BlackBox flightlogger

User's Manual

www.utr-online.com/blackbox

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Applies to: V2.9.41

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This application was programmed by Jasper Bussemaker.

Go to www.utr-online.com/contact to contact me.

The BlackBox flightlogger can also download and install the XPUIPC module. You as the user are only allowed to use this XPUIPC module for your own usage. You are not allowed to redistribute it. All copyrights go to Torsten.

Warranty

The BlackBox comes without any warranty. I am not liable for the application not working or any kind of damage done to your or other people's system or PC. The application is written in the Visual Basic language on a Windows Vista pc and should be working on all Windows NT platform PC's (including XP, Vista and Windows 7).

Also no warranty is included in the pictures in this manual, if the application differs a bit from the pictures in this manual, nothing especially important changed in the application.

Introduction

What is the BlackBox flightlogger?

The BlackBox flightlogger is an application which logs your flight in Microsoft Flight Simulator or X-Plane. It uses [FSUIPC](#) or XPUIPC (an interface module) and thus is compatible with FS98, FS2000, FS2002, FS2004, FSX and X-Plane (read the X-Plane part on the next page for X-Plane operations). It logs your flight and saves it to disk. At the end of your flight you can convert the logged data to the format of the well known Google Earth. So this means you can review your flight in 3D in Google Earth.

It is also possible to log your flight in animation mode; this makes it possible to review your flight in full animation (even with other traffic!) See Logging in animation mode for more information.

System requirements

- Windows 98 or higher (not such a big deal I think…)
- An installed version of Microsoft Flight Simulator 98 or higher or X-Plane
- [FSUIPC](#) version 3.40 or later which is installed
- [XPUIPC](#) (for X-Plane) which is installed; read the X-Plane part on the next page
- The latest version of [Google Earth](#) installed on your PC
- Some hardware like a display and a mouse (keyboard not needed :-P)
- VB 6.0 runtime objects, on XP they are present, else download them [here](#)

Installing the BlackBox

Unzip the downloaded package (BlackBoxSetup.zip) and run the installed inside (BlackBoxSetup.exe). Follow the on screen instructions and the BlackBox is ready for use!

In the package of the BlackBox two big (high resolution) icons are placed. Go to the map of the BlackBox (Default: C:\Program Files\BlackBox) and locate Logo.png and Logo.ico. I included them for use with for example [object dock](#). When you run over an icon, it gets really blurred. Now you can set one of the two Logo files to display and it will show up nice.

The BlackBox will automatically update itself when a new version is released. Depending on the settings, it will download and install a new version if it is a minor update. If "Download and install all available updates" is unchecked, the BlackBox will only download and install major updates. You can also turn the updating completely off, which is not recommended.

X-Plane & the BlackBox

It is possible to use the BlackBox with X-Plane! The only thing you have to do is to configure the BlackBox flightlogger for automatic updating of the XPUIPC (FSUIPC for X-Plane) module.

There are two ways you can do this:
- During the first time the BlackBox flightlogger is started.
- On the options screen.

You can also keep the XPUIPC module up-to-date by downloading it from the official website. If you download it from there, it will also include the SDK and some other goodies. But keep in mind that the XPUIPC may get outdated.

First start
When you start the BlackBox flightlogger for the first time, it will ask you if you want to use the BlackBox with X-Plane, click Yes here. Now read the instructions and locate the X-Plane plugins folder (by opening any file inside that folder). In this folder the XPUIPC will be installed and kept up-to-date. When you located it the BlackBox will automatically download and install the XPUIPC module.

On the options screen
If you clicked No on the first start of the BlackBox or for instance your X-Plane folder has changed, you can also set up the automatic updating via the Options screen.

To do this, first click Options…

Now check the checkbox which says "Enable XPUIPC downloading and installing" and click Browse… next to the textbox above it.
Now read the instructions and locate the X-Plane plugins folder.

The BlackBox will now automatically download install the XPUIPC module and you are ready to fly with X-Plane!

Using the BlackBox flightlogger

Using the BlackBox is easy:
- Start your flight simulator and prepare your flight.
- Start the BlackBox flightlogger, minimize it and click Yes. The logo will now show up in the system tray.
- Fly!!
- When you completed your flight, shut down your FS. The BlackBox will now automatically show up (if you do not wish to shut down your FS, just click the BlackBox logo in the system tray).
- Click "View flight in Google Earth" and enter a name!

For more detailed information and a lot more functions, read the rest of the manual.

