

# The AVSIM Basic FSX/P3D Configuration Guide

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#### Introduction:

The **AVSIM Basic FSX/P3D Configuration Guide** provides members with a one-stop guide for configuring FSX/P3D for optimum performance. Our goal at AVSIM is to make configuring FSX/P3D as simple as possible and to educate. There are many FSX Configuration Guides published around the Internet and a member only has to do an Internet search using the Google or Bing search engines to find them.

The Microsoft-owned Flight Simulator is possibly the game industry's longest-running continuous franchise. The first Microsoft-branded version was released in 1982 with the most recent version, FSX, released in 2006 and expanded in 2007 with the release of Acceleration/SP2. FSX is a 32 bit application that can reside in a 64 bit Windows operating environment. Acceleration and the freeware version SP2 included a preview to DX10 technology as the Microsoft team did not have sufficient time to completely program FSX for DX10. They had hoped to finalize development in a future update (as well as improve on the FSX engine) but the development team (AKA Aces Studio) was released by Microsoft before those upgrades could be published. Currently, an add-on developer has fixed many of the issues left behind by FSX. You can get more information about DX10 in our DX10 Forum.

Lockheed Martin has a license to further develop Microsoft ESP, a visual simulation software development platform derived from FSX. Lockheed Martin's product is dedicated to flight training at all levels, and they have named their project Prepar3D (P3D), pronounced "prepared." Reviews of P3D, through version 1.4, can be found on AVSIM by using the Search Articles box and entering 'Prepar3D". This is exciting news for the flightsim community! A major feature of Version 2.0 will be compatibility with DX11 technology.

There is no free lunch with FSX/P3D! Performance improvements come only from faster and/or overclocked processors and reduced display settings. Period! All else is wishful thinking without any substantive testing. Regrettably, all money spent on newer graphics cards since the 8800 GT in 2007 is wasted, except as needed for use of multiple monitors and higher resolutions. Faster/larger memory might help a little, but we cannot verify that yet. On the other hand, with P3D, newer graphics cards will suddenly find their usefulness. We think a new day is coming soon.

# FSX Tweaks

## General:

When you first installed FSX, SP2 or Acceleration and ran the program, most of us probably saw FPS near 100 and, in some cases, nearing 300 fps! Then you started adding scenery and aircraft and the FPS began to drop dramatically and members began to seek "tweaks" for better performance. We hope this guide will provide some performance improvements and enjoyment of FSX/P3D and the many freeware and commercial add-ons.

There are several tweaks that may or may not improve FSX performance. We recommend employing no tweaks unless you know exactly what a tweak will do to FSX on YOUR system. Simply employing a tweak recommended by others, even those we are recommending, may or may not work on YOUR system. If FSX freezes, crashes to the desktop, performance drops dramatically, or just closes without explanation, suspect one or more of your tweaks first. FSX performs well with any i7 system beginning with the Sandy Bridge chipset and properly overclocked to increase performance.

We have done some testing with various tweaks vs no tweaks and we see little or no change to FSX performance. In fact, with no tweaks installed, the frame rate is sometimes higher. If you own the latest Intel i7 core chipset (Haswell) with a high-performing video card such as the GTX 780, you should avoid tweaks and simply tweak your display driver and adjust the LOD\_Radius and Texture\_Max\_Load settings in your FSX.cfg.

We did studies and reviews on FSX performance. A review of FSX Booster 2013, a payware program found the program does increase the frame rates but only by decreasing display settings. More information regarding this review and testing can be found at the following link - <u>FSX Booster 2013 Review</u>.

Do not over-tweak your system! Tweaking too much can cause serious problems running FSX. There is no holy-grail or magic bullet 'tweak' that will make FSX/P3D run flawlessly.

#### Tweaks:

**HighMemFix=1.** When Acceleration/SP2 was released in 2007, this line item was to be **added to the Graphics Section** of the FSX.cfg, but inadvertently left out. So, it is really not considered a tweak but a graphics fix. It must be added to all FSX configurations or you might see texture anomalies, like missing textures on an aircraft or building.

**Texture\_Max\_Load=2048.** The default setting is 1024 and located in the **Graphics Section** of the FSX.cfg. You can increase this to 4096 but this is not recommended except on the latest high performance systems and, if you see Out-of-Memory messages, you should lower this to at least 2048. Setting this to 2048 or 4096 (high definition) will affect FSX performance but is best for those who want some real "eye-candy" during their flightsim sessions. We do not recommend a setting higher than 2048 for any system. **Important note**: This setting will revert back to the default setting (1024) if you open up the settings page and make any changes after you start up FSX. You will have to go back into your FSX.cfg and reset the tweak in that case. Try to avoid changing settings within the FSX settings page(s).

