MGL Avionics

Plates compiler

Preliminary documentation
for beta versions

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General

The MGL Avionics plates compiler is a Windows based tool that allows management of images and documents for compilation into MGL plate files for use with EFIS systems.

Typical uses are to combine the documents related to an airport into a single file for use as reference by the EFIS user.

The system currently allows to import Adobe PDF files (single or multiple page), JPEG or BMP images.

In this document a "plate" is a single page of a PDF document or an image.

Plates compiler

The plates compiler works with "Projects". You can have multiple projects. Typically however, you will only use a single project. Each project may contain one or more airport plates collections. In addition you can create a "Info" collection of plates. This is used to hold "other" documents that are not related to airports as such.

Each collection of plates has one or more plates. For example, Los Angeles International (KLAX) requires about 80 plates.

Sources of plates

Plates can often be sourced via free internet downloads or they may be part of data subscriptions. Please check copyright issues if you are going to distribute plates data compiled using the MGL Plates compiler.

Consider using download tools such as "Nacomatic" to batch download plates (www.Nacomatic.com – for the U.S.A). Nacomatic names the downloaded PDF files in a way that makes automatic batch import of plates into the MGL compiler easy.

Plates compiler sample run

Your MGL Plates compiler contains a few sample plates. Using these, follow the instructions on the following pages to create your first project, load the plates, set plates properties and finally compile the plates into files that can be used with the EFIS.
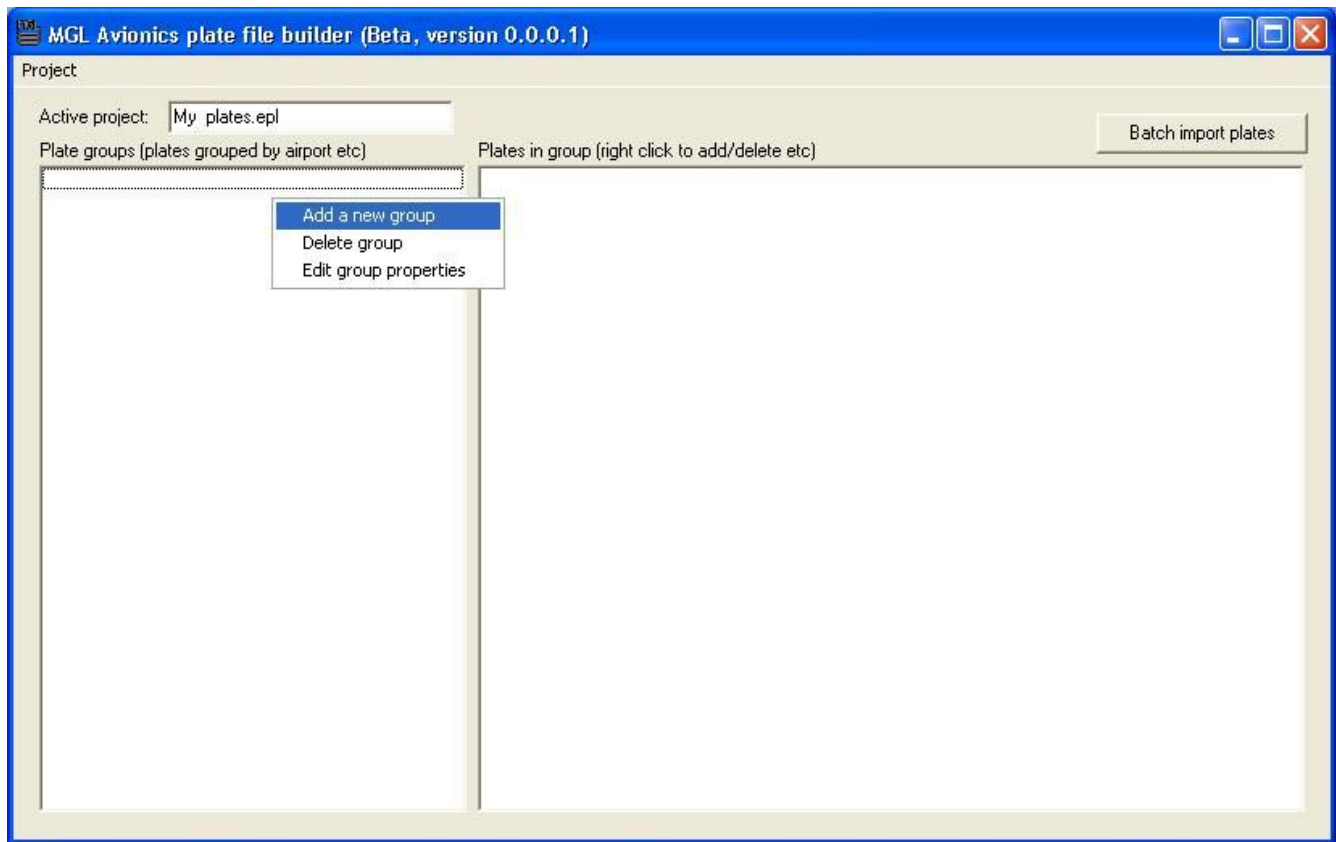
When you first start the plates compiler, your first task is to create a new project:
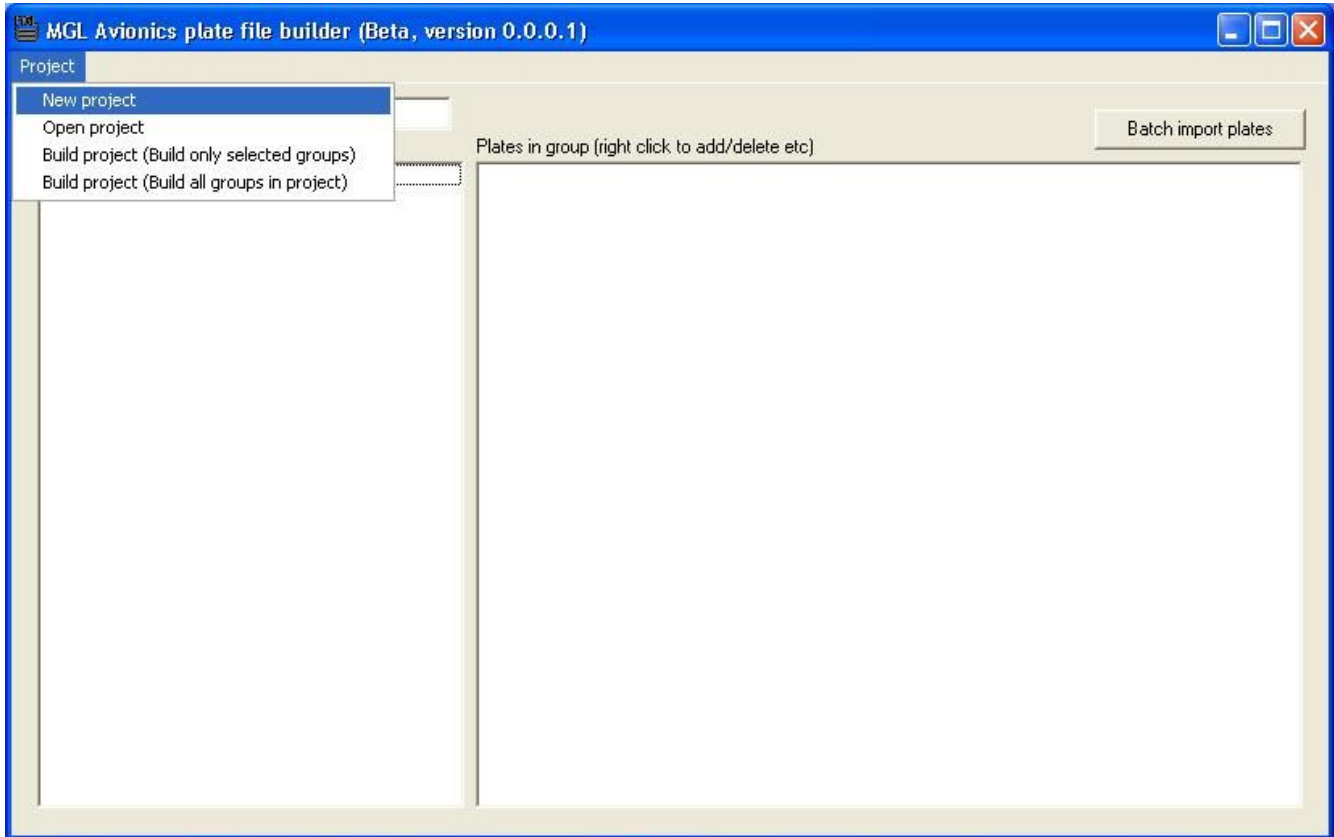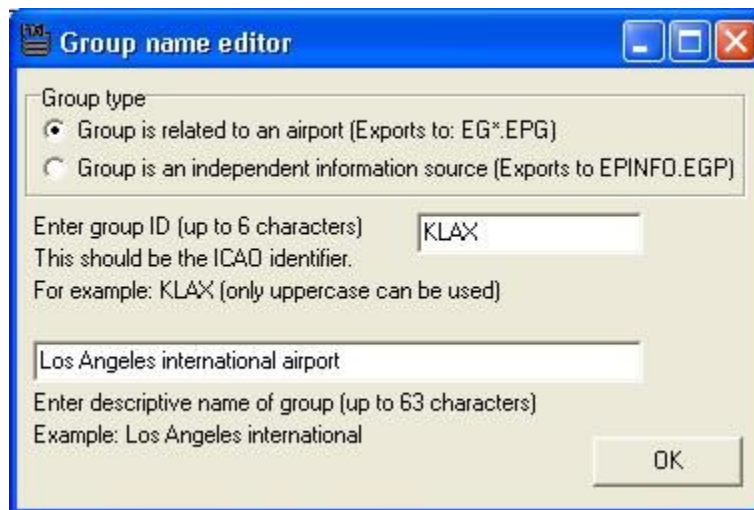

