



Software & Hardware Guide for FSX

Version 1.0.1

Date of Issue: January 22, 2013

Compiled by Paul Johnson,

AVSIM Hardware and Operating Systems Forums Manager

This is a living document that is updated frequently and it is under revision control. The original document resides at AVSIM.com. Please do not copy or host this document elsewhere.

Page 1

Acknowledgements

We wish to acknowledge the major contributors to the accessible AVSIM knowledgebase compiled in this guide: Our grateful thanks...

Jesus "Bojote" Altuve, Nick "Nick N" Needham, Ryan "Tabs" Maziarz, Bill "Fr.Bill" Leaming, David "OPA" Marshal, Holger "Genius" Sandmann, Pete "FSUIPC" Dowson, Mike McCarthy, Michael "FS-GS" Greenblatt, Phil "Aces" Taylor, Srdan "Kosta" Kostic, Steve "DX10" Parsons.

The following have also significantly contributed to the advancement of FSX performance and understanding within AVSIM:

Jim Young, Zach Waddell, Dario Iriberry, Bruce K, Ryan Butterworth, HL James, Richard Asberg, Bob Scott, Christopher Low, Corey Meeks, Luis Feliz Tirado, Paul "PJ"Johnson..

With the advent of the new breed of Intel multi-core processor – the i7, Bloomfield, Sandy and Ivy Bridge, and some correspondingly huge advances in the graphic processor unit, FSX seems, at long last to be delivering on Microsoft's "As real as it gets" sales statement... This compendium has been re-created as the beginning of a 'melting pot' of the most effective ideas, suggestions, facts, from many disparate pieces out of other guides: from present and past members, and from the current members and staff of the Avsim Family, the cream, if you like, of the forum posts that have dealt with hardware problems, software problems, FSX problems, overclocking problems and tweaking, etc.. This is the current fodder of our great hobby.

Documents like this are a living entity, changing and growing as the hardware and software environments change over time; as new information or products become available. We will endeavor to keep it as current as possible. As you read, also keep in mind concerning new hardware and configuration, this guide cannot tell you how to spend your hard-earned paycheck, or how to setup your "Windows Experience", but a high-performance pc is necessary for FSX, and is only achieved by rigorous paring down of those pretty visuals of the stock Windows, along with the purchase of high-end, or mid-to-high-end hardware, and much customization of the system itself and of the fsx.cfg. The adage "cheap things are seldom good, and good things are seldom cheap" does apply very often in the FSX world, (also often applying to software addons once you find out how big this world is!)

Read all you can – use the internet/Google and other guides, too, *but also note the date published*. We also hope this will help many of you – especially the newcomer - to gain greater enjoyment from the hobby, and perhaps provide answers to some of the questions that pop up, whether rejoining the hobby, buying or building a new PC, maybe looking to upgrade, or just simply tweaking the fsx.cfg.

Contents

<u>The Hardware Environment</u>	3
<u>Processor</u>	3
<u>Mainboard</u>	3
<u>Memory</u>	3
<u>GPU</u>	4
<u>Storage</u>	4
<u>Raid</u>	5
<u>Cooling</u>	5
<u>Overclocking</u>	6
<u>The Software Environment</u>	8
<u>Operating System</u>	8
<u>Folder Options</u>	8
<u>Windows Update</u>	8
<u>UAC</u>	8
<u>Overclock</u>	8
<u>Background processes</u>	8
<u>Page File</u>	8
<u>Desktop Heap Limitation</u>	9
<u>FSX Installation</u>	9
<u>Nvidia Drivers and Inspector</u>	9
<u>The FSX.CFG File</u>	10
<u>Modifications and Additions to the FSX.CFG File</u>	10
<u>Addons: Missing Alphas and MipMaps</u>	15
<u>DX10 "How-To"</u>	17
<u>DX10 Notes</u>	21
<u>Appendix and Glossary</u>	25

The hardware environment

Perhaps the hardest choice for the beginner - and the easiest choice for the long-time sim flyer, is “What pc should I buy?” The simple answer is – don’t. Either build it yourself, or have someone trustworthy, (someone who uses FSX preferably!) build it for you, and for a couple of reasons:

- 1). Prebuilt – or ‘[proprietary](#)’ - systems are usually built with the bios paired up with a customized operating system, such that upgrading or overclocking becomes difficult in the least, and maybe not even possible. Examples of vendors that package systems in this manner are: IBM; Dell; HP and Gateway, Toshiba and Sony.
- 2). The second reason is, FSX usually requires a good deal of “tweaking”, with a *strong* recommendation that the processor be overclocked. If you build the system yourself, you are halfway there, as it usually takes a leap of faith for a raw beginner to enter the BIOS and begin an overclocking adventure!
- 3). The third reason is that one is able to make a more educated choice of components for that pc; much better that *you* decide on your graphics card, than some unknown tech at HP. FSX is not an “average” game, nor an “average” application. It is almost unique in the computer world – possibly only bettered only by the various graphic design programs such as AutoCad. Following the addition of any number of popular addons, one finds out that FSX will *eat* processors, memory and graphics cards for breakfast, and so keep that in mind when purchasing your components.

Processor:

FSX is known as being “[processor-bound](#)”, and so in order to make our latest Boeing 737 appear to fly realistically through a graphically perfect world on the biggest or widest monitor(s) one needs to obtain the most powerful processor one can afford. One can have the best and fastest graphics card in the world, but it cannot display more than the system which is feeding it, and so one ends up having the “tweaker blues”, trying to get ‘better graphics’ or ‘better frames’.

So - purchase the fastest ‘unlocked-clock’ processor you can afford, so make the choice only after reading and studying the many forum posts to find the most used and the most recommended processor you can. These charts [here](#) group current cpus by their performance, price and best value, etc... At the time of writing there are only two processor manufacturers – Intel and AMD, and over perhaps the last ten years, Intel has been producing the stronger chip, in the guise of the i7, i5 and i3 series – the i7-2xxx-K and i7-3xxx-K procs are the ones recommended here, being used in the higher-end 4.7 – 5.0GHz gaming pc, with the i5-xxxx-K used in the mid-range 4.2 – 4.6GHz gaming pc. In 2011 Avsim conducted a voluntary performance-testing “FSX Mark11”, publishing the results [here](#). This will give one an idea of what one might expect from a particular choice of components. Be aware of the [socket](#) and the warranty ([Intel](#)) ([AMD](#)) policy before you buy.

Mainboard:

Very much a matter of personal preference based on experience, as there are a number of very good vendors who have catered to the pc “gamer” world over the last few years. Purchasing considerations are: processor compatibility, overclock-ability, memory type and speed, PCI slot(s) and type, hard drive interface(s), usb ports & version(s) and interface, on-board video capability and wireless capability. It is also *not* likely that you will be able to use the on-board video with FSX.

Memory:

This must be matched to the mainboard Memory Support List for compatible [DIMMS](#), but most major gaming dimms - [Corsair](#), [G-Skill](#), [Patriot](#), [Mushkin](#) will work. [Here](#) is what an ASUS QVL looks like. What *is* important is the highest speed rating, with the lowest CL timings, the lower – the better, and in most cases, one should purchase ‘performance’ memory with guaranteed timings and speeds. Sandy

and IvyBridge procs are both dual-channel, so one should buy 8 gig of ram in *two* x four GB DIMMs – not 16GB in *eight* x 2GB DIMMs. As with virtual cores in the processor – the more cores, or the more memory modules there are – the more the overhead for the processor to manage.

The GPU:

The GPU is one component that needs to be matched to the processor speed, or *better* than the processor speed. Too “low-end”, with a fast proc will result in a bottleneck, and be the cause of never-ending “tweaking blues” and overheating. You will want a gpu that can take everything that the system can push, and in Nvidia-speak, that will generally mean a “GTX” – not a “GTS”. Be aware that there are various levels of effective performance here, too.

The first number in the Nvidia lineup is the generation, with the second and third numbers being the performance rating – the higher the number – the higher the performance, 8 being the King, but with the 9 being Emperor. ATI follows a similar pattern, though using four numbers instead of 3, eg, 5870. The first number is generation, second number is family, third and fourth number is performance level. e.g. a 4870 is 4th generation. The 8 = family, so the “48XX” are of the same generation and family, with the last two numbers being performance level. Generally the higher that number the better the performance, but – caveat - this does not *always* hold true with either Nvidia or AMD/ATI gpu’s, so do your homework before committing ~\$500 on a card which may not be the “the right one”. Remember – it must match or be “hotter” than the system’s main processor.

