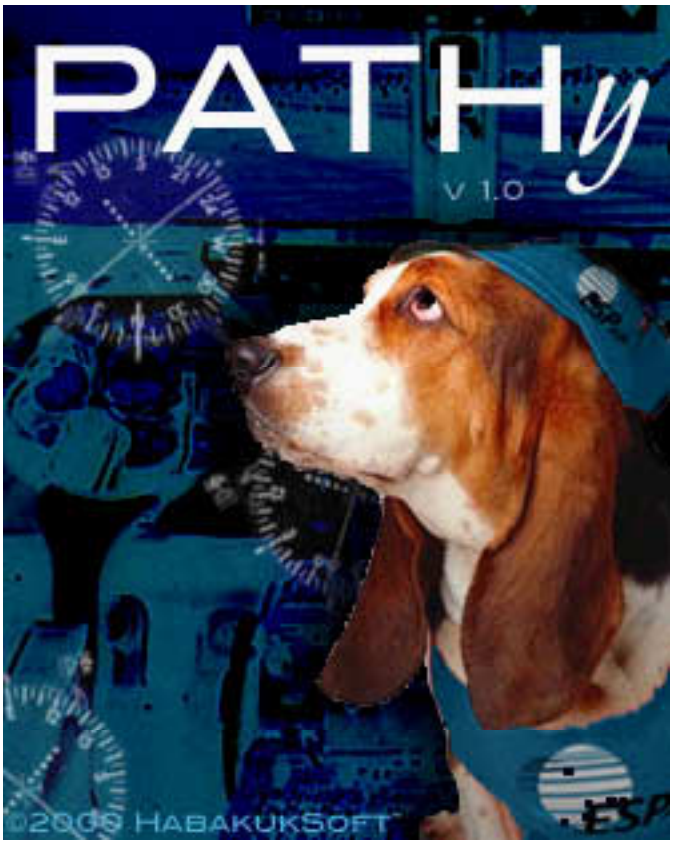
PATHy 1.0

Your guide dog through the sky.



USER MANUAL

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PATHy 1.0 - What's it?

PATHy is your guide dog for the skies. Have you been flying in areas where you don't have maps for? Have you ever tried to plan a flight for X-Plane without maps? dESPair pilots don't fly without maps. Period. To keep our pilots maintenance costs as low as possible, dESPair HQ decided to init the development of a flight planner tool.

PATHy currently can deal with all 13025 airports, 3204 VORs, 6684 NDBs and 1930 ILS points in the apt.dat and nav.dat files from a freeware source (freely available at ftp.x-plane.com).

PATHy displays the airports and navaids on a scalable map, and you can simply select the various leg points and get a nice flight plan with heading, distance and estimated leg time.

You can print the map and the flight plan, and you can easily use underlying maps to have more information for your planning.

See the tutorial pages for more detailed view of the features.

Roland
aka. Capt. Habakuk "the Seagul"
CEO dESPair & HabakukSoft™

2.) Requirements

PATHy is a cross platform software project, developed on a Mac. It has been tested on various systems and configurations, both on Mac and PC.

PATHy on a Mac

- PowerPC (G3 and better recommended)
- 6 MB RAM (8+MB recommended for full ap/nav set)
- 1024*768, 256 colors
- MacOS 8.5 and later
- Quicktime 4

PATHy on a PC

- Pentium (300+ MHz recommended, the faster the better...)
- 6 MB free RAM (8+MB recommended for full ap/nav set)
- 1024*768, 256 colors
- Win95/98/2000/NT (MacOS recommended ;-)
- QuickTime 4 for windows

In PATHy, both speed and memory consumption, greatly vary with the amount of airports, VORs, NDBs and ILS you want to be handled. To speedup initialization or the leg point lookup procedure of PATHy, and to simultaneously decrease the required memory partition, you might want to use PATHy with subsets of the airport and navaid files.

Due to copyright restrictions, I cannot include these subsets into the PATHy package. You can either truncate the files yourself, or you can ask one of the dESPair crew members for help.

General requirements

PATHy needs two files to run: “apt.dat” and “nav.dat”. Both files need to reside in the root folder of PATHy (in the same folder as the PATHy application).

You can get these files freely from:

ftp://ftp.x-plane.com/pub/links/

Thanks to Robin Peel, who manages a central database with all the airports and navaids, you can get a free copy of the latest files through the X-Plane ftp server.

The airport and navdata has been gathered in thousands of hours work from many friendly soul in the X-Plane realm. All these people that have spent so much work for free deserve a big applause.

PATHy would be useless without this data.

