3jFPS-control-1.23

A Plugin (lua-script) for X-Plane 10
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Features:
+ smoothly adapting view distance depending on FPS
+ smoothly adapting clouds quality depending on FPS
+ nice graphical display modes
+ see avg. FPS, FPS-variation, effect of plugin at a glance
+ manual mode to test effect and find out best settings

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1 Introduction

3jFPS-control is designed to give you a smoother flight experience, by **automatically reducing world view distance and/or clouds density/size** in real time, when your FPS go to low. When the frame rate gets better, view distance and clouds density get automatically increased again.

On my system (mid-range CPU and very mid-range GPU) the script works very well. It reduces load of GPU, CPU and bus by controlling the number of objects and cloud puffs to draw, when scenery or weather get a little too hard.
I am not sure how good it works on low-end or high-end systems. If your performance is quite ok but goes down in some situations, I recommend you give it a try.

But... ***This script won't do miracles****. If you have trouble with your FPS in general, it probably won't help.*

I have tried to keep the visible effects as low as possible, so the script changes all parameters **very smoothly**.

The basic idea of adapting the LOD-bias based on the current frame rate comes from **AUTO_LOD1.3** by **Gerhard** from **www.x-plane.at**. Please visit his website for lots of extremely nice scenery (esp. austrian airports), plugins, objects and so on!

2 Requirements

2.1 X-Plane version

I have tested the plugin with **X-Plane 10.36, 10.40 and 10.45**. Other versions of X-Plane 10 are likely to work too, but it is not guaranteed, as the script works with 3 datarefs that could possibly change in every new release.

2.2 FlyWithLua

3jFPS-control is a **lua-script** and needs the plugin FlyWithLua installed. See the files section of www.x-plane.org for details, download and installation instructions, if you don't have it already.
http://forums.x-plane.org/index.php?/files/file/17468-flywithlua-for-xp9-and-xp10/

The script was tested with **FlyWithLua 2.4.0** but it should work with other (esp. higher) versions too.

FlyWithLua is a great plugin by **X-Friese**, which makes it very easy to extend X-Plane with small scripts.

3 Installation

Simply put the script file 3jFPS-control.lua in the scripts folder of FlyWithLua:

```
X-Plane 10/Resources/plugins/FlyWithLua/Scripts/
```

That's it.

4 Configuration

To configure 3jFPS-control edit the script file with a text editor. In the first section you will find all variable definitions.

It is recommended to keep a copy of the original script file before you edit it. Just in case...

There are **3 levels of configuration**:

1. `QUICK-START SETTINGS`: If you only want to fly, just change the values here.
2. `DETAILED SETTINGS`: Here you can do a more detailed configuration, but for this you have to experiment some time to find the best settings.
3. `ADVANCED SETTINGS`: As it says, for advanced users only, see the comments in the script file for further information.

4.1 Quick-start settings

For an **easy and fast configuration**, simply edit these values (to be found at the top of the script file):

`jjjFPSC_qsPosition`: Position of the display, "top-left" (default), "top-right", "bottom-left" or "bottom-right"

`jjjFPSC_qsAimedFPS`: The FPS value you want to achieve, e.g. 30 (default, normal system) or 60 (high-end system). Should be a realistic value for your system!

`jjjFPSC_qsAutoViewDistance`: Presets for the view distance: "lo", "mid", "hi" or "off".
I recommend to start with "lo". If you have a strong system, you can try "mid" or "hi", when you feel that view distance gets reduced too much.
Set it to "off", when you want only the clouds details to be reduced. (That would make sense, when your FPS only go down on cloudy weather.)

`jjjFPSC_qsAutoCloudQuality`: Preset for the cloud rendering quality: "lo", "mid", "hi", "off".
I recommend to start with "lo". If you have a strong system, you can try "mid" or "hi", when you feel that the clouds quality get reduced too much.
Set it to "off", when you want only the view distance to be reduced. (That would make sense, when your FPS don't go down, even on very cloudy weather.)

