MGL Avionics

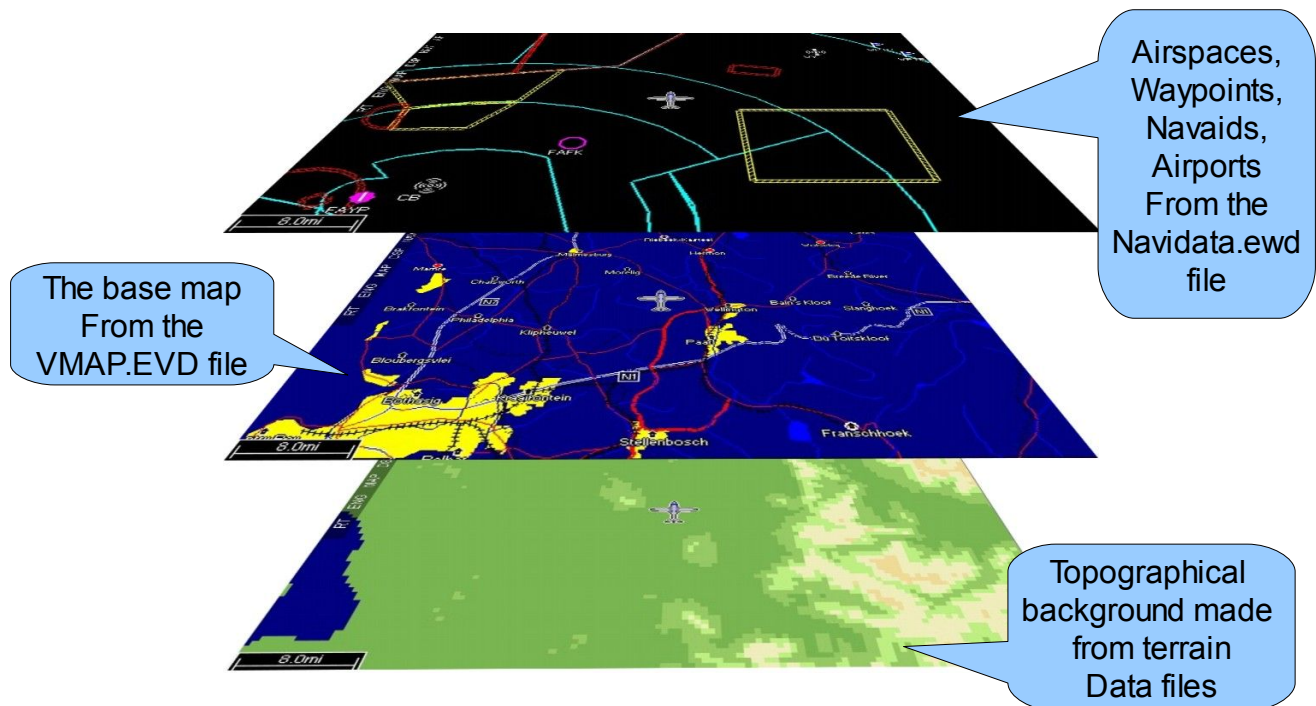# Map and Aviation database installation

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General

This document is valid for MGL Avionics Enigma, Voyager G1, Odyssey G1, Voyager G2 and Odyssey G2 EFIS instruments.

Layer system

The MGL EFIS systems require several files in order to have moving map display and access to an aviation database that contains airports, airspace and related information.

The system works in several "layers" as illustrated here:

Airspaces, Waypoints, Navaids, Airports From the Navidata.ewd file

The base map From the VMAP.EVD file

Topographical background made from terrain Data files

The base map

This contains cultural items such as towns, urban areas, roads, rivers. This information is contained in a single file called "VMAP.EVD". There are several of these files available to cater for different coverage regions. For example, one of these files covers the region for "North America". You can download these files from the MGLAvionics.co.za website (Follow the Downloads button on the left).
The VMAP.EVD file is used for "vector map" display. It is not used if you have switched your EFIS to "raster map" display.

For G2 systems it is possible to have more than one VMAP.EVD file if you need your system to cater for more than one region. In this case, rename the files VMAPA.EVD, VMAPB.EVD, VMAPC.EVD,.. and so on as needed. You can then choose which file you want active in the map menu function (left hand keypad). We recommend that you use the standard coverage regions for the letters "A,B,C,..." as listed in this document.

G1 and Enigma systems can only use a single file and this must be named VMAP.EVD.

The terrain data:
Terrain data contains the elevation of terrain grid points. There are several files and they have names like W020N40.DEM. Each of these files represents an area 40 degrees wide by 50 degrees high. The filename itself refers to the top left hand corner of the location. For this example the file would cover the area from West 20 degrees to East 20 degrees and North 40 degrees to South 10 degrees.

You would need the files to cover the area that you intend operating in. For example, for North America you would typically need 4 such files and these would be just over 200 MBytes in size (each file is a little over 50 MBytes and contains 28.8 million elevation points).