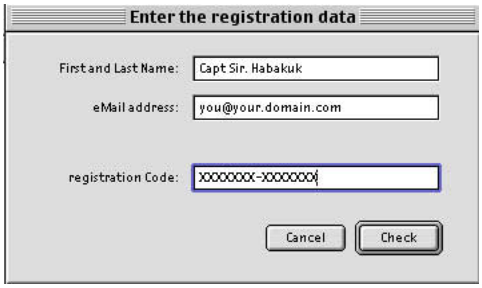
3.) Registration

PATHy is released as Shareware. This means you can use PATHy for a period of 30 days.

After this trial period, you need either to buy a licence or delete PATHy from your computer and storage medias.

PATHy conception, developing and testing took many hours, countless long nights, and many eMails with the test group. Please honor this work by not abusing PATHy.

We decided to not cripple PATHy. You get a fully working, unrestricted version with the “demo” download. The shareware messages will go away as soon as you have entered the registration code.



You find the registration dialog in the (Apple)About Menu.

By ordering a licence for PATHy (Mac or PC) through the secure online shop at Kagi com, you will receive the registration code for your personal copy of PATHy.

Pricing:

Mac version: Single Licence $10

PC version: Single Licence $15

The differences in the price is not a political thingy, Because PATHy has been developed on a Mac, the PC build required an extra portion of thinking and work (and the required amount of support is bigger), and this reflects in the price.

Registered users are entitled for free updates as PATHy gets more mature and the last bugs get squashed. Major new versions will offer a fair upgrade price for registered users.

And last, but not least, registered users have a direct line to the developers, and thus can influence the future development very much.

You can register PATHy through the secure online store at Kagi.com - the shareware ordering home:

https://order.kagi.com/?QRY2&&

Support shareware - register PATHy 1.0 !

Installation of PATHy

Unpack (decompress) the downloaded archive. (Mac: StuffitExpander, PC, Winzip).

Either copy the apt.dat and nav.dat files into the PATHy folder - or move the PATHy application into the “X-Plane/Additional nav data / Earth/” folder.

If you do the latter, make an alias in the XP root or wherever you find it useful.

Navigation / Controls in PATHy 1.0

Double click PATHy application to start it up.

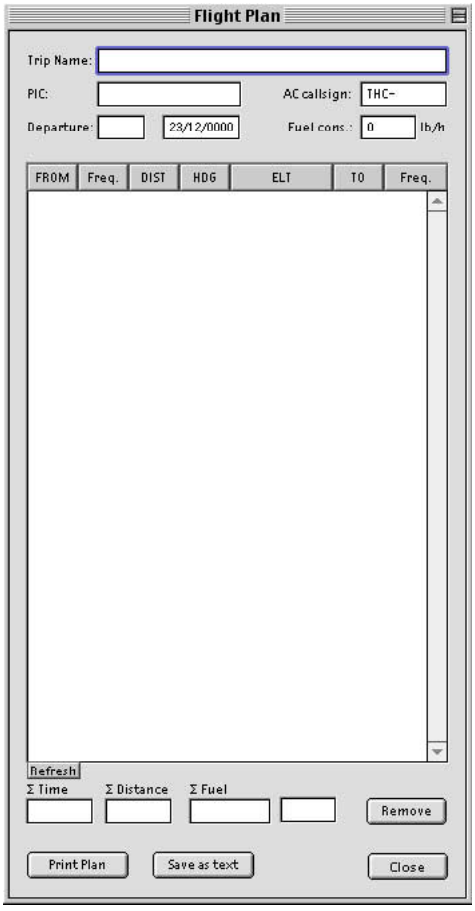
You will see the splash screen. Clicking on the splash screen inits the loading of the data.

Once the data has been loaded you see the statistics for a few seconds, then the screen closes and the two main windows appear.

The hurried ones can click “Proceed” to skip the waiting.

Exploring the main windows

The left most window is the empty flight plan list. It is titled “FlightPlan”. Here will the numeric leg data appear, and it is from this window that you can save and print the flight plan.

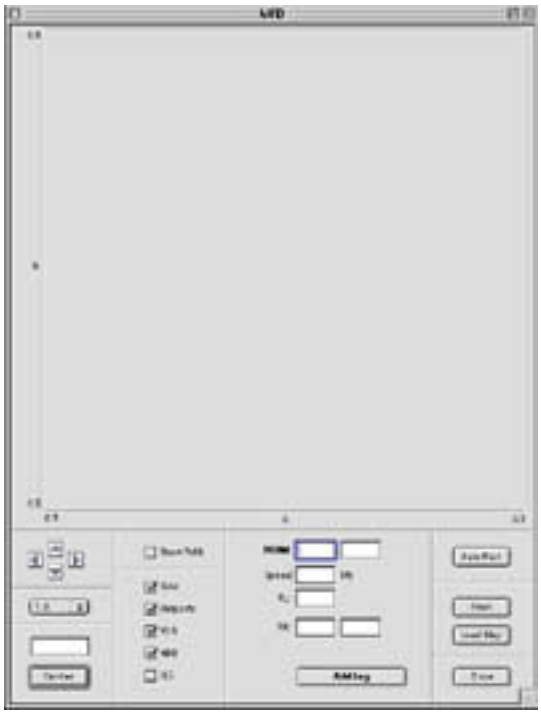


STEP 1 : File the flight
Your first step in flight planning will always happen in this window, as you first type in the trip name, pilot in command, aircraft callsign, average fuel consumption of this aircraft, and the proposed departure time and date.

