This product is an add-on that is intended for use with the Microsoft Flight Simulator (FSX): Acceleration Boeing F/A-18 Hornet. Microsoft Flight Simulator X: Acceleration and the Boeing F/A-18 Hornet must already be installed for this product to work. THIS PACKAGE DOES NOT CONTAIN THE COMPLETE F/A-18 HORNET.

FSX BLUE ANGELS F/A-18 A/C HORNET

version 12.3

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FSXBA F/A-18 HORNET MANUAL CONTENTS

LIST OF PICTURES/ILLUSTRATIONS i

PREFACE ii

LIST OF ACRONYMS/ABBREVIATIONS iii

1 PITCH AUTO TRIM SYSTEM 1
- 1.1 Up & Away Auto Trim 1
- 1.2 Dirty Auto-Trim 1
- 1.3 Powered Approach Auto Trim 1
- 1.4 Takeoff Trim 2
  - 1.4.1 Land Based Takeoffs 2
  - 1.4.2 Carrier Based Takeoffs 2

2 AUTO FLAP SYSTEM 3
- 2.1 Powered Approach Auto Flaps 3
- 2.2 Up & Away Mode 3

3 AUTO RUDDER SYSTEM 3
- 3.1 Angle of Bank Rudder Control 3
- 3.2 Rolling Surface to Rudder Interconnect (RSRI) 4

4 SPEEDBRAKE RETRACT SYSTEM 4

5 PIROUETTE LOGIC 4

6 AUTO THROTTLE CONTROL (ATC) SYSTEM 5
- 6.1 Up & Away ATC 5
- 6.2 Powered Approach ATC 5

7 AIRCRAFT LIMITATION CONTROLLERS 6
- 7.1 G Limiter 6
- 7.2 Roll Rate Limiter 6
- 7.3 Mach Limiter 6
- 7.4 Altitude Limiter 6
- 7.5 Inverted Flight/Negative G Limiter 6

8 FUEL DUMP AUTO DISENGAGE 6

9 ANTI-SKID BRAKE SYSTEM 7
- 9.1 Ground Operations 7
- 9.2 Carrier Operations 7

10 AIRCRAFT.CFG & .AIR FILE CHANGES 7
- 10.1 Aerodynamics 7
- 10.2 Landing & Arresting Gear 7

10.2.1 Ground Stance 7
10.2.2 Carrier Trap Stability 7
10.2.3 Catapult Launches 7

11 AVIONICS 8
11.1 Updated Heads Up Display (HUD) 8
11.2 Combat HUD 9
11.3 Carrier Landing Gauge 9
11.4 Refueling Gauge 9
11.5 Status Gauge 10
11.6 Data Gauge 10

12 PILOT LANDING AID TELEVISION (PLAT) CAMERA VIEW 11

13 VISUAL EFFECTS 11
13.1 Leading Edge Extension (LEX) Vapor 11
13.2 Afterburners 12
13.3 Engine Exhaust 12
13.3.1 Approach (APP) Engine Exhaust Smoke 12
13.3.2 Normal (NORM) Engine Exhaust Smoke 13
13.4 Heat Shimmer 12
13.5 Lighting 13

14 SOUNDS/AUDIO 13
14.1 Betty Warnings & Advisories 13
14.1.1 Warning, Warning 13
14.1.2 Ground Proximity Warning System (GPWS) 13
14.1.3 Master Caution 14
14.1.4 Engine Fire Test 14
14.1.5 Stall Tone 14
14.2 Aircraft External Sounds 14
14.2.1 Aircraft Engine Sounds 14
14.2.2 High G Air Buffeting Sounds 14

15 REDUCED PACKET SHARING FOR MULTIPLAYER USE 14

16 NEW TEXTURES 14

17 SPECIAL THANKS 15

LIST OF PICTURES/ILLUSTRATIONS

SECTION 1 PITCH AUTO TRIM SYSTEM
Figure 1 MASTER ARM SWITCH
Figure 2 PITOT HEAT SWITCH

SECTION 2 AUTO FLAP SYSTEM
Figure 3 Leading Edge & Trailing Edge Schedule

SECTION 6 AUTO THROTTLE (ATC) SYSTEM
Figure 4 ATC HUD Indication
Figure 5 ENGINE ANTI ICE SWITCH

SECTION 11 AVIONICS
Figure 6 Updated/Combat HUD
Figure 7 HUD Control Panel
Figure 8 Refueling Panel
Figure 9 Status Gauge
Figure 10 Data Gauge
Figure 11 Test Aircraft Variants

12 PILOT LANDING AID TELEVISON (PLAT) CAMERA VIEW
Figure 12 PLAT Camera

13 VISUAL EFFECTS
Figure 13 LEX Vapor Effects
Figure 14 Afterburner Effects
Figure 15 Afterburner Effects
Figure 16 Engine Exhaust Smoke
Figure 17 Nose Gear AOA Light Assembly