Note: When you start the BlackBox flightlogger for the first time, it will ask you if you want to use the BlackBox with X-Plane (another flight simulator). Read the X-Plane & the BlackBox part if you want to.
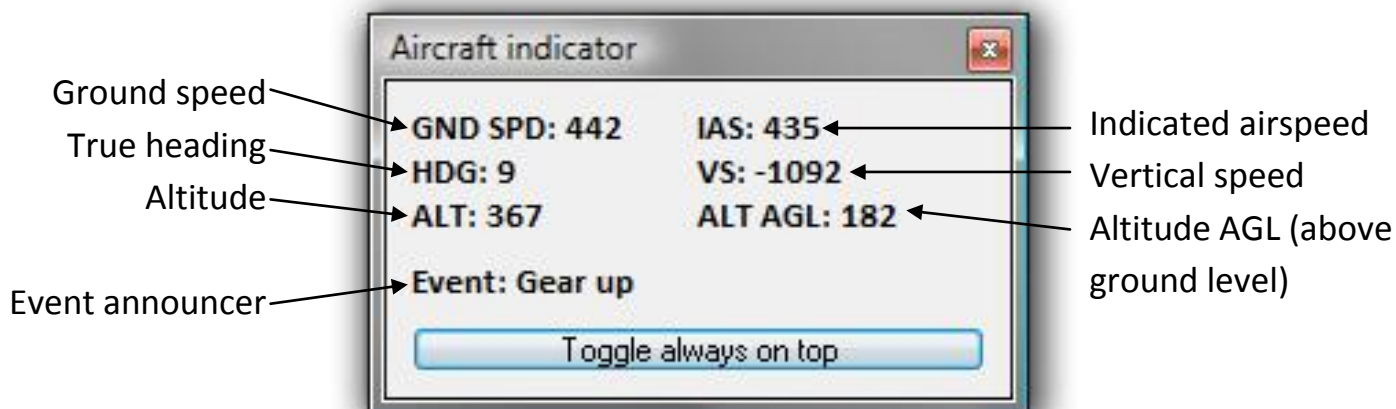
The main application
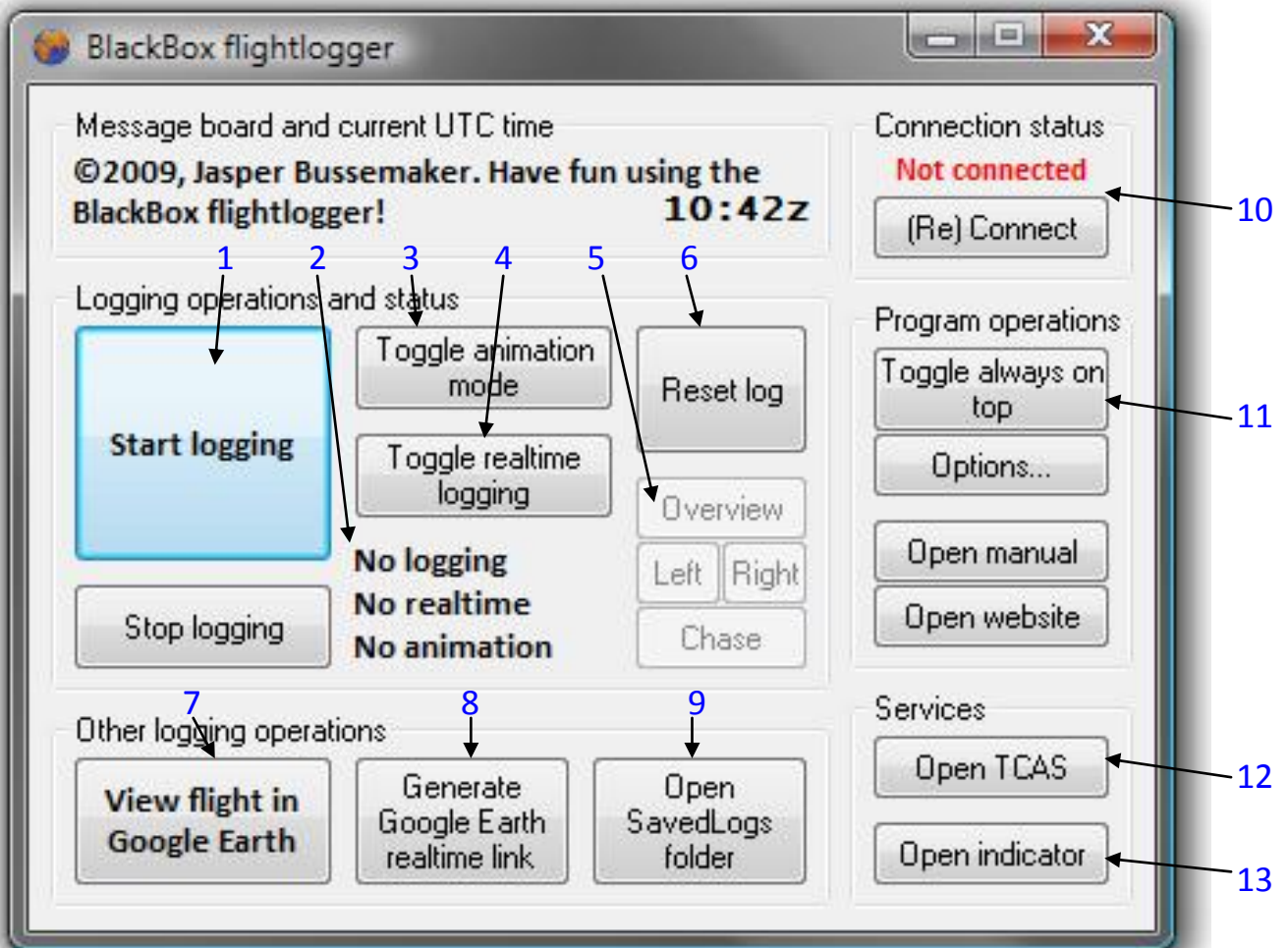
1. Click this button to start the logging. Before being able to start the realtime or animation logging, first click this button. Click the button which says "Stop logging" to stop all the logging. Note that the BlackBox must be connected to FSUIPC or XPUIPC before being able to start the logging.
2. These are the logging indicators. When the upper one gets green, this indicates that the previous timestep (1 second) was saved to the log file.
3. Click this to toggle the animation mode. If the animation mode is enabled, you will be able to see an animation of your flight afterwards. Do make sure your whole flight is logged in animation mode. For more information, see Logging in animation mode.

4. Click this to toggle realtime logging. If realtime logging is enabled, you will be able to see your plane moving in realtime in Google Earth. See Realtime Flightlogging for more information.

5. These four buttons handle the view in the chase airplane mode of the realtime flightlogging. When you log in realtime, you can also enable the Chase View network link, this will then force Google Earth to chase the aircraft. Read more about the different views in the Using the Realtime flightlogging section.

6. Click this button to reset the flightlog. Note that if the last entry in your flight was made an hour or more ago, the BlackBox will already have reset your flightlog on startup.

7. Click here to view your flight in Google Earth! See Viewing your flight in Google Earth for more information.

8. Before you are able to use the Realtime mode, Google Earth needs two network links. To make the network links, click here. This is only needed once.