At the bottom of the window you see four empty fields. Here you will appear the calculated total time, distance and burnt fuel for the legs you have selected (if you have supplied speed and average fuel consumption values).

At the very bottom of the window, you find the “Print Plan” and “Save file” buttons. They do exactly what their caption suggests...

The right most window is the map window. It's title is "MFD" (for Multi functional display).



The top part of the window is covered with the display zone. Here you will see the airports, and here you will work if you want to "paint" legs, instead of selecting them.

At the bottom of the page you find many buttons and switches. We will discover all the knobs and switches during our tour.

Far left are the center field, the zoom popup and the scroll arrows. All these influence the display coordinates.

Left of the middle you find a row of check boxes. Selecting or deselecting them decides over what is getting drawn. The uppermost checkbox is separated - it is the switch to activate manual leg planning. More about that later on (VFR flights).

Right of the middle you find a couple of empty edit fields. This is where you enter the leg waypoints, if you don't draw them.

And to the far right, you find some functions behind push buttons. Printing does exactly this, "New Plan" deletes the currently active flight plan, and starts the planning process all over again.

The arrow buttons let you scroll the displayed area.
>> You can scroll the map with the arrow keys too!

In the zoom popup menu you select the zoom level. The value you select represents the number/fraction of degrees that are displayed on x and y axis.

Selecting 1 means you get a display of 1 * 1°. You can zoom in to 0.1 degree - and zoom out to 180 degrees.

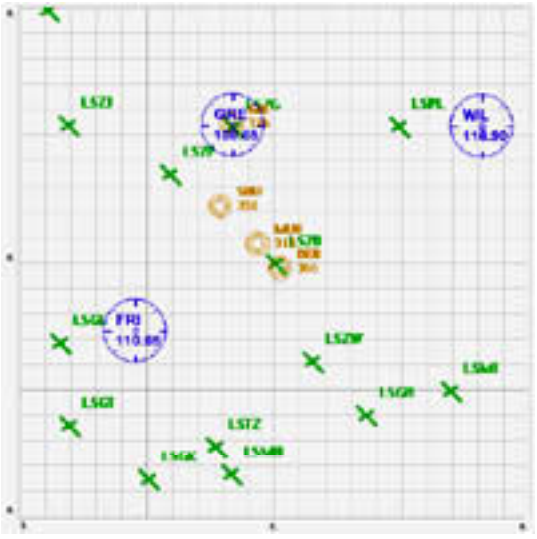
Just below the zoom popup, you see an editfield and a button labeled "Center". To center the display of the MFD on a given (loaded) airport, enter the ICAO in the edit field and hit "Center". Now, the map displays the airport and all nav aids in the vicinity (depending on the zoom level and the selected display options).

STEP 2 : Centering the display

For our tutorial plan, we plan an IFR flight from Bern-Belp (LSZB) to Zürich-Kloten (LSZH) in Switzerland.

Enter "LSZB" into the empty editfield just above the center button. Hit the button and wait a moment. PATHy now searches all airports and nav aids in the vicinity of LSZB and draws the map in the MFD.

Playing with the controls
Now that LSZB is centered on our map, we can look for near nav aids that we want to use for our navigation. To the right, you see a picture of how your map should look now.



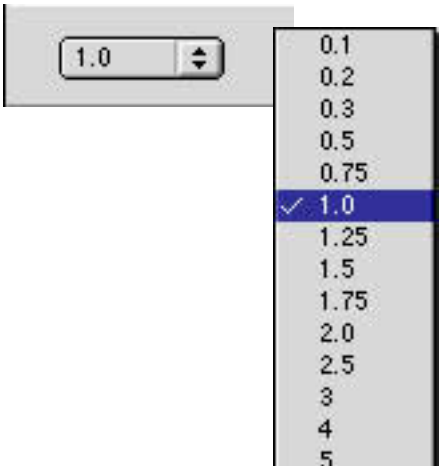
The airports are green, the VORs blue and the NDBs are in dark yellow. ILS are drawn in red.

