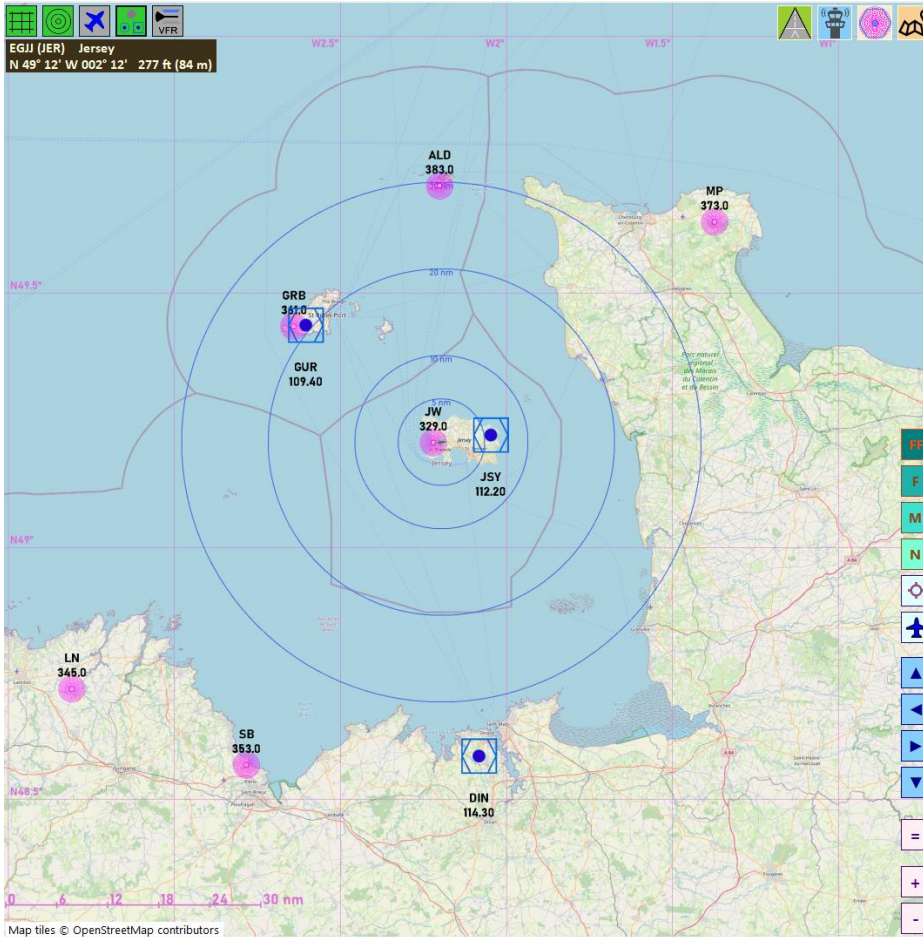
VOR, DME, and NDB navaids are shown with ID and frequency at their location.

There is no further interaction available.

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

Above the runway 26 was selected (clicked), Approach waypoints with their assigned altitude found in the database are placed on the map if Navaid decoration is visible. If multiple approaches are found all of those waypoints are shown at once (above RW26 has actually 5 approaches sharing some waypoints)
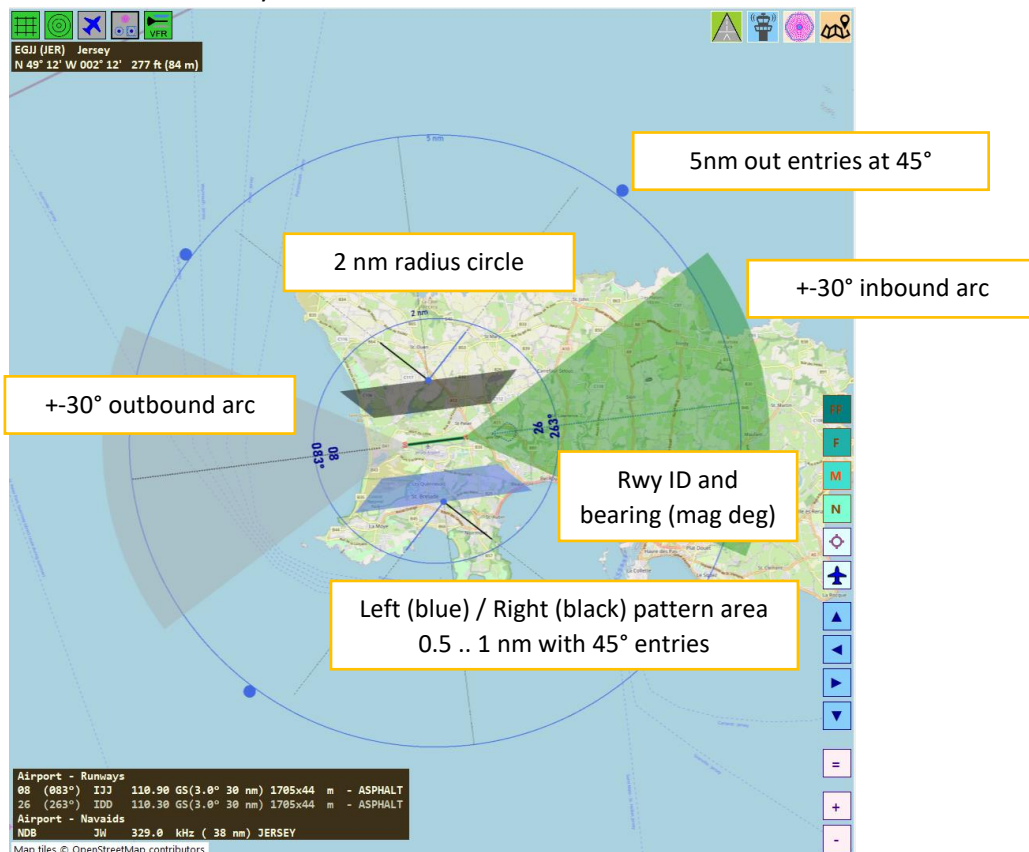
Airport VFR Marks