PREFACE

After about a year in the making, the FSX Blue Angels F/A-18 Hornet is out and available for download. Through the efforts of many, we have been able to collaborate and produce a quality add-on for the Microsoft Flight Simulator X: Acceleration Boeing F/A-18 Hornet. Everything from new textures, to new avionics, to a new flight augmentation system has been incorporated into this aircraft in an attempt to provide the user with a realistic flying, sounding, and looking F/A-18. We tried our best to make all adjustments as close to the actual F/A-18 as possible by use of the actual F/A-18 Manual (NATOPS), interviewing actual fleet F/A-18 pilots, studying video and audio tracks, and even comparing our simulator flight model to those actually used to train U.S. Marine pilots at Marine Corps Air Station Miramar in California. Many hours were also spent trying to make life easier and more fun for the average simmer by providing convenience gauges and gauges that allow pilots to participate in skill-based activities such as in-flight refueling and air combat maneuvering. Thanks to a few hard workers, cool visual effects were added to the aircraft such as high G vapor and after burner effects to add to the emersion factor. Lastly, a great amount of effort was placed into making the jet both computer and multiplayer friendly. This was done by metering the amount of computer workload and internet traffic that the aircraft generated. This, in affect streamlined the jet so it can be flown on most computers running Microsoft Flight Simulator X (FSX). All of these things combine to bring you a very stable, sophisticated, yet fun to fly aircraft. We're sure you will enjoy flying this jet in formation as you would dog-fighting with it. Enjoy!

Very Respectfully,

Justin "Jimi" Hendrix
Commanding Officer
FSX Blue Angels
jimi@fsxblueangels.com

LIST OF ACRONYMS/ABREVIATIONS

A

A/A	Air to Air
A/G	Air to Ground
ACM	Air Combat Maneuvering
AGL	Above Ground Level
AOA	Angle Of Attack
AOB	Angle of Bank
APP	Approach
ATC	Auto Throttle Control

C

CFG	Configuration File

F

F/A	Fighter/Attack
FCS	Flight Control System
FL	Flight Level
FSX	Flight Simulator X
FSXBA	FSX Blue Angels

G

G	Gravitational Units
GPS	Global Positioning System
GPWS	Ground Proximity Warning System

H

HARV	High AOA Test Vehicle
HUD	Heads Up Display

I

ILS	Instrument Landing System
KIAS	Knots Indicated Air Speed

L

Lbs	Pounds
LEX	Leading Edge Extension

M

MDF	Multi-Function Display
MOI	Moment of Inertia
MSL	Mean Sea Level

N

N1	Low Speed Compressor
N2	High Speed Compressor
NASA	National Aeronautics and Space Administration
NAV	Navigation Radio
NORM	Normal
NU	Nose Up

P

PA	Powered Approach
PID	Proportional Integral Derivative
PLAT	Pilot Landing Aid Television

R

RPM	Revolutions Per Minute
RSRI	Rolling Surface to Rudder Interconnect

T

TACAN	Tactical Air Navigation

U

UA	Up & Away
USNTPS	United States Navy Test Pilot School

W

WOW	Weight Off Wheels or Weight On Wheels

*******IT IS HIGHLY RECOMMEND THAT THE FSXBA F/A-18 HORNET BE FLOWN WITH FLIGHT MODEL REALISMS SET TO FULL*******

1 PITCH AUTO TRIM SYSTEM *NATOPS 2.8.2.8 Control Augmentation System (CAS)*

Depending on the aircraft configuration, the pitch auto trim system is designed to automatically maintain the aircraft at a certain condition once controls are released to assist the pilot in flying the aircraft. This system can be disengaged by arming the jet's MASTER ARM SWITCH located next to the left Multi-Function Display (MFD) found in the virtual cockpit (see figure 1).

Figure 1 MASTER ARM SWITCH (deactivates FCS)

Depending on the aircraft configuration, the pitch auto-trim program logic will behave in one of four ways:

1.1 Up & Away Auto Trim (Gear Up, Flaps AUTO, 250 Knots Indicated Air Speed (KIAS) and faster)

The up & away pitch auto trim system features a sequential, 2-stage system that uses elevator trim to automatically trim the aircraft to 1 G, zero pitch-rate (pitch attitude doesn't change once activated) flight once the flight control stick is within + or - 3 percent of center. Once the stick is released, the aircraft will first use elevator trim to trim the aircraft to 1 G flight. After achieving 1 G flight, the trimming system will then proceed to trim the aircraft to zero pitch rate flight to minimize oscillations along the aircraft's longitudinal axis. During large accelerations or decelerations (+ or - 10 feet per second squared), the pitch rate trim system will disengage to allow for the trim system to raise or lower the nose of the aircraft in an attempt to compensate for the extra or loss of lift created due to rapid acceleration and deceleration. In order to provide the pilot with consistent pitch authority throughout the flight envelope, the trim automatically resets to zero once the control stick is pushed or pulled beyond + or - 3 percent in the Y axis.

