XView User Guide

A scenery generator for PSX based on X-Plane

1.   INTRODUCTION

XView is a program that provides Precision Simulator by Aerowinx (PSX) with world-wide scenery and spectacular lighting effects. It is implemented as a plugin to the X-Plane flight simulator by Laminar Research and connects to PSX over a network.

In addition to detailed rendering of the scenery with accurate ground elevation, the system provides highly detailed airports with sloping runways and full runway and taxiway lighting. The runway positions in X-Plane exactly match those in PSX so that there is no need for offsets.

XView feeds PSX with the scenery elevation, so if you fly into a mountain you will crash! XView uses the settings in PSX to drive the time of day, the weather, and comprehensive animation of most of the external parts of the aircraft, including

- lights for landing, taxi, turn-off, beacon, wing, logo, strobe, navigation
- flaps, ailerons, speed brakes, rudder, elevator, elevator trim
- gear, sprung suspension, rotating wheels, steering nosewheel
- reverse thrust cowling movement, fan rotation
- two opening doors on port side

Aircraft traffic can be specified by either PSX or X-Plane and in either case the traffic shows up both in the scenery and in the cockpit Navigation Display (ND). Operation with VATSIM should be possible.

PSX supports muli-pilot set-ups for flying as captain and co-pilot in one aircraft or as captains in two independent aircraft. XView will generate the appropriate views in both cases.

To enable visual animation of the aircraft components a new aircraft has been developed for use with X-Plane. It is called PSX Plane and is provided with XView, although its use is not essential.

Installation is simple: just a few files need to be added into the X-Plane directories.

X-Plane is a current product and is continually being extended by Laminar Research. There is an active user community developing enhanced scenery and buildings for airports.

2.   REQUIREMENTS

 To use XView you will need:

- PSX
- X-Plane Version 9 or 10 (32- or 64-bit versions)
- Windows
- XView
- PSX Plane, for correct animation of external components.

X-Plane benefits hugely from a high performance system with a fast modern graphics card. PSX is less demanding. It is possible for both XView and PSX to run satisfactorily on one machine if it is powerful enough, for example Windows Experience Index 7.8. Two machines connected via a LAN is probably the best configuration.

3.   INSTALLATION

X-Plane is available as Version 9, which is a 32-bit program, and as Version 10, which can be either 32- or 64-bit. Using the 64-bit version is strongly recommended over the 32-bit versions because of the extra memory it supports.

The installation package contains the following:

* XView32.xpl
* XView64.xpl
* XView.cfg
* XView User Guide.pdf
* PSXPlane.zip

You may need to modify the XView.cfg file to reflect your hardware set-up, see below.

3.1   VERSION 10 64-BIT

The file XView64.xpl needs to be placed in the following subdirectory of the X-Plane installation:

    ...\Resources\plugins\XView\64

It then needs to be renamed win.xpl. As an example, it might look like this:

    D:\X-Plane 10\ Resources\plugins\XView\64\win.xpl

The file PSXPlane.zip needs to extracted into a directory called PSX Plane in the X-Plane directory

    ...\Aircraft\Heavy Metal

Finally you place the XView.cfg file in the root directory of your X-Plane installation. In the example above, it would be:

    D:\X-Plane 10\XView.cfg

3.2   VERSION 10 32-BIT

The installation is the same as in paragraph 3.1, except that XView32.xpl goes into the subdirectory:

    ...\Resources\plugins\XView\32

Rename it and install the XView.cfg file in the X-Plane root directory as above.

3.3   VERSION 9 (32-BIT ONLY)

The installation is the same as in paragraph 3.1, except that XView32.xpl goes into the subdirectory:

    ...\Resources\plugins\XView\

Rename it and install the XView.cfg file in the X-Plane root directory as above.

3.4   PSX PLANE

PSX Plane is a directory containing an aircraft especially developed for PSX. Put this into X-Plane's *Aircraft /Heavy Metal* subdirectory .

PSX Plane is a substantial modification of the standard B747-400 United that ships with X-Plane. It supports animation of many external features of the aircraft, such as flaps, gear, and lighting, under the control of switches in PSX. Select this plane from X-Plane's aircraft menu.