Selecting a runway for VFR or IFR approach waypoints decoration

To select a runway get the Runway list and **click** one of the runways.
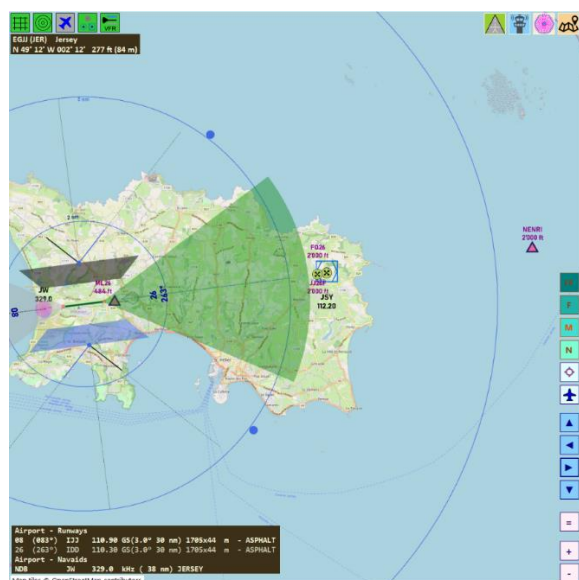
To clear the selection, click the 'Airports – Runways' text (hand appears) and the decorations will go away.

```
Airport - Runways
24  (239°)  IPH          GS(3.0° 27 nm) 2161x44  m      PHALT
06  (059°)                              2161x44  m      ASPHALT
21  (194°)  IGD   109.50 GS(3.0° 27 nm) 3441x44  m  - ASPHALT
03  (014°)  IPN   110.10 GS(3.0° 27 nm) 3441x44  m  - ASPHALT
Airport - Navaids
```

For a selected runway VFR marks are shown.

5nm out entries at 45°

2 nm radius circle

+-30° inbound arc

+-30° outbound arc

Rwy ID and bearing (mag deg)

Left (blue) / Right (black) pattern area
0.5 .. 1 nm with 45° entries

```
Airport - Runways
08  (083°)  IJJ   110.90 GS(3.0° 30 nm) 1705x44  m  - ASPHALT
26  (263°)  IDD   110.30 GS(3.0° 30 nm) 1705x44  m  - ASPHALT
Airport - Navaids
NDB       JW     329.0  kHz ( 38 nm) JERSEY
Map tiles © OpenStreetMap contributors
```

Above the runway 26 was selected (clicked)

When Navaid decoration and VFR marks is on it looks like above.

METAR Tab

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

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.

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:

Checked '**Show Airport IFR Navaids**' will show all approach waypoints for the selected runway when Navaids decoration is ON
Note: some labels will overlap when approach waypoints are close together (did not found a reasonable way to resolve this)

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 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

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.