You can turn off the grid, if you want.

The x and y axis are labeled with the latitude and longitude values, according to the zoom level you selected.

By centering the display on a given airport, you can easily read out the coordinates for the (first runway of the) airport.

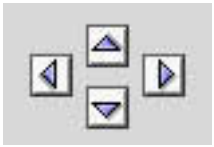
Zooming
To zoom the map in or out, you select the range in degrees the map shall display. You can zoom in to 0.1 degrees (per 500 pixel) and up to 180 degrees. The smaller the value, the more zoomed the map appears.



Sometimes the displayed data is overlapping. Then, you simply center on an airport, and zoom in. The ILS data for example, becomes better readable if you zoom in - and the manual route selection will be more accurate.

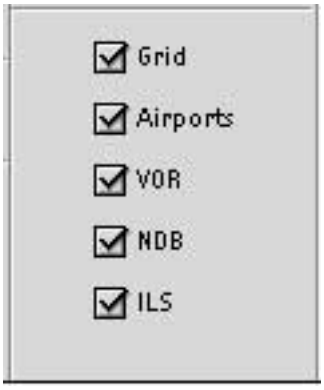
You can zoom in and out at any time during the planning process.

Scrolling
To scroll the map, use the arrow button array to the left of your MFD window, or the arrow keys on your keyboard.



Holding the Shift-Key pressed while clicking on an arrow button or hitting an arrow key will increase the scroll steps by a factor 10.

Configuring the display
You can select what data is getting plotted on your MFD map. Simply select or deselect the appropriate check box in the check box array shown to the right:

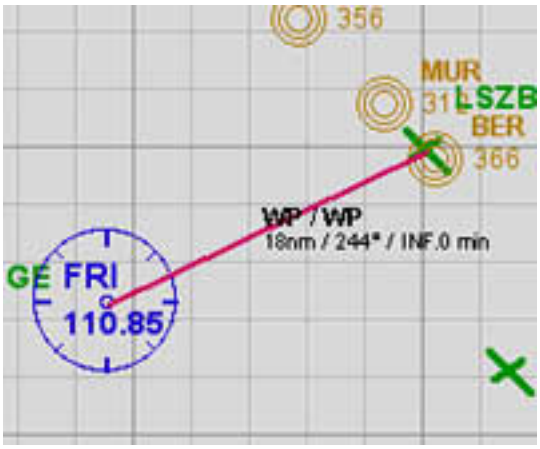


Redrawing speed of the MFD display is greatly improved by deselecting the not required options.

Measuring distances / headings

If you only want to know a few headings and distances, you probably don't want to go through the whole planning process. Then, you simply

- center the map on the airport of your choice
- click on the first leg point and hold the mouse
- drag the mouse pointer to the leg end point and
- release the mouse button



Now PATHy draws the line, calculates heading and distance, and - if you have supplied an airspeed for the leg - the estimated leg time. Scrolling or zooming the map will delete the line.

This is an easy way to get some basic informations from the airport and nav data set.

Planning a flight

A flight plan serves the purpose to know from where via what legs you plan to receive the destination airport. PATHy facilitates this process.

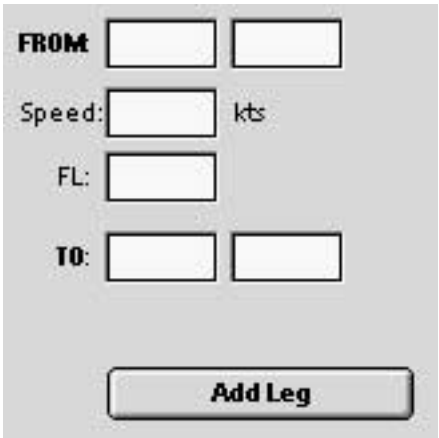
In IFR flights, you will fly from nav aid to navaid - in VFR flights you will fly based on the topography. If you need realism, then you need to buy real maps and plan the flight based on this data. PATHy displays only data that is relevant to (XP) flight simming.

Planning a flight in PATHy always follows the same sequence of tasks: First, you "file" the flight by supplying the trip name, PIC, aircraft and come detail data like the proposed departure time and average fuel consumption.

Once this data is entered in the FlightPlan window, you begin to plan the legs.

Ok, we now know how to center the map and how to zoom and scroll, and we have filed our flight in the FlightPlan window.

Let's go on and plan our first leg. Adding a leg can be done either manually (drawing the leg), or by "jumping" from nav aid to nav aid. Our first flight is an IFR flight, so we use the "jump" method. The "draw" method is explained in the VFR chapter.