Over the last fifteen years or so, it has become evident that Nvidia is the recommended brand name *as applicable to FSX*. In many other games – the ADM/ATI gpu is the better choice.

At this moment, the most popular gpu’s are the GTX560Ti, GTX570 and GTX580, covering the mid and high-end range, with the GTX6xx series beginning to make inroads.

Budget oriented: GTX5 560Ti when matched to an i5/i7 at 4.2 – 4.6 GHz.

Performance: GTX 580 or 660 when matched to an i7 at 4.7 – 5.0 GHz.

GTX680: This GPU is very new, and should be an excellent counterpart to a 4.9 - 5.4 GHz processor.

Storage

The faster the hard drive – the faster FSX will load. 7200rpm is generally a minimum, with many drives rotating at 10,000rpm. The Western Digital ‘VelociRaptor’ is usually the acclaimed king of hard drives – but somewhat expensive, too. The [WD](#) “Black” series are recommended for the lower-priced drives. Recommended sizes and function are:

C-drive: The Operating System drive. A good size is 500GB.

D-drive is usually the DVD/CDROM drive (though these drive letters can be moved around).

E-drive: This can be used for storage. Recommended – a minimum of 1TB.

F-drive: FSX should reside here, on its own drive. FSX with lots of addons may well exceed 100GB, so – perhaps 500GB would be appropriate.

Note: Regardless of Operating System: Unless you have only one drive it *is not a good idea* to place FSX in the default folder, which is C: \ Program Files(x86), as “Trusted Installer” owns this, and it often inhibits access to different files and folders in a seemingly random manner. It is *much* better to install FSX on its own drive, owned by yourself, where applications and addons can be utilized as you wish, and where a backup or a disk image can be created with a minimum amount of complexity. (Read “aggravation”)

Raid:

Redundant Array of Independent Drives (or disks)

Raid 0 - any number of drives, the data stream being written sequentially in a 'stripe' to all drives, such that the movement of drive heads is minimized, this will provide a speed increase, but with a total loss of data should one fail.

Raid 1 – a pair of drives, mirrored, giving a slight increase in performance, over a single drive, as the drive/head with the least seek time will service the request first. Moderate redundancy.

Raid 5 & 6 – needs a minimum of three disks, generally used in DataCenters, where many drives are included into arrays of drives, each array using the equivalent of one or more drives as Parity drives, such that should one, or even a second one failing, the array continues in service until the defective drive(s) can be replaced. Good performance with good reliability, but costing the earth.

Arrays are generally somewhat difficult to administer, particularly with the not-too-reliable lives which our FSX computers lead, hence none of the above (Raid 0 & 1) arrays are as dependable as a good backup or disk image.

SSD's:

Certainly SSD's are the coming replacement for the mechanical 'rotating platter' drive, and many decent-sized ssd's are now moving into an affordable price range for many pc builders because of their enormous performance gains during the loading of FSX and its textures. Note that there will be little or no observable difference in smoothness or in frame rates during a flight.

Tom's Hardware is a good place for comparisons and benchmarks. [Here](#) T.H. compares various ssd's to the VelociRaptor and a couple of other popular drives, with a link [here](#) showing how to clone a hard drive to an SSD using Windows 7. Best choice for OS and FSX, if affordable.

PSU:

Load stability is the one area that a good PSU must excel in. In other words, as the processor ramps up to 4.8 GHz and FSX begins to load its graphics, its sound, its texture loads – the psu must hold its 3.3 volt rail, its 5 volt rail and more importantly – its 12volt rail, both positive and negative, as a drop in voltage here may trigger an increase in current somewhere, and that could be disastrous. Overclocking stability depends upon this. You are building a good computer, and saving pennies on the PSU might cost you big money down the road. Assuming one has an i5 or i7 series proc, overclocked, with one, or maybe a pair of GTX 580 (680's?), then you should consider at least 850w+. As mentioned earlier – modular is good, so that you connect only the cables you need, making for better airflow in the computer. Also not a bad idea is to get a PSU with an 80+ Gold certification. Good PSU companies include [Corsair](#), [Seasonic](#), [Cooler Master](#), [SilverStone](#)...

Cooling:

Starts with the choice of the case, and considering which power supply you're going to purchase, which gpu – and how many because of SLI and Crossfire, and what cooling method you're going to use for the cpu. As a general rule, the case side panels should be left on, with at least two or more 120mm fans inside the case - the rear fans blowing hot air out of the case and the front fans sucking in cold air.

1). In the first instance, psu's have lots of cabling, and these cables must not be allowed to impede the all-important airflow through the case. Many recent power supplies have removable cables, as not all cabling is needed, this being of special importance in an air-cooled pc. Strips of Velcro or plastic tie-wraps can be utilized to hold cabling away from that airflow, and, as an aside – to also prevent cabling from fouling fans.

2). One of the biggest heat-producers and air-flow blockers is the GPU. The length of an Nvidia GTX 680 is 10" – 253mm, taking up two slots: A GigaByte GV-R7870-2D GPU (AMD 7870) is even longer – taking up 11" – 280mm and again two slots, and they both produce a great deal of heat. This is doubled in their SLI/Crossfire configuration, along with them both increasingly impeding the flow of air through the case.

3). The cpu cooler. The latest processors – the i7-2 and 3xxxk variants - have a better heat profile than their immediate predecessors – the i7-9xx series. Often at 4.2 GHz the i7-920's temperature will be upwards of 75deg.C – even approaching 90 - with liquid cooling being very necessary for any sustained run at 4.4 GHz. The newer processors in the i7-2 & 3xxxk series can easily run at 4.5 GHz – maybe slightly higher on their stock air coolers, and with something like a Noctua NH-D14 or a Muggen2 being used, they will allow a push into the upper 4-7-8 or 4.9 GHz regime.

3a). Air Cooling: The issue of cooling method is important, too, as if *air* is used, then room must be available for that great big radiator and it's two (again, 120mm) fans – one pulling air *into* the cooling fins, and the other on the opposite side, pulling warmed air out of those fins. This flow direction should be aligned to be in the same direction as the other fans in the case. It is also better to have an extra fan at the case rear, so that it assists the 'incoming air' fan. Plan on five 120mm *quiet* fans to fit into the mid or full-sized tower case that is recommended here. Note, too – air cooling may not be useable in tropical or semi-tropical countries.

3b). Liquid Cooling: One will find that there is much more room in the case when liquid cooling is employed. The newer 'unit-style' system consists most often of a single 120mm radiator, taking up one fan space, with the fan against the case perforations, pulling air from inside the case, through the radiator, and then pushing the warmed air out through the perforations or grill at the rear of the case. This radiator has two flexible metal pipes about 8 or 9 inches long, entering a dual pump/water block arrangement that is mounted directly onto the top surface of the proc, with a measured amount of heat-conducting joint compound between the mating surfaces. Often this type of system is the same or only slightly more expensive than the best air coolers available. Again, Tom's Hardware has a plethora of great [information](#). Some popular brands are the [Corsair](#) Hydro series, [Thermaltake](#) Water series, and the [Antec](#) Kuhler series. These run around U\$60 – U\$120

Should one wish to explore a high-end water cooling system – [here](#) is an example of the component choices and prices available. Be prepared to spend at least U\$300!

Overclocking:

This is almost a 'must', given that we do not yet have a processor that natively runs at 4.8 [GHz](#) and above. As an ideal speed for FSX - most users are running their SB chips around 4.5-4.8, with some venturing into 5 GHz and above. It is not a good idea to use Windows or the vendor's tools to change clock settings or voltages, or use the many 'auto' settings that one finds in the bios. Overclocking means entering the pc's [BIOS](#) and changing the effective speed of the system's main processor, along with a number of other settings and voltages. **Never put 'auto' for the cpu's vCore voltage.**

There are very good guides from beginner to expert on the internet, and here are a few: Read-read-read these *before* starting any bios modification.

