Skywolf's P3D Optimization/Reduce OOMs Guide

Version 0.5 (March 30, 2013)

Disclaimer: This is not a Final Document

Contact me on the AVSIM Forums: Skywolf or Twitter: @anishsikri

This is a living document, and will get updated as the settings listed below are confirmed/improved by other P3D users. <u>Please DO NOT COPY OR HOST THIS DOCUMENT ELSEWHERE</u>, unless stated by the Author

Acknowledgements

I would like to thank everyone who was involved in creating the FSX Guide as posted in Avsim.com forums. That document was inspiration for me to create this document.

Personal Thanks goes to the companies/individuals whose products I have so far used in FSX and P3D.

Lockheed Martin, Orbx, PMDG, Aerosoft, Pete Dowson's FSUIPC, Quality Wings, Carenado, Feelthere's ERJ, OpusFSX, A2A Simulations, Maarten Boelens SimLauncher, REX, FSDT, Flightsim Estonia, Microsoft, Mark Russinovich's Process Explorer

I also would like to thank everyone who has helped me in the forums on myriad number of questions/issues that I have posted.

My Goal

I wanted to figure out on how to improve the performance of P3D on my computer (with triple screen). P3D by default works very well, but if I added complex sceneries and aircrafts – I would be very close to hitting the P3D's 4GB Virtual Address Space (VAS), and it would yield to P3D's out of memory crash (OOMs).

I knew there has to be a way to achieve far better performance as P3D is made from refined FSX code.

My performance gains have to come from the currently owned hardware.

My Setup

My Hardware

Cpu - i5-750 (OC to 4.01 Ghz)

Ram – 8GB+ Ram DDR-1866 (OC to 1910)

SSD – 256 Sata III (6 G/bits) – I have a Sata 3 addon card for my msi p55a-fuzion 1156 motherboard.

Video - One XFX AMD 6970 Radeon 2GB Card (not overclocked).

Joystick – Thrustmaster Hotas-X

Monitors – 3x 1920x1200 Resolution Monitors / Eyefinity Resolution 5780x1200 with 6080x1200 (Bezel Corrected Res)

My Software

OS – Windows 8 Pro 64 Bit

FlightSim – Prepar3d 1.4 Windowed Mode Only (Clean System, No FSX installed)

FlightSim Utilities – FSUIPC, FSX to Prepar3d Migration Tool

AI Traffic - My Traffic 5.4B P3D

Weather Generation – OpusFSX for weather

Textures – REX Essentials with Overdrive Upgrade

Sceneries – FSDT KJFK, Orbx – PNW, KORS Airport, All Orbx Freeware, New Zealand North and South Island

Aircrafts – Carenado HD Series (I bought so many during 2012 Christmas sale), Aerosoft Airbus X, Quality Wings 146.

Misc – FS Flying School Pro 2013 P3D, SimLauncher 8.4, A2A Accusim v 2.0

P3D VAS Memory Jump Discovery

I started to observe on how each specific change in P3D configuration affects if 4 GB Virtual Address Space.

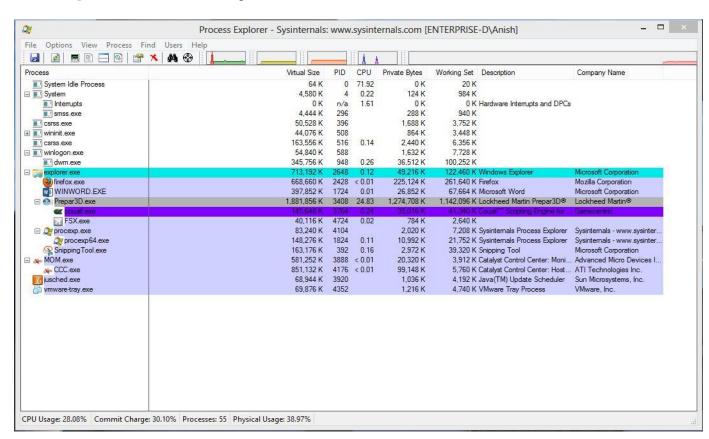
Basic P3D Config (P3D is going to re-create a brand new one)