Give your project a descriptive name. In this case we choose "My plates":
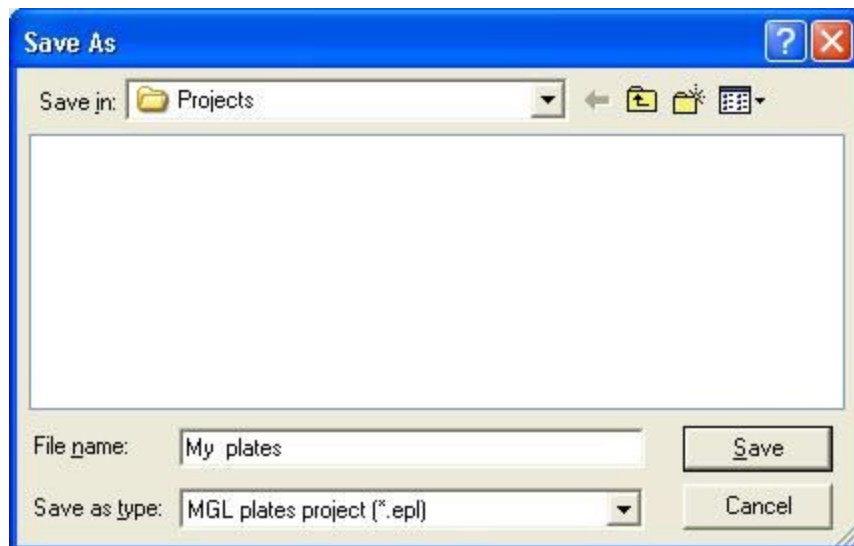
Your next step would be to add a new group. Right click on the groups window and select "Add a new group".

The first group you will create is a group to hold the plates for Los Angeles international (sample plates have been included in your installation).

Now select the group properties. You want to create an airport group (this will create a file starting with "EP" followed by the airport short identifier and then followed by the file extension "EPG". Choose the group ID carefully – it must match the real identifier so your EFIS is able to find this file quickly using the nearest airports feature. In this case we use "KLAX".

We now enter more verbose descriptor for the plates group. This is the text that will be offered to the pilot if he is browsing for the plates for an airport so make sure the descriptor makes sense.

Our next task is to add our first plate to the group. Make sure that the group on the left window is selected (appears in blue) and then right click on the right window. Now select "Add a plate".
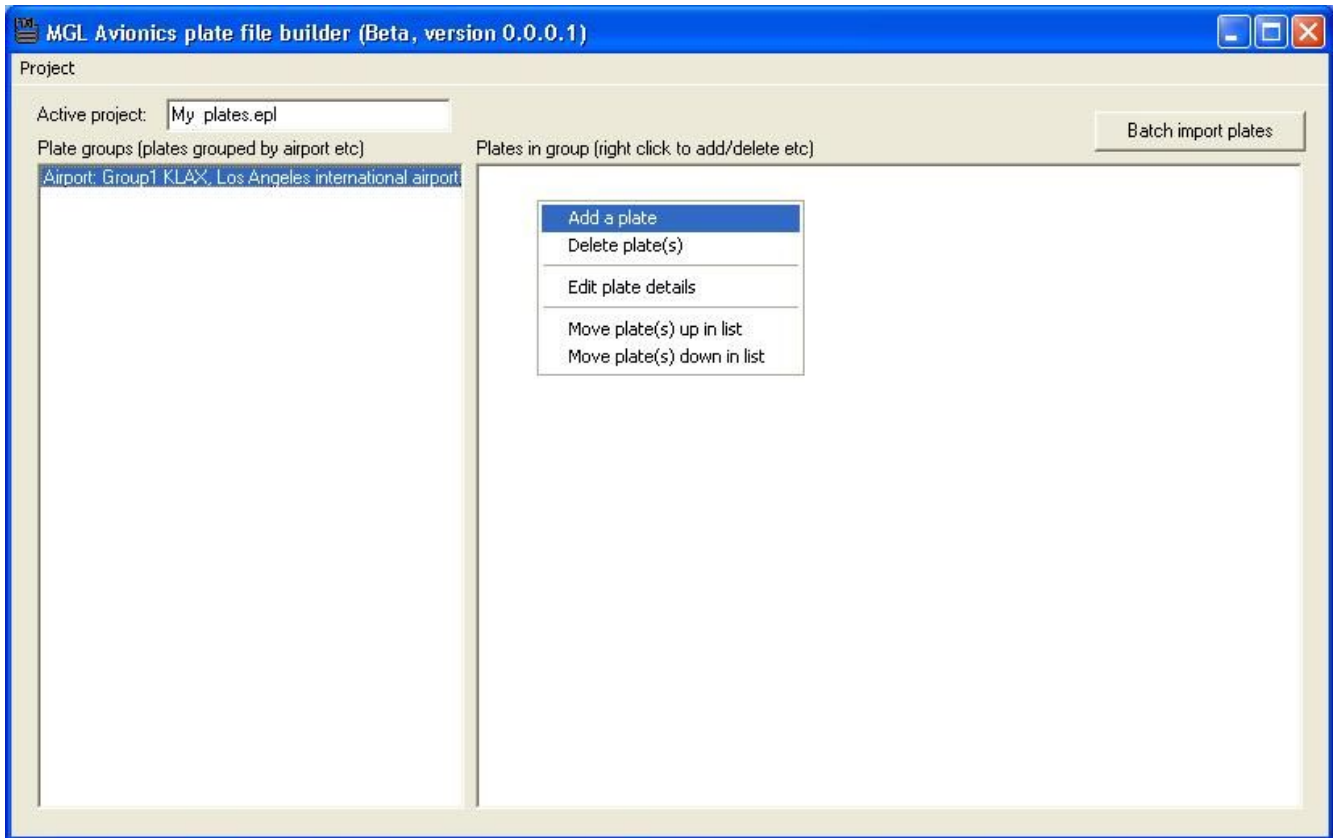
The first plate will will add is the Los Angeles airport diagram. We recommend that if you plate collection has a airport diagram to insert this diagram as your first plate (you can move plates around later if required).