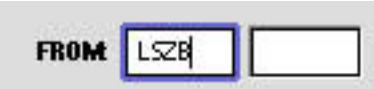
From airport to airport

Note the blank edit fields in the middle of the lower part of the MFD window. There are four rows:

The FROM row with two fields
the leg speed
the leg flight level
the TO row with two fields

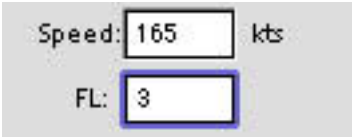
Step 3 - The first leg

We start from LSZB, Bern-Belp. Enter the departure ICAO four letter ID into the first field of the first row. Hit “Tab” twice (skip the second field in the first row).



Enter the leg speed (here 165 kts) + hit tab

Enter the flight level (here 3 (3000) feet) + hit tab twice
(skipping the second TO field, and landing in the first one, you’ll see later why it works that way...)



Now that you are in the first field of the TO row, enter our first leg end point - LSPL. Hit “Tab” and your display should now look like the picture to the right:

PATHy draws a line between the start and end point of the leg, and displays the departure and arrival ICAO code, the distance, estimated leg time and heading (from leg 1).

The leg is not yet fixed. If you scroll or zoom the map, the path will be discarded, and you have to tab through the from and to fields again.

Fixing/Adding the leg

If you are pleased with the path that is drawn in the MFD map, you simply hit the “Add Leg” button. This adds the displayed leg to the flight plan.

If you don’t hit this button, the next redraw of the map will erase the displayed path.

Once the leg has been added, the data box is drawn in a lighter gray, and the path now is drawn permanently and scrolls along with the map.

In the same time, the leg data appears in the “Flight Plan” window.

Double clicking a line of the flight plan listbox brings up the detail data window for this leg. There you can see the raw values of lat/lon, heading, distance, speed, leg time etc.

At the bottom of the FlightPlan window, you find four fields showing the totals of the various values: total trip time, distance and fuel consumption as well as the average speed.

So, this is the standard airport-to-airport leg creation. Let's move on with using a VOR as a leg point.

Using VOR and NDB

Using VOR and NDB navaids as leg start or endpoints is not different from using airports as leg points. Only the way how you enter the identifying code is different.

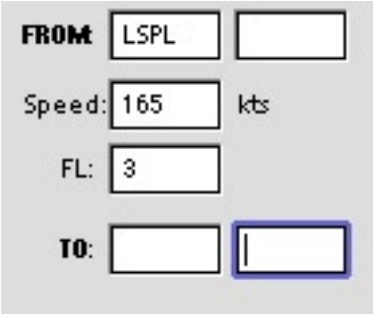
Because VOR and NDB identifiers are not unique, you need to tell PATHy more about the navaid. That's why the From and To lines have two fields each.

To point PATHy to the correct navaid, you need to supply the frequency and the identifier code.

> Enter the frequency into the first field,
> the identifier into the second field.

Step 4 - The second leg - towards a VOR

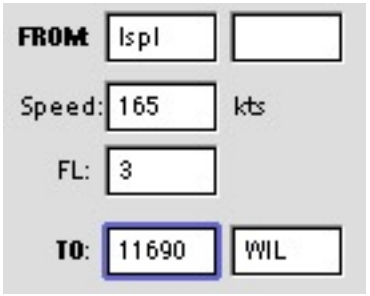
So, in our example, we want to proceed from LSPL towards the Willisau VOR at the frequency 116.90.



As you can see from the picture to the right, the last leg end point is already filled in the FROM field, speed and FL are kept until you change them manually.

The cursor is already in the second TO field, ready for input.

Enter the VOR name "WIL" (not case sensitive) and tab out - now you're in the first TO field, enter 11690 (116.90 without the dot) and hit tab key again.



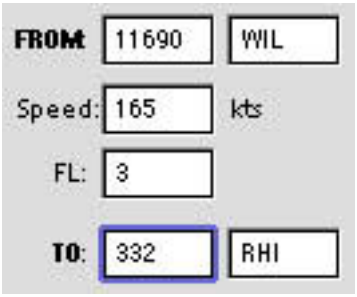
Tabbing out of the first FROM or TO field always inits the calculation of the leg points, and the display of the leg data.

Use the mouse to move out of the two "hot" fields, without activating the sometimes lengthy search.

PC USERS: on the win32 platform, there is one more button, labeled "Check legs". Tabbing out of the fields has no function on the PC, so, you fill in all required fields and hit check legs. If you are satisfied with the displayed legs, you hit "Add leg" just like the Mac users.

NDBs are treated like VORs:

Frequency goes into the FIRST from/to field
Name goes into the SECOND from/to field



BUT, you must enter the name (ID) before tabbing out of the first (frequency) field - with only the ID or the frequency alone, PATHy can't find the navaid.