1.2 Dirty Auto Trim (Gear Down, Flaps AUTO or HALF, 250 KIAS and slower)

The dirty pitch auto trim system features a single stage system that uses elevator trim to automatically trim the aircraft to zero pitch rate flight once the flight control stick is within + or - 3 percent of center. In order to provide the pilot with consistent pitch authority throughout the flight envelope, the trim automatically resets to zero once the control stick is pushed or pulled beyond + or - 3 percent in the Y axis. In this mode, changes in throttle input have no effect on aircraft's longitudinal axis.

1.3 Powered Approach Auto Trim (Gear Down, Flaps FULL, 180 KIAS and slower)

The powered approach auto trim system features a 2-stage system that automatically trims the aircraft to the F/A-18 Hornet's "On-Speed" Angle of Attack (AOA), which is 8.1 degrees, once the flight control stick is within + or - 3 percent of center. The first stage is activated if the aircraft is in the power approach configuration, and the aircraft's AOA is either greater than 9.0 or less than 7.0 degrees. In these situations, the auto trim system will automatically increment nose up trim (less than 7.0 degrees AOA), or nose down trim (greater than 9.0 degrees) until the aircraft is within 7.0 - 9.0 degrees AOA. Once the aircraft is within 7.0 - 9.0 degrees AOA, the second stage is activated and will use a specific Proportional–Integral–Derivative (PID) controller that allows the aircraft to achieve and maintain an AOA of 8.1 degrees while the stick is

released. Because of the system's attempt to maintain an 8.1 degree AOA, changes in throttle input will directly affect the longitudinal axis of the aircraft. Adding power with the system active will cause the nose of the aircraft to rise, while easing power will cause the nose of the aircraft to fall.

1.4 Takeoff Trim

For takeoff operations, the FSXBA F/A-18 Hornet has been equipped with takeoff trim, which upon activation, automatically configures the aircraft's elevators and elevator trim for takeoff. This option can be activated or deactivated by toggling the aircraft's PITOT HEAT SWITCH (see figure 2). The amount of elevator and elevator trim used is based on whether the aircraft is taking off from a land-based airfield, or a carrier catapult launch system. The system uses the status of the catapult launch bar to decide whether land based or carrier based takeoff trim should be used.

1.4.1 Land Based Takeoffs *NATOPS 7.2.2 Normal Takeoff*

With the takeoff trim activated for land based operations, the aircraft's elevators and elevator trim will automatically set themselves to 12 degrees NU and 7 degrees NU respectively. In this configuration, the jet will automatically rotate and will become airborne around 155-165 KIAS. Once the nose of the jet has reached a pitch angle of 10 degrees nose up, the takeoff trim will automatically disengage and the PITOT HEAT SWITCH, thereby disengaging the takeoff trim mode.

1.4.2 Carrier Based Takeoffs *NATOPS 8.2.8 Catapult Launch*

With the takeoff trim activated for carrier based operations, the aircraft's elevators and elevator trim will automatically set themselves to 16 degrees NU and 5 degrees NU respectively. As with the land based takeoff trim configuration, the jet will automatically rotate and will become airborne around 155-165 KIAS. Once the nose of the jet has reached a pitch angle of 10 degrees nose up, the takeoff trim will automatically disengage and the PITOT HEAT SWITCH, thereby disengaging the takeoff trim mode.

Figure 2 PITOT HEAT SWITCH (Activates Takeoff Trim)

2 AUTO FLAP SYSTEM 11.1.3 NATOPS *Auto Flap Configuration*

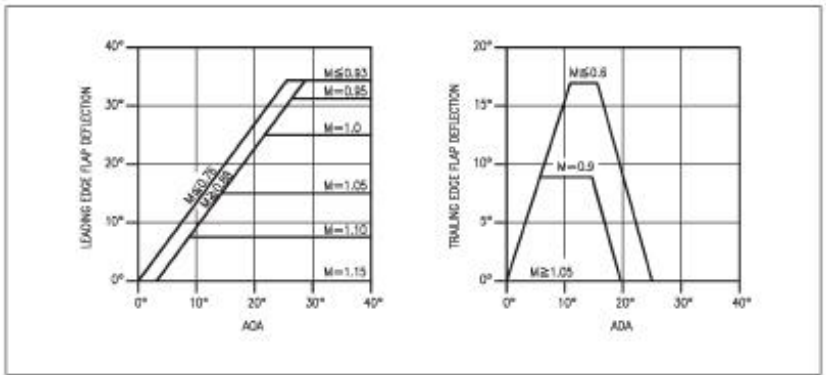

Figure 3 F/A-18 Leading & Trailing Edge Schedule

The auto flap system in the FSXBA F/A-18 Hornet features a combination of the default auto flap system and a revised auto flap system to control the leading edge and trailing edge flaps throughout various combinations of speed, AOA, and configuration.

