Flight Plan
&
Virtual Navigator "Boris"

Route:		FLIGHTPLAN			DATE:
ID	FREQ	CRS	DIST	LAT	LON

TOTAL DIST: KM   ETE: H

NOTES:
VIRTUAL NAVIGATOR HANDLES
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Flight Plan

The flight plan can load a flight plan in the .fms format and display it along with course, distance and frequency information.

These sites (among others) can be used to generate .fms routes:
http://www.simroutes.com/fb2/ParseRoute.aspx
http://www.gkpnet.net/x-plane/Resources/xpwp.php
http://x-plane.indexf1.hu/fms/
All .fms flight plans must be stored in \Output\FMS plans

To load an .fms flight plan, click on the flight plan. This gives the flight plan "focus", meaning that all key strokes will be sent to the flight plan and not X-Plane. The route entry field will be underlined to indicate that the flight plan has focus.

Route: UHMM-UEEE

You can now use your real keyboard to enter the name of the route. It is case insensitive and must not include the ending (.fms). Press enter to load the plan.

To give focus back to X-Plane, click outside of the flight plan. Then X-Plane will receive all keystrokes again.

ID	FREQ	CRS	DIST	LAT	LON
UHMM		000	0.0	N59° 54`36	E150° 43`00
TNLIR		282	268.2	N60° 18`24	E145° 56`17
OMAVI		290	163.6	N60° 46`36	E143° 05`59
BAGUN		287	148.1	N61° 09`00	E140° 27`47
GILUN		285	260.2	N61° 40`54	E135° 41`41
KUNIK		281	109.4	N61° 51`11	E133° 38`42
ITVIN		279	114.4	N62° 00`06	E131° 28`47
UEEE		277	89.6	N62° 05`35	E129° 46`14

The course is magnetic and the distance is in KM.
When you click on the ident of the waypoint, you can stroke it to indicate that you passed that waypoint.

TOTAL DIST: 1153.6KM   ETE: 2:33H

On the bottom, you can see the total length of the route. Use it for the load manager to calculate the fuel!

Virtual Navigator "Boris"

You had the feeling your copilot and navigator were sleeping while you had to do all their work on your own?
Then we got good news: We just hired Boris, your new virtual navigator. He is able to handle to flight plan, the radios and the NCNS (non-cooperative navigation system) without falling asleep.
The lower row is used to set the tasks for Boris. Simply click on a mark to change it's state.

VIRTUAL NAVIGATOR HANDLES
FLIGHTPLAN ☒   RADIOS ☒   NCNS ☒   GPS ☒

Please mind that a flight plan must be loaded for Boris or he won't know where you want to fly to!

Handle Flight Plan

Boris can automatically take care of the flightplan. He can determine his position to decide if we've overflown the next waypoint.
He has four means to do determine his position:

1. GPS

*When the AN-24 is equipped with a GPS or Garmin, Boris uses it to determine the current position.*
You need to enter your next waypoint into the GPS and Boris will mark the current waypoint as overflown if you are within 10 KM of the waypoint and the distance is increasing.

2. DME

If no GPS is available, Boris uses the DME to determine his position. He can use it for VORs, NDBs and fixes. However, there are some restrictions:
The waypoints must be all on the same radial (+-1°) to determine their position.
Take a look at the scheme below. The black line is our route, the red points are waypoints.

