

FSX: Acceleration “ Unofficial ” F-18 Cockpit Manual



by K. Copeland (a.k.a. RxWookie)

Dedication: This manual is dedicated to my father who used to take me flying in a Cessna 172 on the weekends. Thanks for being my best friend and for always challenging me to do better. I miss you everyday.

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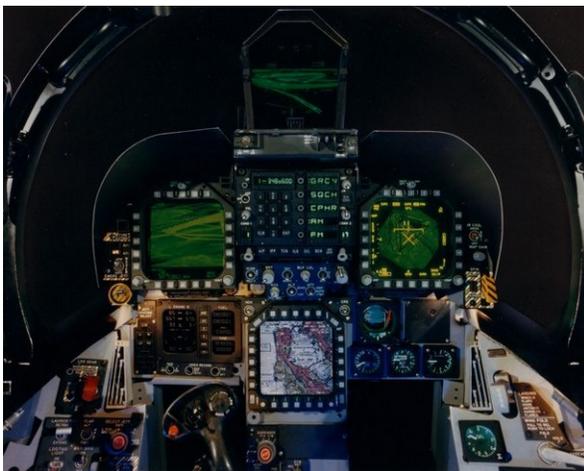
1.) Introduction

So you decided to buy the FSX: Acceleration Expansion. After getting everything installed, you finally have the program up and running. It's not a hard decision which plane you're going to try out first... the F/A-18, of course! The load screen takes forever, or at least it seems that way, and suddenly you are sitting in one of the meanest, fastest, and toughest aircraft ever built. I mean, come on, its nickname is 'Hornet', what else would you expect? You smile involuntarily and then look around the beautifully rendered virtual cockpit and suddenly realize, "I have no idea what these displays, switches, and readouts mean!"

If you are like me, you shrug, open the throttles to full, and take off... relying on previous flight experience to guide you through. Somehow, after a lot fun (including barrel rolls, inverted loops, and a blistering supersonic ride), you find your way back to an airport and land. What an exhilarating ride! This aircraft is simply fun to fly. After a few flights like this, you begin to get a feel for some of what you are seeing in the cockpit, mainly the HUD. But, you wonder... is there a guide out there to help you understand what all these controls and readouts actually mean? After a few, frustrating hours on the internet, you realize that there is very little available, especially in condensed and printable format. The only real exception is the fsdreamteam.com forum where you can find some useful information from the guys and gals who worked their tails off to bring you one of the best aircraft for the MS FlightSim series, ever.

So, I set out to create this document to help others who want to get everything they can out of this amazing aircraft. Even if you never use the navigational aids to make an authentic cross-country trip, I hope that this information helps you in some small way. I know that understanding all of the readouts in my HUD and virtual cockpit was the difference between only occasionally (and successfully) landing on a carrier to consistently snagging a '3-wire' with a textbook approach. It also helped me appreciate just how hard the design team must have worked on this amazing virtual cockpit.

Please note: In order to allow you to visualize what you will actually be seeing in FSX, most images are taken from actual screen shots. I hope you enjoy!



F-18 Cockpit, Nighttime



FSX: Acceleration F-18 Cockpit, Nighttime

Let's fly!



F-18 taking off from a carrier at full military power.