[ASUS P8P67](#) [ASUS Maximus Formula](#) [ASUS Z77 IvyBridge](#) [SandyBridge](#) [SandyBridge2](#)

Given the friendly nature of the modern [UEFI](#) BIOS, overclocking is a job which *can* be done by oneself, or with the guidance of a more experienced 'techie' person - even with him/her remotely on the 'phone. Some free recommended monitoring and loading tools for overclocking are '[CoreTemp](#)', and '[RealTemp](#)', both for monitoring the cpu's temperature as the load is applied, '[CPU-Z](#)' – a general monitoring tool, for speeds and voltages and memory timings, '[IntelBurnTest](#)' ('IBT') and [OCCT](#), both used to apply a series of loads to the processor, with an output showing each load time taken, along

with the speed in GigaFlops (GF). As it's quite possible to get a "Blue Screen of Death" (BSOD) while overclocking, one also needs a tool to see just what caused the problem: when Windows crashes, it creates a 'core dump' of what was in memory at the time of the crash. [Nir-Soft](#) has a number of free tools – '[BlueScreenView](#)' being one of them; when run it displays the core dump in a readable fashion, such that the error codes can be interpreted and corrective action taken.

Basic overclocking outline: The process will vary between mainboard vendors and processor used:

Processors are matched to sockets, with each vendor making several versions of their mainboards, some examples being [ASUS](#) - 'Rampage', 'DeLuxe', 'Pro': [GigaByte](#) 'GA-Z77X-UD3H', '[GA-X58A-OC](#)' and so on. Access to the BIOS is usually achieved by holding down the 'Del' key as the system boots. Generally, following the mainboard vendor's 'official' overclocking guide will take you along the safest path, and give you very specific values and parameters that can or need to be changed, while offering suggestions for heat control. Note – FSX cannot virtual cores, and so HT should be turned off. This will also lead to a cooler-running proc. Begin with small increments for both the [multiplier](#) and the [vCore](#), pressing "F10" to save the new settings, and restart the pc. It will pay dividends if one creates a [paper](#) log to chart your settings and temperatures.

Once the bios has been changed to the new values, IBT, CPU-Z and CoreTemp will be loaded, placed on the desktop where you can see them, '5 times to run' set into IBT, and the 'start' button pressed. At the end of each cycle, as the test progresses, a new result will be written to IBT's output window, showing the time the test took, and the speed of the test in GigaFlops (GFlops). The cpu's temperature must be monitored throughout this procedure, but in general, provided there is adequate cooling and the temperatures are kept below ~80deg.C, no harm will come to the processor. Most processors are also protected by an automatic 'throttling' in the event that the temps *do* reach a predetermined maximum - generally in the 90 – 110degC range. In practice – as above – don't let it rise above 80 degC and she'll be fine with FSX. [Here](#) is a link to some i7-xxxxK 9xx and 27xx-k settings.

Software Environment

Operating system;

At this moment – the most solid, expandable and reliable OS is Windows 7 – 64bit – anything less is going to cause performance, reliability or compatibility issues – XP, in 32 or 64-bit, has memory problems, compatibility issue and OOM's. If your intention is to run FSX in DX10 mode - be aware that XP does not support DX10 either, so - if you can – purchase or upgrade to the 64 bit version of Windows7. There is insufficient data to recommend Windows 8 at this time.

Speaking of Windows 7 - there are a number of “User Experience” applications running in the default OS, and besides “dumbing-down” the interface, while at the same time adding extra layers of background applications, they hide many of the files and folders which, in the course of day-to-day management of the simulator, are necessary to see, open and change.

We recommend that you open your Control Panel->Appearance and Personalization, selecting “Windows Classic” as the default desktop, with “no sounds” and “no screensaver” set at the same time.

Windows Update: Turn this on and set it to “Download Windows Updates” - but to ask you when to install them.

UAC: W7's User Account Control. Turn this off completely, and save hours of frustration. Most of our pc's are attached to the internet via a router with a built-in firewall, with W7 itself having the same, plus Microsoft supplies a very good A/V solution in MS [Security Essentials](#). As long as these are installed, up and running it is highly improbable that a virus or other exploit will be successful in corrupting your PC. Use [MalwareBytes](#) to clear out other noxious software.

Overclock the system before spending hours – (maybe days!) installing FSX. This is counter to some opinion, but the overclocking process can introduce corruption of the OS and any application that happens to be running when a BSoD, a CTD or a crash/reboot occurs. A synthetic test session – IBT, OCCT or Prime95 will stress the pc far more than FSX can, and if the pc can successfully run those apps to a conclusion at the highest speed you can get – then the *chances are* that it will now run FSX without a problem.

Background processes: If at all possible – also download and setup Ken Salter's “[AlacrityPC](#)”, (free) configured such that it kills as many un-needed processes as possible, and then launches either TrackIR, with you launching FSX, or the other way around. One does *not* need the Acronis Scheduler, SyncAgent, Nonstop Backup, Bonjour, Google Updater, Windows Cardspace, iPod, Appl. Identity, Cryptographic, Function Discovery, Fax, Office Source Engine, Viewpoint, Search, Homegroup, and so on, services running - while FSX is struggling to get 25 or 30 frames, so I *always* use [AlacrityPC](#). It has a very small (1.5MB) footprint, can be used to stop all the services and processes that aren't needed, and will launch TrackIR, or AS2012, RC4, etc., or FSX, itself.

PMDG Pilots – Please note this: in relation to the above recommendation re stopping processes: we need to warn you that you will have one running process that must not be stopped. PMDG products need an application called “FLEXnet Licensing Service” running in order that they can run. Both GameBooster and Alacrity have the ability to stop this, and you may not be aware of it. Make very sure that the “Action to take” is set to “Nothing”. PMDG advises us that this is a major source of service requests.

Page File: A corrupted or a fragmented page file is a major source of “Out of Memory” errors - (“OOM’s”), and by creating a fixed, “custom” size the chance of this can be minimized. To make this a “Custom” size, enter the “My Computer”->“Properties”->“Advanced System Settings”->“Advanced”->“Performance”->“Settings”->“Advanced”->“Change”, and then, assuming three or more drives in the PC and using [these](#) pics as a guide – set a “Custom size” for the C:-drive to 100 (MB) in each box, and then press “Set”. Select the next drive – not the FSX drive, and make its Custom size 3072 (MB) in each box, and press “Set”. If you have only one drive, or one extra used for FSX - then just set 3072 in each box for the C:-drive. This will give one a fixed Page File size of 3 GB, will be more than adequate for Windows 7 and FSX, and will not be subject to defragmentation in the way which it is when managed by Windows. Reboot.

Desktop Heap Limitation:A second reason for OOM’s occurring is the default setting for the Desktop Heap is low: we recommend you change this as follows: To modify this, follow these steps:-

- 1). Click **Start**, type **regedit** in the **Start Search** box, and then click **regedit.exe** in the **Programs** list.
- 2). Locate and then click the following registry subkey:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\SubSystems
Right-click the **Windows** entry, and then click **Modify**.
- 3). Right-click the **Windows** entry, and then click **Modify**.
- 4). In the **Value data** section of the **Edit String** dialog box, locate the **SharedSection** entry, and then increase the second value to 20480, and the third value to 1024.

The FSX Installation: This should be done on *any drive other than the C:-drive*, so that the drive is not handling requests from the OS and from FSX at the same time, and especially – it should not be installed in the “Default” C:\Program Files(x86)\, as this folder is owned by “Trusted Installer” and you will have many frustrating arguments with FSX and your pc if this is the case – even with UAC turned off. FSX has a habit of growing, so allow a drive space of at least 200GB, with another drive on the system to store all of the downloads, tools, licensing and textures, such as those of HiFi ActiveSky or REX.

Once FSX is installed, the two Service Packs should go in, FSX being started and then shut down, with a reboot between each SP. You do not need either SP if you have Acceleration. Assuming all is good, set up the fsx settings to your preferences, make a test flight and then shut fsx down. At this point a defrag should be done, as sorting the scenery indexes on the disk by folder/filename will provide a goodly increase in FSX’s performance, and the best way to do this is to use a defrag utility such as O&O Defrag or UltimateDefrag.

Once completed, reboot, have a flight to see if anything else needs attention, and then a complete backup - or a drive image - of FSX to a spare storage drive. Also, because we’re never *1000% sure*, that we are going to end up with a great sim, we need to make sure we can get back to the FSX configuration as it is at this point. You can do this by creating a new folder on that storage drive, say “FSX Configs” and then copy/pasting the entire C:\Users\{your_username_here}\AppData\Roaming\Microsoft\FSX\ folder into it.

Nvidia Inspector: We need to install the latest Nvidia Driver – at this moment 310.90 – from [here](#): Similarly with Nvidia Inspector – from http://majorgeeks.com/NVIDIA_Inspector_d6630.html (or other favourite site.) The latest is 1.9.6.8.