9. Click here to open the folder which contains all the saved flight logs.

10. This is the connection indicator. If it is saying Connected, the BlackBox flightlogger is connected to FSUIPC or XPUIPC. To reconnect if this isn't done automatically, click the (Re) Connect button below.

11. Click here to toggle always on top. This will keep the BlackBox flightlogger always on top of other windows.

12. Click here to open the TCAS window. See The TCAS for more information.

13. Click here to open the Aircraft status indicator. See the similar-named section for more information.

The Aircraft status indicator

On the aircraft status indicator various data like the ground speed, heading and altitude AGL (above ground level) is shown. You can even put it on top of other windows.

Ground speed — GND SPD: 442   IAS: 435 — Indicated airspeed
True heading — HDG: 9   VS: -1092 — Vertical speed
Altitude — ALT: 367   ALT AGL: 182 — Altitude AGL (above ground level)
Event announcer — Event: Gear up

Toggle always on top

Open this window by pressing "Open indicator" under services.

The TCAS
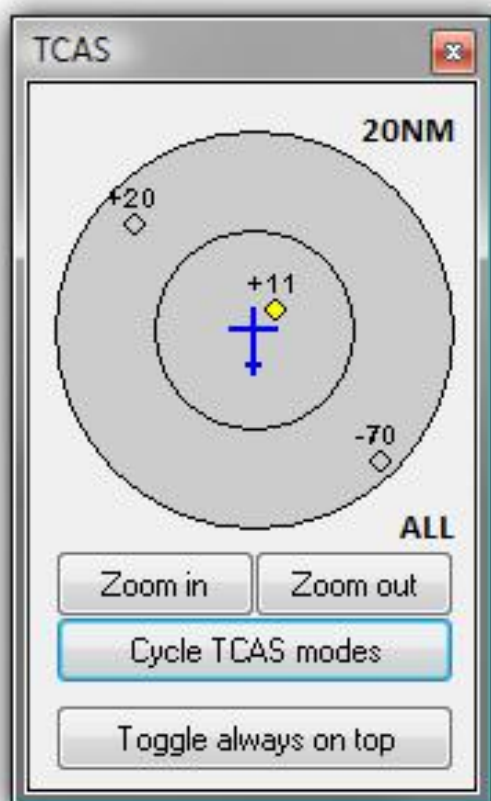
The BlackBox also includes a TCAS (Traffic Collision Avoidance System). This TCAS only generates TA's (Traffic Advisories), but can still be handy or fun to use or look at. TCAS is a system developed to avoid mid air collisions, that is why the TCAS only shows airborne aircraft (aircraft which are in the air).

Open the TCAS by pressing "Open TCAS".

Use the "Cycle TCAS modes" key to cycle trough the available TCAS modes (see table below).

TCAS

20NM
+20
+11
-70
ALL
Zoom in   Zoom out
Cycle TCAS modes
Toggle always on top

Use the Zoom in and Zoom out keys to zoom in and out trough the available zooms: 5NM, 10NM, 15NM, 20NM and 40NM. The outer range ring corresponds with the range selected, the inner with the half of it.

These are the available TCAS modes:
- OFF, no TCAS data will be shown.
- ABV (above), all other aircraft in the range from -2000ft (relative to your aircraft) to +9900ft will be shown.
- BLW (below), all other aircraft in the range from -9900ft to +2000ft will be shown.
- NRM (normal), all other aircraft in the range from -2000ft to +2000ft will be shown.
- ALL, all other aircraft within the selected TCAS range will be shown.

An aircraft will be shown as a diamond on the screen; it can have various color codes:
- Green (unfilled) (blue in GE (Google Earth)), not near you.
- White (yellow in GE), the aircraft is within a range of +-2000ft and 6NM.
- Yellow (orange in GE), the aircraft is within a range of +-1200ft and 4NM. Try to discuss with the other aircraft or ATC if they don't notice you.
- Red (red in GE too), the aircraft is within a range of +-500ft and 2NM. The aircraft opposes a serious tread for you, correct your aircraft now!

Above all the diamonds (aircrafts) are a '+' or a '-' and two digits. This indicated the altitude relative to your aircraft. The digits are the altitude in hundreds of feet. For example, -20 means 2000ft below you. And in that same matter, +01 means 100ft above you and -84 means 8400ft below you.

When you are running in realtime mode, traffic can also be displayed. To do that, switch the TCAS on (set the TCAS in a mode which is not OFF). You will see all the aircraft within the selected range with their callsign and relative altitude. The predicted paths of these planes have got a color code, see the color codes above. Realtime must be enabled off course, see Realtime flightlogging for more information.

Options

The BlackBox flightlogger has got two types of options. Firstly the general options, secondly the logging parameters which influence the accuracy of the flightlog and some other things.
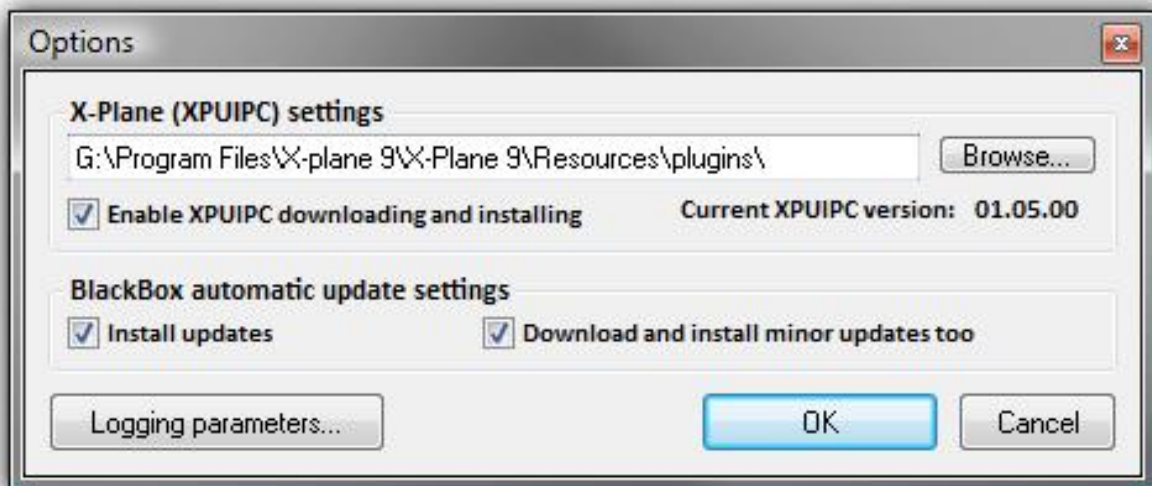
The general options
Bring up this window by clicking "Options…" on the main screen.