Photo courtesy U.S. Navy

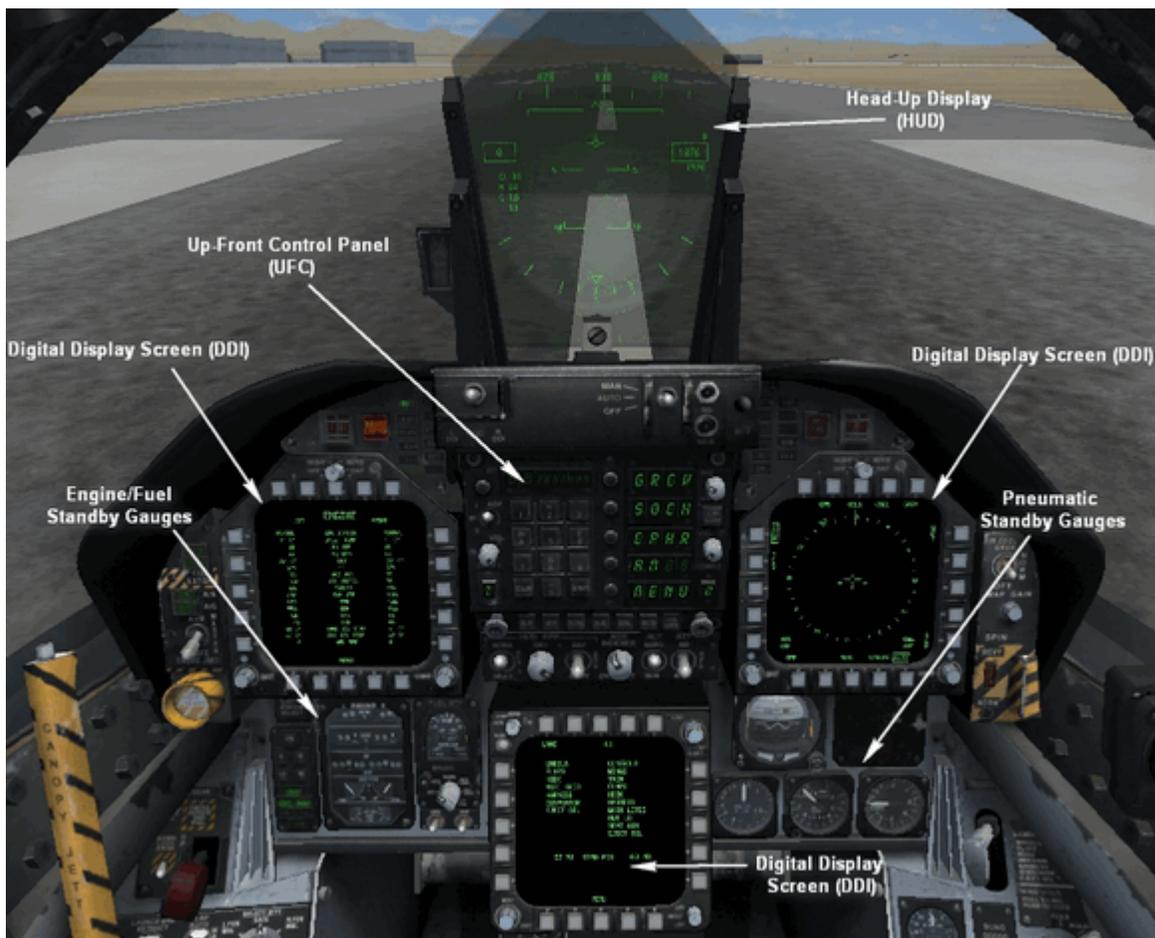
(public domain)

2.) Getting Oriented

While your first experience with the F-18 cockpit is likely to leave you bewildered, once you get oriented it's actually a very nice layout. If you look out the front canopy, you will see the Head-Up Display (HUD) which gives flight data such as speed, altitude, etc.

Looking down into the cockpit, you will see three large displays. The one on the upper-left is known as the Master Monitor Display (or MMD) and serves as a primary monitor for the pilot. The one on the upper-right is known as the Multifunction Display (or MFD) and is generally tasked out to radar, though it is constantly changed as the situation dictates. The final large display is located in the bottom-center of the cockpit and is called the Horizontal Situation Display (HSD) and is primarily used for navigation. The beauty of this design is that the displays all have the same root menu and submenus available which gives triple redundancy in the event of a system failure. It also means you can configure the displays to your personal preferences.

In between the two upper displays is a number pad and row of displays showing several letters known as the Up-Front Control Panel (UFC). This controls communication and NAV / Auto-Pilot functions. To the left and right of the lower display (HSD) are a small set of standard instruments intended solely for use as a backup system. If you pan left and right in the cockpit, you will see lots of switches and knobs, many of which are useable.



FSX F/A-18 Virtual Cockpit

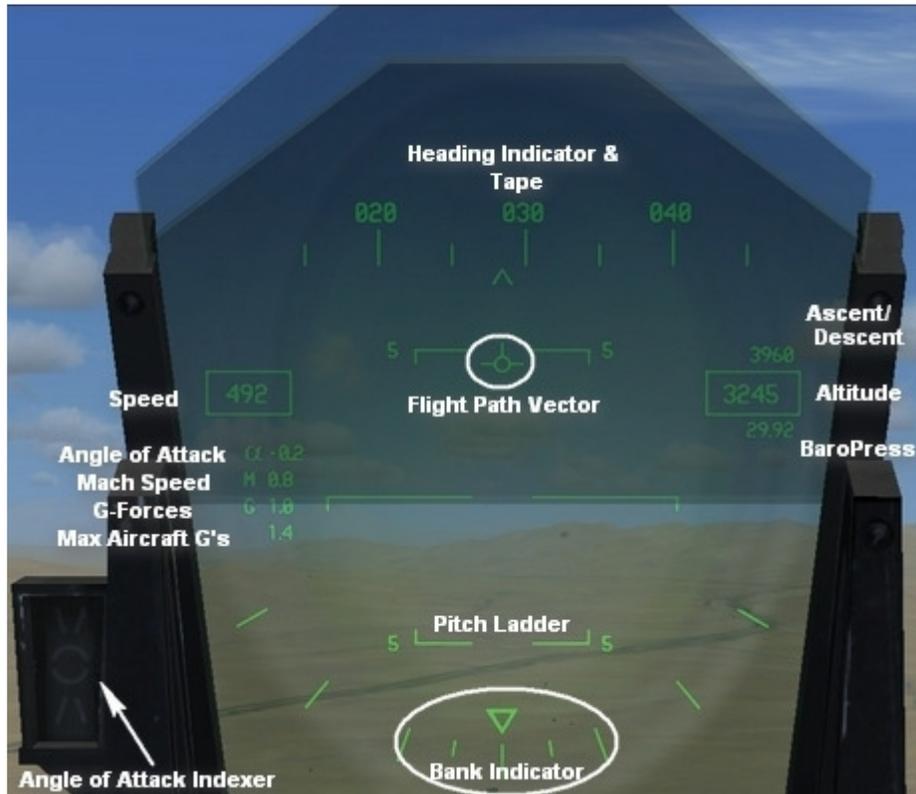
What do all those knobs and switches do again?