The major difference between the 300 series of drivers (for us) and the older drivers is that of how it manages vsync, so [here](#) are three ‘starter’ Nvidia Inspector configurations for DX10, from 2SGSS to 8SGSS loads, courtesy of SGSS work done Mike Krawczyk, plus one with “Bioshok” AA Compatibility, and [here](#) is a shot of settings which will work in DX9 for many pc configurations.

These settings are for moderate-to-high clocks, with SGSS used to control Shimmering. There are many combinations for FSX when using DX9 and the choice is quite subjective, however when using DX10 (covered elsewhere) the choices are much more limited.

The use of SGSS is largely an unknown in DX9, but has made waves in the DX10 world, in solving the shimmering issues – mostly trees and cockpits, but also along the shorelines around islands with high water settings.

Largely dependent upon the proc/gpu combination, 2x SGSS is minimally hard on the system (shimmering reduced greatly), 4x SGSS somewhat harder, and 8xSGSS very hard on the system, especially cloudy situations (absolutely no shimmering). Note – this is not so apparent when using DX10, which handles loading much more effectively.

The FSX.CFG File:

The fsx.cfg can be found here, in Windows 7 and Vista:

C:\Users\{your username here}\AppData\Roaming\Microsoft\FSX

in Windows 7 & Vista, and here in Windows XP:

C:\Documents and Settings\Application Data\{your username}\Microsoft\FSX

While in this spot – select “Folder Options”->”View”, and run down the list under “Files and Folders”. A tick in each box will turn each line on or off, and specifically – we need to “tick” the following:

“Hidden Files, Folders and Drives” – **Show** hidden files, folders and drives”

We then need to “un-tick” the following:

“Hide empty drives in the Computer folder”

“Hide extensions for known file types”

“Hide protected operating system files”

“Show pop-up description for folder and desktop items”

Ignore any warnings during this process, press the “Apply to all folders” button, and then “OK”.

This file is read by FSX around the same time as the “spinning aircraft” window opens. If FSX doesn’t find the file – *it will create one for you*, choosing settings based upon what it thinks best suited to your hardware. Open the fsx.cfg with “Notepad”. This is an editable text file which subdivided into sections (or section headers) like so: [Main], [Display].

Inside each section are a set of parameters which will generally change what you normally will see on the screen. They are in no particular order, nor are the parameters themselves in any particular order: however, they must be spelled correctly, else they will not work.

Should you experience an unusual problem, or the sim fails to start, etc., the first step in the repair process is to copy this file as “fsx-Copy.cfg”. It will automatically rename the file to this, if you simply “copy/paste” using the rt mouse button to select the commands.

Then delete the existing fsx.cfg, and restart the sim, which will then make a new one. There are a number of changes which need to be made at the outset before serious flying will take place. Your “settings” dialogue within the sim will modify a good number of these settings, but there are also a number of additions to be made.

Modification and Additions to the fsx.cfg:

The first addition is BufferPools, because it's complex, and needs to be tested, tested, and tested with different figures in order to come up with a solution which will yield high frame rates with a minimum of stuttering, no artifacting, and while allowing an increased graphics load which is heavier than a cfg without the BP entry might be.

There are two kinds of buffers in FSX – Dynamic Vertex Buffers or shared buffers, and Static Vertex Buffers, and are created in the GPU's memory area. Both are used by FSX depending upon the configuration as shown in the example below.

The default PoolSize is 8MB (8388608 bytes). This is the size of a single buffer. Other sizes which can be tried are 10MB (10485760, as below), 15MB (15728640), and other sizes on up, but with little more to gain.

The second figure here is the Reject Threshold (RT) – a function which will cause any data bigger than the RT to be given its own dedicated buffer, and smaller objects going into the shared buffers. The balance between shared and dedicated buffers can be changed by setting a RejectThreshold. (BP=1, RT=xxxxxx). BufferPools=0 means that there are no shared buffers. Generally a dedicated buffer is faster than a shared buffer, and this is the case when BP=0, but the gpu *must* be able to handle all that FSX and the main cpu can send, such as when a GTX 560Ti is paired with a 3.4GHz processor.

If the processor can provide more data than the gpu can handle, then the BufferPools will need to be set to 1 and a RejectThreshold set.

This can be notated as UsePools=1 or Bufferpools=1, both are identical.

```
[BufferPools]
BufferPools=1    // UsePools=1
PoolSize=10485760
RejectThreshold=524288
```

```
[BufferPools]
BufferPools=0
```

For the very best performance, BP **does need to be in the cfg**, and I would suggest simply estimate the 'match' between proc and GPU, and start with what you consider reasonable. Default Microsoft Poolsize is 8MB.

Finding the right size is difficult, because it interacts with other parameters – TBM & Water, for example. TBM is a 'throttle' that increases the graphics data to the GPU. It's "*pressure*". Depending upon how high texture, mesh, autogen, traffic, weather or set – too high a TBM setting *may* cause graphics corruption, max is about 120, 80 is good.

Notes:

Normally a locked framerate is required (30 set in fsx). BP=0 will cause artifacting and flashing if the 'match' is wrong. In this case, either set water to High 2.x, or set BP to "1" and add a RejectThreshold. Testing for size is a few hundred identical low-level flights with on-screen frame rates visible, around a known frame-rate killer area, such as the city of Seattle.

[GRAPHICS]
HIGHMEMFIX=1

This must be added to the cfg. We understand from the various MS blogs, this parameter was missed in SP2, and so needs to be placed back into the fsx.cfg file. It will prevent cloud flashing and other anomalies.

This is a “must-have” addition.

[DISPLAY]
TEXTURE_BANDWIDTH_MULT=40

If your GPU has 1.2 -1.5GB memory (or higher) set TBM to 120. If less than 1.2GB memory, set TBM to 80. If less than 700MB, set it to 40.

Recommendations from various quarters are not to set this higher than 120.

[GRAPHICS]
TEXTURE_MAX_LOAD=4096

This number sets the maximum texture resolution size that FSX can use. If you are not running high-resolution (4096) textures (such as some REX clouds are), there is no reason to have it set to 4096, however there will be zero impact if it is set to 4096.

It is not a performance killer unless you are using 4096 textures. Examples are LevelD McPhat HD textures, 4096 clouds...

Note: Using 4096 clouds with high levels of Anti Aliasing like SGSS will strongly impact the GPU, especially the 560Ti. An overclocked GTX 580 is also not immune to such high loads and IQ. If IQ is important, then 2048 clouds are a good compromise. Note, also FSX will reset a 4096 entry to 1024 if one changes any settings and saves them while in-game.

[DISPLAY]
UPPER_FRAMERATE_LIMIT=30

FSX dynamically provides textures and motion information in response to your flight situation. There will be times when there are few changes occurring, and the processor is able to do “housework” and other functions – not necessarily FSX-related – perhaps updating Google..... If there is *no* frame limit – fsx will suddenly jump to any higher rate that it can, and likewise, when the proc is heavily loaded, the framerate will plunge. Running FSX at an internal limit such as the 30 recommended by Nvidia (Vsync 1/2 Refresh Rate) will allow fsx to synchronize its display to that constant 30 frames without stuttering or hesitations, providing the load can be managed.

VSYNC TWEAK – Full Screen

Place “ForceFullScreenVSync=1” into the [Display] section of the fsx.cfg when using pre-310-series drivers and older Inspector versions. This tweak will cost approximately 4fps.

When using post-310 drivers, set the framerate to 30 within FSX, like so:

[Display]
UPPER_FRAMERATE_LIMIT=30

And then, in Inspector, set
“Vertical Sync Tear Control” to “Standard”
and
“Vertical Sync” to “½ Refresh Rate”

This should help the system hold that 30 frames, and cure the screen tearing at the same time. If you still have issue – a fix was found by Avsim member LeonHardt:

Place “DisablePreload=1” in the [Main] section. This works splendidly in DX10, and should also work in the same fashion in DX9.

VSYNC TWEAK – Windowed Mode

Prior to this tweak - “ForceWindowedVSync=1” - the frame rate always ran at a lower multiple than the monitor’s refresh rate i.e. 60, 30 or 15: it was never able to run at 25fps, or 23. If the system could not maintain to set frame rate – in most cases – 30 fps, the frame rate would plunge to 15.

Thanks to Avsim members Tabs (Ryan Maziarz) and guenseli (Gunter) and Kosta - there is now a fix, as follows:

Once FSX is started in the normal manner, Windows Aero is started – but started *after* FSX, which in return fixes the normal Vsync operation in windowed mode.

Note – this fix will not work if “Themes” is disabled in Windows Services.