Step 6 - Towards an NDB

So, in our third leg, we navigate from WIL 116.90 towards Rheinfelden RHI 332.

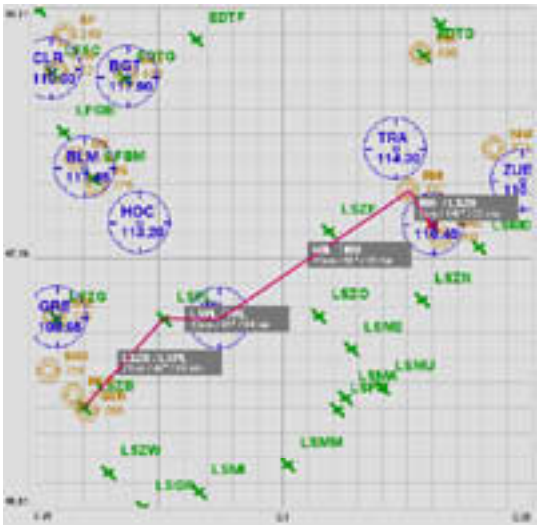
WIL 11690 is already filled into the FROM fields and the cursor is in the second TO field. Simply enter "RHI", tab, "332" and tab.

Our third leg is displayed. If you like it the way it is, hit "Add leg" to fix it. Else simply change the FROM and/or TO fields and tab out again to draw an other path. Scrolling the map before the leg is fixed, will erase all the lines.

Step 7 - Arrival airport

The last leg leads from RHI 332 NDB directly to LSZH, Zürich Kloten. Since LSZH has a VOR placed on the airport, you could choose the VOR as the endpoint. Here, we chose the airport itself.

RHI 332 is filled into the FROM fields, and the cursor is in the second TO field. Hit "Tab" and enter "LSZH". Hit Tab again - and fix this last leg.



Well done. Now you have a detailed plan to fly from LSZB to LSZH using airports and navaids.

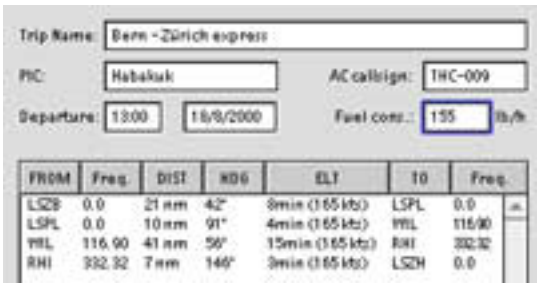
Zoom out to 1.5° view, and your flight plan should look like this:

You can now print the map by hitting the "Print" button.

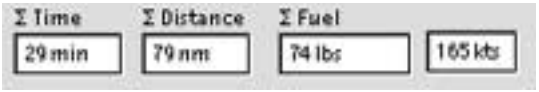
Adding legs

As long as a leg's data is displayed above a dark grey box, the leg is not fixed. This gives you the chance to change your mind on the last leg definition.

Once you are satisfied with the drawn leg (and it's detail data), you hit the "Add leg" button below the entry fields. This will add the leg data to the internal leg array, and display the leg data in the flight plan window.



Now that we have planned the whole flight from LSZB to LSZH, you can get the summary flight data from the fields below the flight plan listbox in the FlighPlan window.



As you can see, the flight from LSZB to LSZH, with cruise speed 165kts, 3000ft and an average fuel consumption of 156 lb/h leads over 79nm, and will take us about 29 minutes and we will spend 74 lb fuel.

To discard the whole flight plan and start all over again, hit the "New Plan" button on the right MFD window side.

Printing the MFD

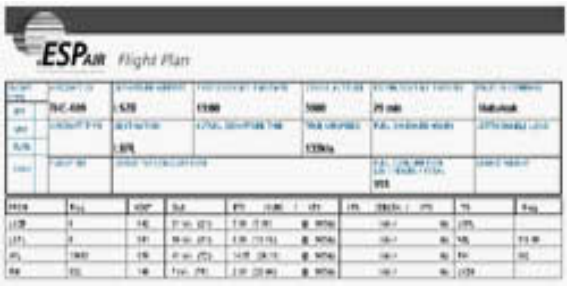
Once you have your flight planned, you may want to print the map displayed in the MFD. Simply zoom in/out until you can see the whole flight path, and hit the "Print" button in the MFD window.

Now you get through the standard PrinterSetup dialogs. In the appearing window, select the page setup and proceed, select the number of copies and proceed. You should now get a usable map for your flight. In conjunction with the tabulated flight plan, your situational awareness will increase tremendously...

PATHy automatically resizes the output to fit on the page. As PATHy's MFD map is square, it doesn't matter if you select landscape or portrait...