Plates will be offered to the pilot in the order that you define them here.

Use the "Browse" button to locate your plate file. You can select a PDF file or a JPEG or BMP image. Select the LOS ANGELES AIRPORTS DIAGRAM that you will find in the "plates" folder of your MGL Plates compiler installation folder.

Enter a descriptive name for the plate. This entry will be shown to the pilot to select his plate. You can set it from the filename if this will work for you.

You will see the airports diagram on the viewer area but it will not have a suitable orientation.

Rotate the image 90 degrees right.

Choose the image scale. If your EFIS has 640 pixels across, choose the scaling value of 640 so the image will fit exactly in the display frame width-wise.

As an exercise, we will apply clipping to this page to get rid of the border. Right click on the image at the top left corner of your clipping rectangle and choose "set clip rectangle" top left, then repeat the operation to set the bottom right location of the clip rectangle.

When you have completed this, check the "activate clip rectangle" box.

The clip rectangle will be shown in red. It will not clip anything in this image but when you compile the project all areas outside the clip rectangle will be removed. Your scaling selection applies to the clipped image, not the entire image so the resultant image will neatly fit the EFIS display screen.

Plate properties editor

Descriptive name for plate (up to 63 characters)

KLAX, LOS ANGELES AIRPORT-DIAGRAM

☐ Name from filename

Source PDF file for this plate

C:\Program Files\Enigma tools\MGL Plates compiler\Plates\CA, LOS ANGELES, LAX, AIRP

Page number 1 ⊞

Number of pages 1

☐ This page is Geo-referenced

Top left latitude	N00°00.00
Top left longitude	E000°00.00
Bottom right latitude	N00°00.00
Bottom right longitude	E000°00.00

☑ Activate page clipping

Top left clip X position	0
Top left clip Y position	0
Bottom right clip X position	0
Bottom right clip Y position	0

Scaling
- ○ Leave at original resolution
- ○ Scale to 1024 pixels
- ○ Scale to 800 pixels
- ⦿ Scale to 640 pixels
- ○ Scale to 320 pixels

Rotation
- ○ Do not rotate
- ○ Rotate 90 degrees left
- ⦿ Rotate 90 degrees right
- ○ Rotate upside down

Cancel

OK

Set geographic reference Top left
Set geographic reference bottom right
Set clip rectangle top left
Set clip rectangle bottom right

X:591 Y:397

You will notice that the airport diagram has convenient latitude and longitude markings. We can use these to geo-reference the image so the EFIS, using the GPS can tell you exactly where on the image you are. Neat ?

OK, get the image to show the top left coordinate crossings and right click on that location, then select "Set geographic reference top left".

Now enter the coordinates as shown on the image.

Please note that you should enter degrees, minutes and seconds (the seconds are from 0 to 59, not decimal seconds from 0 to 99).