The terrain data is used to create your 3D look ahead terrain view but is also used to create a terrain backdrop for your map if you are using "vector map" display.

The raster maps

Raster maps are usually scanned paper map images that have been processed and geo-referenced. Raster maps consist of files containing the actual image data as well as a single "index" file. This file is named "MapIndex.MM0". It contains information on which map files are used, what geographic areas each map contains and at what resolution the image has been produced.

The map data files have names like "N34E040a.M34" and usually there are many of them. MGL does not provide these files except for Southern Africa but you can find other regions at the Stratomaster users group "http://groups.yahoo.com/group/stratomaster_users_group" or you can create your own if you have suitable map image files using the free "mapmaker" utility from MGL Avionics.

Airspace display for raster maps can be switched on/off in System Setup -> Setup Navigation.

The aviation database (Navidata.EWD file)

The MGL EFIS systems use a single file navigation database named "navidata.ewd".
This file can be obtained from various sources. You can get subscription products such as "PocketFMS" (www.PocketFMS.com) which also include a flight planning tool, Jeppesen Navdata or you can also use freely available data. MGL Avionics provides free data based on the FAA/NACO database for North America and also provides free data for Southern Africa. You can create your own Navidata.ewd file using the "MGL Central" aviation database and flight planning program which is available from MGL Avionics free of charge (download from their website). Using this program you can import data from ARINC424 sources, www.Navaid.com and a few simple text file formats. This program allows you to edit this data, even edit and create your own airspace data. You can create new airport, navaid and waypoint information and finally export everything into your own private navidata.ewd file.

The navidata file can contain the following information:
a) Waypoints, navigation aids, intersections, airports (all forms)
b) Airport data such as frequencies and runways
c) Airspace data (with frequencies where available)
d) Obstacle database
e) Airways
f) ILS details
g) Approaches, arrivals and departures
e) Other information

Odyssey and Voyager G2 systems can support multiple navidata files. You might want this if you need to cover separate areas or if you need to add to an existing subscription product.
Here is how this works:

Rename your navidata.ewd files as required to place them into "regions". Again, it is recommended to use standard region codes as listed at the end of this document.
"NAVIDATA.EWD","NAVIDATB.EWD","NAVIDATC.EWD",...
Using the selection in your G2 Navigation menu (left hand keypad) to select which navigation code to use for your PRIMARY navidata.

Subscription products such as Jeppesen Navdata are already named according to the coverage region.

Secondary navidata file

The G2 systems allow use of a secondary navidata file that is active at the same time as the primary navidata file.
The secondary navidata file is named "SNAVI.EWD". Any navidata file can simply be renamed to become a secondary navidata file, there is no difference in the file format:
The secondary navidata file cannot be a subscription product, it must be created in "open"

format. The purpose of the secondary navidata file is to allow you to add private airport information and waypoints to an existing subscription product that you cannot change.
You create the secondary navidata file either by exporting from the "MGL Central" aviation database and flight planner and then renaming the resultant navidata.ewd file or you can use any other navidata file provided it has been created in "open" format.
The EFIS will not use any information other than waypoints, navaid and all airport and airport related information from a secondary navidata file. Airspaces and all other aviation related information is only used from the primary navidata file in order to prevent conflicts.

Be aware that there is a chance for duplicate waypoint or airport information if you use a secondary navidata file. If the same airport is defined in both primary and secondary navidata files, the EFIS will show you both ! You can identify the data source by reading the leading identification character in a waypoint or airport listing. It will be "N" for the primary navidata file and "S" for the secondary navidata file.

Supplementary waypoint file

The supplementary waypoint file can be created in the "MGL Central" aviation database and flight planning tool as well as any EFIS.
Navidata files as described above cannot be changed once they have been created. The supplementary waypoint file however can be edit in the EFIS.
If you need to create a new waypoint or airport location in the EFIS, you will do this in the supplementary waypoint file. You can also route "markers" to the supplementary waypoint file. "markers" are "on the fly" waypoints that are created using the current location when you press the "Enter" button from a normal operating EFIS screen.
Markers usually get written to a special "route" file in the EFIS called "markers.ert" but you can choose to send them to the supplementary waypoint file instead.
You might for example want to do this if you have just landed at a small airstrip that is not in your database.
You can export the waypoint.ewd file from the EFIS and then import the waypoints it contains to the MGL Central application if you like.
EFIS systems always contain a "waypoint.ewd" file. If none exists, an empty file is created.
You can copy supplementary waypoint files created by MGL Central to an EFIS as well.

Valid SNAVI.EWD filenames are:

SNAVI.EWD (Same as SNAVIA.EWD, used with region A).
SNAVIA.EWD, SNAVIB.EWD, SNAVIC.EWD,...

Region codes

These single letter codes are used as the last character of the filename for NAVIDAT, SNAVI and VMAP files.