F/A-18 cockpit.
Photo courtesy U.S. Navy
(public domain)

3.) Using the Head-Up Display (HUD)

The HUD on the F-18 was one of the first developed to serve as a 'Primary flight display' and as such provides the majority of information you will need to visually fly the F-18 in FSX. Switching the cockpit to 2D mode causes the HUD to be superimposed over the screen.



FSX F/A-18 HUD (Virtual Cockpit)

At the very top of the display is a digital heading and tape. In the center of the display, and moving around, is the flight path vector. Wherever the flight path vector sits in the HUD is where the aircraft is headed regardless of pitch, attitude, etc. There are several horizontal lines representing the pitch ladder. At the bottom is a bank indicator.

To the left you will find airspeed in kts, angle of attack (α) in degrees, current mach speed (M), acceleration/gravitational forces (G) you are experiencing, and peak aircraft G's. On the right, you will find the ascent/descent rate in ft per min, current altitude, and altitude barometer setting.

Just outside of the glass portion of the HUD is a visual angle of attack indexer. This is used in setting up the aircraft for landing. If you see an arrow pointing up, you need to reduce thrust (or pull back on the stick). If you see an arrow pointing down, you need to add thrust (or push the stick forward). If you see an orange donut, the angle of attack for landing is ideal.

Ready for the ride of your life?



Front canopy view of F-18 sitting on carrier deck, attached to catapult.

Photo courtesy U.S. Navy

(public domain)

4.) Using the Head-Down Displays

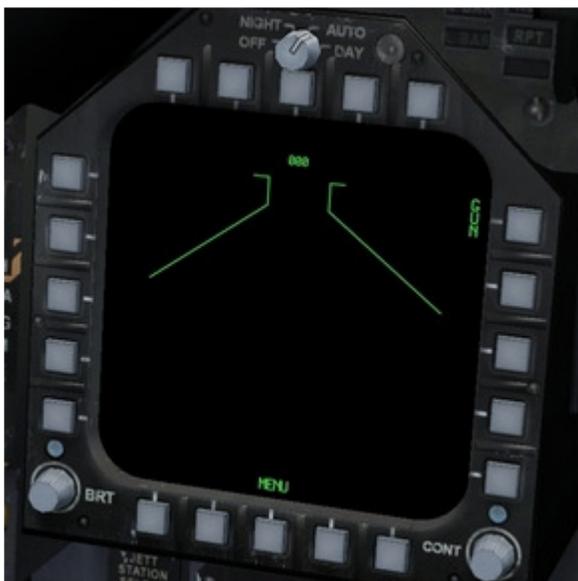
There are three large digital display screens (DDIs) that provide information. They are surrounded by twenty softkey push-buttons and all have the same menus and displays available.

Root Menu – The root menu is the top-level option where all other display menus can be selected.



Root Menu

SMS (Stores Management System) – SMS controls armament. Since weapons are not implemented in FSX, this screen is blank and the 'GUN' submenu is inoperable.