To enable Vsync in windowed mode add following to your FSX.cfg:

```
[GRAPHICS]
ForceWindowedVsync=1
```

Starting or re-starting Aero:

Method 1). Create a batch file in Notepad, containing:

```
@echo off
start "" "E:\FSX\FSX.exe" (insert your own path for “E:\FSX\”)
net stop uxsms
net start uxsms
```

Save it as Aero.bat (or something similar) and run it. FSX is going to start and Aero will be started after FSX.

Method 2). Using the registered version of FSUIPC. Create a batch file named Aero.bat in Notepad and place it in your FSX root folder.:

```
net stop uxsms
net start uxsms
```

To set FSUIPC to run the batch file automatically, edit the FSUIPC.ini and enter:

```
[Programs]
Run1=HIDE,"E:\FSX\Aero.bat" (insert your own path for “E:\FSX\”)
```

This solution is going to do everything silently. No CMD popup windows, only visible Aero activation.

Reference post:

[Link](#)

[TERRAIN]

LOD_RADIUS=6.500000

This setting controls the visibility of the textures and objects in the immediate area surrounding the aircraft. This should not be set over 6.5, as it is a known source of OOM errors - even 6.5 will cause OOM's when combined with other scenery packages, cloud levels or very complex aircraft, etc.. Maximum FSX default is 4.5, and FSX will reset this back to 4.5 any time one changes any settings and saves them while in-game. Note, too, that the zoom level also has an impact on appearance.

[DISPLAY]

WideViewAspect=True

This addition to the cfg file should be used if you have a widescreen monitor, otherwise 2d instrument panels will be greatly distorted.

[Main]

FIBER_FRAME_TIME_FRACTION=0.1

FFTF is an addition to the cfg file, and determines the fraction of the CPU time given to the scenery loader in relation to the time spent rendering. Frame rate will improve as this number is reduced toward 0, however, if run at 0, the CPU has progressively less, or no time to load textures as memory load increases and frame rates drop. The faster the CPU, the lower this number can be, because a lesser fraction of the CPU clock time is required to successfully load that scenery.

Much like BP=0, this tweak is dependent on the balance of the system, and so expecting that lowering the FFTF will *always* result in a frame rate increase is somewhat of a misconception. Default is 0.33. The lower the number, the better the FPS, but this may also result in ground textures blurring, with loss of autogen. Good settings – start at 0.2 and lower it from there. Experimenting is the key here.

VIDEO DRIVER Line.

[DISPLAY.Device.NVIDIA GeForce GTX 580.0]

Mode=1920x1200x32 // 32 indicates 32-bit color.

Anisotropic=1 // always a "1"

The line DISPLAY should appear only once per Display.

If you have more lines (and only one monitor), it may indicate that you have DX10 enabled, or have used both DX9 and DX10. These lines can be deleted, and FSX will automatically create a new entry for each monitor it sees, and for each version of DirectX.

Skidmark Tweak

Here is a quite unknown tweak. A skidmark tweak: Set FPS unlimited for this test. Go to a default well performing airport, with a default aircraft, slew in for landing and land, then change to external view and look behind aircraft. Note the FPS. Next, rename/delete fx_skidmark.fx in the Effects folder. Repeat the above test and note the FPS when looking behind aircraft. Your frame rate will be much higher!

G3D.DLL Crashes and Fix

Pete Dowson, hero of FSUIPC fame, has incorporated a g3d.dll crash fix into his product. It does not fix all g3d.dll issues, as there are numerous causes, which can cause this error. You should always install the latest module from his website. More details [here](#):

UIAutomationCore.dll FIX

One known bug which has reared its ugly head as a result of MS not testing FSX on Windows 7, is that the current version of the Windows7 UIAutomationCore.dll is not fully compatible with FSX. The symptoms are a screen ‘freezing’ with the sound continuing. It is the result of too many menu or mouse clicks. This is “fixable” by downloading the one from [this](#) link, placing in the root folder of FSX and renaming it to the correct name.

The Windows 7 version is 6.1.7600.16385, and is resident in the Windows\System32 & SysWOW64 folders. The version needed is 6.0.5840.16386, and is for Vista. It must be simply placed into the FSX_Root folder and not be registered, as this will change the operating system.

Addons: Missing Alphas and MipMaps:

Any time the GPU receives a texture – which, of course, it’s doing constantly – it expects to see an alpha texture. If it doesn’t find one - it looks for one: if there are enough textures without alpha’s – it will cause stuttering and/or hesitations. Similarly with MipMaps – the gpu wants to see a mipmap, and will look for one if one is not present, and without “mips” shimmering is possible. Adding mips to a texture will virtually eliminate shimmering, and when combined with a powerful graphics card - which can use some transparency supersampling - you can pretty much get rid of shimmering entirely.

This is not so much an issue with the FSX, SP2 or Acceleration application - they are “clean”, as ACES mip’d all default textures in the flight Sim, but there are hundreds (thousands?) of textures in the addon market which are missing one or the other – or both.

So, how to fix this issue? Fortunately, thanks to [Peter Van Der Veen](#) , we have **AlphaSearcher2**, from [here](#): or [here](#): For batch processing, there is a nice, though somewhat convoluted in its interface - **ConvimX**, from [here](#): or [here](#): and lastly **DXT3FixerX**, from [here](#):

Easiest way to use the tools:

First, run AlphaSearch2 against any addon’s texture folder, be it an aircraft or scenery. This will list any files which are missing mips or alphas. Next, run ConvimX by selecting the list of files found by AlphaSearcher2, taking care to note where the output files are being sent to, and that the Options selected are correct. After this one can run DXTFixerX to just check that everything went as expected.

AlphaSearcher2: - Peter Van Der Veen (Garfield_x of the Alpha-India site)

Testing for Alphas and MipMaps: Whereas it is possible to simply run ConvimX on FSX’s root folder, letting it check and fix everything all in one shot – it is far wiser to plan out a strategy of breaking the sim down into smaller sections, backing up that section, and then running the tools. This way, you can test it immediately and quickly, and you can fix the issue by moving the original file(s) back into the original spot(s) and running AlphaSearcher2 to check for the issue again. It’s also quite easy to take a screenshot or copy/paste the list of files produced by AlphaSearcher2, so you have a reference to go by. [Here](#) is a shot of AlphaSearcher2 running.

DXTFixerX: - Peter Nyman (neumanix) of the Alpha-India site.

DXTFixerX will begin fixing textures with missing Alpha channels as soon as you select the root folder, but does not add or test for mips. There is a checkbox to prevent any fixing, while creating a log.txt of files needing fixing.

ConvImX: - Author unknown at this time.

A very capable image converter, and will convert .bmp to dds, giving a choice of DXTx output, with or without mipmap, much the same as DXTBMP will, but as a batch process instead. It appears to hang when working on a zillion files, but it is still running, so beware – don't close it – just let it finish. [Here](#) is a screenshot.

User Aircraft:

DXT1, DXT3 or 32bit

32-bit textures are hard on frames, but the modern high-speed gpu seems to handle them easily, but this may have an impact when used on a low-end system, so in general - don't use 32bit textures. Convert all textures to DXT3 with mips, with the exception of props, if they are 32bit – leave them that way, as they may lose much of their transparency when converted to DXT3.

VC:

DXT1, DXT3 or 32bit

The VC ought not to be mipped unless any shimmering is present and annoying.

Existing FSX texture types, and their basic rules:

DXT1 Does not have to have an Alpha channel, nor does it need one.

DXT3 **Must** have an Alpha channel, and in many textures – they are missing.

DXT5 **Must** have an Alpha channel, and in many textures – they are missing.

32-bit Automatically has 8 bits assigned as Alpha, and does not need attention.

DXT1 only has 1 bit for transparency (or no alpha at all which is fine for DXT1), that means the alpha channel can only contain fully white or fully black pixels. Where there are white pixels, the image (RGB data) will show and where there are black pixels the image will be totally transparent.

DXT3 has 4 bits of Alpha information, which gives you 16 shades of gray (0-15 in decimal) or levels of transparency. This is better but still not good enough for really smooth transparency (like light splashes and prop textures).

DXT5 the alpha information uses a palette, similar to the way the color information is stored. This palette contains a minimum and maximum alpha value. Then 6 other alpha values are interpolated between this minimum and maximum. This thus allows more gradual changes of the alpha value.

32bit bitmaps have four channels that are 8bits each, Red, Green, Blue and Alpha. This gives you >16 million colors (255 x 255 x 255) plus 255 shades of gray (levels of transparency). Wiki info [here](#) , and for an excellent reference, www.fsdeveloper.com has a Wiki on DXT compression [here](#).