Animation of the lighting is important as it is needed to illuminate the runway in the dark. The effects are particularly good if you run with HDR turned on in X-Plane's menu *Settings, Rendering Options.*

XView will run with the X-Plane's standard B747-400 United model (or any other model) if you do not want to download PSX Plane. However many of the animations and lighting effects will not work.

3.5   XVIEW.CFG

The configuration file contains some basic parameters for XView. If you don't supply one, XView will generate the one shown below. It contains the default values, but you will probably need to modify it to reflect the IP addresses in your own hardware configuration. This modification can be done while XView is running in the "Settings Window", see Section 5 below. The updated settings will be written out to the configuration file at the end of the XView session.

Each line of XView.cfg consists of a tag, followed by =, followed by a value, followed by an optional semicolon (;) with comments after. The comments are ignored, as is white space. Text entries such as file names need to be enclosed in quotation marks to preserve any spacing. The formats are:

> *tag = value* [; *comment*]
>
> *tag = "text"* [; *comment*]

The default file is as follows:

    HEADER = "XView Configuration File Mon Apr 07 15:32:56 2014"
    SETTINGS_PATH = ""
    BOOST_ADDRESS = "127.0.0.1 : 10749"   ; IP address
    MAIN_ADDRESS = "127.0.0.1 : 10747"   ; IP address
    SMOOTH_TRAJECTORY = FALSE   ; Extrapolate between PSX updates (default: FALSE)
    DO_ANIMATIONS = TRUE   ; Animate external view, eg gear, etc(default: TRUE)
    DO_LIGHTSS = TRUE   ; Animate lights (default: TRUE)
    INJECT_ELEVATION = TRUE   ; Set to true to send scenery elevation to Main server
    PSX_TRAFFIC = 1   ; Set to the number of traffic planes you want driven by PSX (max 7)

The IP addresses above are for a configuration in which PSX and XView are running on the same machine. For LAN set-ups theIP address will probably be of the form 192.168.xxx.xxx

The details of XView.cfg are shown in the table below.

HEADER	This line is free text and can be used to label your file. It is printed in the log file. It has no effect on the simulation.
SETTINGS_PATH	The storage location for XView.cfg file. Get this right or nothing will work. If left blank XView will look for the file in the X-Plane root directory, ie where X-Plane.exe is stored. It is simplest to keep the configuration file in the X-Plane root directory.
BOOST_ADDRESS	The IP address of the PSX Boost server. The format is *host : port*. The port name needs to be 10749. The host address will be 127.0.0.1 if PSX and X-Plane are running on the same machine. If PSX is on another machine on your local network it will be 192.168.x.x. If you are not sure what x.x should be, run ipconfig on the PSX machine from the cmd prompt.
MAIN_ADDRESS	The IP address of the Main Server. The host name will be the same as above, the port must be 10747.
SMOOTH_TRAJEC-TORY	A value of *TRUE* turns on the extrapolation feature which will smooth the path of the plane when the X-Plane frame rate is much faster than the PSX update. This is not normally needed if you are running the Boost Server at a high update rate. The extrapolation feature can be turned on and off in the settings window within the program.
DO_ANIMATIONS	A value of *TRUE* turns on simulation of movement of the outside surfaces of the plane. This involves significant processing so you may get a smoother simulation if you turn it off for relatively slow machines. These animations are visible only from outside views of the aircraft.
DO_LIGHTS	A value of *TRUE* turns on the animation of all the lights controlled by the switches in the overhead panel. It is independent of DO_ANIMATIONS. This option is needed to see the illumination of the runway by the landing lights.
INJECT_ELEVATION	With this option set to*TRUE*, PSX uses the ground elevation from the X-Plane scenery.
PSX_TRAFFIC	PSX can handle up to seven traffic planes. This setting determines how many sets of position data is transferred between PSX and X-Plane. It is still necessary to set the number and type of planes to be drawn in X-Plane, which is done in the X-Plane menu: *Aircraft, Aircraft and Situations, Other Aircraft*.

4.   GETTING STARTED

Start PSX and go into the PSX instructor panel and select the Network, Boost tab. Turn the Boost server ON. Under the Network, Main tab, check the Main server is ON - it usually is.

Start X-Plane. Scenery can take a very long time to load, so starting X-Plane after PSX can avoid double scenery loads.