FTX Central: Set to P3D

AI Traffic: Disabled in Scenery.cfg

Windows Desktop: Eyefinity Mode

VAS Usage: 1,881,856 K (1.88 Gigs of VAS)



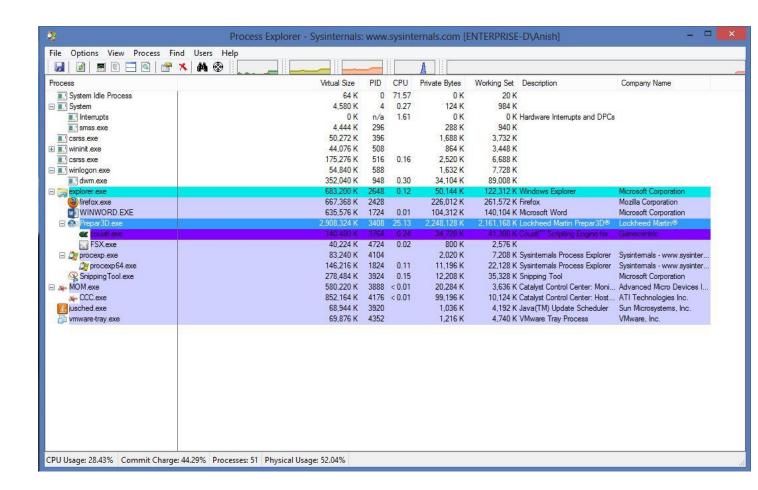
All Default P3D Setting are at the end of the document for reference

Now let's say that I want to increase my Global Texture Resolution to 4096x4096 (Just like in FSX Guide for being able to load those HD textures)



Now Observe the VAS Usage

VAS USAGE with one change to 4096x4096 Global Texture Resolution



VAS Jumps to 2,908,324 K (2.9G of VAS) in one shot only. Nothing else is changed. P3D is on the default flight, default plane: Mooney Bravo, and at its default location on the runway.

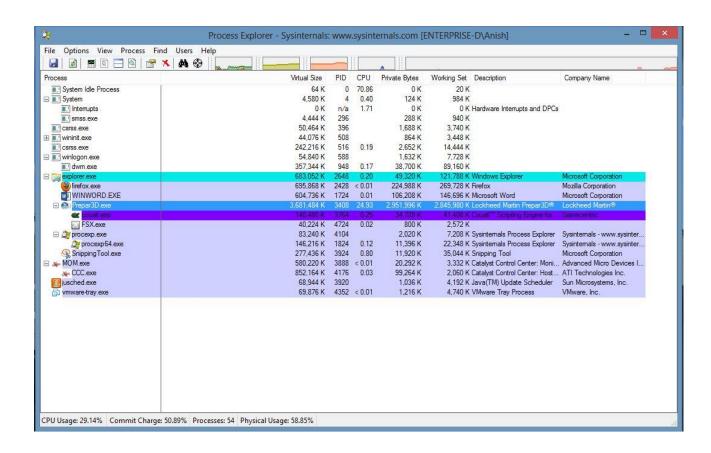
VAS Jump is 1,026,468 K (1 Gig of VAS)!!!!!!!!

Massive VAS Spike and Solution

This is a huge increase, and leaves very little room with total VAS limitation at 4GB to load up complex sceneries, aircrafts, autogen, weather, AI, etc.

With 4096 Textures Setting, we are left with 1 GB of free VAS approx. till OOMs hit P3D.

Let's see what happens when I load the awesome Quality Wings 146 with default P3D Settings at the Default Flight with everything else as is



VAS = 3,681,434 K (3.7 Gigs of VAS) – Good luck loading anything now as now you have less than 400MB of free VAS till OOMs are detected. I would say 300MB and P3D will crash, 400MB is pushing it.