4.2 Detailed settings

For a **more accurate** configuration:

Find out, how the view distance and clouds density affect your FPS. It is recommended to fly to a place with many objects (houses, trees etc.) where your computer struggles with the framerate. Then pause X-Plane and set a more or less cloudy weather.

Next, watch the FPS value and activate the manual mode (see *6.3 Auto / manual mode*).

Now move view distance "LOD" up and down and see how the FPS react on this. Then move clouds density "COD" up and down and see how the FPS react. Do the same with clouds puff size "CPR".

Then, move them all up and down and try to get a feeling what helps most with the FPS and what reduction of quality you can accept. Then, edit the following values:

Please NOTICE: *Set* **`jjjFPSC_qsUseQuickStartSettings = false`***, otherwise some of the detailed settings will be overwritten by the quick-start settings!*

4.2.1 Auto mode settings

`jjjFPSC_autoMode`: if "true" start in auto mode, if "false" start in manual mode

`jjjFPSC_autoFpsMin`: if FPS go below this value, view distance and/or cloud quality will be reduced (default 27)
Put your aimed FPS value here, minus 3 to 5.

`jjjFPSC_autoFpsMax`: if FPS go above this value, view distance and/or cloud quality will be increased (default 30)
Put your aimed FPS value here (maybe plus 2 or 3).

4.2.2 World view distance control settings

`jjjFPSC_lodMin`: LOD-bias for minimum view distance in auto mode (higher values mean you will see less objects when you have bad FPS)
(default 4.8)
Fly where are lots of objects, pause the sim, switch to manual mode (see 6.3 Auto / manual mode) and change the LOD value up and down to find out what is perfect for you as ***the smallest view distance you can accept for better FPS****.*

`jjjFPSC_lodMax`: LOD-bias for maximum view distance in auto mode (lower values mean you will see objects farer away when you have good FPS)
(default 1.0 / with strong CPU and GPU try 0.5 or even 0.1)
Fly where are lots of objects, pause the sim, switch to manual mode (see 6.3 Auto / manual mode) and change the LOD value up and down to find out what is perfect for you as ***the highest view distance you want to have when your FPS are good****.*

4.2.3 Clouds density control settings

`jjjFPSC_codMin`: "cloud overdraw control"-value for minimum clouds density in auto mode (higher values mean less cloud puffs are drawn when you have bad FPS)
(default 0.9)
Fly with cloudy weather, pause the sim, switch to manual mode (see 6.3 Auto / manual mode) and change the COD value up and down to find out what is perfect for you as ***the lowest cloud density you can accept for better FPS****.*

jjjFPSC_codMax: "cloud overdraw control"-value for maximum clouds density in auto mode (lower values mean more cloud puffs are drawn when you have good FPS)
(default 0.75, that is XP's default value)
*Fly with cloudy weather, pause the sim, switch to manual mode (see 6.3 Auto / manual mode) and change the COD value up and down to find out what is perfect for you as **the highest cloud density you want to have when your FPS are good**. (I would strongly recommend to use 0.75, lower values could have very bad influence on performance without any noticable effect on how the clouds look.)*

4.2.4 Clouds puff size settings

jjjFPSC_cprMin: "cloud plot radius"-value for minimum clouds puff size in auto mode (lower values mean cloud puffs get smaller when you have bad FPS)
(default 0.8)
*Fly with cloudy weather, pause the sim, switch to manual mode (see 6.3 Auto / manual mode) and change the CPR value up and down to find out what is perfect for you as **the smallest cloud puffs you can accept for better FPS**.*

jjjFPSC_cprMax: "cloud plot radius"-value for maximum clouds puff size in auto mode (higher values mean cloud puffs get bigger when you have good FPS)
(default 1.0, that is XP's default value)
*Fly with cloudy weather, pause the sim, switch to manual mode (see 6.3 Auto / manual mode) and change the CPR value up and down to find out what is perfect for you as **the biggest cloud puffs you want to have when your FPS are good**. (I would recommend to use 1.0)*