2.1 Powered Approach Mode Auto Flaps

With the aircraft in powered approach mode (landing gear down, below 250 KIAS), the pilot has full control over the leading and trailing edge flaps. Although the FSXBA F/A-18 Hornet has 9 independent flap settings, the pilot only has the ability to select one of three flap settings: AUTO, HALF, and FULL. The remaining 6 flap positions are reserved for Up & Away Auto Flap Mode. Upon lowering the landing gear, the Flight Control System (FCS) will automatically reset the leading and trailing edge flaps to the AUTO setting. With flaps set in AUTO mode, the flaps will retract fully to a final position of zero degrees. By selecting HALF, the leading edge flaps will extend to 15 degrees, while the trailing edge flaps will extend to 30 degrees. Selecting the FULL option will place the leading edge flaps to 33 degrees, and the trailing edge flaps will extend to 45 degrees.

2.2 Up & Away Mode

With the landing gear retracted, the aircraft's flap system will automatically transition to Auto Flap mode, and the pilot no longer has controls over the flaps. The leading edge flaps are controlled by the default FSX auto flap control system, and continually extends as AOA increases, with a maximum of 33 degrees by 26 degrees AOA as shown on the left side of figure 3. The trailing edge flaps have been reprogrammed to closely model the both the subsonic and supersonic F/A-18 flaps schedule, which is based on a combination of AOA and Mach. From 0 to approx. 12 degrees AOA, the trailing edge flaps will extend 3 degrees for every 2 degrees AOA, with a maximum extension of 18 degrees. From 17 degrees AOA to approx. 26 degrees AOA, the trailing edge flaps will start retracting on a schedule of 3 degrees for every 2 degrees AOA until the trailing edge flaps are completely retracted by 26 degrees.

3 AUTO RUDDER SYSTEM *NATOPS 2.8.2.8 Control Augmentation System (CAS)*

The FSXBA F/A-18 features a dual system auto rudder system based on angle of bank (AOB), and roll rate to keep the aircraft coordinated through various turns and rolling conditions.

3.1 Angle of Bank Rudder Control

With lateral stick position less than 30 percent of center, the aircraft will use Angle of Bank (AOB) to calculate the amount of rudder trim needed to keep the aircraft coordinated during turns. The system will continually add rudder trim in the direction of the turn until 90 degrees AOB is achieved, at which point the system will decrement the rudder trim until zero rudder trim is used while wings level, inverted. Optimal coordination occurs around 300-360 KIAS. Below 300 KIAS, the rudder trim authority tends to diminish and additional rudder input may be required to keep turns properly coordinated. Above 360 KIAS the auto rudder system provides a little excessive rudder trim input, but not to the effect of impeding

smooth coordinated flight. Slight notching of the rudder trim might be experienced while the system increments/decrements the amount of needed rudder trim.

3.2 Rolling Surface to Rudder Interconnect (RSRI)

With lateral stick inputs beyond 30 percent of center, the auto rudder system will use lateral stick input to calculate the amount of rudder needed to keep the aircraft coordinated during rapid rolling maneuvers. The more stick input that is detected by the aircraft beyond 30 percent of center, the more rudder trim is implemented until the stick is back within 30 percent of center at which point the auto rudder logic switches back to angle of bank auto rudder control.

4 SPEEDBRAKE AUTO RETRACT SYSTEM *NATOPS 2.8.4.8 Speedbrake*

The speed brake auto retract system is meant to automatically retract the speedbrake if already deployed. This will occur when any of the follow conditions are met:

-The aircraft is at or above 6.0 Gs.

-The aircraft is at or above 28.0 degrees AOA.

-The aircraft is below 250 KIAS, and the flaps are extended beyond 20 degrees.

5 PIROUETTE LOGIC *NATOPS 11.1.8.1 High AOA Flying Qualities*

Due to its excellent slow speed handling characteristics, the F/A-18 can perform maneuvers which other fighters cannot. One such maneuver is the 'pirouette'. When properly performed, the pirouette maneuver allows the F/A-18 to rapidly reverse direction at low speeds and high angles of attack. To activate the pirouette logic in the FSXBA F/A-18 Hornet, the aircraft needs to be in the following conditions:

-Above 25 degrees AOA

-Below 210 KIAS

-Full lateral stick and rudder deflection in the same direction

Once all of the aforementioned conditions are met, the aircraft will augment its elevator trim, aileron trim, and rudder trim to allow the maneuver to be performed. The aircraft will continue to implement these controls until one of the previously mentioned conditions are not met. The maneuver can be cancelled at any time by releasing lateral stick input, rudder input, or both.

Caution: There is a high possibility with stalls and secondary stalls with this maneuver. Maneuver should be executed with maximum power.

6 AUTO THROTTLE CONTROL (ATC) SYSTEM *NATOPS 2.1.2 Automatic Throttle Control (ATC)*

Figure 4 ATC HUD Indication

Figure 5 ENGINE ANTI ICE SWITCH (Activates ATC)

The Auto Throttle Control (ATC) system on the FSXBA F/A-18 is meant to keep the aircraft at a specified speed under certain circumstances. This system can be activated and deactivated at any time by toggling the ENGINE ANTI ICE SWITCH (figure 5). Depending on the aircraft configuration, the ATC will either maintain the indicated speed of the aircraft at the point in which it was activated, or it will maintain "on speed" for landing operations. The "ATC" indicator is shown on the lower right side of the HUD when the ATC system is active (figure 4).