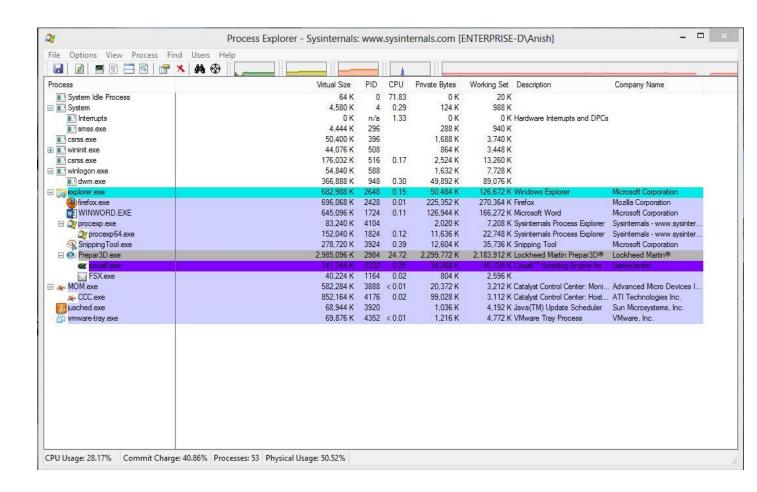
Game Changing Solution to this vexing OOM Issue

Set global Textures to 2048 and see your VAS Usage

	4 K	1.29 0.49 1.39 6 0.19 3 0.53 0.45	Private Bytes 0 K 124 K 0 K 288 K 1,688 K 864 K 2,512 K 1,632 K 34,496 K 80,520 K	Working Set Description 20 K 988 K 0 K Hardware Interrupts and DPC 940 K 3,744 K 3,448 K 13,168 K 7,728 K 98,756 K	Company Name
	0 K n/s 0 K n/s 4 K 296 4 K 396 6 K 506 4 K 516 0 K 588 4 K 946 6 K 264 0 K 2426	4 0.49 1.39 6 0.19 3 0.53 0.45	124 K 0 K 288 K 1,688 K 864 K 2,512 K 1,632 K 34,496 K	988 K 0 K Hardware Interrupts and DPC 940 K 3,744 K 3,448 K 13,168 K 7,728 K 98,756 K	`s
■ Interrupts ■ smss.eve 4,44 □ csrss.eve 50,46 ■ wininit.eve 44,07 ■ csrss.eve 175,28 ■ winiogon.eve 352,74 □ dwm.eve 352,74 □ winiogone.eve 772,53 □ winiogone.eve 697,16 □ winiogone.eve 697,16 □ winiogone.eve 83,24,26 □ winiogone.eve 83,24,26 □ winiogone.eve 83,24,26 □ winiogone.eve 152,04	0 K n/a 4 K 290 4 K 390 6 K 500 4 K 510 0 K 580 4 K 940 6 K 2644 0 K 2420	1.39 3 3 0.19 3 0.53 0.45	0 K 288 K 1,688 K 864 K 2,512 K 1,632 K 34,496 K	0 K Hardware Interrupts and DPC 940 K 3,744 K 3,448 K 13,168 K 7,728 K 98,756 K	`s
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WINWORD EXE 624,26 □ procexp.exe 83,24 ≥ procexp.64.exe 152,04		0.01		156,424 K Windows Explorer	Microsoft Corporation
☐ ☐ procexp.exe 83,24	JK 172		226,060 K	270,756 K Firefox	Mozilla Corporation
© procexp64.exe 152,04			115,944 K	151,032 K Microsoft Word	Microsoft Corporation
			2,020 K	7,208 K Sysinternals Process Explorer	
Spinning Tool eye 279 44			11,580 K	22,684 K Sysintemals Process Explorer	
			12,996 K	34,760 K Snipping Tool	Microsoft Corporation
			1,595,776 K	1,509,612 K Lockheed Martin Prepar3D®	
			34 452 K	40 712 K Couat!" Scripting Engine for	Gamecentric
FSX.exe 40,11			788 K	2,576 K	
		3 7 7 7 7 7	20,328 K	1,508 K Catalyst Control Center: Moni.	
№ CCC.exe 852,16			99,028 K	12,048 K Catalyst Control Center: Host.	
Siusched.exe 68,94			1,036 K	4,192 K Java(TM) Update Scheduler	
mware-tray.exe 69,87	5 K 435	2 < 0.01	1,216 K	4,772 K VMware Tray Process	VMware, Inc.