The first seven letters "A,B,C,D,E,F,G" are allocated to fixed regions as follows:

A   Africa
B   Europe
C   Eurasia
D   Middle East
E   North America
F   South America
G   Pacific

Letters "H" to "Z" can be used as required, they are currently not allocated. You could use any of these letters to identify a private file for your own use.

Installation of data files

Enigma systems

Enigma systems have limited internal storage space so most of the files are typically installed on an SD card and loaded from there.

Copy all of the following files to the root folder of your SD card. Note: it is a good idea to format the SD card to a clean state if it has been used before. This can help improve the access speed to the files.

All raster map files including the matching MapIndex.MM0 file.
The VMAP. EVD file for your region.
The Navidata.EWD file from your data subscription product or an open format file created by the MGL Central application.
All terrain data files to cover your region.
If you have prepared a Waypoint.EWD file, copy that too.

For Enigma systems you can install the Navidata.EWD file into the instrument if you have sufficient space on the internal SSD drive. The drive can hold 6 MBytes (3 MBytes on early versions). If your navidata file is too large for this, leave it on the SD card.

Use the "Installation tasks" menu to install the navidata file. If there is not enough space, the Enigma will tell you and not install the file.

Note: If you install the file, remove it from the SD card or else the Enigma will still use the file from the SD card, it will only use the installed file if it cannot find a file on the SD card.

Odyssey/Voyager G1 systems

Copy all of the following files to the root folder of your SD card. Note: it is a good idea to format the SD card to a clean state if it has been used before. This can help improve the access speed to the files.

All raster map files including the matching MapIndex.MM0 file.

The VMAP. EVD file for your region.
The Navidata.EWD file from your data subscription product or an open format file created by the MGL Central application.
All terrain data files to cover your region.
If you have prepared a Waypoint.EWD file, copy that too.

Using the EFIS "Installation tasks" menu perform the following tasks:

Install terrain data
Install vector map
Install raster maps
Install Navidata database
Install supplementary Waypoint file (if required).

After this, the files can be removed from the SD card. Please note that the Navidata.ewd file should be deleted from the SD card after installation or another SD card used. The EFIS will load the navidata.ewd file from the SD card if it finds one and will in that case not load the installed navidata.ewd file.

Odyssey/Voyager G2 systems

Copy all of the following files to the root folder of your SD card. Note: it is a good idea to format the SD card to a clean state if it has been used before. This can help improve the access speed to the files.

Rename any navidata.ewd files if you want to use more than a single navidata file to cover several regions. Do the same if required to the VMAP.EVD file(s) if you need to cover several regions. If you want to use a secondary navidata file (SNAVI.EWD), also rename these files as decribed above to cater for different regions.
Navidata files from subscription products such as Jeppesen are already named correctly. For example the navidata file for North America is named NAVIDATE.EWD. (The "E" in "NAVIDATE" sets the region to North America).

Copy all of the required Navidata and SNavi files to your SD card.

Copy all raster map files including the matching MapIndex.MM0 file.
The VMAP. EVD file for your region.
All terrain data files to cover your region.
If you have prepared a Waypoint.EWD file, copy that too.
Copy the "World.BMP" file to the SD card (you do this only once when you install it the first time).

Using the EFIS "Installation tasks" menu perform the following tasks:

Install terrain data
Install vector map
Install raster maps
Install Navidata database(s)
Install supplementary Waypoint file (if required).
Install World Image (MAP).

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After this, the files can be removed from the SD card.

Using the MAP and NAV menus (left hand keypad) select the required map, primary and secondary database region you want your EFIS to load.

MGL Central

The MGL Central aviation database program and flight planning tool should also receive a copy of your map and terrain data.

Copy the VMAP.EVD file for your area to the "MAPS" folder of the MGL Central application. Copy all terrain files, the World.BMP file and all raster map files (including the MAPIndex.MM0 file) to the same "MAPS" folder.

Data sources (Where to get data files)

Navidata.EWD (and the SNAVI.EWD) files

a) Jeppesen Navdata subscription (download from internet)
b) PocketFMS subscription (Export from PocketFMS Flight Planning application)
c) Free data sources maintained by MGL Avionics (download from www.MGLAvionics.co.za) and some MGL distributors or available elsewhere.
d) "Make your own" using the MGL Central application. This application can import free data from sources such as www.Navaid.com to get you started.

Raster map files

Raster maps to cover South Africa are distributed on DVD with each system sold in Southern Africa. Other sources are available from some MGL distributors or from the Stratomaster users group "http://groups.yahoo.com/group/stratomaster_users_group".
You can create your own raster maps if you have compatible map image files (such as scanned images) using the free MGL Mapmaker utility.

Vector map files and terrain data

These files can be downloaded from the MGL Avionics website for your region (www.MGLAvionics.co.za). Follow the "Downloads" button on the left and choose "EFIS airspace, terrain and vector maps".

Waypoint.EWD file

You create this file yourself. It is created in the EFIS when you add supplementary waypoints or you can create this using the MGL Central aviation database and flight planner. The supplementary waypoint file contains waypoints that you can edit, delete or add to within the EFIS itself.