Use the "PSX Plane" by selecting it in the Aircraft menu. Other aircraft will get you a view, but may not support any animations.

XView uses the daytime, seasons and weather set in PSX.

## 5.   SETTINGS WINDOW

5.1   OVERVIEW

XView has a settings window that is opened through the X-Plane menu *Plug-in, XView, Settings*.

It is seen here in the bottom left of the screen. It can be dragged to any position within the X-Plane window. Click on the cross at the top right of the settings window to close it.

This image shows a dawn take-off from EGLL.
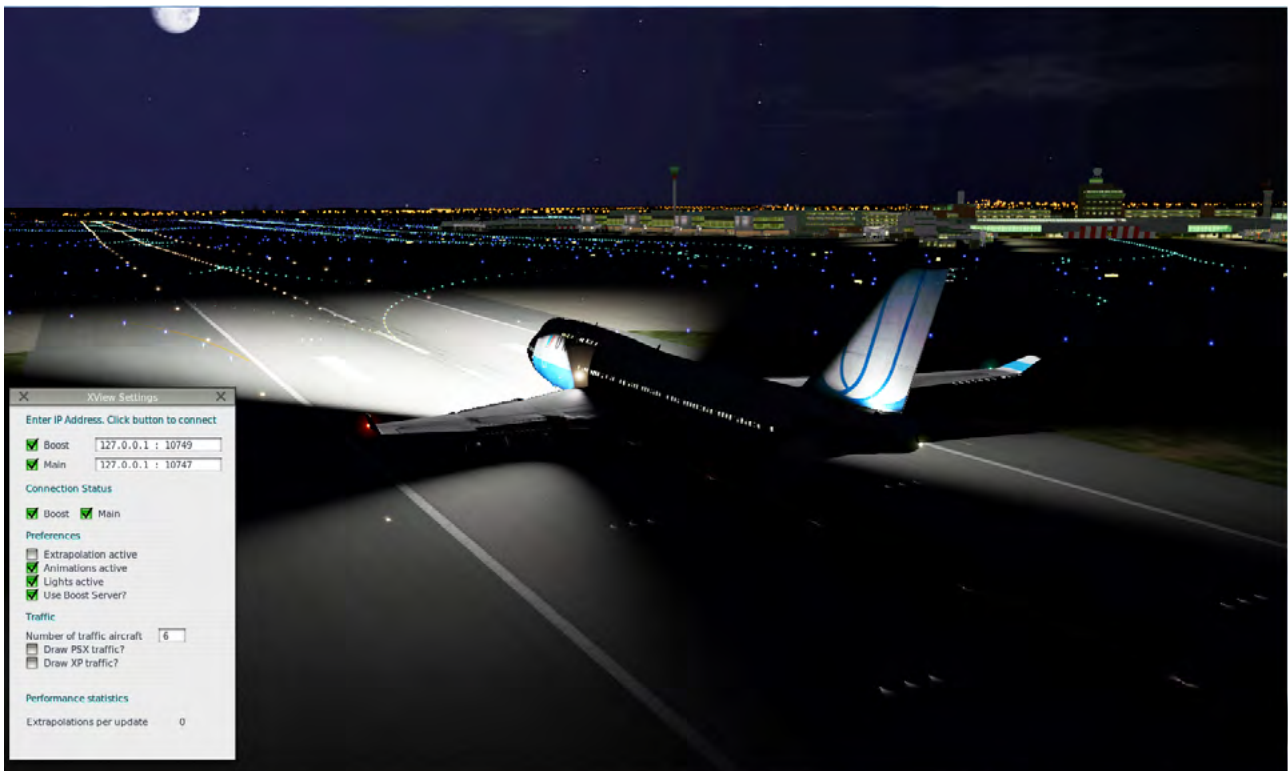
The details of the window are described on the next page.
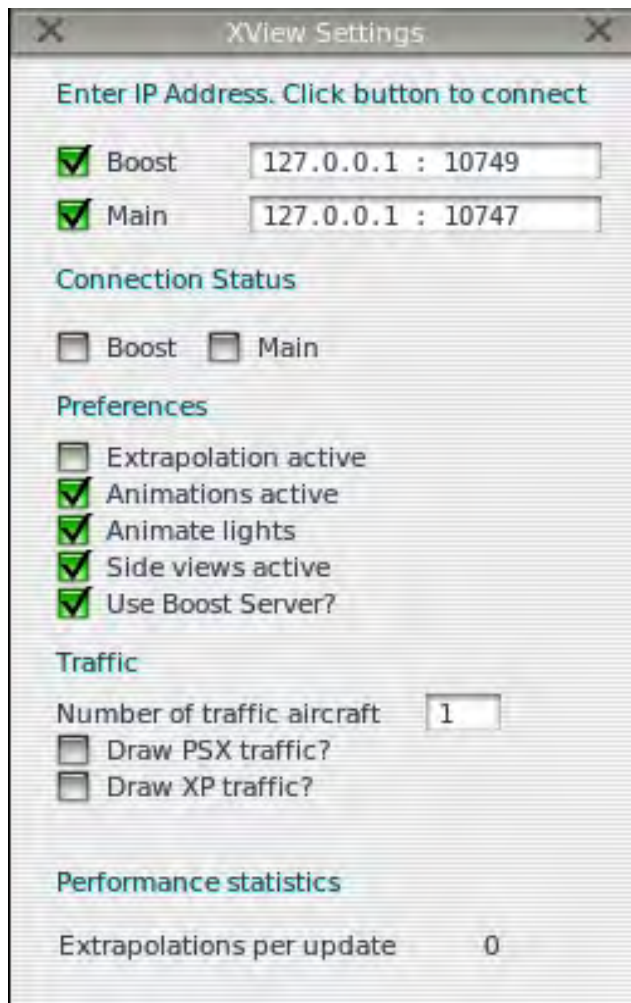
The IP address of the PSX Boost and Main servers can be changed as required. The boxes on the left should be ticked if you want to connect to the corresponding PSX server.