**Texture\_Bandwidth\_Mult=40.** The default is 40. For dual core processors we recommend a setting no higher than 40. For quad core and higher we recommend a setting of 80-100. We do not recommend anything higher than 120. The higher you set this value the more textures FSX will allocate and copy per frame to the graphics card. Higher settings can cause stutters on frames where the terrain system has finished putting together a lot of textures. Lower settings can reduce stutters on busy frames and can spread it out over multiple frames. Setting is really dependent on your video card. If it is high end, you can try 120 but, if you see stuttering, you will need to reduce this setting accordingly for a happy medium. This parameter is located in the **Display Section**.

**WideViewAspect=False** (the default) or True. If you have a widescreen monitor (most modern monitors are widescreen) change this value to True. This will affect screen resolutions but will not affect performance. This parameter is located in the **Display Section**.

**Upper\_Framerate\_Limit=**30. The default is 24. This setting is system dependent. Parameter is located in the **Display section**. Setting the parameter at 30 works for most members but it is not the perfect setting. It is a setting you will have to test and you can monitor the frame rate within FSX by clicking on Shift+Z Z. If you have a system built before the Intel i7 or comparable system, you might have to lower this back to the default or lower for best performance. We do not recommend anything lower than 20. It might reduce stuttering or blurry textures as it will slow down your frame rates for FSX to catch up with the rendering. If you have a very modern overclocked system (an Intel i7 or comparable), we recommend setting this parameter to 0 (unlimited). This is currently recommended by many developers of FSX add-ons, especially when using MegaScenery or Orbx products.

**Fiber\_Frame\_Time\_Faction=**0.33. This is the default setting if you **do not** add this to the **Main Section.** This parameter was made as the default for FSX as the parameter helped reduce blurry textures in previous versions of FS and found to be the best setting. Computers systems have gotten a whole lot better since then. The parameter is built into FSX and does not need to be added unless you want to lower it. This parameter gives more processing time towards scenery versus rendering. The lower you set this parameter, the more CPU processing is used or diverted to loading textures. Lowering the number can possibly provide an increase in frame rates. If you are seeing blurry textures without the parameter, then you can add this parameter and set it at 0.15. Do not lower this parameter any lower than 0.10. We recommend leaving this parameter out of the FSX.cfg unless you are seeing a lot of blurry textures (which could be caused by many other things).

**LOD\_Radius**=6.5. Great for High End (Intel i7 and comparable) and better computer systems! Do not exceed this setting or you will risk getting Out-of-Memory (OOM) errors. This parameter is located in the **Terrain Section**. System dependent. Some members have had the parameter up to 9.5 but usually lower this setting if OOM's are experienced.

We do not recommend this setting be employed on older systems before the Sandy Bridge i7 and comparable systems. **Important note**: This setting will revert back to the default setting (4.5) if you open up the settings page and make any changes after you start up FSX. You will have to go back into your FSX.cfg and reset the tweak in that case. Try to avoid changing settings within the FSX settings page(s).

**Bufferpools** – Not recommended except for tweaking Autogen. Autogen has a default texture buffer of 4 million (PoolSize=400000) but this default function is not displayed in the FSX.cfg. If you want to change this value you will have to add the heading [BufferPools] and then, on the next line enter the new parameter. This will override the default setting set by Microsoft when they developed FSX. Setting the value to UsePools=0 means it will completely use the video card memory as the texture buffer. This could provide improvements to FSX with a very modern video card but may produce artifacts, memory spikes, and many times crashes. If you want to play with this parameter, you can simply search the Internet for **Bufferpools FSX**. We have seen too many issues by many who have tried this so-called 'tweak' so users should use caution when employing this parameter.

**AVSIM Reviews/Benchmark Tests** – Although not a tweak per se, AVSIM members can find excellent reviews and testing of various computer systems. If you own one of the Z77 or Z87 motherboards, you might be interested in our review of a Z77 Computer where the system configuration played a major role in dramatically increasing FPS. These reviews are constantly being updated and you can check them out <u>here</u>. Of course our Hardware Forums provide benchmark testing too.

That is it! There are several more tweaks out there in the Flight Sim community but we do not recommend they be employed as most will do little or nothing to improve performance.