VAS Jumped to only 2,213,112K (from 1.88K of default VAS approx. It only took 330MB!!! And you have approx. 1.7 to 1.8 Gigs of VAS free – Let's just say 2 Gigs free rounded

Complex Aircraft Load Only: QW 146 with 2048 Texture Setting



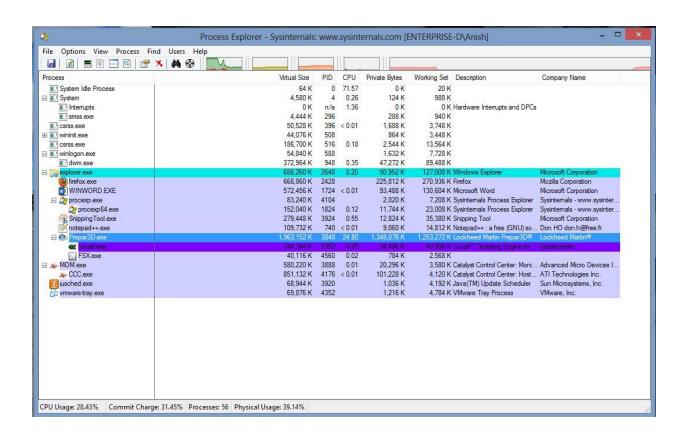
VAS Now Jumps to 2,985,096K (2.9 Gig). We Still have 1 Gig of VAS free.

Second Optimization

Works really well with 2048 Textures – LOD Radius to 5.5 from default 6.5

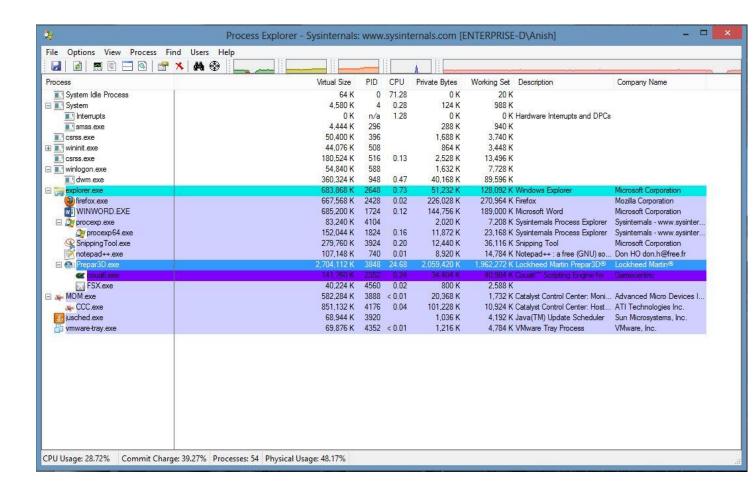
Since I am running everything at 6080x1200 Resolution, it really helps my system, as it has push everything to 3 screens.

Default Settings with 2 changes: 2048 Textures, and LOD Radius at 5.5 – VAS Usage



VAS is literally at 1,963,152 K (1.9G)!!!! which is hardly a jump from 1.8G. This is way better than 6.5 LOD – it frees up more VAS Space

Complex Aircraft Load Only: QW 146 with 2048 Texture Setting, and 5.5 LOD – VAS Usage



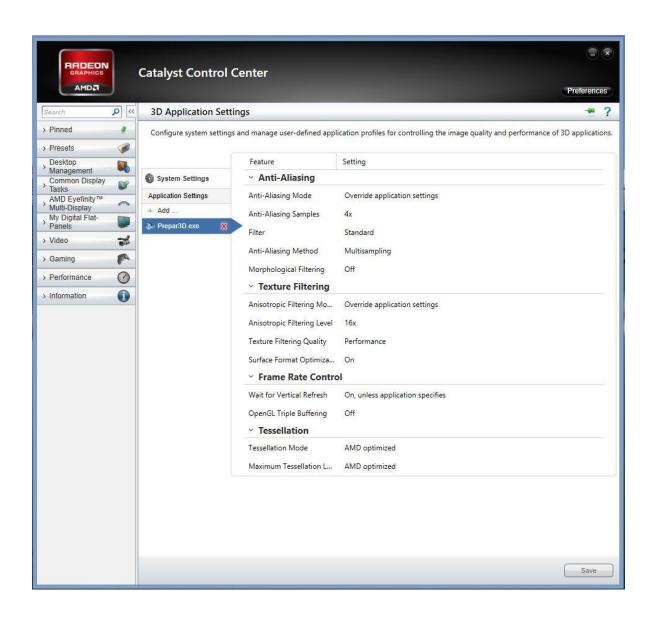
VAS has now jumped to 2,703,588K (2.7 Gigs). We still have 1.3 Gigs approx. of Free VAS!!!!! After extreme complex aircraft is loaded

I have all the major complex aircraft (got them on great sales), QW 146 takes the biggest VAS, and works fantastic on my system.