The boxes under Connection Status show whether or not the connection is active. Clicking these boxes has no effect.

The Preferences can be clicked to activate them. See the detailed description in the next section.

The number of traffic aircraft (max 7) sets the number of traffic aircraft for which data is exchanged between PSX and XView. See below.

"Extrapolations per update" shows the number of frames X-Plane is drawing between PSX frames.

5.2   PREFERENCES

The following preferences are all set in the Settings Window.

Extrapolation

Checking this box can improve the visual effect by producing a smoother movement of the scenery in some circumstances, particularly if the hardware is struggling to meet the demands of the software. Normally leave this unchecked.

Extrapolation is a mathematical technique used here to predict aircraft position in situations where the X-Plane frame rate is much higher than the rate of position updates provided by PSX. If you are using the Boost Server at 72 fps then it is unlikely that you will want to turn on extrapolation.

However, if your system or network struggles with high Boost Server data rates or low PSX frame rate, then you can turn off the Boost Server (*Use Boost Server?* checkbox) and run using just the Main Server data. Turning on Extrapolation will then give better visuals. It works best if the "Extrapolations per update" is at least 3, but preferably 4 or more.

You will probably not use this feature, but experiment with it to determine if it improves the experience for your configuration.

Animation

Many of the external parts of the plane can seen to move appropriately if you are using one of X-Plane's external views.   These animations include:

- flaps, ailerons, speed brakes
- rudder, elevator, elevator trim
- gear, sprung suspension, rotating wheels, steering nosewheel
- reverse thrust cowling movement, fan rotation
- two opening doors on port side

Simulating the animations requires a fair amount of processing each frame. Turn the "Animations active" option off if you experience poor frame rates.

Lights

The lighting effects in X-Plane are spectacular when using the X-Plane option HDR Rendering. You can set this in the X-Plane menu: Settings, Rendering options, HDR rendering. You need a good graphics card for this, especially when the lights are turned on.

XView supports all light switches with the corresponding illumination. You can turn off the simulation of lights by unchecking the "Animate lights" box. You will sacrifice some great effects, in particular the landing and taxi lights will not illuminate the runway, but you may get a higher frame rate.

You must choose PSX Plane from the X-Plane aircraft menu to see the correct lighting effects.

Boost Server

This server was specially developed to provide a high data rate to PSX add-ons and should normally be left on. If you are having performance problems try running without it and turning on extrapolation.