Printing the flight plan

To print the flight plan in a tabulated form, you go to the FlightPlan window, and hit the "Print Plan" button. This brings up a preview of the flight plan as it will be printed (excluding the logo).



If what you see is ok to print, hit the Print button in the preview window. This will direct you to the standard PrinterSetup dialoges. Select page setup (landscape) and as many copies as you like.

Saving the flight plan

In some situations you may want to save the flight plan data. dESPair hub commanders and pilots plan many flights and share the plans with each other - be it for a guided tour over nice scenery or be it a SOAS undercover mission...

To save the flightplan data, go to the FlightPlan window and select the "Save as text" button. The default file name is built from the trip name you supplied. The plans end with the extension .flp for easy detection.

The next chapter deals with waypoint leg planning. This is required if you want to create a VFR flight plan, and cannot rely on (many) navaids. Read on...

Working with Maps

PATHy can use any 500*500 pixel picture that represents 1* 1 degree of any area of the world as an underlying map in the MFD.

You can scan and resize road maps, maps from online map sites, or you can use MapShooter 1.0, which comes with your PATHy download package.

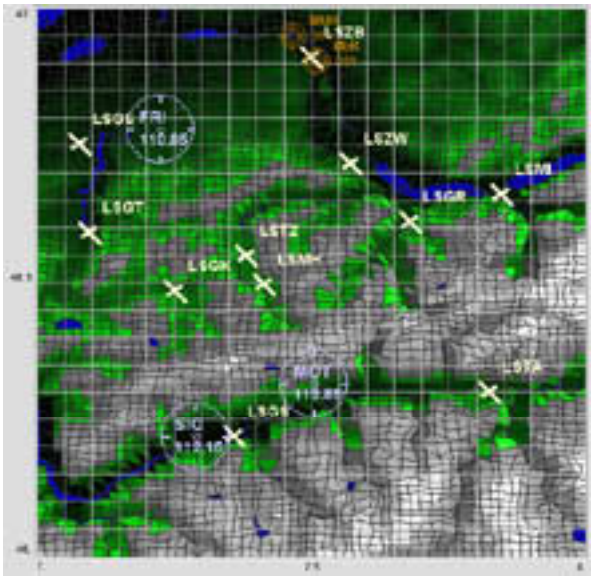
MapShooter can (batch) process any env file - the scenery files that are freely available for X-Plane. MapShooter loads the env grid data, draws the polygon map and shades the map altitude related.

With only a few mouse clicks, you can produce tons of pretty useful maps to be used in PATHy.

The maps need to be named exactly like the env files, in the format:

+-Lat-+Lon.pct (e.g. +046+007.pct, +032-121.pct etc.)

MapShooter names the map correctly, so you don't need to bother about that.



To load one of those 1*1° map pictures into the MFD display, hit the "Load Map" button in the MFD window. Select the proper file and notice that PATHy not only draws the map, but also displays the proper airports and navaids.

Scrolling is not yet usefully implemented (sorry, this is tricky stuff). But you can simply reload the adjacent map to "scroll" in 1 degree steps.

You can think of those labeled pictures as "bookmarks" for a certain area. If you want to fly around Bern, Startup PATHy and load the +0046+007 picture map - PATHy will automatically load and display the proper airports and navaids.

If you have QuickTime (Quicktime for windows) installed, you should be able to load maps from almost any important picture format. On the Mac, you can use any Quicktime formats, like Pict, JPG, GIF, windows Bitmap, tiff, png, pdf and many more. I suggest you work with JPGs, as they allow for good compression with controllable quality.

If you don't use MapShooter, you can scan and resize any map you want. Just make sure that

a) the lower left corner of the map is at the coordinates stated in the file's name

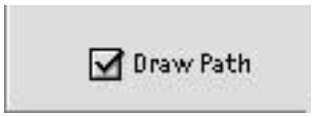
b) the map is 500*500 pixel big and covers exactly 1 by 1 degree

Planning VFR flights

There are many occasions where you can't rely your flight plan on VOR's, NDB's or airports. Imagine you want to lead a wing on a sight seeing tour over your local scenery... how do you describe the flight path?

Easy with PATHy! Here's how:

First, select the "Draw Path" checkbox. If this checkbox is checked, then each leg you draw is instantly converted into a flight leg with the proper coordinates, heading etc.