Please ensure that you enter the correct hemispheres (N,S and W,E).
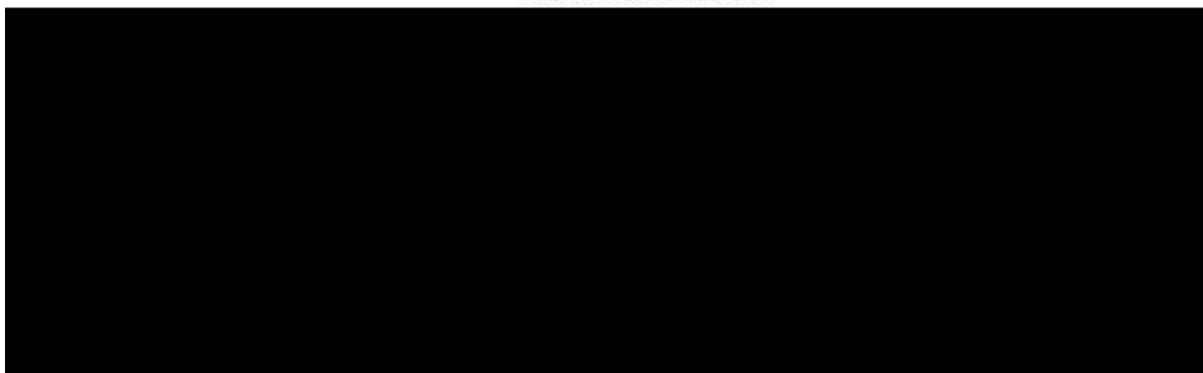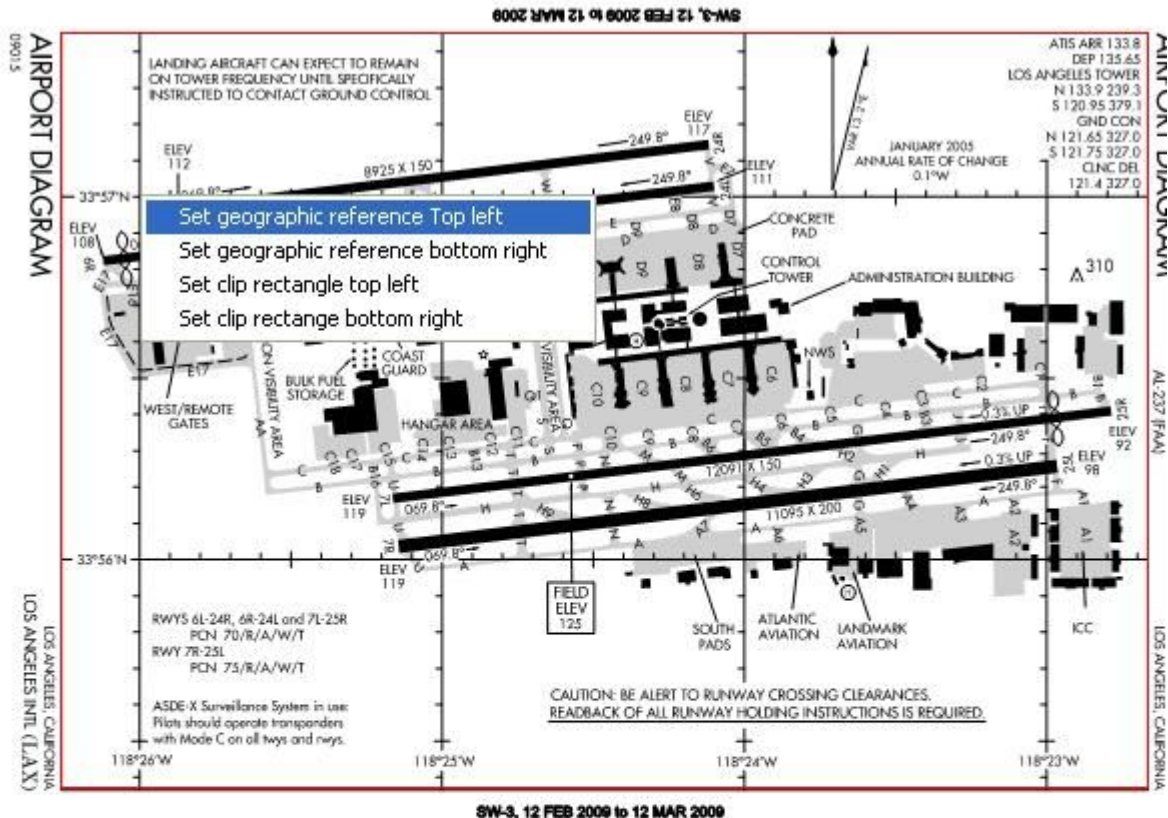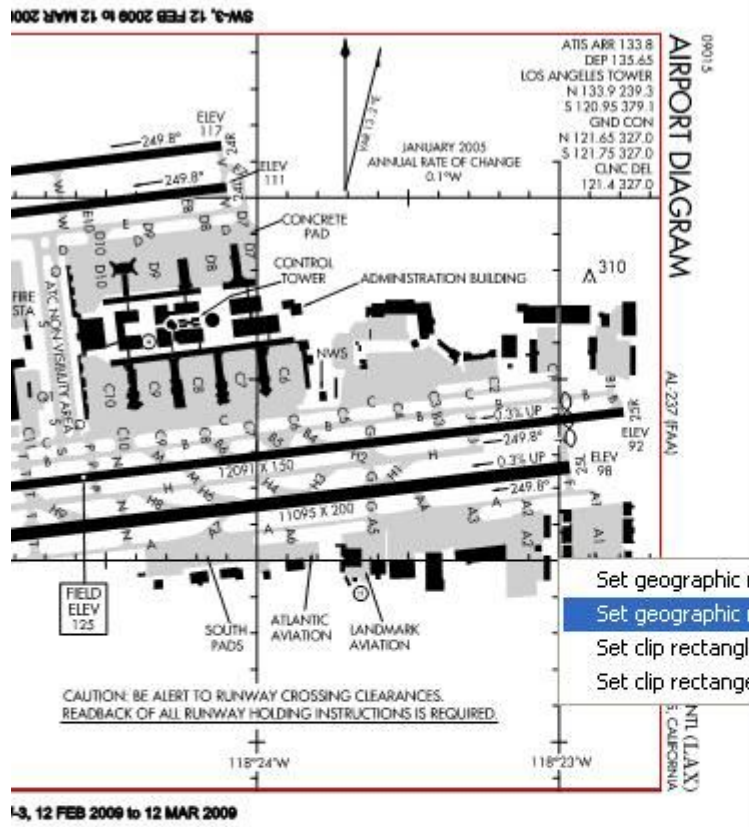
Now repeat this for the bottom right geographic reference:


Set geographic reference Top left
Set geographic reference bottom right
Set clip rectangle top left
Set clip rectange bottom right

You are almost done.

Check the box "The page is georeferenced".

PLease note that the geographic coordinates as shown on this window are a bit different from those that you entered. This is OK. The system will recalculate the coordinates to refer to the edges of the image. Have a brief look at these coordinates to make sure they make sense. If not, repeat the process.

When you are done, click on the "done" button.

Using the batch import

If your plates are suitable for a batch import, you can make use of the "batch import facility". In this case, we will use this facility to import the remaining plates.

Click on "Batch import plates".

The sample plates have been downloaded from the internet using "nacomatic", a free utility that can be downloaded from www.Nacomatic.com (only for U.S. FAA plates at current).

Nacomatic provides useful file names that identify state and airport as first part of the name. As this is fixed for every airport, we can enter this fixed part into the field "Add all PDF files where the file name starts with". Please note that the text entered hear includes an additional trailing space. The batch import will use the remainder of the filename as plate descriptor.