## FSX Recommended Settings

The following settings will work for the majority of FSX users. It is important to note that even with some of the most powerful systems, moving the sliders all the way to the right will most likely result in poor graphics and performance. It is not like other modern computer games where one with a powerful system can usually select all the extreme settings and the game will run fine. It has an older engine that is not set up to provide the extreme optimization. Nonetheless, the following settings are fairly high and, if you have a computer that is less than High End (High End=an Intel i7 or comparable system), you should consider reducing the sliders in the Scenery Tab to the defaults (click on the Reset Defaults on the Scenery Tab page). You can then move the sliders up a notch until you start seeing issues with FPS or performance.

|               | Cosplay settings |                  | Other settings  |
|---------------|------------------|------------------|-----------------|
| art<br>i      | 2                | Graphics: Custom | Sound           |
| AYER<br>CORDS | 9                |                  | <u>Controlz</u> |
|               | ab               | Ajrcraft: Custom | Realism         |
|               | 000              |                  | <u>G</u> eneral |
|               | 1 Alertan        | Scenery: Custom  | el              |
|               |                  |                  |                 |
|               | 6 C              | 0                | el              |
|               |                  | Traffic: Custom  |                 |
|               | 62               |                  |                 |
|               | to a to a        | 4                |                 |
|               | Suye             | Customize        |                 |
|               | Logd             | Reset Defa       | ults            |

To get to the FSX Settings, simply start up FSX and click on the buttons with the red arrows.

| GRAPHICS AIRCRAFT SCEIERY    | WEATHER TRAFFIC                      |
|------------------------------|--------------------------------------|
| Global settings: Custom      | Reset Defaults                       |
| evice-specific options       | Global options                       |
| Device:                      | Global texture resolution: Very high |
| NVIDIA GeForce GTX 780.0.0   | 1                                    |
| Target frame rate: Unlimited | Preview DirectX 10                   |
| 6                            | Lens flare                           |
| Full screen resolution:      | Light bloom                          |
| 1600x1024x32                 | Advanced animations                  |
| 1680×1050×32                 |                                      |
| 1920x1200x32                 | - Informational text                 |
| 1920x1440x32<br>2048x1536x32 | © Continuous                         |
| 2560×1600×32                 | Single line                          |
|                              |                                      |
| Tittering: Anisotropic       |                                      |
| M Anti-aliasing              |                                      |
|                              |                                      |
|                              | L                                    |

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**Preview DirectX 10 is only on systems with SP2 or Acceleration** 

"Aircraft casts shadows on itself" must be on for DX10 Preview to view shadows in VC. Do not use this setting in DX9 as it is a frame rate killer.

|                               | SCENERI | WEATHER                 | TRAFFIC        |
|-------------------------------|---------|-------------------------|----------------|
| Global settings: Custo        | m       | 0                       | Reset Defaults |
| Ferrain and water             |         | C Scenery objects       |                |
| Level of detail radius: Large |         | Scenery complexity: E   | xtremely dense |
| 6                             | 0       | 8                       |                |
| Mesh complexity: 100          |         | Autogen density: Norn   | nal            |
| <u>6</u>                      | U       |                         | 러              |
| Mesh resolution: 5 m          | 0       | Ground scenery s        | hadows         |
|                               | - U     |                         |                |
| Texture resolution: 7 cm      |         |                         |                |
|                               | V       |                         |                |
| Water effects: Low 2.x        |         | Special effects detail: | High           |
| 0                             |         |                         | V              |
| 🗹 Land detail textures        |         |                         |                |
|                               |         |                         |                |
|                               |         |                         |                |
|                               |         |                         |                |

Autogen density slider is set to normal for Mid-Range and below systems. High end (Intel i7 or comparable can move this setting to Dense or Very Dense - with caution!)

| Global settings: Medium High            | Reset Defaults                 |
|---|--------------------------------|
| Visual settings                         |                                |
| Cloud graw distance: 60mi / 96km        | Cloud detail                   |
| V                                       | Simple clouds                  |
| Thermal visualization:                  | Cloud coverage density: Medium |
| None                                    |                                |
|   |                                |
|   |                                |
| Simulation settings                     |                                |
| 📄 Download minds aloft data with real-w | orld weather                   |
| Disable turbulence and thermal effects  | s on aircraft                  |
| Rate at which weather changes over time | Medium                         |
| n 0 .                                   | 3                              |
|   |                                |
| · · · · · ·                             |                                |

If you have an external or commercial weather program like AS2012, REX, or OPUS, these settings will be overwritten by the weather program add-on.