DX10 “How-To” Notes:

This unusual facet of FSX began with an inquisitive programmer who wanted nothing more than to create a blog, simply describing experiments investigating how FSX works.

“I then asked myself the question – “Why do runways flash in DX10?” It turned out that the question I should have asked was “Why *don't* runways flash in DX9?””

That was how Steve’s astounding path to opening the door to FSX – DX10 began.

Included below are the links to his site, links to Steve’s Shader10 patch and Steve’s more general FSX knowledgebase. It’s a good idea to read Phil Taylor’s Blog on Accelleration-SP2, which is [here](#), (doc) or [here](#) (pdf), as it describes the many improvements DX10 has made in the sim, and then visit Steve’s blog-site, as it will introduce you to a world unseen by most simmers: read about flashing runways; shadows; fencing – and more. If you’ve already been there, and now want to take the plunge to “the new Sim”, start here, with this “General How-To”. I say “General”, as we all know - what works on mine may well be somewhat different on yours, but by and large, the adherence to some known fixes, plus patience and a bit of technical moxy – at the end of the tunnel – there’s a somewhat faster, “prettier”, more stable sim, fewer, or even *no* OOM’s, with a lot more going on than DX9 would ever tolerate.. If you have a very powerful machine – it will be Nirvana, as FSX will run smoother, and with settings which you never thought possible.

The fixes thus far are:-

- 1) Flashing runways/taxiways:
- 2) Yellow/white runway markings transparency
- 3) Opaque chain fences
- 4) Progressive Taxi markings missing
- 5) Missing night scenery/semi-transparent dusk scenery (often mis-described as missing night textures)
- 6) Some addon cars with black headlights
- 7) Softer shadows
- 8) Eliminated false sun on VC roof and side wall
- 9). Darker Water colour
- 10) Blue “FSX” squares gone!

I’ll start the ball rolling with the necessary changes before we start tweaking.

Note here that, while some similarities *do* exist, AMD/ ATI gpu’s are not covered in this doc, as Steve has created a very good Summary [here](#): However as individual DX10’ers come up with successful CCC configurations – I will gladly include them here.

For my part – I have a GTX580, and so Nvidia Inspector settings are uppermost here.

“The Fix”

Important -> **First!!** Do you **know** if the **default DX10 works** on **your** machine?

In Settings ->Display - tick the “Preview DX10” box, restart FSX and check that it **does work before** applying this modification: If you **don’t** see the option to select DX10 then either your OS, your FSX Service Pack level, or your hardware doesn’t support it. It’s important that you try this out first to avoid a situation where the patch gets the blame!

Page 1
18

Once that’s successful – follow [this](#) or [this](#), link (v3.2.2), download, save and unzip the file, and then follow Steve’s instructions to install the modified section of the ShadersHLSL file. Be sure to follow his very detailed ReadMe, backing up the folder first.

If, by any chance – the ShadersHLSL folder gets messed up – [here](#)’s a brand-new one - stock: just delete the “bad one”, unzip this one, and copy it into the old one’s place, then delete the two Shaders cache folders inside your (Windows 7) “C:\Users\{your username}\AppData\Local\Microsoft\FSX\”. FSX will then rebuild these two the next time it starts.

Background processes:

If at all possible – also download and setup Ken Salter’s “AlacrityPC”, (free) configured such that it kills as many un-needed processes as possible, and then launches either TrackIR, with you launching FSX, or the other way around. One does *not* need the Acronis Scheduler, SyncAgent, Nonstop Backup, Bonjour, Google Updater, Windows CardSpace, iPod, Appl. Identity, Cryptographic, Function Discovery, Fax, Office Source Engine, Viewpoint, Search, Homegroup services running - while FSX is struggling to get 25 or 30 frames, so I *always* use [AlacrityPC](#). It has a very small, 1.5MB footprint, and can be used to stop all the services and processes that aren’t needed, and will launch TrackIR, or AS2012 – or FSX, itself.

PMDG Pilots – Please note this: in relation to the above recommendation re stopping processes: we need to warn you that you will have one running process that *must not* be stopped. PMDG products need an application called “FLEXnet Licensing Service” running in order that they can run. Both GameBooster and Alacrity have the ability to stop this, and you may not be aware of it. Make very sure that the “Action to take” is set to “Nothing”. PMDG advises us that this is a major source of service requests.

FSX Configuration and the Inspector:-

Backup your FSX DX9 User files..!!!

Because we’re never *1000% sure*, that we are going to end up with a great sim, we need to make sure we can get back to FSX as it is at this point – a DX9 version. There are a couple of ways to achieve this: my preferred way is to create a new folder under the C:\Users\{your_username_here}\AppData\Roaming\Microsoft\FSX\ folder. Name it as something like “DX9 Configs”.

At this time, then, as we make this folder, we are sitting in the: C:\Users\{your_username_here}\AppData\Roaming\Microsoft\FSX\ folder, right? This is where the “operational” dll.xml, exe.xml, cameras.cfg, scenery.cfg, and fsx.cfg all reside, and what we need to do is to make sure those files are safe, along with a copy of the current Nvidia Inspector profile or your ATI CCC config. We can do this by simply “Copy and Paste” –ing them or exporting them into the new “DX9 Configs” folder below. Safe!

Nvidia Inspector:

With that out of the way, let's open up Nvidia Inspector, choosing our "MS Flight Simulator X" profile, shift over to the top-right a bit, and click on the little box with the green arrow pointing up, and select the "Export Current Profile Only", then Browse to the folder which you just made, and save that DX9 profile in there as well. This makes it a "special" profile, and it won't get forgotten - as it might do when mixed in with fifteen other "good" profiles in its normal home folder...

The above also assumes you have the latest video drivers and software, but here are their links, in case you don't have them. We need to install the latest Nvidia Driver – at this moment 310.90 – from [here](#):

Similarly with Nvidia Inspector – from [here](#): (or other favourite site.) The latest is 1.9.6.8.

The major difference between the 300 series of drivers (for us) and the older drivers is that of how it manages vsync, so [here](#) are three 'starter' Nvidia Inspector configurations, from 2SGSS to 8SGSS loads, courtesy of SGSS work done Mike Krawczyk, plus one with "Bioshok" AA Compatibility.

I suggest the 4x to begin with. You can try App-Controlled AA & AF, but stock AA results in lots of shimmering, and Mike's is a very nice setup. For extra performance, you might drop 8xSGSS down to the 4xSGSS one without any appearance penalty, and this will work with Steve's recommendation below, re: [MultiSamplesPerPixel](#), and [MultiSampleQuality](#) – set within the fsx.cfg [Graphics] section.

Copy these settings into your Inspector, and then save the profile, perhaps as DX10_01+{today's date} . Apply and close it.

AMD/ATI Catalyst Control Centre Examples:-

ATI HD 5770 card with driver 12.10. CCC settings: Courtesy of DX10'er Carl (Avsim member ctiger)

AA :	Use App Setting checked..
AF:	Use App Setting Checked
Tesselation:	AMD Optimized
Catalyst AI	Quality
Mipmap	High-performance
VSync:	Off unless app specified
AA mode:	MSAA (can use higher)
OpenGL :	
Triple buffering	Unchecked

Changes to Settings within FSX:

To be honest, you can really begin with your old cfg file, but it's probably best to err on the side of good practice, so delete the old one, start FSX, let it make a new one, then "fix" it. So – having done that - open up the Free Flight screen and load your most normal flight: something like the default C172, at a not-too-busy airfield: one of the PNW airfields is fine – not too close to Seattle or Vancouver – perhaps Skagit or Diamond Point – maybe the Orbx freebee - KHQM – Bowerman. Make it "day", "Summer", "Clear skies' – and save this as the "Default" flight. Ok – now into settings. Because this is a new fsx.cfg, you'll have the crazy music. If you like it – keep it! What concerns us is the more important performance config. You can set up your sound, your Realism etc., later, but the performance is what concerns us most, SO –

Settings ->Customize ->Graphics->Target frame rate ->30. This is ½ Refresh Rate of 99% of all LCD Monitors, and the new Nvidia drivers will make an excellent attempt to keep your precious fps in that region.

Filtering: *Anisotropic.....* AntiAliasing: *Ticked...* Global Texture Resolution: *Very High*.
Preview DirectX 10: *Ticked...* Lens Flare: *open...* Light Bloom: *open...* Advanced Animation:
Ticked...