Third Optimization Tip: Need other testers to confirm

Do not Use internal AA or Anisotropic settings – leave to bilinear in P3D – Do all the changes in ATI Catalyst Control Center

Create a 3d Application Profile with this – (ATI experts, help me optimize this further)



Hypothesis: Using Windows 8 provides smoother flight

The reason this is my hypothesis is that from what I can recall, in Windows 8 all windows drawn have screen have DirectX acceleration. Since I use P3D in Windowed mode only: I figured that DirectX acceleration is happening to its window also.

I do not use P3D in full screen mode due to ATC window and I want to pull up other applications with ease when simming at times. Besides the window is at 6080x1200 – it is super immersive for me.

Runway Light Fix – This improved smoothness for me

Since I am running at super wide resolution, this tweak from FSX Guide helped me. I had REX textures installed first, and I followed all the steps stated in the FSX Guide Runway FIX

Please see the FSX Guide Page 22 – It starts with the following sentence, "From a post by Brett Lucas... and end with last statement Michael Swannick's lights found here: Instructions are included in the zip"

 $\frac{http://forum.avsim.net/topic/398016-avsims-official-software-and-hardware-guide-for-fsx/$

My Settings (Set and Forget) – Orbx + REX + OpusFSX + My Traffic 5.4B Enchanced.

[Display]

RUNWAY_LIGHTS_SURFACE_SCALAR=0.9 //Runway Lights

RUNWAY_LIGHTS_VASI_SCALAR=0.9 // VASI Lights

RUNWAY_LIGHTS_APPROACH_SCALAR=0.9 // Approach Bars

RUNWAY_LIGHTS_STROBE_SCALAR=0.9 // Strobes

ChangeTime=4.000000

TransitionTime=4.000000

ActiveWindowTitleTextColor=255,255,255

ActiveWindowTitleBackGroundColor=0,28,140,64

NonActiveWindowTitleTextColor=255,255,255

Non Active Window Title Back Ground Color = 24,33,87,64

InfoUpperRightTextColor=255,0,0

InfoUpperRightBackGroundColor=0,0,0,0

InfoLowerLeftTextColor=255,255,255

InfoLowerLeftBackGroundColor=255,0,0,128

InfoLowerRightTextColor=255,255,255

InfoLowerRightBackGroundColor = 255, 0, 0, 128

InfoBrakesEnable = True

Info Parking Brakes Enable = True

InfoPauseEnable=True

InfoSlewEnable=True

InfoStallEnable=True

InfoOver speedEnable = True

BLOOM_EFFECTS=0

SKINNED_ANIMATIONS=1

TEXTURE_BANDWIDTH_MULT=120

UPPER_FRAMERATE_LIMIT=20

WideViewAspect=True

[Main]

 $FIBER_FRAME_TIME_FRACTION = 0.22$

User Objects=Airplane, Helicopter, Submersible, ExternalSim

 $SimObject Paths. 0 = SimObjects \backslash Airplanes$

 $SimObject Paths. 1 = SimObjects \backslash Rotorcraft$

SimObjectPaths.2=SimObjects\GroundVehicles

 $SimObject Paths. 3 = SimObjects \backslash Boats$

SimObjectPaths.4=SimObjects\Animals SimObjectPaths.5=SimObjects\Misc SimObjectPaths.6=SimObjects\Submersible $SimObjectPaths. 7 = MyTraffic \backslash Aircraft$ ProcSpeed=12011 PerfBucket=7 Location=2520,189,3560,968,\\.\DISPLAY2 Maximized=2 HideMenuNormal=1 HideMenuFullscreen=1 [PANELS] IMAGE_QUALITY=1 QUICKTIPS=1 PANEL_OPACITY=100 PANEL_MASKING=1 PANEL_STRETCHING=1 $UNITS_OF_MEASURE = 0$ [Weather] $Windshield Precipitation Effects \!\!=\!\! 1$ MinGustTime=10 MaxGustTime=500 $MinGustRampSpeed{=}1$ MaxGustRampSpeed=200 MinVarTime=5 MaxVarTime=50 MinVarRampSpeed=10 $MaxVarRampSpeed{=}75$ Turbulence Scale = 1.000000 $WeatherGraphDataInDialog{=}0$ AdjustForMagVarInDialog=1 DynamicWeather=0 $DownloadWindsAloft\!\!=\!\!0$ DisableTurbulence=0 CLOUD_DRAW_DISTANCE=3 DETAILED_CLOUDS=1 CLOUD_COVERAGE_DENSITY=8

