

Field Finder - A Navigation Utility using LB and Google Earth

For your interest and update - here are some details of the Field Finder and Route Planner software that I have been working on recently. I am sharing this in the hope that other aviation enthusiasts might see potentials or problems I have missed. Particularly in the way that routes and fields are displayed and managed. It is relatively easy to write the code, but so much harder to see past the obvious when it comes to user interaction. I see the software used in one way, others will see it in a totally different way. Your input would be most valuable. What I see is a concept with considerable potential to assist the aviation community and improve flight safety and as such the software is free and unencumbered under the Open Commons Licence (use not for profit). The source code can be made available to any who might understand it.

This all started as something of a small project and then grew like topsy as the potential started to become apparent. There are two distinct modules. The Field Finder uses static data modules such as the SAANZ and AIPNZ data supplied in the download package. The Route Planner uses dynamic, user modified data sets that reflect the specific requirements. Both use Google Earth to perform most of the display tasks. The only assumption is that Google Earth is installed on the running computer in a standard way and location. Unfortunately there are many ways to modify software installations in Windows and I cannot possibly cater for them all. Should GE not start as advertised, please check your installation path or contact me by email.

There is a (sort of) interesting back story to the Field Finder software in the documentation attached. Unfortunately I cannot send EXE files by email but there is a link below to download the full FieldFinder installer.

I have attached samples of the Field Finder printouts as PDFs and some Google Earth scripts that you can play on GE just by clicking them. These KML files are just a complex form of HTML really, so they are small and text based - easy to send around.

Here is a file list and explanation :

FieldFinder.doc - Word File documentationNZAIP.PDF - Track(m) and distance - Anywhere to Anywhere in the AIP airfieldsSAANZ.PDF - ditto for the SAANZ fields

KML Files for Google EarthNShoreRW - Simple top down look at North ShoreNShoreTop - Oblique of North Shore onto runwayRyansCreek - Oblique onto Ryans Creek

(You can use the software to look at any airfield in these two modes).

NStoOHAKEA1000kts3000ft - Rhumb Line transit from N Shore to Ohakea at 3000ft AMSL and 1000ktsNStoKERIKERI500kts1000ft - Ditto N Shore to Kerikeri at 1000ft and 300 kts

The sequence here is open to modification. What it does now is :

Start looking vertically downwards over the FROM field at 1000ft top to North. Rotate onto Rhumb Line heading while descending to selected transit altitude. Pitch up to selected Pitch value (default 10 degrees nose down from level). Accelerate up to selected Speed over the next 3-5 seconds. Fly to the TO field. Note the software has no innate sense of MSA, so selecting a transit altitude below route MSA may result in flying through the ground. I do attempt to cater for gradual changes in terrain altitude, but I do not have much of a look ahead at the higher speeds. On reaching destination, stop, pitch down to show the field on transit heading. Pull up facing vertically downwards to 10000 ft whilst rotating onto North.

It took a very nauseating long while to get this sequence to an acceptable flow. However if you have a large screen or are prone to motion sickness it might be well not to stare too closely at the display during the vertical transitions.

You can play any combination of airfields in this way, with control over height, speed and lookdown angle. These are at 10 degrees down, 20 or more shows more ground detail. However at any time you can use the PLAY BAR in the bottom left of the GE screen to stop the action or fast forward, look around, go back etc etc. Pressing PLAY again puts you back on track. Very slick little subversion of Google's software (if I say so myself).

Then this all morphed into something more complex. As I became more familiar with some of the rather scantily documented commands within Google Earth I saw more possibilities to compound some of these effects into something more directly useful. The principle tool in GE is control of a form of ball turret camera that has freedom in the 3 major axis plus height, speed, direction and apparent visibility over anywhere on or below the Earth's surface or seas.. Effectively 7 dimensions in all - and this takes some getting the remaining neurons around at times. But I am learning.

Here is a script that shows a proposed script for simulator lesson / navigation briefings.

SIMTD2011 - This is a departure from HKG with a return for the ILS 25R and diversion to 16 at Macao. (at 1000kts real time speed) Press PlayMe! in the left sidebar to start the flight. This route planner module is still in progress, but I now have the protocols worked out to fly any routing on earth at any speed, altitude and show both the horizontal and vertical profile and small amounts of notation. I can control camera angle and allow user interaction to examine terrain detail at FF/ Rewind at will. All this with a script into Google Earth. The core data that made the HKG-MACAO module is attached here :

HKG25RtoMacao16.RPT - This is a text file - open it with wordpad or notepad.

You will notice a slightly changed data layout for the RPT files which reflects the changed needs of the RoutePlanner software module. The present work in progress is to make an editor for this data file so that it can be created without resorting to a text editor for input and, more specifically, removes most of the errors that seem endemic when entering Lat/Long values.

Likewise you can see the content of the KML files above using OPEN WITH and use wordpad. They are just program generated HTML scripts - but you would not want to do them by hand !

Anyway, you can see the potential for NAV training and route discovery / briefing here, using an old and a new idea. I will get a copy of the full FFinder software to you in the next few days so you can have a play. Note, if you are playing these one after the other they tend to stack up in the sidebar. Untick them or leave GE and "discard" them if this is a problem. I avoid this in the software by having a single filename that overwrites. But I have had to rename the files to send them individually.

enjoy

Ken

The link to obtain the program installer is here if you want to try the whole FieldFinder package. Just let it install to the default of C:\FieldFinder unless you know better. Includes all run times and data files - just run FF.EXE

[FieldFinder.exe](#) - from this Wiki Space

<http://www.filefactory.com/file/cdfc740/n/FieldFinder.exe> - or from FileFactory

[Field_Finder.doc](#)

[NShoreTop.kml](#)

[NShoreRW.kml](#)

[NZAIP.pdf](#)

[SAANZ.pdf](#)

[NStoOHAKEA1000kts3000ft.kml](#)

[NStoKERIKERI500kts1000ft.kml](#)

[RyansCreek.kml](#)

[SIMTD2011.kml](#)

and the two data files that reference New Zealand airfields that the code uses. If anyone makes some more DAT files for other countries or area - please add them here :

[NZAIP.DAT](#) - All New Zealand Registered Airfields

[SAANZ.DAT](#) - Private strips