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)

FS20_FlightBag.exe - Standalone FlightBag Application

- FShelf.dll – Shelf WinForms library
- bm98_Album.dll – Image display library
- bm98_Map.dll – Mapping display library
- MapLib.dll – Mapping library
- MetarLib.dll -- METAR retrieval and formatting library
- CoordLib.dll -- Generic Geodetic Coordinates and Algorithm library
- SettingsLib.dll – Application settings persistence library
- SimConnectClient.dll -- FlightSim interface to MSFS2020 SimConnect
- FSimClientIF.dll -- Generic FSim Client interface definition
- FSimIF.dll -- Generic FSim interface definition
- FSimFacilityIF.dll – MS facility database interface definition
- FSimFacilityDataLib.dll – MS facility database access library
- BM98CH_WasmClient.dll–WASM Module client to get LVars (not in use)

3rd Party Libraries

- BingMapsRESTToolkit.dll – Microsoft provided library for accessing Bing Map data
- LiteDB.dll – 3rd party data management library

From MSFS2020 Developer Kit SU10 for convenience included:

- SimConnect.cfg
- Microsoft.FlightSimulator.SimConnect.dll
- SimConnect.dll

.\DemoBag   contains some images to showcase the Flight Bag

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 4 different ranges: FF= 9, F=10, M= 12, N=13, C=15

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 ~64MB / ~2560 tiles at startup of the application.
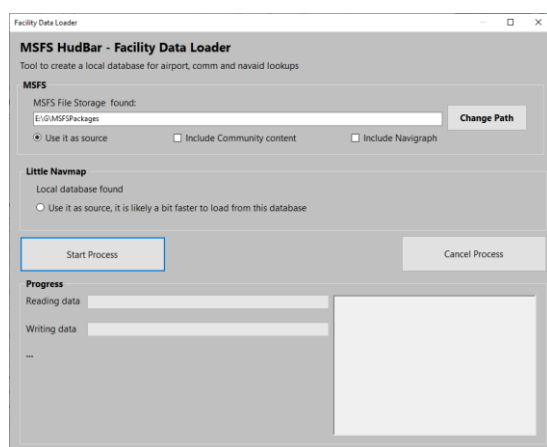**MapLib** maintains a memory cache for 400 tiles (about 10 MB RAM) while an application is running.
→ If you encounter incorrect tiles or other oddities – first delete the cache files and try again.

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

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 somewhat larger than 130MB.
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://flightsim.to/file/16604/msfs-hudbar

MapLib – Map tile retrieval library

© 2022 - M.Burri

Supported Map Providers

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

➔ <mark>ALWAYS consider the terms of use for any of the map providers</mark>

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

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

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

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: FF= 9, F=11, M= 12, N=13, C=15

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 ~64MB / ~2560 tiles at startup of the application.
MapLib maintains a memory cache for 400 tiles (about 10 MB RAM) while an application is running.
➔ <mark>If you encounter incorrect tiles or other oddities – first delete the cache files and try again.</mark>

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_HudBarSave`) 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

`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 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}/{y}/{x}.imageformat`

Where the {z} {y} {x} parts will be replaced by the requested zoom and coordinates.
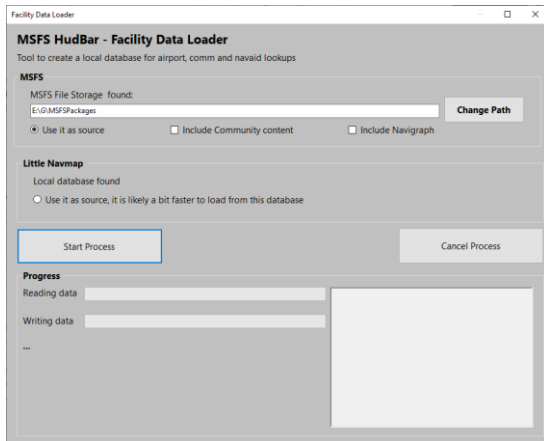The library expects a Mercator Tile Set with 0/0 top left tile number and 256x256 sized tiles – PNG and JPG image formats are supported.

Example: 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 somewhat larger than 130MB.

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]
; /// Enabled=TRUE
; /// Http=URL
;
; Text after a semicolon is treated as comment
;
; => Filename must be 'MapLibProvider.ini'
;
; Define the DefaultProvider from the [PROVIDER] names
;
; In each providers section:
;   Set 'Enabled=true' to be able to use 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 instances are available - {s} can be used
; For some you need an accees key (personal, subscription etc)
;   Key=sadfsdfsdf
;
;  NOTE there is not 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>

[OSM_OpenStreetMap]
; OpenStreetMap (see terms of use before using it)
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)
Enabled=true
;Http=https://tile.opentopomap.org/{z}/{x}/{y}.png  ; default

[Stamen_Terrain]
; Street Map 3D shaped
; Stamen.com (see terms of use before using it)
Enabled=true
;Http=https://stamen-tiles.a.ssl.fastly.net/terrain/{z}/{x}/{y}.jpg  ; 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
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
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
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)
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)
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)
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
Enabled=false
;Http=https://ip_or_address/route/{z}/{y}/{x}.imageformat

[USER_TILES_2]
; User defines Tile Server No 2
Enabled=false
;Http=https://ip_or_address/route/{z}/{y}/{x}.imageformat

[USER_TILES_3]
; User defines Tile Server No 3
Enabled=false
;Http=https://ip_or_address/route/{z}/{y}/{x}.imageformat