Now select the folder where the plate files can be found. For the sample files this is the "plates" folder of the MGL plates compiler installation folder.
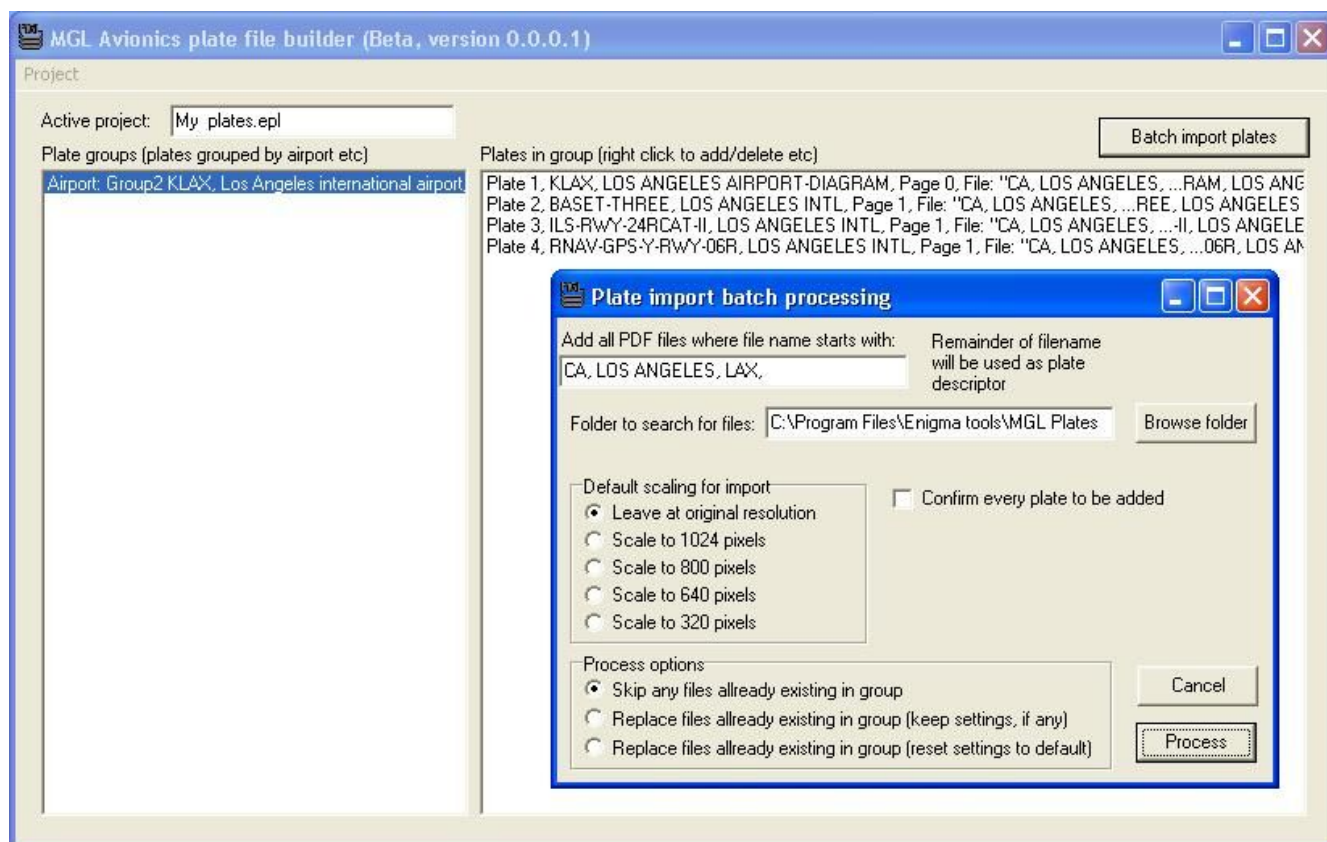
Select the desired scale (click on the 640 pixels) and in this case select "skip any files already existing in the group" (or else the work we have done on the airport diagram plate may be overwritten).

When finished, click on the "process" button and the remainder of the plates are added to the group.

To end your session, briefly step through each plate (double-click on the plate entry in the right plate listing) to view the plate and properties. Rotate each plate as needed and set the scaling to suit.

Add a info group

Each project can have one info group. The info group is very similar to an airport group but will result in the file "EPINFO.EPG". The idea is that any information that is not directly related to a particular airport goes in here.

In this example we will add just one plate. It is a JPEG image of the whole World. We will georeference it and then the EFIS can show us where on the World we are.