4.2.5 Display settings

You can customize the way 3jFPS-control is displayed with the following variables:

jjjFPSC_displayMode: Default display mode when X-Plane is started
0 = no display, 1 = numeric display, 2 = numeric + graphic display, 3 = graphic only

jjjFPSC_displayOpacity: opacity of display
0.0 = invisble, 1.0 = fully opaque (default is 0.8)

jjjFPSC_displayX: horizontal position in pixels
if positive: pixels from **left** side of screen
if negative: pixels from **right** side of screen

***jjjFPSC_displayY**: vertical position in pixels*
*if positive: pixels from **bottom** of screen*
*if negative: pixels from **top** of screen*

5 Keyboard / joystick commands

You can use X-Plane's keyboard / joystick assignments to control the following functions:

1. FlyWithLua/3jFPS-control/**toggle_display_mode**: Swicth between the display modes

2. FlyWithLua/3jFPS-control/**toggle_auto_mode**: Turn automatic control of view distance/clouds density on/off

6 Usage in X-Plane

When 3jFPS-control is installed correctly and you run X-Plane, it should show a FPS display on your screen. (Unless you did not set display mode "none" as default.)

6.1 FPS display

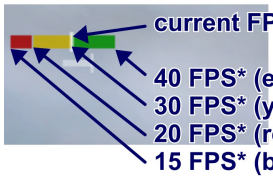
3jFPS-control calculates current FPS by measuring the system time. It does not use X-Plane's FPS value because this does not go below 20, even if your actual frame rate is much lower.

The displayed FPS value is smoothed. That means the value doesn't change with every frame, you see an average value of the last frames.

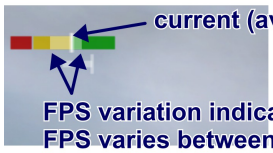
The FPS that are displayed (and used to control view distance / clouds density) are calculated every frame like this:
*smoothFPS = (smoothFPS*19 + currentFPS)/20*

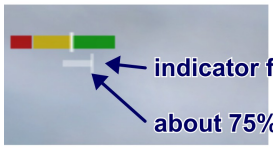
6.2 Display modes

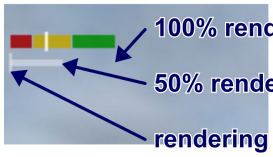
Display mode „graphic“



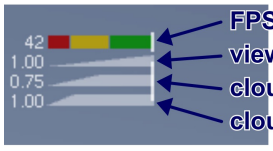
** absolute values depend on configuration. In this example ‚jjjFPSC_qsAimedFPS‘ is set to 30.*

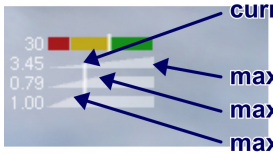




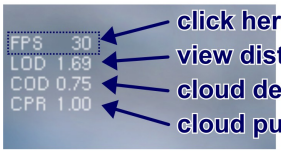


Display mode „graphic + numeric“





Display mode „numeric“



Display mode „numeric“ in <u>manual mode</u>



Click on the upper line (where the FPS are shown) to switch between the following display modes:

numeric: show all values as numbers
numeric+graphic: show all values as numbers and graphical
graphic: show all values graphical
none: no display

Graphic display mode: FPS go from left (low) to right (high), the limits of the scale can be configured in the script file. Red represents "bad FPS" (<= 20), yellow means "ok FPS" (> 20 and < 30*) and green is "good FPS" (>=30*).

**when you use the quick-start settings 30 will be replaced with the value of* `jjjFPSC_qsAimedFPS`

The white vertical line indicates your current FPS.