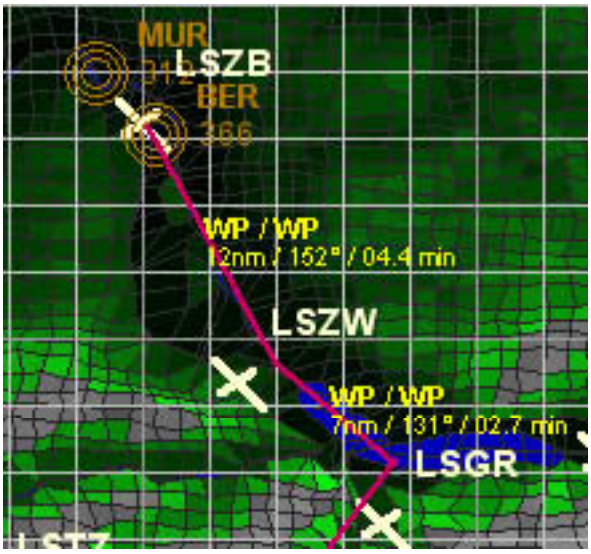


So, you point to the start location, click and hold the button, move the pointer to the end location on the map, and release the button.

The leg will be drawn and the data added to the FlightPlan window listbox.

VFR flight planning on top of the map

You can now use both techniques to define legs: the jump method (from ap/nav to ap/nav) or the "Draw Legs" method (waypoint1 to waypoint 2). The map & DrawLegs feature make it easy to describe a pretty accurate flight path through the scenery. Load a map, and draw the plan while looking at the env topo below. It can't get easier.



In the PATHy 1.0 release, the drawn legs are not matched to any nearby navaids or airports. So, drawing legs does not give you any information about the nearby navaid frequencies.

FROM	Freq.	DIST	HDG	ELT	TO	Freq.
WP0	0.0	11 nm	152°	4min (160 kts)	WP0/2	0.0
WP1	0.0	7 nm	131°	3min (160 kts)	WP1/2	0.0
WP2	0.0	14 nm	217°	6min (160 kts)	WP2/2	0.0
WP3	0.0	10 nm	226°	4min (160 kts)	WP3/2	0.0
WP4	0.0	11 nm	189°	4min (160 kts)	WP4/2	0.0
WP5	0.0	12 nm	249°	5min (160 kts)	WP5/2	0.0
WP6	0.0	6 nm	329°	2min (160 kts)	WP6/2	0.0
WP7	0.0	12 nm	74°	5min (160 kts)	WP7/2	0.0

Downloads / Updates

PATHy is being worked on. Expect a couple of bugfixes, and updates that can deal with changed airport/navaid data file structure.

As a registered user, you will be notified of new releases of PATHy or MapShooter.

The generic download page of PATHy is through the Habakuk Soft homepage:

http://www.habakuk.ch/pathy/

Alternate download site is the dESPair airline pilot tools pages, where PATHy releases are announced:

http://www.habakuk.ch/despair/staff/ptools/pathy/

Mac versions are stuffit archives. Use stuffit expander 5.5 to expand the archive.

PC versions are ZIPed - use any available windows unzipper to extract the files.

You are not allowed to redistribute PATHy. Please direct any interested soul to the above link, so he can get the latest version of PATHy.

BEFORE USING PATHy, READ THE LICENCE AGREEMENT!

Support

In case of troubles with PATHy, you can contact the developer directly at habakuk@g-point.com.

If you have any problems with PATHy, please gather the following data, before contacting the support address:

- Detailed description of the problem
- Steps to reproduce
- If applicable, screenshots of the error messages
- Operating System (version)
- exact PATHy version number

You send the above data along with a copy of your PATHy preferences file (named pathyprefs.ptp, in the PATHy root folder) to the support address:

support@g-point.com

This helps me greatly finding out what is going wrong.

Feedback / Feature requests / Bug reports

Future PATHy development greatly depends on the feedback and feature requests the users send to us.

As a registered user, you have a direct line to the developer. If you have any idea on how PATHy could get even more useful, please don't hesitate and communicate those ideas!

As the CEO of dESPair international airlines, I can assure you that PATHy will be stress tested by the most experienced pilots in XP realms. The daily use in our airline and your precious feedback will be a great help in making PATHy better with each release.

Special thanks

PATHy would not have come true if I had not the help of Michel Verheughe (Capt. Sir Skybuster) for the navigation calculations, and for the occasional motivation kicks... many thanks goes to Timothy G. Hill (Capt. Sir Troll) for his careful testing and constructive feedback.

Lotsa kuddos to the whole dESPair crew. They participate in a very special online role playing game, and help making a dream of mine come true. dESPair is the most exciting, entertaining and socially educating group I ever belonged to - many thanks to all of you!

And finally, thanks to all the nameless coworkers that compiled the huge X-Plane airport and navaid data files. There went countless hours of development from hundreds of participant into this collection of data. Without that data set, PATHy would not be of any use.

Have fun.
Roland

aka Capt. Sir Habakuk
CEO HabakukSoftware
CEO dESPair international airline