The upper part of the window includes options on the downloading and installing of the XPUIPC module. **If you don't own X-Plane or you do not know what X-Plane is, these options should all be left off.**
The path in the textbox is the path to the plugins folder of X-Plane, the folder in which the XPUIPC module will be installed.

The lower part of the window includes an option for the downloading and installing of the BlackBox flightlogger itself. Enable "install updates" to let the BlackBox update itself when a new version becomes available (recommended!). Check the second option to let the BlackBox update itself at all available updates, else the BlackBox will only download important updates.

The logging parameters

Bring up this window by clicking "Logging parameters…" on the Options screen.
Click "Reset" to reset all the values to the default values.

The settings in the left column are about the flightlogging.

 'Heading offset', if the heading changes by this value if you are below 10.000ft,
the BlackBox will log where you are. Unit: degrees.

'Altitude offset', if the altitude changes by this value if you are below 10.000ft,
the BlackBox will log where you are. Unit: feet.

'Vertical speed offset', if the vertical speed changes by this value if you are
below 10.000ft, the BlackBox will log where you are. Unit: ft/m.

'Heading offset abv FL100', same as HDGOffset, but then for if you are above
10.000ft. Unit: degrees.

'Altitude offset abv FL100', same as AltOffset, but then for if you are above
10.000ft. Unit: feet.

'VS offset abv FL100', same as VSOffset, but then for if you are above 10.000ft. Unit: ft/m.

'Check VS above', if the vertical speed is within this value (+ and -), the altitude (change) is being checked for the logging. If the vertical speed if higher or lower than this value, the changes in vertical speed are monitored. Unit: ft/m.

'Localizer intercept %', the localizer display displays the intercept angle from left to right. This is the percentage of this angle of which the localizer is seen as being intercepted. For example if you set this to 99, the localizer is seen as being intercepted when it starts moving. Setting it to 50 results in seeing the localizer as intercepted when the indicator is half way (50%) right (or left) and the middle. It's mind twisting ☺... Unit: 0-99%. If you set it 100 or above, the ILS will always look intercepted, but then you also don't see any sign of ILS interception...

'Glideslope intercept %', same as LocInt, but then with the glide slope instead of the localizer. Unit: 0-100%.

'Ignore ILS below', below this altitude (AGL, above ground level) the ILS intercept (and interception lost) is ignored, else you will get one at every touchdown. Unit: feet.

'Ignore ILS above', above this altitude (AGL, above ground level) the ILS intercept (and list) is ignored, else you will get one while cruising. Unit: feet.

'Ignore ILS above VS', above this vertical speed the ILS interception is ignored, this also applies to the outer, middle and inner markers. Unit: ft/m.

The settings in the right column are about the views in the Realtime flightlogging mode.

'Chase degree offset', this is the offset to the true heading in degrees. Used in chase (view) mode. Unit: degrees.

'Chase tilt', this is the number of degrees which the viewpoint in Google Earth will tilt when chasing the aircraft. 0 is top down, 90 is equal to the ground. Unit: degrees.

'Overview degree offset', this is the offset to the true heading in degrees. Used in overview mode. Unit: degrees.

'Overview tilt', this is the number of degrees which the viewpoint in Google Earth will tilt when in overview mode. 0 is top down, 90 is equal to the ground. Unit: degrees

'Overview range multiplier', the altitude above ground level (AGL) in feet, will be multiplied by this number. The range in Google Earth is in meters. Unit: any valid number.

'Overview range minimum', this is the minimum range when viewing in overview mode. Unit: meters (as defined by Google Earth).

'Ground tilt', this is the number of degrees the viewpoint in Google Earth will tilt when on the ground. Unit: degrees.

'Ground range', this is the range when on ground. Unit: meters (as defined by Google Earth).

'Predicted path multiplier', the predicted flightpath, which is calculated on one second base, is multiplied by this number. Unit: any valid number.

'Pred path TCAS multiplier', this is the same as above, but then for the predicted paths of the aircraft shown in Google Earth as other traffic. Unit: any valid number.

Flight logging

The main feature of the BlackBox flightlogger is to log your flight and to display it in Google Earth.

First off all, we can distinguish three modes:
- Logging
- Logging in animation mode
- Realtime logging

The next sections tell about these three modes.
Note that to enable logging in animation mode and realtime logging, the normal logging must also be enabled. Logging in animation mode and realtime logging can be used at the same time.

Normal flight logging

To log a flight without any fancy things like animations, just do the following:
- Start your flight simulator and prepare your flight.
- Start the BlackBox flightlogger, minimize it and click Yes. The logo will now show up in the system tray.
- Fly!!
- When you completed your flight, shut down your FS. The BlackBox will now automatically show up (if you do not wish to shut down your FS, just click the BlackBox logo in the system tray).
- Click "View flight in Google Earth" and enter a name!

That's how easy it is ☺!