6.1 Up & Away (UA) ATC

The ATC system in UA mode uses the default FSX speed hold system to hold the indicated airspeed once activated. When activated, the ATC system completely disconnects any pilot inputs to the throttle lever. The system will deactivate under the following conditions:

-The ENGINE ANTI ICE SWITCH is placed in the off position

-The landing gear is lowed

Once disengaged, the pilot resumes full authority of the throttles.

6.2 Powered Approach (PA) ATC

The ATC system in PA mode uses a PID controller that is very similar to the PA auto trim system to keep the aircraft at the optimal AOA for landing approaches, which is 8.1 degrees AOA. In order to active PA ATC, the aircraft must be in the following conditions:

-Aircraft off of landing surface (weight off wheels)

-Below 180 KIAS

-Landing gear extended

-Flaps must be extended 27 degrees or greater

-Engine N2 RPM less than 100 percent

-Throttle lever between 10-75 percent

-Within 70 degrees angle of bank

-Between 5.0 and 11.0 degrees AOA

If the PA ATC system is engaged and any one of the conditions mentioned above are not met, the ATC system will automatically disengage. Once disengaged, the ATC system has to be manually re-engaged by toggling the ENGINE ANTI ICE SWITCH.

7 AIRCRAFT LIMITATION CONTROLLERS

7.1 G Limiter *NATOPS 11.1.7 G Limiter**

The G-Limiter is designed to keep the aircraft within allowable stress tolerances throughout the entire flight envelope by inducing down or up elevator to negate excessive pitch input. Although the system works well, the limiter can be saturated with rapid applications of pitch input at higher speeds, altitudes, and pitch/roll combinations. With the aircraft's total weight at and below 44,000 lbs., the limiter will limit the aircraft to +7.5 Gs and -3.0 Gs. Above 44,000 lbs., the limiter will limit the aircraft to +5.5 Gs, and -3.0 Gs.

7.2 Roll Rate Limiter *NATOPS 11.1.7 G Limiter*

The roll rate control system constantly monitors the roll rate of the aircraft. Once the max roll rate for the FSXBA F/A-18 Hornet has been exceed (approx. 240 degrees per second), the system disregards further lateral stick inputs so that the max roll rate cannot be exceeded.

7.3 Mach Limiter

The FSXBA F/A-18 Hornet is equipped with a Mach limiter to keep the aircraft within speed tolerance throughout its operational envelope. This limiter takes input from the aircraft's recorded speed capabilities and current altitude above Mean Sea Level (MSL) to calculate a speed at which the throttles will automatically retard to prevent a faster speed from being obtained. At sea level with full afterburners, the aircraft will reach a top speed of 1.2 Mach before the system engages. At the F/A-18 Hornet's operating altitude of FL 360 (36,000 feet MSL), the Hornet's maximum speed becomes 1.8 Mach. All cutoff speeds between sea level and FL 360 are calculated and implemented by a basic algorithm.

7.4 Altitude Limiter

The FSXBA F/A-18 Hornet is also equipped with an altitude limiter that automatically engages once the aircraft has reached its service ceiling of 50,000 feet MSL. Once activated, the aircraft's engines will automatically shut down and can only be reactivated by engine restart once the aircraft is below 50,000 feet MSL.

7.5 Inverted Flight/ Negative G Limiter

The F/A-18 Hornets used by the United States Flight Demonstration Squadron (Blue Angels) are equipped with improved inverted fuel tanks that allow their jets to fly inverted for longer periods of time before experiencing engine problems. In order to emulate this condition, the FSXBA F/A-18 has been equipped with a gauge that monitors the elapsed time that the jet has been flying in negate G conditions and automatically shuts down the aircraft's engines after 45 seconds of negative G flight simulating a starvation of fuel to the engines. The engines can only be reactivated by engine restart with the aircraft in a positive G state.

8 FUEL DUMP AUTO DISENGAGE *NATOPS 2.2.7 Fuel Dump System*

The FSXBA F/A-18 Hornet has been equipped with a fuel dump auto disengagement system, which, under certain circumstances, automatically disables the fuel dump system. These conditions are:

-If BINGO fuel has been reached

-If both auxiliary fuel tanks (tanks 1 & 4) are empty

-If either one of the feeder fuel tanks (tanks 2 & 3) are at FUEL LO state (approx. 800 pounds)

9 ANTI-SKID BRAKE SYSTEM

The anti-skid brake system on the FSXBA F/A-18 Hornet has been designed to reduce the landing roll spinout that is popular with the default Acceleration F/A-18 Hornet.

9.1 Ground Operations

With weight on wheels and tail hook retracted, the aircraft's anti-skid system is automatically engaged to prevent the main landing gear brakes from locking up and therefore causing skidding, sliding, and dramatic nose diving when aircraft brakes are applied. This provides and aircraft that is easy to control and brake during takeoffs and landing roll outs.