A note here, courtesy of Steve's blog: [quote] In order to have any AA when in DX10 preview mode you **must** ensure that anti-aliasing is enabled in game.[/quote]

Also, from Steve: [quote] Be aware that sometimes when switching between DX9 and DX10 the setting seems to turn itself off. This doesn't happen on my Win 7 PC with HD7700, but did used to occur on my Vista PC with a HD4670 [/quote]

Settings ->Customize-> Aircraft->Set the left side as you like, but un-tick the right side boxes (for now).

Settings ->Customize-> Scenery->Mesh Resolution-> 2M: Water Effects-> *Low 2.x, Med 2.x or High 2.x* :

Low and Med look pretty good, and don't cause any shimmering, whereas High 2.x causes land reflection shimmering on some pc's...

Land Detail Textures: *Ticked...* Ground Scenery Shadows: *Un-ticked.....*

All others: as high as you think may work, as with DX9, but beware full right will give more scenery and AG than in DX9, (it will take it) so you may happily back them both down - and still have *better than DX9*.

Settings ->Customize-> Weather-> Cloud Draw Distance: 60 Miles/96km... Thermal Vis: *None*
Rate of change: *Medium...* Detailed Clouds: *Ticked...* Cloud Coverage Density: *Maximum*.

Settings ->Customize-> Traffic->AI: 20%... GA: 20%... Road: NOT MORE THAN 10% No red numbers, Ships or Boats.

It is worth noting here, if your other settings are high-to-maximum – then that Road traffic may well cause flashing and artifacting. With the sim running at maximum settings - Road Traffic, while nice to see, is the single most major frame killer in the Sim.

Quit FSX, as we now need to add some “known” fixes to the cfg file...

Open up the FSX.CFG using Notepad, Notepad++, or other ASCII editor:

And add or modify these lines under each of the respective section header:

[Graphics]

MultiSamplesPerPixel=4 // **Must have** for good AA Can be 8

MultiSampleQuality=8 // **Can be 4** for better performance.

D3D10=1 // DX10

HIGHMEMFIX=1 // A fix Microsoft forgot

TEXTURE_MAX_LOAD=1024 // Can go higher later

[Display]

TEXTURE_BANDWIDTH_MULT=XXX //Between 40 and 120 in multiples of 5. High-end –start at 80.

UPPER_FRAMERATE_LIMIT=30 // **Must be 30** for the Nvidia driver ½ RR setting

[Main]

FIBER_FRAME_TIME_FRACTION=0.1 // Generally 0.12 – 0.22 gives very smooth flight: 0.33 is default, but may result in stuttering: Lower than 0.1 *may* give blurring of ground textures when flying fast at low level.

Last note – I haven't mentioned BufferPools here because it's a heavy subject and covered so much better in so many other very recent forums. Generally a 560 (minimally) to a 580 will handle BP=0 in DX9, but almost *any* configuration of BP will yield little variance with DX10. For my 2600K-GTX580 – I'm now running this setting, shown here, and have abandoned the BP=0, and also my earlier default PoolSize and RT, because of cloud flashing in "Vancouver+" when in solid overcast, thundery weather. I use Jon Patch's *great* Vancouver+, as it is the most densely-packed scenery I have. The settings below gave me no flashing on the roads, and moving RT up or down would make no difference and then I moved road traffic from 45% (pretty high, anyway) down to 28 – and this stopped ALL flashing. Note -This was done during the same testing cycle as the BufferPool tests.

[BufferPools]

BufferPools=1
PoolSize=10485760
RejectThreshold=524288

For the very best performance BP **does need to be in the cfg**, and I would suggest simply use this one, or copy it right from your old fsx.cfg at this point. Default Microsoft Poolsize is 8MB.

Finding the right size is difficult, because it interacts with other parameters – TBM & Water, for example. TBM is a 'throttle' that increases the graphics data to the GPU. It's "*pressure*". Depending upon how high texture, mesh, autogen, traffic, weather or set – too high a TBM setting *may* cause graphics corruption, max is about 120, 80 is good.

Save this config to the "Configs" folder as the default DX10 Master.

Done!

Now go Fly! From here onward – experiment away, using this base: you will find you can move the scenery complexity, autogen, weather and traffic sliders around with considerably more abandon – particularly if you have a powerful pc. Not only is the experience smoother, the fps variance stays much tighter than in DX9 – and with a higher load.

A Couple of Notes:**Nav and Strobe Lights for aircraft which use the MS stock lights:**

The difficulties encountered by Steve are covered in Steve's Blog [here](#), but pretty complicated for the average sim flyer, for sure. His lighting fix works, but it does involve a number of edits, copy's and pastes to files within the Effects folder, and has been further complicated by the addition of an excellent modification to Steve's method, by an unnamed feller known at Avsim as "RNGR"!

In that light I have taken Steve's modified files, added in the two ready-modified navred and green light files, and dropped the ballast.fx, per RNGR's post Dec. 6, 2012.

The seven files are now to be found [here](#): Simply unpack and unzip them to a temporary spot, copy or rename the original files in the "Effects" folder (or the whole Effects folder itself), and then paste these updated files into the Effects folder.

Clouds:

Steve has a good comparison between DX9 and DX10 clouds [here](#), and a note on testing.. Post #7. Following some good research on REX clouds – RodO (The Family Man) [here](#), post #14, states that he found that - after making sure that DXT5 and 1024 x 1024 textures are used – the frame drop is gone.

Rain Fix:

This has been an issue for many years, and the fix, too, but it's not generally known who did it or where to find it. Doing some digging – I found that one of the ACES team – Gizmo - created it; it's still current, but has just been upgraded by another version, this time by Avsim member MattNischan, and so I've included it here.

Gizmo's Original Rain Fix:

Open your (drive) \%\FSX-root%\ShadersHLSL\Misc\ and make a backup copy of Rain40.fx, then replace it with this modified version [here](#).

Once done – go to your C:\Users\your username\AppData\Local\Microsoft\FSX\Shaders10\ShadersHLSL\Misc folder, and remove/delete the Rain40.fx_0x4700000000000000_0x0f file. This will be replaced by FSX when you next fire it up.

You can reduce the tunnel effect – and also the rain color by altering the transparency of the shaders output. Change this line:-

```
return float4(1,1,1,In.cDiffuse.w) * (cColor0 + cColor1);
```

This is Default. You can change the three numbers to any, such as those below - altering them will adjust the umbrella effect as well as the transparency.

```
return float4(0,0,0,In.cDiffuse.w) * (cColor0 + cColor1);
```

```
return float4(0.5,0.5,0.5,In.cDiffuse.w) * (cColor0 + cColor1);
```

```
return float4(0.4,0.4,0.4,In.cDiffuse.w) * (cColor0 + cColor1); ← best
```

... remember to repeat the steps above to force a new recompile. In flight the only downside to this is it also alters the colour of the snow effect as the two seem to be interlinked at a shader level. You can try a few other values, too - I find this last one 100% better than the default . Done! **Gizmo**

Matt Nischan's Rain Fix:

I recently purchased another monitor, plus a GTX680 to utilize a triple monitor Surround/Eyefinity setup. All was well, until I saw the rain. Wow! What an awful effect. And, furthermore, the rain graphic was not nearly filling the entire drawing surface at certain angles, especially in spot view. All in all, the effect is pretty darn terrible, but given the limited number of inputs passed in to the shader, there's not a whole lot that can be done. However, I was able to fix a few problems. Firstly, the rain cylinder will no longer be cut off at extremely wide resolutions. I also incorporated a similar fix for the opposite problem, which happens when the cylinder intersects with the environment, and gets clipped. The solution in the first case was to scale the rain cylinder 4x in the x and y directions, and in the latter case to disable z-buffer tests. I also took the liberty of decreasing the opacity of the rain a touch as well as making the streaks a little smaller. This reduces the "millions of fat laser beams" effect. At very wide exterior zooms this looks marginally worse than the original, and better in pretty much all other cases.

You can find the file here: <http://www.sounduit.com/rain40.zip> ... **Matt**

I have also included Matt's fix [here](#), as a backup.

Place it into your ShadersHLSL\misc\ folder in your FSX install. Be sure to make a backup of the original as well as delete the DX10 shader cache before running FSX. Many thanks for the effort, Matt. The results make this a “must have” fix – pj.