The slightly lighter area left and right from the white FPS line shows the FPS variation. Here you can see between which values your FPS vary. *(These minimum / maximum values of course use the real not-smoothed FPS to react on variations of single frames.)*
If the variation area is very close around the white line you have very stable FPS.
If the white line is for example around 30 FPS but the lighter area (variation) moves around somewhere in the red, it means you have average FPS about 30, but you have drop-outs where one or a few frames go below 20.

6.3 Auto / manual mode

*To activate the manual mode, first **switch to display mode "numeric".** Then **click on the line(s) below*** **the upper line** to toggle between auto mode and manual mode. In manual mode, the indicators "LOD", "COD" and "CPR" are displayed in red.

In **manual mode** ("LOD" displayed in red) to change the **view distance**:

Move the mouse over the "LOD" value (2nd line from top) and use the mouse wheel to increase or decrease the view distance.

You can change it from 0.1 (see objects that are VERY far) to 10.0 (see only VERY near objects).

Because this mode is for testing, the LOD-bias limits you have defined (default 1.0 to 4.8) do not apply.

In **manual mode** ("COD" displayed in red) to change the **clouds density**:

Move the mouse over the "COD" value (3rd line from top) and use the mouse wheel to increase or decrease density.

You can change it from 0.5 (LOTS of cloud puffs) to 1.0 (very FEW clouds puffs), XP's default is 0.75.

Because this mode is for testing, the COD limits you have defined (default 0.75 to 0.9) do not apply!

In **manual mode** ("CPR" displayed in red) to change the **clouds puff size**:

Move the mouse over the "CPR" value (4th line from top) and use the mouse wheel to increase or decrease the size of the cloud puffs.

You can change it from 1.5 (very big cloud puffs) to 0.5 (very small clouds puffs), XP's default is 1.0.

Because this mode is for testing, the CPR limits you have defined (default 0.8 to 1.0) do not apply!

7 Known issues

7.1 Real Terra Haze / compatibility

3fFPS-control is only compatible with **RTH 4.0** (supposedly with higher version too). If you are using an older version of RTH, please update it.

7.2 Real Terra Haze / flickering clouds

If you use Real Terra Haze, please read carefully:

RTH also changes cloud density and cloud puff size, this leads to **peridoic flickering of the clouds** (about once in a second), as both plugins work with these parameters.
There are 2 solutions:

1. Deactivate automatic adaption of cloud qualitiy in 3jFPS-control:
   Set `jjjFPSC_qsAutoCloudQuality = "off"` (if you are using the quick-start settings)
   or `jjjFPSC_codActive = false` and `jjjFPSC_cprActive = false` (detailed settings)
   Then 3jFPS-control will only change the view distance to increase performance.

2. For skilled users: Modify RTH.lua (please make a safety copy of it first!):

   Search for "overdraw_control" in RTH.lua, you will find **2 lines** like this:
   `set( "sim/private/controls/clouds/overdraw_control", cld_control)`
   change **both lines** to
   `-- set( "sim/private/controls/clouds/overdraw_control", cld_control)`
   (simply put two "-" at the beginning of the line, this deactivates it)

   then serach for "plot_radius", you will find **1 line** like this:
   `set( "sim/private/controls/clouds/plot_radius", cloud_plot )`
   change it to
   `-- set( "sim/private/controls/clouds/plot_radius", cloud_plot )`

   Save RTH.lua (you have made a backup of the file, right?) and you're done.
   Your modified RTH won't affect cloud density and cloud puff size anymore and the flickering is gone.

7.3 Objects pop up

The automatic adaption of the view distance during flight, sometimes let some objects **suddenly pop up**. (I call it the "FSX-effect", though here it is about single objects, not whole forests...)
In theory that should not happen, as the view distance is changed very smoothly by the plugin. But I guess messing around with the LOD-bias-ratio sometimes can confuse X-Plane's (very well programmed, no FSX-effect normally) loading/pre-loading algorithms for objects.