9.2 Carrier Operations

With weight on wheels and tail hook extended for carrier operations (i.e. tail hook extended), the anti-skid system is automatically disengaged to provide maximum braking authority while the aircraft is performing carrier operations.

10 AIRCRAFT.CFG & .AIR FILE CHANGES

10.1 Aerodynamics

Numerous parameters have been adjusted and tweaked in both the aircraft.cfg and .air file to bring the FSXBA F/A-18 Hornet closer to its real life counterpart. The following are a few of the major adjustments:

-Flap drag and lift

-Aircraft parasitic and induced drag values

-Aircraft fuel consumption

-Aircraft elevator/speed control authority

-Aircraft Moment of Inertial (MOI) values

-Engine military and afterburner thrust values

-Aircraft controllability at low speeds

10.2 Landing & Arresting Gear

The landing gear compression, stroke, and damping values have been adjusted to allow the FSXBA F/A-18 Hornet to be much more stable during both ground and carrier operations.

10.2.1 Ground Stance

The aircraft's landing gear values have been adjusted to provide the proper "stance" while parked or during ground/taxi operations.

10.2.2 Carrier Trap Stability

Multiple aircraft.cfg values were also tweaked to eliminate the violent teeter-totter or "pee-pee dance" experienced by the default Acceleration F/A-18 Hornet during carrier traps, or arrested landings.

10.2.3 Catapult Launches

Other values have been adjusted to allow the FSXBA Hornet to smoothly link up to the carrier catapult launch system with very little or no bucking.

11 AVIONICS

In addition to flight handling, many avionic improvements have been included in the FSXBA F/A-18 Hornet to provide more realism, improved Situational Awareness (SA), and to provide a better overall flight experience.

11.1 Updated Heads Up Display (HUD)

Figure 6 Updated/Combat HUD

Figure 7 HUD Control Panel

The updated Heads Up Display or HUD from Scott Printz and Jivko Rusev has been integrated into the FSXBA F/A-18 Hornet. If features many improvements over the default HUD to include:

-2D and VC HUD

- Updated HUD instrumentation to include courseline steering arrow, HUD Energy caret, AOA bracket, ILS needles and ACLS tadpole

-Ability to link to NAV1, NAV2, or GPS

-Multiple clock modes

-Realistic HUD reject options

-Altitude options

- switch panel; docs and image files for instructions on use.

-Precise ILS and TACAN navigation for aircraft carriers (including moving carriers) that allow carrier landings in low visibility and at night

-The HUD symbology is conformal to the outside world: The horizon bar stays on the horizon, velocity vector shows actual flight path as read against the outside world (if you keep your vector pointed at a certain spot on the runway, this is exactly where you will land)

-Caged mode with ghost vector for use in heavy crosswind conditions

-Elements repositioned to make the HUD look as close as possible to the real Hornet HUD.

11.2 Combat HUD

In addition to the realistic HUD, the combat HUD from Jivko Rusev has been integrated into the FLEET and TEST versions of the FSXBA F/A-18 Hornet to use for Air Combat Maneuvering or ACM. This is the Acceleration F/A-18 Hornet equipped with 20mm M61 cannon and a fully functional air-to-air gun mode found in the real F/A-18. With the two radar modes, the two gun sights and the flying tracers, the virtual dogfight will be very similar to a real one. You will not be able to shoot down other aircraft, but you will receive an immediate indication on your HUD if a fired round hits the bandit. To activate the combat HUD, the HUD control panel needs to be activated by pressing SHIFT + 2 on the keyboard. Once the HUD control panel appears, the system can be activated by clicking on the A/A- A/G button to activate the Air-to-Air mode, and arming the weapons system by toggling the MASTER ARM SWITCH to ARMED. Both of these buttons/switches are located on the HUD Control Panel. In order to fire the cannon, a button or key must be assigned to the "Release Droppable Objects" event in Microsoft Flight Simulator. This can be done by selecting Options>Settings>Controls and entering the SETTINGS – CONTROLS screen from the simulator main menu. After a button or key has been assigned, the repeat slider in the SETTINGS - CONTROLS menu needs to be placed to maximum (full right).

11.3 Carrier Landing Gauge (SHIFT + 6)

The Carrier Landing or Trap Gauge conveniently displays all the vital information such as AOA, aircraft weight, and fuel state, which are needed to conduct aircraft recovery procedure for carrier operations. Once trapped aboard the aircraft carrier, the gauge displays additional information such as arresting wire caught, rate of decent, and final airspeed during the carrier trap. Although this gauge automatically displays once the tail hook is lowered, it can manually be brought up by pressing SHIFT + 6 on the keyboard.

11.4 Refueling Gauge (SHIFT + 5)

Figure 8 Refueling Panel

The refueling gauge is installed in both the FLEET and TEST versions of the FSXBA F/A-18 Hornet that allows the aircraft to conduct in-flight refueling operations from selected aircraft. The refueling control panel can be called to the screen by pressing SHIFT + 5 on the keyboard. Once the tanker aircraft is selected and the refueling probe is extended, refueling can commence given the aircraft is in the refueling position, in reference to the tanker aircraft.