| Glo              | obal settings: Custom      | 1              | 9                    | Reset Default         |
|------------------|----------------------------|----------------|----------------------|-----------------------|
| Aviation traffic | 0                          |                | 20.000               |                       |
| Airline traffic  | c density (%): 30          | Airer          | ft labels            |                       |
| 6                | 0                          |                | Show aircraft Jabels |                       |
|                  |                            | - 81           | lser aircraft        | Tail number           |
| General avia     | ation traffic density (%): | 20             | ganufacturer         | 📈 Distance            |
| a V              |                            |                | M <u>o</u> del       | V Altįtude            |
| Aimort vahir     | de density i our           | Labe           | el golari            | Cycle rate:           |
| fi               |                            | Red            |                      | t seconds             |
|                  | •                          |                |                      |                       |
| Land and seat    | te affic                   |                |                      |                       |
| David understand | - (W.). 10                 | chine and feet |                      | 1                     |
| Road genicie     | *1                         | gnips and term | es (%): 10           | Leisure goats (%): 10 |
| v                |                            | -v             | ~                    | TV.                   |
|                  |                            |                |                      |                       |

#### **FSX Display Settings**

Below are the recommended NVidia Inspector settings. You can get the NVidia Inspector at the following link - <u>http://www.guru3d.com/files details/nvidia inspector download.html</u>. These settings are for high end (Intel i7 or comparable). Those who own older video cards and CPU's should not employ the Antialiasing – Transparency Supersampling and set this to `none'.

**Antialiasing** – Transparency Supersampling – Should be set to none or no higher than 2x's.

| rofiles: MS Flight Simulator X                      | • 🖗 • 🕲 🗠 • 🗙 🐻 🖬 • 🔌 • 🗞 • 🔞 🗐 🖓 🖉 🖉 Apply chan |                                      |                         |   |
|---|--|--------------------------------------|-------------------------|---|
| puese.  |  | Don't forget to click on apply       |                         |   |
| Setting ID  | SettingValue                                     | changes before closing               | SettingValueHex         |   |
| Antialiasing  |  |                                      | Exercite the product of |   |
| Antialasing - Behavior Flags                        | None   |                                      | 0x00000000              |   |
| Artialasino - Gamma correction                      | Off  |                                      | 0x00000000              | 1 |
| Artialasing - Line gamma                            | Default  |                                      | 0x00000010              |   |
| Antiakasing - Mode                                  | Overtide any application setting                 |                                      | 0x00000001              |   |
| Antialasing - Setting                               | BxS (Combined: 1x2 SS + 4x MS)                   |                                      | 0x00000018              |   |
| Arbalasing - Transparency Multisampling             | Disabled   | •                                    | 0x00000000              |   |
| Antialasing - Transparency Supersampling            | Ex Sparse Grid Supersampling                     |                                      | 0x00000028              |   |
| NVIDIA Predefined FXAA Usage                        | Allowed  |                                      | 00000001                |   |
| Toggle FXAA Indicator on or off                     | Off  | 2x's Sparse Grid SS = some shimmerin | 00000000                | 1 |
| Toggle FXAA on or off                               | On   | 4x's Sparse Grid SS = no shimmering  | 0 00000001              |   |
| Texture Filtering Eliminates jaggies on             | 2283   | Known FPS killer! Turn off if your   | -                       |   |
| startup screen and                                  | halastino ontralad                               | system has problems.                 | 00000000                |   |
| fixes FSX AA issues.                                | Of Dineard                                       |                                      | 0-00000001              |   |
| No marrie of Enistence Remo                         | 0v0000000  |                                      | 0x0000000               |   |
| Texture filtering - Anisotropic filter antimization | OF   |                                      | 0+00000000              |   |
| Texture filtering - Anisotropic sample optimization | CE   |                                      | 8+00000000              |   |
| Texture Reding - Driver Controlled LOD Ras          | 01   |                                      | 0x00000001              |   |
| Texture filtering - LOD Blas (DX)                   | +0.0000  |                                      | Gx00000000              |   |
| Texture fittering - LOD Blas (OGL)                  | +0.0000  |                                      | 0x00000000              |   |
| Texture filtering - Negative LOD bias               | Clamp  |                                      | 0x00000001              |   |
| Texture filtering - Quality                         | High quality                                     |                                      | <b>OxFFFFFFF</b>        |   |
| Texture fittering - Trilinear optimization          | Off  |                                      | 0x00000001              |   |
| Common  |  |                                      |                         |   |
| Ambient Occlusion setting                           | Off  |                                      | 0x00000000              |   |
| Ambient Occlusion usage                             | Disabled   |                                      | 0x00000000              |   |
| Extension limit                                     | Off  |                                      | 0x00000000              |   |
| Frame Rate Limiter                                  | Off  |                                      | 0x00000000              |   |
| Maximum pre-rendered frames                         | Use the 3D application setting                   |                                      | 0x0000000               |   |
| Multi-display/mixed-GPU acceleration                | Multi display performance mode                   |                                      | 0x0000003               |   |
| Power management mode                               | Prefer maximum performance                       |                                      | 0x0000001               |   |
| Show PhysX Visual Indicator                         | 08   |                                      | 0x34534064              |   |
| Threaded optimization                               | Auto   |                                      | 0x0000000               |   |
| Triple buffering                                    | Off  |                                      | 0x00000000              |   |
| Vertical Sync Smooth AFR behavior                   | Off  |                                      | 0x00000000              |   |
| Vertical Sync Tear Control                          | Standard   |                                      | 0x96861077              |   |
| Vertical Sync                                       | 1/2 Refresh Rate                                 |                                      | 0x32610244              |   |