THERMAL_VISUALS=0
[DISPLAY.Device.AMD Radeon HD 6900 Series.0]
Mode=1920x1200x32
[CONTROLS]
Controls_Default=Standard
Controls_Current=Standard
KBDAIL=64
KBDELEV=64
KBDRUD=64
[TextInfo.1]
Latitude=1,1
Longitude=1,2
Altitude=1,3
Heading=1,4
AirSpeed=1,5
WindDirectionAndSpeed=1,6
[TextInfo.2]
FrameRate=1,1
LockedFrameRate=1,2
GForce=1,3
FuelPercentage=1,4
[TextInfo.3]
Latitude=1,1
Longitude=1,2
Altitude=1,3
Heading=1,4
AirSpeed=1,5
WindDirectionAndSpeed=1,6
FrameRate=2,1
LockedFrameRate=2,2
GForce=2,3
FuelPercentage=2,4
[SlewTextInfo.1]
Latitude=1,1
Longitude=1,2

Altitude=1,3

AirSpeed=1,5
[SlewTextInfo.2]
FrameRate=1,1
LockedFrameRate=1,2
[SlewTextInfo.3]
Latitude=1,1
Longitude=1,2
Altitude=1,3
Heading=1,4
AirSpeed=1,5
FrameRate=2,1
LockedFrameRate=2,2
[GRAPHICS]
HIGHMEMFIX=1
ForceFullScreenVSync=1
SHADER_CACHE_PRIMED=236096256
TEXTURE_MAX_LOAD=2048
NUM_LIGHTS=8
AIRCRAFT_SHADOWS=1
AIRCRAFT_REFLECTIONS=1
COCKPIT_HIGH_LOD=1
LANDING_LIGHTS=1
AC_SELF_SHADOW=0
EFFECTS_QUALITY=2
GROUND_SHADOWS=0
TEXTURE_QUALITY=3
IMAGE_QUALITY=0
See_Self=1
Text_Scroll=1
[DynamicHeadMovement]
LonAccelOnHeadLon=-0.020000
LonAccelOnHeadPitch=-0.010000
RollAccelOnHeadLat=0.010000
YawAccelOnHeadLat=-0.100000
RollAccelOnHeadRoll=0.100000

Heading=1,4

MaxHeadAngle=5.000000
MaxHeadOffset=0.300000
HeadMoveTimeConstant=1.000000
[VirtualCopilot]
VirtualCopilotActive=0
[ATC]
ShowATCText=1
AutoOpenAirTrafficWindow=1
UsePilotVoice=1
PilotVoice=0
[USERINTERFACE]
SHOW_MISSION_CAPTIONS=0
PAUSE_ON_LOST_FOCUS=0
PROMPT_ON_EXIT=0
SITUATION=FLIGHTS\OTHER\Prepar3D
Map_Orientation=2
MUTE_ON_LOST_FOCUS=224
[PointOfInterestSystem]
CycleSetting=0
[SOUND]
PrimaryPlaybackDevice={DEF00000-9C6D-47ED-AAF1-4DDA8F2B5C03}
VoicePlaybackDevice={DEF00002-9C6D-47ED-AAF1-4DDA8F2B5C03}
VoiceCaptureDevice={DEF00003-9C6D-47ED-AAF1-4DDA8F2B5C03}
SOUND=1
SOUND_QUALITY=2
SOUND_LOD=0
UISound=1
SOUND_FADER1=0.490000
SOUND_FADER1=0.490000 SOUND_FADER2=0.490000
_
SOUND_FADER2=0.490000
SOUND_FADER3=0.490000 SOUND_FADER3=0.490000
SOUND_FADER2=0.490000 SOUND_FADER3=0.490000 SOUND_FADER4=0.530000
SOUND_FADER2=0.490000 SOUND_FADER3=0.490000 SOUND_FADER4=0.530000 [SCENERY]
SOUND_FADER2=0.490000 SOUND_FADER3=0.490000 SOUND_FADER4=0.530000 [SCENERY] LENSFLARE=0