VOR 2
VOR 1
✓ Can Determine Position
✗ Can't Determine Position
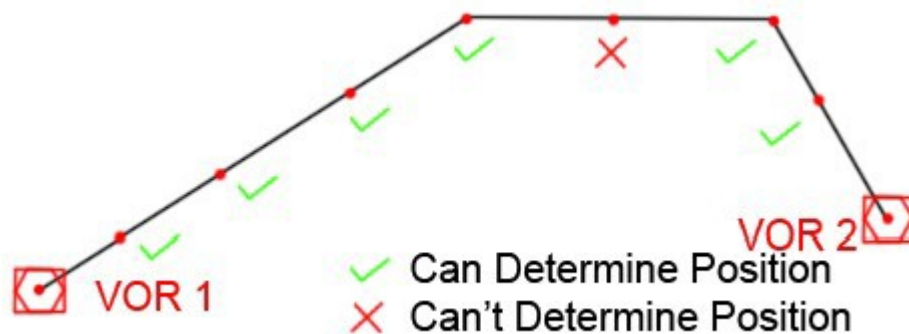
*Boris can't determine if we overfly the waypoint with the **X**, because it not on the same radial (+-1°) as the other waypoints.*
Furthermore, Boris uses only the previous and the next radio station to determine his position.
VORs and NDBs are treated as radio stations. This means, that when we overfly an NDB and no
VOR/DME is following, Boris can't mark the following waypoints as passed.

VOR   NDB

Of course Boris needs a valid DME signal for this mode.
He'll switch only to the next waypoint if you are within 10 KM of the calculated DME distance.

3. VOR/NDB needles
If Boris can neither use a GPS nor a DME, then he'll watch the needles of his radio compass.
If the needle swings around 180°, then we just overfly the radio station. Boris can use this mode for
VOR stations and NDB stations.

4. NCNS
No GPS, no DME, no VOR or NDB? Boris last resort will be the NCNS then. As soon as the north needle of the NCNS displays the distance to the next waypoint, Boris will mark the current waypoint as overflown.
If we got nothing of the above, then even Boris will be lost. He won't cheat, he can only use the methods available. If nothing is available, then you are on your own.
On the bottom, you can see Boris' notes. He'll write down when to turn to the next course and which source he uses.

NOTES: Turn to 349 in 97.9 km (DME)

If Boris forgets to switch to the next waypoint, you can still manually click the ident of the waypoints in the flight plan to set the right waypoint.

Handle Radios
Boris can automatically handle the radios, including VOR, DME and NDB.
He'll always switch on the previous and the next radio station of the route.
The previous radio station will be tuned on NAV 2 or ADF 2 and the next radio station will be tuned on NAV 1 or ADF 1.
The DME will be tuned to the next radio station, except if it get's no signal, then it will be set to the previous radio station.
The KPPM source will be set to NAV 1, in the case that NAV 1 has no signal, it will be set to NAV 2.

Handle NCNS

If you let Boris handle the NCNS, he can operate the whole device automatically.

When switching to the next waypoint, the NCNS needles will be set to a precalculated values,

taking the turn into account.

It is highly recommended to enable "handle flightplan" for this mode to improve NCNS accuracy.

Handle GPS

This field is only visible if either the GPS or Garmin are enabled in the option. Boris will simply enter the next waypoint into the GPS.

FAQ

Q: Why does Boris set the NCNS to ANU mode?

A: The ANU mode is used if the DISS is not available. You probably forgot to turn on the radar. The switch is located on the overhead panel.

Q: Boris handles the NCNS, but when I follow the NCNS, I drift off from the course

A: The NCNS relies on the GDI (gyro direction indicator), therefore it is very important to have the GDI precisely aligned.

Even a 1° error can cause a significant drift over a long time. It is highly recommended to use VOR/SHORAN/NDB in your route to improve the NCNS accuracy.

If no radio station is used, then realign the GDI with magnetic north only shortly before each turn and then leave it as it is. This will make the An-24 fly a great circle route and you'll stay quite well on the route.

Q: Boris should handle the radios/NCNS, but why doesn't he set them?

A: Boris will set these devices shortly after takeoff

Q: Boris is controlling the NCNS, but why does he set it to land although I'm over water?

A: Sometimes the radar signals are reflected over water as good as over land. Boris knows that and sets the switch to the best mode. Trust him, he's correct ;-)

The font used for the notes is VincHand. It is used with permission from Joe Bob.

Check out his other fonts here:

http://www.joebob.nl/