Traffic

Traffic refers to other aircraft in the simulated world besides the one you are flying. To see traffic in X-Plane you will need to set up the other aircraft in X-Plane's menu: *Aircraft, Aircraft and Situations, Other Aircraft*. You can set how many planes there are and which aircraft model to use for each one.

XView exchanges traffic positions between X-Plane and PSX. PSX supports a maximum of seven traffic planes. The traffic plane positions can be determined either by X-Plane or PSX, but using X-Plane as the master is the preferred option as it updates the positions rapidly, giving good realism in the external view. The traffic can be generated either internally by X-Plane's AI system or from VATSIM or similar via XSquawkBox.

Select "Draw XP traffic" in the Settings Window to set X-Plane as the master. Data is passed to PSX, which then draws the traffic positions on the navigation display (ND). Set "Externally Controlled" in the PSX Instructor Panel tab: *Situation, Human, Traffic*.

If you select "Draw PSX Traffic", then PSX is the master and specifies the traffic locations. XView will then draw the aircraft in the correct positions in the external view using the aircraft model that you have specified. PSX can specify the traffic in an arbitrary fashion, (see Instructor Panel tab: *Situation, Human, Traffic*) or, with additional software, obtain it from an external source. Note that PSX does not pass information on what type of plane a traffic aircraft is: this has to be set-up in X-Plane.

The PSX setting "Number of traffic aircraft" specifies how many traffic aircraft positions etc are exchanged between PSX and X-Plane. The number and type you will see is determined by the settings in X-Plane.

Performance statistics

With extrapolation turned on, the value for "Extrapolations per update" shows the number of X-Plane frames being drawn between each postion update from PSX. Do not use extrapolation if this figure is less than three.

6.   WEATHER

XView treats PSX as the master for weather. This is because PSX defines the flight model and the weather, in particular the wind, can have a big affect on the plan's trajectory. XView picks up the weather for Local Zone 1, that is the second tab from the left under the PSX weather tab. Other weather zones are not considered.

The way in which weather is defined in PSX is rather different to the definition in X-Plane and in particular does not a provide sufficient range of visibility. Compromises have to be made.

The maximum visibility in PSX is 9999m, that is 6.21 statute miles (sm). This severely restricts the view in X-Plane. To overcome this, the PSX visibility number is interpreted as metres up to 9990, but for greater values the least significant digit is used to determine the visibility as follows:

    9991 - 10sm
    9992 - 20sm
    9993 - 30sm
...... and so on up to 9999.

The X-Plane cloud cover and cloud heights are chosen as a reasonable match to those in PSX. The only wind value used by XView is that at ground level as this affects the orientation of windsocks.

7.   SIDE VIEW

XView normally displays the scenery as seen through the front window of the cockpit. However, there may be times when you want to see the view from one of the side windows.

If PSX and XView are running on the same machine, then in X-Plane assign a button on your controller to glance left or right (Settings, Joystick and Equipment, Buttons: Basic). In PSX, make sure that this button is not assigned.

If X-Plane and PSX are running on different machines, then .... (tbd)

8.   MULTI-PILOT SET-UP

You can set-up PSX with XView to run with two or more pilots using networked computers. There are two possibilities.

(a) two pilots flying separate aircraft and each seeing the other's aircraft correctly located in the view.

(b) two pilots flying one aircraft as captain and first officer with each pilot seeing the same view