11.5 Status Gauge (SHIFT +4)

Figure 9 Status Gauge

Located on the bottom left and right of the screen, the status gauge provides a quick reference of the basic condition and configuration of the jet such as the landing gear, speed brake, tail hook and smoke status. It also displays current engine N2 RPM (left engine only) and current Gs. The status gauge can be brought up by pressing SHIFT + 4 on the keyboard.

11.6 Data Gauge (TEST AIRCRAFT ONLY) (SHIFT + 8)

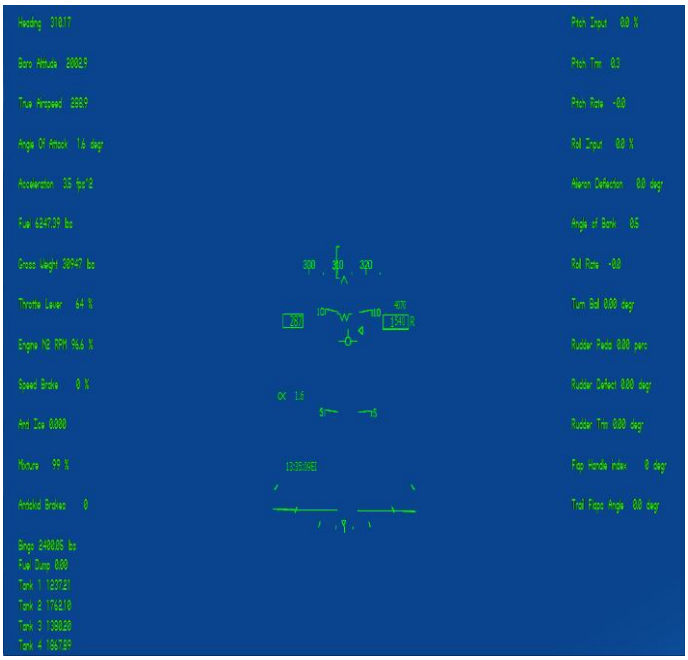

Figure 10 Data Gauge

Figure 11 Test Aircraft Variants

The data gauge provides the pilot with a plethora of aircraft information which might be useful for flight systems testing or for monitoring certain gauges under certain flight/configuration conditions. This gauge is only available in the three TEST Aircraft (i.e. Prototype, US Navy Test Pilot School (USNTPS), NASA High Alpha Research Vehicle (HARV) aircraft) and can be activated by pressing SHIFT + 8 on the keyboard.

12 PLATFORM (PLAT) CAMERA VIEW (SHIFT + 7)

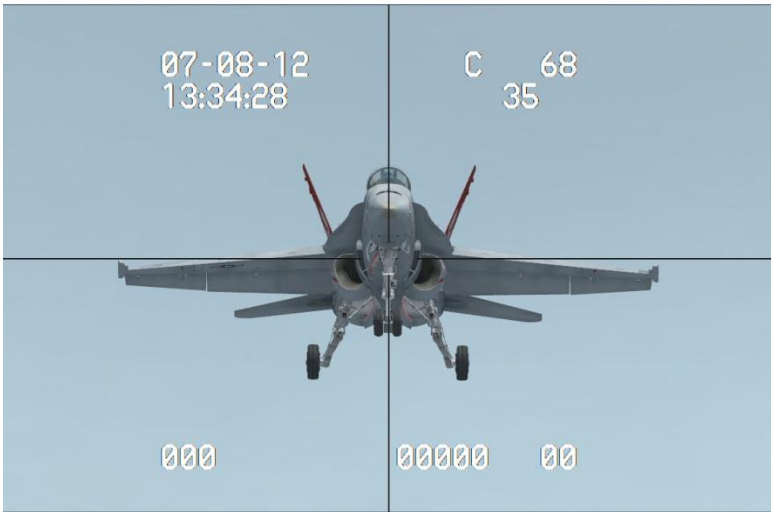

Figure 12 Platform Camera

Pressing SHIFT + 7 on the keyboard will call forth the carrier platform camera view along with pertinent carrier approach information.

13 VISUAL EFFECTS

In addition to the many improvements to the aircraft's flight handling and avionics, the FSXBA F/A-18 Hornet has also been fitted with many quality visual effects thanks to individuals and companies such as Christian "Sludge" Snow and AlphaSim.

13.1 Leading Edge Extension (LEX) Vapor (EFFECTS or FX Aircraft Only)

Figure 13 LEX Vapor Effects

The LEX vapor appears over the leading LEX as the surrounding air is chilled rapidly and dew point reached due to the low pressure caused by the aircraft during high speed/high g maneuvers. In the FSXBA F/A-18, the vapor gauge takes the ambient temperature and Gs pulled to calculate a point in which the vapor will appear on the aircraft. The higher the ambient temperature, the earlier the vapor will appear on the jet. In colder temperatures, more time and G's will be required to see the vapor. Due to the standard lapse rate (air gets colder with altitude); more G is also required at higher altitudes to see LEX vapor.