Start by adding a new group. Select that this group is an info group and give it a suitable name (In this case the name is not material, use it for your own reference).
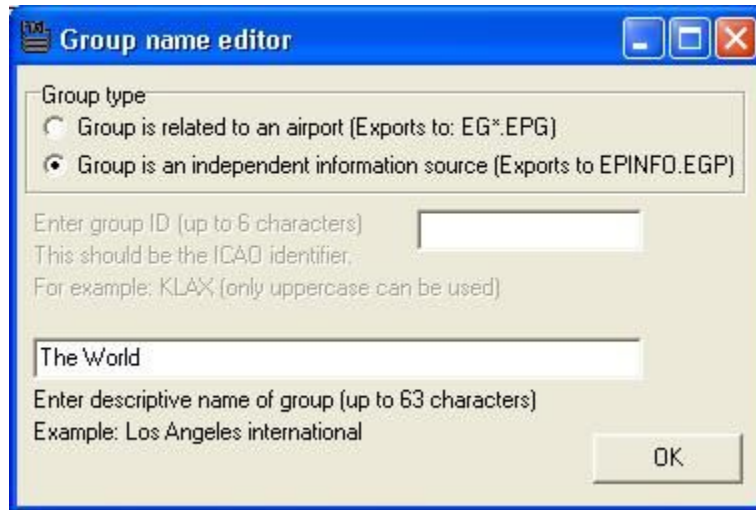
Now add a plate to this group, select the image as shown below (the JPEG image is in your plates folder).
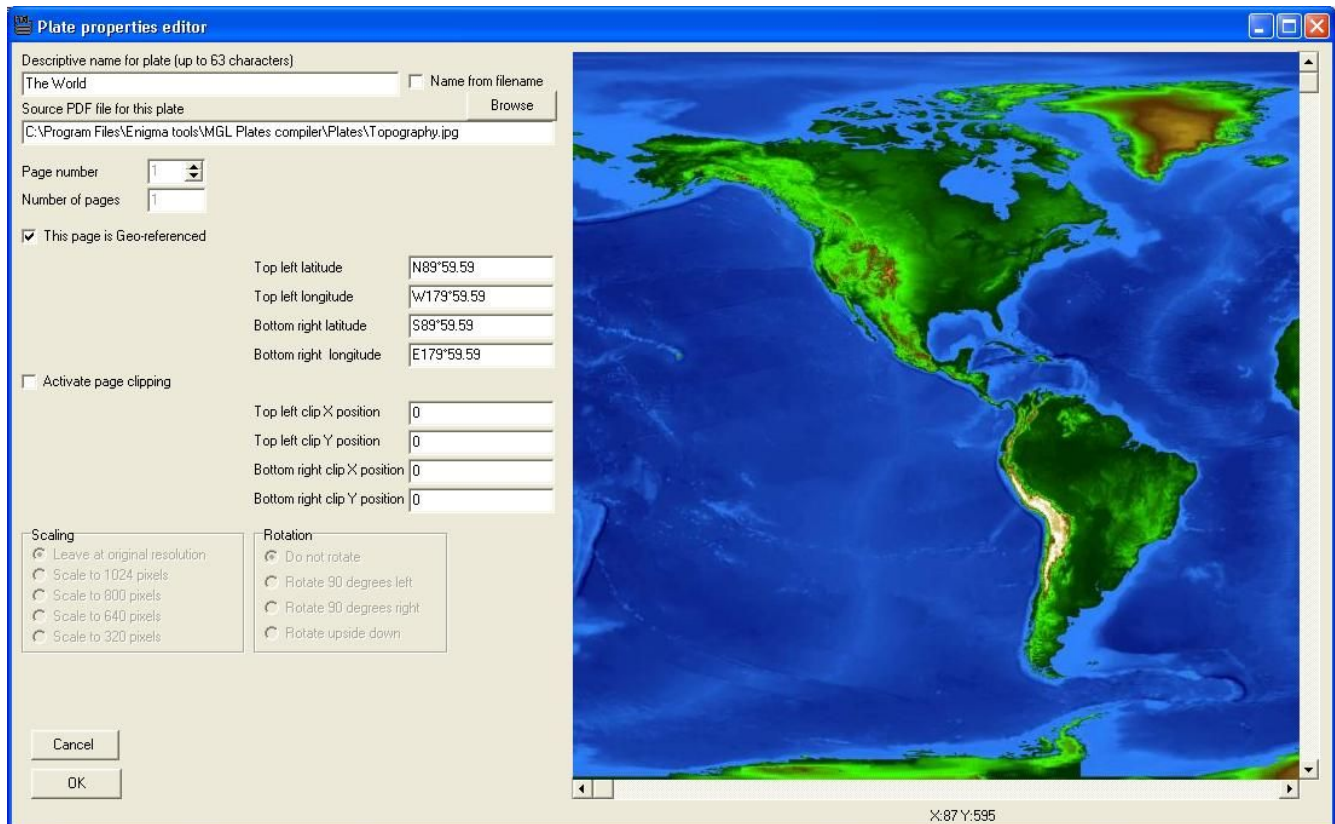

Geo reference the top left and bottom right corners of the image. Be sure to right click exactly on the most top left and most bottom right pixel of the image. Coordinates to enter are N89°59.59/W179°59.59 and S89°59.59/E179°59.59.

We are not going to clip anything on this page to leave that box unchecked.
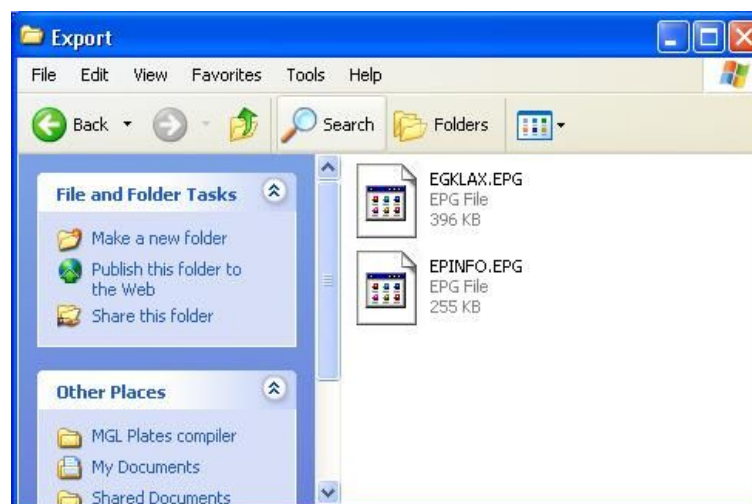
Compiling the project