Logging in animation mode

The BlackBox includes the feature to log in animation mode. This means the flight is logged as an animation. Optional the AI/Online traffic is also logged. To log in animation mode, first click "Start logging", then click "Toggle animation mode".
If you also want to see other traffic in your animation, enable the TCAS. This can be done by opening the TCAS window and then putting it on. Note that in

your flight animation, you will only see the aircrafts you will see at the TCAS. So to see the most, set the range at 40NM and the mode to ALL.

However, there are some disadvantages of the animation mode:

- Expect huge file sizes: Ten minutes flight can be 12 MB (So imagine a 12 hours flight…).
- Grabbing the TCAS data from FS takes a long time so data will be left out resulting in a less smooth animation. Solve this by turning of the TCAS.
- Converting the log takes a longer time, because for each second an almost complete log file must be created.

So I recommend you not to log in animation mode with very long flights or flights you fly on a regular base. See viewing your flight in Google Earth for more information on how to review your animation.

Realtime flightlogging

Another great feature is the realtime flightlogging. This makes it possible to see where you are in Google Earth in realtime!

To use this feature, you must run your flight simulator and Google Earth together, so this requires a strong processor and graphics card.

Setting up the Realtime flightlogging

To use the realtime flightlogging, Google Earth needs a so called network link. Before you can use the realtime flightlogging, you must let the BlackBox generate one of those.

Click "Generate Google Earth realtime link", Google Earth will now open.

You will now find two new network links in the temporary places folder:

- BlackBox Realtime Flightpath
- BlackBox Realtime Chase View

The first one contains the flight path and position data. The second one contains the chase view data. If you enable the Chase View network link, Google Earth will chase your aircraft.

Using the Realtime flightlogging

To start the Realtime flightlogging, click "Start logging" and then "Toggle Realtime flightlogging". Now open Google Earth and enable the "BlackBox Realtime Flightpath" network link. Optionally enable the Chase View network link too.

To change the view the Chase View network link generates, click one of the four buttons below the "Reset log" button.

MS Flight Simulator and Google Earth running together (two screen setup):

If the TCAS is on, you will also see other traffic in Google Earth. See The TCAS for the color codes.

Viewing your flight in Google Earth

Off course the best feature of the BlackBox is to view your flight in Google Earth. To do this (after you have logged your flight) click "View flight in Google Earth", enter a name and click OK. Now Google Earth will open (if not opened) and Google Earth will show your flight. You will now see the flightpath and some 'special placemarks' like T/O and T/D. Click on such a placemark to see data about that precise place and time. You will see data like Ground Speed (GS), Indicated Airspeed (IAS) and Vertical Speed (VS).

If you logged your flight in animation mode it is possible to review your flight as an animation!

Deselect the folder of your flightlog in Google Earth. Now enable the folder called Animation. You will now see a slider in the 3D area.

The time and date should initially state the time and date when you started logging (in this case 30 Augustus 2008 at 7:49:29 pm local time). Click the little clock symbol to open the settings window. Set the animation speed to the lowest and enable 'Restrict time to selected folder' (not sure if this is the right translation, because I have the Dutch version. In Dutch is it 'Tijd beperken tot geselecteerde map'). Click OK to close the settings window.
To start the animation, click the play button (the tilted triangle).

IvAc traffic in Google Earth

It is not really a very useful function, but it can be funny if you have no traffic temporary. It is also no particular function, it is more like a setup.
Since version 2, the version which gave the BlackBox the TCAS function, it is possible to view IvAc traffic in Google Earth. I will explain now how to do this.

What do you need?

These are the applications you need apart from FS, [FSUIPC](#), the BlackBox and [Google Earth](#):
- IvAc, virtual ATC client from the IVAO network.
- IvAi, IVAO interface.
- IvAp, virtual Pilot client from the IVAO network.
These three applications can be downloaded from the [IVAO software development website](#), you do need an IVAO account to download these ones.

The setup

1. The first thing you start (after installing it) is IvAi - IVAO Interface. Start it and click the button Start. Now minimize it, we don't need it anymore.
2. Now start IvAc and click the button connect. Now fill in all the forms and do it the same way as you always do. The only thing you change is the Server Address, change this to 'localhost' (without the quotes) or to the IP address of the computer IvAi is running on in case of a network setup. It should now look as the screen below:
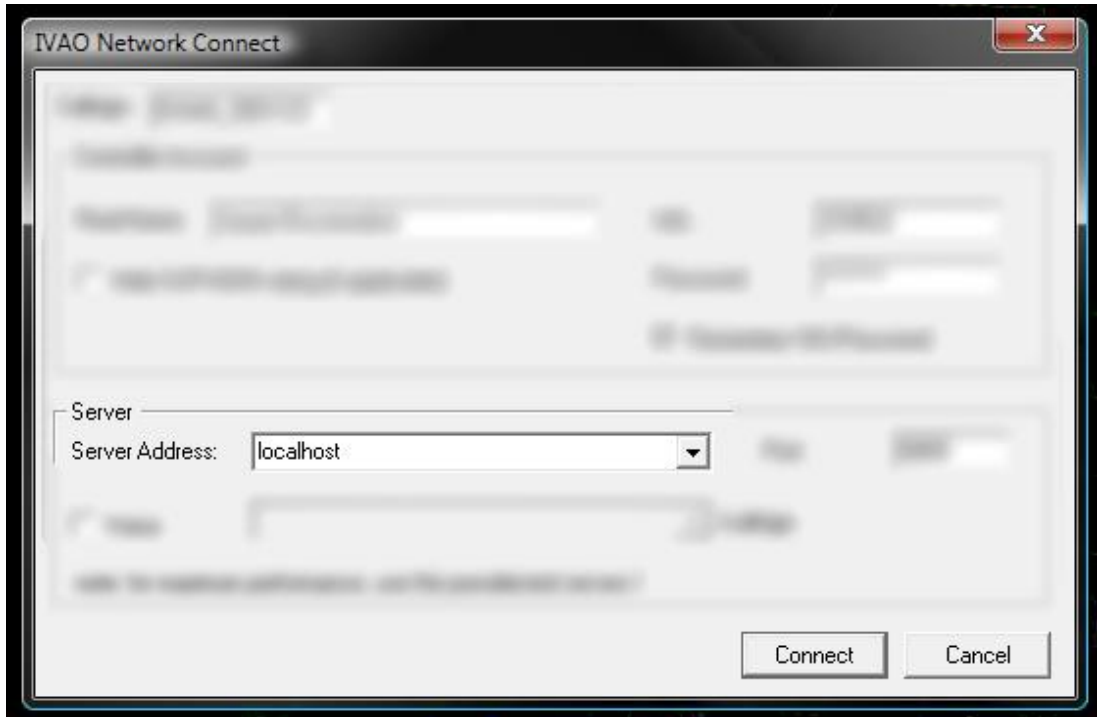
Now click Connect. It may be good to login as an observer the first time you do this setup.