Multi-player Configurations

Red and green systems may be connected via internet
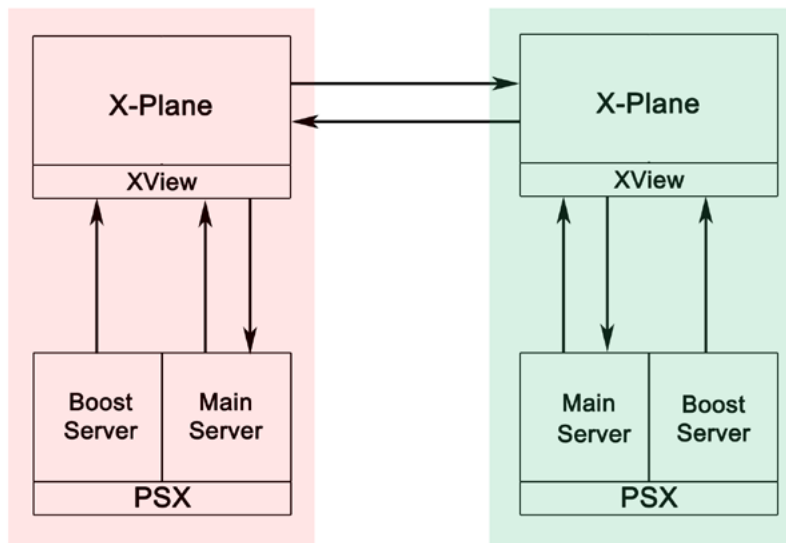
Two aircraft with independent pilots
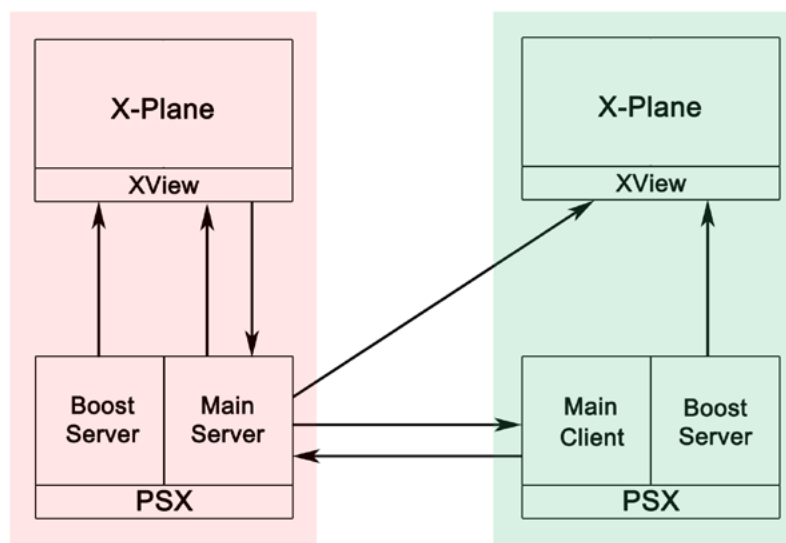
One aircraft with captain and co-pilot

These configurations require two independent systems that will normally be connected over the internet. To help with the description, the left-hand system in the diagram is referred to as the red system, and the other as the green system.

For configuration (a) with two independent aircraft each driven by a copy of PSX, set-up the two configurations in the normal way. Then link together the two copies of X-Plane using X-Plane's multi-player feature, which can be found under the menu *Settings, Net Connections*.

For configuration (b) with one aircraft and two pilots, set-up one system (the red one in the diagram) in the normal way and note its IP address which can be found in the PSX Instructor panel under tabs *Preferences, Basic*. Set-up the green system by first changing INJECT_ELEVATION to FALSE in the XView configuration file, XView.cfg. Start X-Plane and in the XView settings window set the Main server address to that of the red system. It is probably worth closing X-Plane and re-opening it at this point to ensure the communication settings are properly saved. To complete the installation, start the green copy of PSX and configure it as a Main Client (Instructor panel, under tabs Network, Main) and give it the IP address of the other (red) system. This is done in the Instructor panel under tabs *Preferences, Basic*, and in the box *Client connects to host*.

9.   PERFORMANCE

Performance of the system can be very good. Development was done on an Intel Core i7-3930 running at 3.2GHz with 16Gb memory and a nVidia GeForce GTX 680. This machine could run both PSX and XView simultaneously, achieving X-Plane frame rates of 100 fps with the Boost Server running at the full 72fps.

It is hard to say how other systems will perform. If things are running slow, put PSX on a separate machine, keeping the faster one for X-Plane. Try reducing the rendering options in X-Plane. Reduce the PSX frame rate to 48/3. Turn off the Boost Server in the XView settings window and turn on extrapolation.

10.   TROUBLE-SHOOTING

When you load a new situation there may be quite a long pause (maybe 15 seconds) while X-Plane loads the scenery corresponding to the new position of the PSX aircraft. This is normal.

If the aircraft crashes with fatal damage when you load a new situation, just reload the situation (not the software). Two or three re-loads solves the problem. This is caused by PSX and XView not using the same value for scenery elevation at start up before they get synchronised.

XView writes a log file XViewLog.txt to the X-Plane root directory. If things have gone wrong, this file may help resolve the issue.