Runway Lighting:

From a post by Brett Lucas... “I had approach lights, but no runway lights. So last night I was going through many of the posts and came across one very important one. If you install Michael Swannick’s [fsx_lights.zip](#), its the Halo bitmap that will fix the runway lights. The trick is, if you use REX or Active Sky 2012, you need to UNCHECK runway lights so it does not get overwritten. In my case, I use both and unchecked both, and presto, I had awesome lights again.”

Michael Swannick’s lights found [here](#): Instructions are included in the zip.

Incompatible Textures:

Whereas the patch will take care of many incompatible textures, you will find *some* – not many - that are still incompatible with DX10, and here, if this is a major concern I would suggest you go to [FlightSimTools.com](#), and download their “AddonConverterX”. From my experience – it has taken care of all of my FS9 port-over aircraft, but didn’t work on the two ORBX (free) scenery packages CEN4 and CEJ4 (NRM). A point to note here, too – I have read reports that *in demo mode* it doesn’t do a very good job, and a second point – it causes pale squares to appear in the water – as though the coastal water masks aren’t right. This is not too much of a concern for me, as I only saw this in the ORBX Skagit – KPAE – Anacortes areas, and a). not everyone uses ORBX PNW, and b). not everyone has port-overs. Steve is working to repair these issues, too.

Orbx PNW custom street lights:

If one does a night flight with the Orbx “Night” lights selected, when flying west from Fall City (as an example) – at say, 2500 feet, one will notice that ‘clumps’ of those nice street light flash on and off. At this moment we have no fix, other than turn them off by selecting “Day”. Orbx staff have suggested this is purely a DX10 issue, and therefore will be very low on the totem pole of ‘things to be fixed’ – *however*, if one switches back to DX9 – you will be noting a frame drop of at least ten – maybe fifteen frames, and those same lights – whereas they don’t blink on and off now – *they dim on and off*. The effect on the ambiance is the same.

Aircraft Shadows:

I fly mostly in the Orbx PNW-NRM-CRM area, and during testing I noticed (actually on Goheen southerly approach) that the (default) static aircraft shadowing at *some* of those airports, was just a black square. The answer for the non-programmers is to turn off the Orbx aircraft in the respective Control Panel, so that your UT2 or MTX, W.H.Y aircraft takes their place. I should add - this is not the case at *all* Orbx airports. Orbx has also just released a free GA traffic bundle... unfortunately it is also not compatible with DX10.

AntiAliasing:

There’s a lot of concern about DX10 AA in almost all of the queries, and a couple of days ago, RodO (The Family Man) found this article on the Tom’s Hardware site [here](#). There’s a lot of reading, covering both Nvidia and AMD, but it is by far the best article I have yet seen.

Vsync:

An issue for some and not for others, as Nvidia Inspector using ½ Refresh Rate, Standard and 30 set in FSX usually fixes it; however – for those who are having conniptions with vsync tearing – this fix came from Leonhardt: just add DisablePreload=1 to the [Main] section of your fsx.cfg... No guarantees on this one, but *it does work*...

Bloom:

Extracted from Steve's WordPress Site:-

It's possible to adjust the bloom effect by editing the last few lines in General10.fxh and then recompiling the DX10 shaders. (Done by deleting the Shaders10 cache folder. C:\Users\{your username}\AppData\Local\Microsoft\FSX\)

The lines in question are:-

```
#else
    static const float fHdrSpecularScale = 1.11; ←Change this number. Larger increases bloom.
    static const float fHdrEmissiveScale = 6.0;
    static const float fHdrCopyScale = 4.25;
    static const float fHdrModAlphaScale = 3.92;
#endif
```

Shade:

Works in DX10! Thanks to tests done by HawkDsl

Blue squares:

While fixed with Patch 3.2.1, there are still occasional black squares popping up, particularly over water, and Simon - (Avsim member flying_w) noticed a line in the cfg left over from DX9 was SWAP_WAIT_TIMEOUT=2, so he removed it, and in doing so – found another fix.

UT2 Traffic and A2A Shockwave Lights:

From gigemaggs99, Nov. 11, 2012: Re: [This](#) site, quote from his post below:

"If you have A2A shockwave lights and UT2 this is a great set of files you can edit the AI aircraft.cfg files. It takes a few mins since there is no auto-installer but I just made sure to make a backup of the original prior to editing them.

In case their site goes down, you can also get the zipfile [here](#).

From bleedair.de:-

To add the effects to your UT2 aircraft please download "ut2_aircraft.zip" and exchange the *aircraft.cfg* file of each aircraft within the respective folders following your FSX installation path:

1) For copyright reasons the download does neither contain SHOCKWAVE 3D LIGHTS REDUX program files nor the complete set of UT2 aircraft but only the respective *aircraft.cfg* files. Both, UT2 and SHOCKWAVE 3D LIGHTS REDUX installations, are required to run the modification provided by the data of this download!

2) Some aircraft did not have a [LIGHTS] section within their *aircraft.cfg* file so there was no chance to change it. For a resolution all the aircraft would have been necessary to be converted to flyable aircraft. However: More than 90% of the traffic will show beautiful nav lights, strobes and beacon lights.

[bleedair.de](#) Copyright © 2009-2012

Water:

You might have noticed that the DX10 water is *much* better than DX9. One reason is that it has four bump maps to DX9's one. Also, the *wave speed and white caps effect is linked to wind speed and direction – YES!! - Much* better; however a second issue has been raised, that of water colour – while being very much more realistic, and matching the current weather, etc., are generally a much lighter color than in DX9. My only answer to this is – true, but it was also the case with stock DX9 water. This is a different sim, with different files and code, and so also needs some configuration: REX & AS2012 both have the ability to change the color, texture, wave type, etc., to suit your particular taste.

Steve has also been active, and has done a fair number of experiments with water configuration, and has now converted it into something we can all use, via Patch v3.2, released December 11th. During part of his testing he also confirmed that FSWCLite *does* do exactly what it claims, and will alter the colour and “look” of DX10 water such that it can be identical to, or better than DX9 water. FSWCLite is free – and can be downloaded from [here](#). RodO has also noted that for best performance with no visual impediments (him using REX water textures) make sure they are DX11 compression.

We aren't new to water color, of course - or other anomalies, but as mentioned at the beginning – if you regard this as a new sim – then you will be successful in your quest for that famous MS “As real as it Gets” statement!

Enjoy, and Good luck!

This document was created to help new, unsure, or just plain interested simmers to be as successful as possible when implementing Steve's DX10 Patch, released June 7th 2012. DX10 is not perfect, but improves just a little bit more with each version of Steve's patch release.

If you need further help with DX10, or other FSX issue, feel completely free to email me at pj@avsim.com If practical, Individual TeamSpeak – TeamViewer sessions are sometimes available for some “hands-on” fixin' through the Avsim [TeamSpeak3](#) server at 173.192.209.157:15797

Appendix

If an application is CPU bound, making graphics optimizations has no impact on performance. Determine if your application is CPU bound and make the relevant optimizations before moving onto graphics optimizations. An application which demands that the processor must act upon millions/billions of instructions and calculations per second

Short for 'gigahertz' – one GHz is a unit of measurement for alternating current (AC) or electromagnetic (EM) wave frequencies equal to 1,000,000,000 Hz.

When referring to the pc's processor - **GHz** is the clock frequency, also known as clock rate or clock speed, representing a cycle of time.

The CPU core voltage (vCore) is the voltage supplied to the main processor, or other device containing a processing core. The amount of power a CPU uses, and thus the amount of heat it dissipates, is the product of this voltage and the current it draws. In modern CPUs the current is almost proportional to the [clock speed](#), the CPU drawing almost no current between clock cycles.

Glossary:

FETF: Fiber_Frame_Time_Fraction: An fsx.cfg parameter, determining the amount of CPU time given to loading scenery data as a fraction of the time spent rendering.

TBM: Texture_Bandwidth_Mult. An fsx.cfg parameter. A multiplier used in the control of data flow to the GPU.

TML: TextureMaxLoad. An fsx.cfg parameter which sets a limit on the maximum size of any individual displayed texture.

BP – Bufferpools. An fsx.cfg parameter, governing the ratio between individual buffers or shared buffers.

SGSS: Sparse Grid SuperSampling

AA: Antialiasing

AF: Anisotropic Filtering

IQ: Image Quality – The process of making the picture look more pleasing.

HT: Hyper Threading. The ability of the CPU to simultaneously operate on multiple tasks.

SB - Sandy Bridge: An Intel name for a processor series.

AM - Affinity Mask. An fsx.cfg parameter, controlling the assignment of an application to a cpu real core.