13.2 Afterburners

Figure 14 Afterburner Effects

Figure 15 Afterburner Effects

The afterburner effects have been improved on the aircraft and show once the aircraft's engines are placed in afterburner. The effect itself is connected to the light system, so the afterburner effect might display itself on player's aircraft or air traffic with the activation of all aircraft lights (pressing "L" key on keyboard).

13.3 Engine Exhaust (EFFECTS Aircraft Only)

Figure 16 Engine Exhaust Smoke

The engine exhaust displays a thin, dark smoke from the aircraft's engines depending on the aircraft's speed, configuration, and throttle settings. The two effects gauges used are Approach (APP) engine exhaust smoke and Normal (NORM) engine exhaust smoke.

13.3.1 Approach (APP) Engine Exhaust Smoke

The APP Engine Exhaust Smoke activates under the following conditions:

-Weight off Wheels

-Engine N2 RPM above 85 percent

-Below 250 KIAS

-Below 5000 feet above ground level (AGL)

13.3.2 Normal (NORM) Engine Exhaust Smoke

The NORM Engine Exhaust Smoke activates under the following conditions:

-Engine N2 RPM 90 percent or greater

-Ambient temperature is -39 degrees Celsius or greater

13.4 Heat Shimmer (EFFECTS Aircraft Only)

A light heat shimmer is displayed behind the engine nozzles to emulate the distortion caused by the heat generated by the aircraft's engines. The effect is only generated while the aircraft is on the ground, the engine N1 RPM is greater than 9 percent, and the engine N2 RPM is less than 89 percent.

13.5 Lighting (EFFECTS Aircraft Only)

Figure 17 Nose Gear AOA Light Assembly

The aircraft's lighting has been upgraded by adding a working AOA box that displays the aircraft's AOA state by three small lights (red, amber, green) on a small box located on the nose wheel gear. This is frequently used by Landing Safety Officers (LSOs) to ascertain the Angle of Attack (AOA) of an approaching jet. Just like the real aircraft, the light changes color to reflect whether the Hornet is too fast on approach (red light), on speed (amber light), or too slow on approach (green light).

14 SOUNDS/AUDIO

Many sounds have been included in FSXBA F/A-18 Hornet. These additions include alerts, warning, and advisories from the "Bitching Betty" system as well as aircraft engine and High G noises.

14.1 Betty Warnings & Advisories

14.1.1 Warning, Warning

Occurs when the jet is off the ground (Weight Off Wheels), gear retracted, has an N2 RPM greater than 90 percent, and an altitude of less than 100 feet AGL. This warning also sounds when the left engine is started.

14.1.2 Ground Proximity Warning System (GPWS)

This warning sounds when the aircraft passes below set GPWS barometric and radar altitudes.

14.1.3 Master Caution

This sound occurs when either of the engine's N2 compressors is below 50 percent. They also sound once the engines are started.

14.1.4 Engine Fire Test

Activated by toggling the ENGINE FIRE TEST A or B SWITCHES, the audio track is played to test all of the engine related audio warnings such as ENGINE FIRE, APU FIRE, and BLEED AIR warnings. The track can be deactivated by toggling the switch to the off position.

14.1.5 Stall Tone

The stall tone is activated once the aircraft has extended outside of its AOA envelope for normal flight operations. The AOA at which the tone is activated is dependent on the flap setting.

- With the flaps set in the AUTO position, the tone will sound at and beyond 25 degrees AOA.

- With the flaps set in the HALF position, the tone will sound at and beyond 15 degrees AOA.

- With the flaps set in the FULL position, the tone will sound at and beyond 12 degrees AOA.

14.2 Aircraft External Sounds

In addition to the added Betty sounds, the aircraft's external sounds have been changed to provide a more realistic sounding jet.

14.2.1 Aircraft Engine Sounds

Thanks to Doug Dawson and Serge LSA, the included sound pack features FSX sound cone technology to provide engine audio sounds far superior to the default Acceleration F/A-18 Hornet.

14.2.2 High G Air Buffeting Sounds

Attached to the LEX vapor effect, the air buffeting file sounds to emulate the sound created by high G maneuvers performed by the Hornet.

15 REDUCED PACKET SHARING FOR MULTIPLAYER USE

Due to recent advances in server monitoring equipment, the current versions of the FSXBA F/A-18 Hornet, have now been re-coded and streamlined to provide a low network footprint by minimizing the amount of IP packets that are sent across multiplayer servers. The lag created by the Multiplayer version of the FSXBA Hornet is slightly more than the default Acceleration F/A-18, and is about the same as the Multiplayer version of the VRS Superbug.

16 NEW TEXTURES

To top off many of the great advancements of the FSXBA F/A-18 Hornet, many great, high quality textures have been included to represent many different Hornet squadrons from various countries to include the United States, Canada, Swiss, and even Kuwait. Special thanks goes out to Ray "Svicar" Gagnon, Scott "Shylock" Berge, JJ "Micro" Guerra, and Braeden "Headshot" Wiens and Serge "FSXNavyPilot" Luzin for the contributions!

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