3. Now before we start FS, start IvAp - Configuration from the start menu. Go to the General tab and make sure populate TCAS table under FSUIPC is checked. See below.
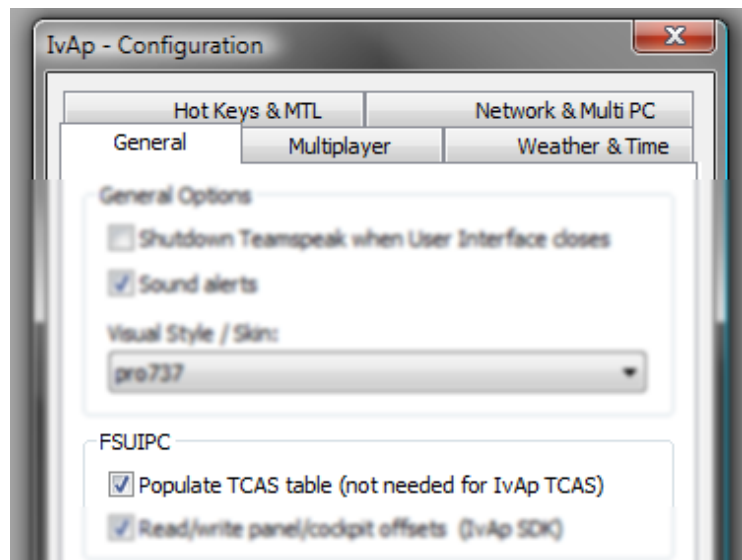

Now click OK to quit IvAp - Configuration.

4. Start FS now. When started select Create a flight and select you airport. I recommend you to put the aircraft on the airport where you are controlling at, or in the middle of the FIR in case you are a CTR controller.

The aircraft doesn't matter as you are not going to fly and no one is going to see you standing there online.

Now click start flight.

5. When FS has loaded, start IvAp by clicking Start IvAp in the IVAO menu.

6. Wait for IvAp to start. Now click the connect button (the two dots below CONN in the lower right corner of IvAp). Now the settings (except the user ID and password) don't matter because no one will see you online. The only settings that does matter, is the server; Insert just like IvAc 'localhost' (without the quotes) in here. In the case of a network setup, insert instead of localhost the IP address of the computer on which IvAi is running. The setup should be like the screenshot below:
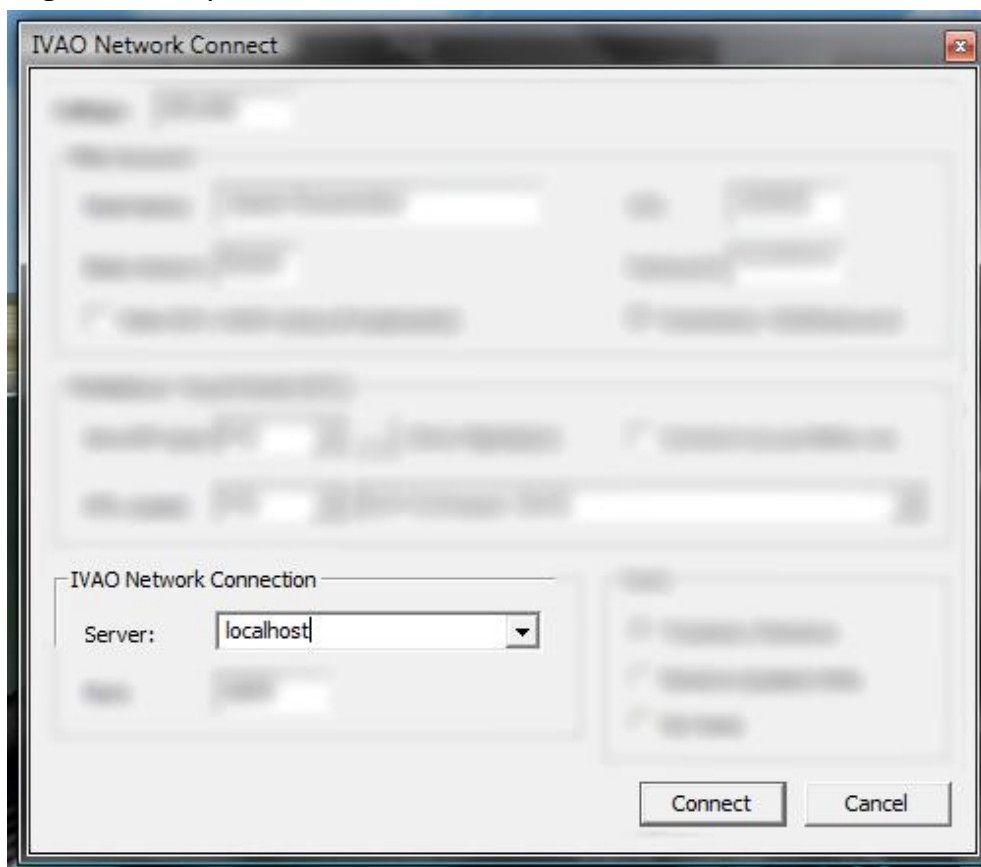
7. Now click Connect. You should receive a message like below:

8. If you want to be sure all is correct, open IvAi and make sure it looks like below, with one primary client which should be IvAc, and one secondary client which should be IvAp/FS. Also check you don't see yourself standing there in IvAc.
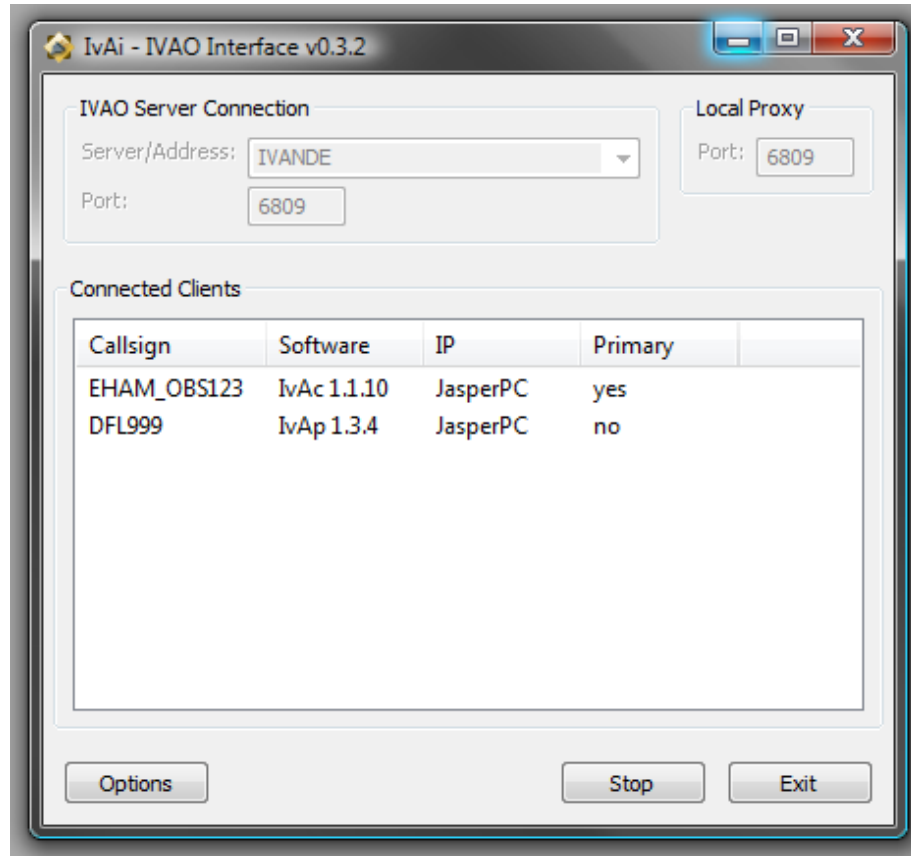
Note that the rest of IVAO will see you as you logged in on your primary client, in this case IVAO will see me as EHAM_OBS123.

9. Now minimize FS and start the BlackBox flightlogger.

10. Enable the TCAS by clicking "Open TCAS". The mode does matter. You will see the same in Google Earth as you see on the TCAS.

11. Now click "Start logging" to start logging. Click "Toggle Realtime flightlogging" and, if you want to review your ATC session, click "Toggle animation mode".

12. If you never used the realtime mode before, click "Generate Google Earth realtime link". Google Earth will start and you will see a BlackBox Realtime folder in temporary places. See Setting up the Realtime flightlogging for more information.

13. Now open the BlackBox folder found in MyPlaces in Google Earth and click the BlackBox Realtime Flightpath network link.

14. Now disable it again to prevent reloading. Click the + sign in front of the network link and enable the AI/Multiplayer traffic folder. It should now look as below.
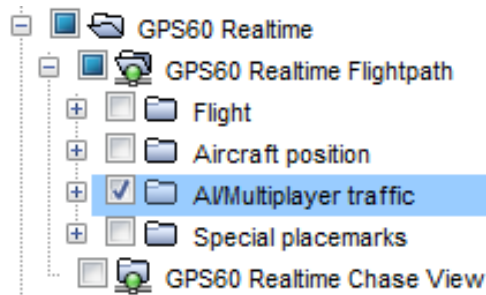
You should now be able to see the traffic within 40NM of you aircraft in Google Earth!!!

Note that you will only be able to see traffic with their transponder switched to active mode.

Example

Here is an example of what it should look like in IvAc and Google Earth.

KLM1667 in IvAc:

And KLM1776 in Google Earth:

Settings (advanced)

The BlackBox doesn't feature something as settings. However, in the BlackBox folder (C:\Program Files\BlackBox\ by default) are two files; The KMLSettings.txt file and the Offsets.txt file. It is not recommended to change something in the two files, so only continue reading if you are an experienced user.

The first file contains the data strings of the sample KML parts. These are fitted together when converting the tracklog to KML to make a file which is suitable for Google Earth. I recommend you not to make any changes in this file!

The second file, however, is more suitable for changes. It contains various variables which the BlackBox uses when logging and displaying realtime in Google Earth.

Troubleshooting

Google Earth can't keep up with my aircraft anymore!

When Google Earth can't reach the aircraft anymore (because you are flying too fast), go to menu Extra, Options, tab "Control" (in between Cache and Navigation) and slide the slider next to Speed a bit to the right.

Why did the flightpath stop updating in GE?

Sometimes, the flightpath will stop moving, this means the link has stopped updating. To correct this, rightclick on the BlackBox Realtime Flightpath network link and select refresh.