AirlineDensity=25
GADensity=25
FreewayDensity=0
ShipsAndFerriesDensity=0
LeisureBoatsDensity=0
IFROnly=0
AIRPORT_SCENERY_DENSITY=3
[TERRAIN]
LOD_RADIUS=5.500000
MESH_COMPLEXITY=100
MESH_RESOLUTION=23
TEXTURE_RESOLUTION=29
AUTOGEN_DENSITY=2
DETAIL_TEXTURE=1
WATER_REFLECTION_DETAIL=4
WATER_REFRACTION_DETAIL=0
ENABLE_BATHYMETRY=0
WATER_CLARITY=0
[AContain]
[AContain] ShowLabels=0
ShowLabels=0
ShowLabels=0 ShowUserLabel=1
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0 ShowLabelDistance=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0 ShowLabelDistance=0 ShowLabelAltitude=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0 ShowLabelDistance=0 ShowLabelAltitude=0 ShowLabelAirline=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0 ShowLabelDistance=0 ShowLabelAltitude=0 ShowLabelAirline=0 ShowLabelAirline=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0 ShowLabelDistance=0 ShowLabelAltitude=0 ShowLabelAirline=0 ShowLabelAirlineAndFlightNumber=0 ShowLabelFlightPlan=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0 ShowLabelDistance=0 ShowLabelAltitude=0 ShowLabelAirline=0 ShowLabelAirlineAndFlightNumber=0 ShowLabelFlightPlan=0 ShowLabelContainerId=0
ShowLabels=0 ShowLabelManufacturer=0 ShowLabelManufacturer=0 ShowLabelTailNumber=0 ShowLabelTailNumber=0 ShowLabelAltitude=0 ShowLabelAirline=0 ShowLabelAirlineAndFlightNumber=0 ShowLabelFlightPlan=0 ShowLabelContainerId=0 ShowLabelAirspeed=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0 ShowLabelDistance=0 ShowLabelAltitude=0 ShowLabelAirline=0 ShowLabelAirlineAndFlightNumber=0 ShowLabelFlightPlan=0 ShowLabelContainerId=0 ShowLabelAirspeed=0 ShowLabelHeading=0
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0 ShowLabelDistance=0 ShowLabelAltitude=0 ShowLabelAirline=0 ShowLabelAirlineAndFlightNumber=0 ShowLabelFlightPlan=0 ShowLabelContainerId=0 ShowLabelAirspeed=0 ShowLabelHeading=0 LabelDelay=1000
ShowLabels=0 ShowUserLabel=1 ShowLabelManufacturer=0 ShowLabelModel=0 ShowLabelTailNumber=0 ShowLabelDistance=0 ShowLabelAltitude=0 ShowLabelAirline=0 ShowLabelAirlineAndFlightNumber=0 ShowLabelFlightPlan=0 ShowLabelContainerId=0 ShowLabelAirspeed=0 ShowLabelHeading=0 LabelDelay=1000 LabelColor=FFFF0000

MEASURE=0
[REALISM]
PFactor=1.000000
Torque=1.000000
GyroEffect=1.000000
CrashTolerance=1.000000
General=1.000000
UnlimitedFuel=False
AllowEngineDamage=True
TrueAirspeed=False
AutoCoord=False
RealMixture=True
StressDamage=False
GEffect=True
ManualLights=True
GyroDrift=True
CrashWithDyn=True
CrashDetection=True
OnCrashAction=0
AutoTrim=False
[SIM]
SYSCLOCK=0
[STARTUP]
DEMO=0
STARTUP_DEMO=
LoadWindow=1
[FACILITIES]
COUNTRY=
STATE=
CITY=
GTL_BUTTON=4096
[Misc]
Com_Rate=7
[MULTIPLAYER]
condAccoutPassword=0

ASLON=0

VoiceVolume=1.060000