**Fast Approximate Anti-Aliasing (FXAA):** This is NVidia's version of post-processing anti-aliasing, applied after the image is rendered unlike more traditional anti-aliasing methods such as MSAA and SSAA/FSAA. This means that many titles which are DirectX 9 and later and which did not previously support anti-aliasing will be able to utilize FXAA; simply because it is applied post-process. With "NVidia predefined FXAA usage" and "Toggle

FXAA" turned on you will see a dramatic improvements with AA in FSX. Only downside which may occur is capturing screenshots as FXAA is applied after the screen is captured. This could include usage in FRAPS. So far we have not seen any major issues. If you see issues, you know what is likely causing the problem and you can simply turn FXAA off.

#### **Performance Tweaks**

**Operating System** – We strongly recommend running FSX/P3D on a Windows 64 bit platform as this platform provides for more Virtual Address Space and manages memory for 32 bit applications like FSX/P3D better.

**Solid State Drives (SSD)** - FSX/P3D will load faster on computers with the programs installed on a SSD. It will not make FSX/P3D perform better after a flight is loaded though.

**Defragment Hard Disk Drives (HHD)** – If FSX/Acceleration were installed on one of your HDD's, defragment the drives. SSD's cannot be defragged. For some reason, when FSX/Acceleration are first installed, the files are thrown all over your HDD so you will see a performance increase after defragging. Make sure all HDD's that contain FSX scenery/add-ons are defragged too.

**Photoscenery** - If you own a lot of add-on photoscenery, such as from Orbx/FTX, Aerosoft, MegaSceneryX, MegaSceneryEarth, Tile Proxy, or Blue Sky, you should know that these products will all install in the background even though you may be using only one or two scenery areas for your current flight plan. Photoscenery loading in the background will take up an exceptional amount of Virtual Address Space (VAS) and degrade performance. In the Scenery Library you should only enable the add-on scenery that you will be using during a particular flight plan and disable the rest. There is a nice freeware utility that you can obtain called the Scenery Configuration Editor and you can get it by going to the following link - <u>Scenery Editor</u>. The editor can be used to enable/disable scenery before you even start up FSX.

**Increase view distance -** Increasing the view distance when in Spot View, Wing View, or VC view will not only provide some better FPS but will give a more realistic views. In the VC, try hitting the minus (-) key on your keyboard a couple of times. In wing view, spot view, or any other exterior view, hit the minus key four times.

**Internet Browsers** – Make sure you turn off your Internet Browser while running FSX as they take up an amazing amount of system virtual address space in the background especially if you have several webpages (using Tabs) open. Some members have found memory resources are still being used even when the Internet browser is closed. Several tabs open will create several processes of Internet Explorer, Firefox, Chrome, as appropriate, still running on your system until you manually shut them down by going into the Task Manager (Ctrl+Alt+Del), selecting processes and looking for Internet Explorer or whatever browser you are running. Make sure all instances of your Internet browser have properly shut down. Otherwise, FSX will take an extraordinary amount of time loading, first to the setup screen, then to loading the flight and again some slowdown during your flight. A hint that processes are running in the background will be the hearing of computer thrashing in the background.

Since this is a **basic** FSX/P3D configuration guide, setting up your computer system for the optimal performance will not be discussed here. Users should visit the AVSIM Hardware Forum where there are members who are experts at properly setting up systems and recommending the latest and best hardware for FSX/P3D.

The AVSIM Staff hopes you enjoy your experiences with FSX/P3D after using this guide.