### Why is my TCAS empty while there are plenty of aircraft in the air?

At first, make sure the TCAS is actually turned on! See The TCAS for more information.

Secondly, you will only see airborne traffic (traffic which is in the air) on your TCAS. When you are flying online, the online client should 'inject' data into FSUIPC; Squawkbox and IvAp are known to do that, XPUIPC not yet.

Make sure, when using **IvAp** that 'Populate TCAS table' under the general tab in IvAp - Configuration is turned **on** (as the screenshot below shows).

When using **Squawkbox**, make sure under the Advanced tab, the 'Skip FSUIPC TCAS table update' is **off.**

You won't see any traffic when you are flying in a 'regular' multiplayer session.
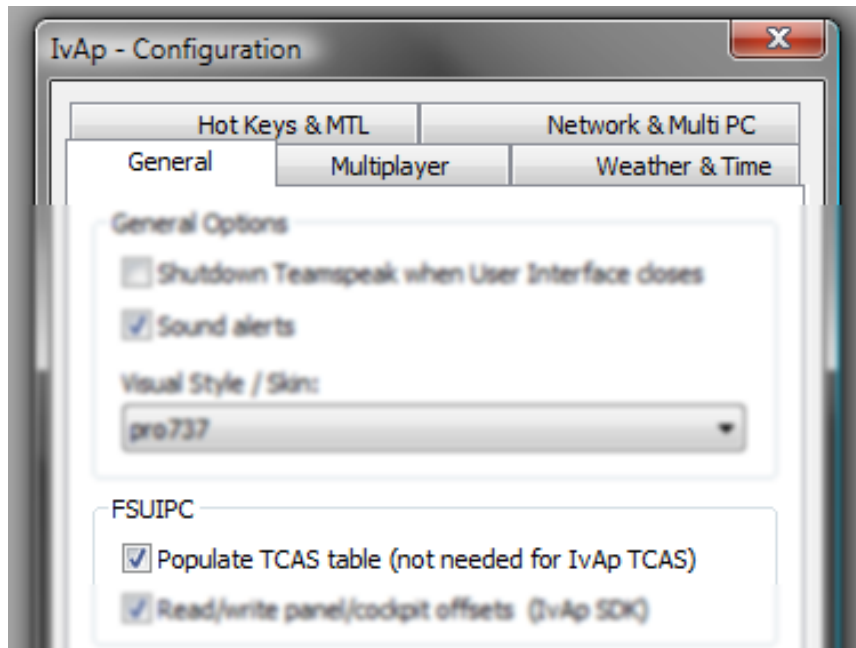
Thirdly, make sure you have got FSUIPC version 3.40 or later!

Why does the reloading of the TCAS take such a long time?

Try zooming in (decreasing range), or else disable TCAS.

In my flightlog, I taxied next to the taxiway!

Some scenery (especially the standard FS scenery) is not perfectly aligned with Google Earth. This can have two causes: The scenery is not good aligned or the Google Earth satellite photo is not properly aligned.

Where are my saved flightlogs saved?

The flightlogs are saved in the My Documents\BlackBox flightlogger folder. You can also click "Open SavedLogs folder" to open this folder.

I receive this error at startup: 'MSINET.OCX or one of its dependencies not correctly registered, file missing or invalid.'

Try a manual install of the MSINET.OCX, do a search on Google and install it.

The flightpath is situated somewhere completely different than where I have flown.

This could be the result of a "," and "." confusion. For example: In the USA they use the . as the comma designator (2.5) and in Europe they use the , as the

comma designator (2,5). Now the BlackBox also uses a comma for the coordinates. But when the comma used on your computer accidentally is set to a different type than when it was when the flight was logged, the BlackBox just does its job and doesn't recognize the comma designator used in the flightlog anymore.

To solve this, go to the BlackBox directory, then navigate to the directory with your windows username and then open Flightlog.txt (default: C:\Documents and Settings\<username>\Application Data\BlackBox flightlogger\Flightlog.txt). Now one line could look like this:
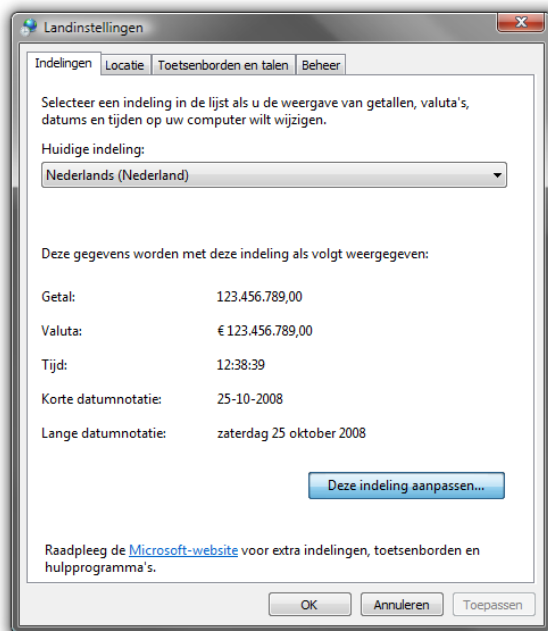
`20081025084121:15,652985240405:38,0741132578258:106:1:SA:0:0:0:0:0:62:20081025084120`

Look what comma designator is used in the number after the first ":" and remember it (in this case it's the ,).

Now it depends on your system on how to solve this.

For Windows® **Vista** users:	For Windows® **XP** users:
Go to Control Panel and open country-settings (in Dutch: landinstellingen). Now click the button 'modify settings…'.	Go to Control Panel and open country-settings (in Dutch: landinstellingen). Now click the button 'modify …'.
Now make sure the decimal-sign is the same as in the flightlog.txt!	Now make sure the decimal-sign is the same as in the flightlog.txt!