You can compile all of the project at once or a selection of groups (you can select one or more groups).
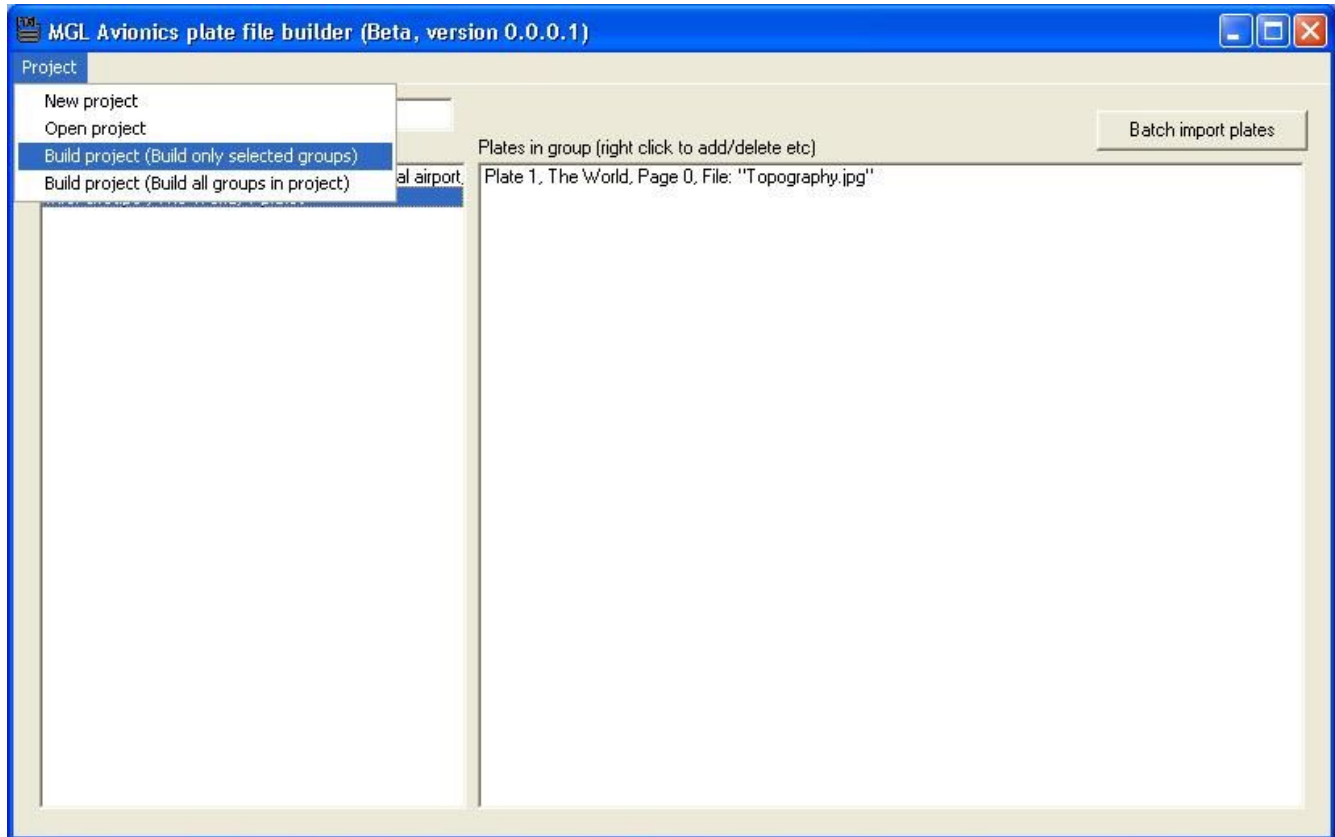
Select Build project as required.

This will result in the following files created in your "export" folder (The export folder is under your MGL Plates compiler installation folder):

Copy these files to a SD card for use with the efis.

To test the files in your EFIS, insert the card and use the airports plates viewer or the info plates viewer from the menu.

Tip:

You can also use the EFIS simulator to view the plates. Copy the files into the simulators "MMC" folder which simulates the SD card.

Using the simulator it is easy to test the georeferencing of your plates. The EFIS will draw an aircraft symbol on the location.

About georeferencing plates

Any plate can be georeferenced. However the following restrictions apply:

The resulting image (after rotation if required) must have true north pointing up, west must be to the left of the image.

Images must be suitable for georeferencing for small areas (like an airport diagram) projection generally does not matter but for large images (like the World in the examples) the projection must be such that all latitudes have the same pixel length in terms of longitude.

Georeferencing must use the correct coordinates to work. The top left longitude coordinate will always be more to the west than the bottom right coordiate. The top left latitude coordinate will always be more to the north than the bottom right coordinate.

About Image sizes

Unlike PDF files, images cannot be scaled inside the MGL plates compiler. Please perform any scaling or other required work on the image using a suitable image processing application.

The EFIS allows panning images larger than the available display resolution. Generally however, it is not recommended that images exceed more than twice the available resolution (although it will work).

When new plates become available

Your current project contains all the properties of the existing plates. If new plates need to be added, simply add them and use the up/down function to move the plates to the required location in the list and set any properties for the new plates.

Updates for existing plates most often do not require any further work, simply replace the source files.

Re-compile the project to create new export files for the EFIS.