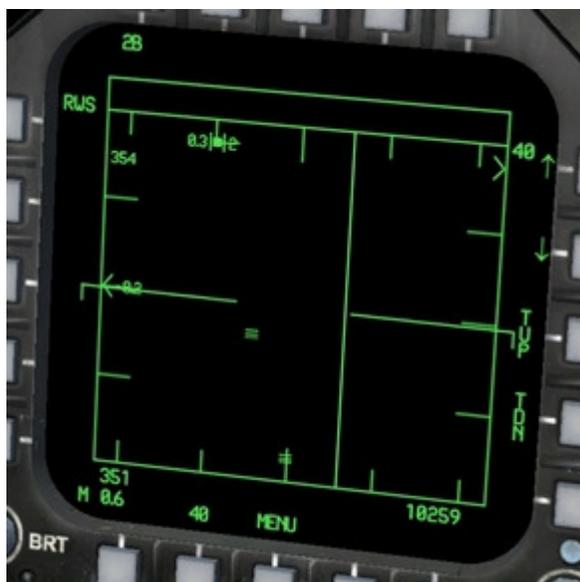


SMS Menu



SMS - GUN Submenu

Now that we understand target acquisition and tracking, let's see what else is displayed. On the top left, there is a number ('2B') that designates the vertical beam pattern. You can change it with the softkey next to it, but it has no effect on the operation of the radar. The term RWS is an indication of the radar mode (Range While Scan). In the lower left corner, you will find your current speed in kts with your Mach speed just below it. In the lower right corner is your current altitude in thousands of ft. To the right of your current speed is the beam width in nautical miles. Correspondingly, on the upper right hand corner is the radar range in nautical miles. These can be changed using the softkeys near them. Lowering these numbers narrows the radar range providing extra detail. Raising these extends the radar range for a broader view. In the example above, each section of the radar represents 10 nm for a total scan of 40 nm by 40 nm. The bottom-right softkeys (TUP & TDN) are used to cycle between targets. The toggle dial at the top cycles through day/auto/night modes, change it by clicking and dragging with mouse. Finally, you can adjust brightness and contrast by dragging the appropriate dials with the mouse.



RDR Menu

Practice your technique by assessing the target selected in the screenshot above. Find the one that is selected. He is traveling Mach 0.3 at approximately 2,000 ft (0.3 | ■ | --2--). Look to the left to see he has a true heading of 354 and is roughly 8,200 ft below me (< -8.2). His position on the screen tells me he is off to my left, traveling from my left to my right. He is approximately 38 nm in front of me (found using the '>' icon on the right-hand side and seeing the radar is set to sweep both 40 nm wide and 40 nm ahead).

In fact, this target is a Cessna Caravan who is flying through an active MOA that I have been dispatched to intercept in the mission "Rocket Launch Air Cover".

I am traveling 351 kts (Mach 0.6) at a height of 10,259 ft and flying relatively level (artificial horizon is level). This means to intercept him, I need reduce throttle to zero and push the aircraft into a dive to shed ~8,000 ft. Once I hit the 2,000 ft mark, I need slow down to around 180 kts (Mach 0.3) and scan for an aircraft in front of me traveling from left to right. Once I have him spotted, I can make a lazy right hand, circular turn, match his speed (plus a few kts), and overtake him from his left side.

HUD – The HUD display functions exactly the same as the one in your canopy.



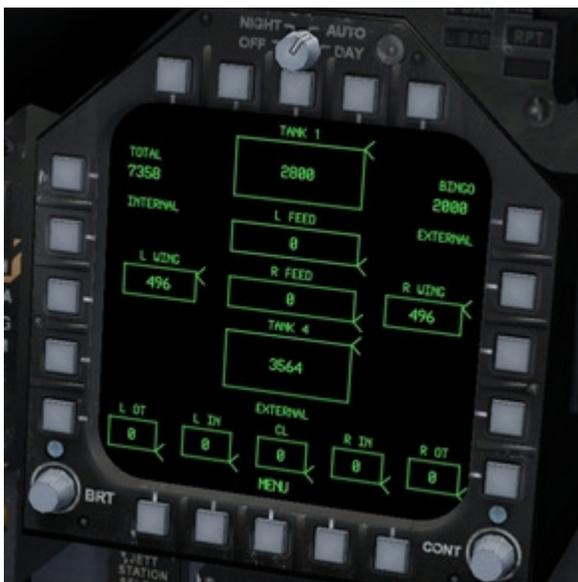
HUD Menu

HSI (Horizontal Situation Indicator) – The icon in the center of the screen represents your aircraft. Select TCN / ILS modes using the keys on the upper left. The lower left number is your heading selection and the lower right number is your course selection for NAV1. Adjust the information displayed using the lower left softkey. If 'AUTO' has a box around it, the HSI is in auto-waypoint mode. To the right is SEQ which places the HSI into route mode. WPT places it into waypoint mode. Pressing the DATA key takes you to a screen where waypoints are displayed. CSEL displays current course. To the left of this is the Map Scale (in nm). Pressing the GPS softkey will take you into the FlightPlan screen.



HSI Menu

FUEL / FPAS (Flight Plan Analysis Screen) – Moving to the bottom row of softkeys on the main menu is the FUEL and FPAS keys.



FUEL Menu



FPAS Menu

The FUEL screen displays current fuel levels as well as your BINGO amount. The FPAS screen displays your current usage of fuel as well as current aircraft weight (which can be used for calculating speed and angles for takeoff and landings). It adjusts in real-time based on current fuel stores and flight parameters.

E/W – The E/W button brings up the Electronic Warfare screen. Since weapons are not implemented in FSX, this screen simply brings up an inoperable display.



E/W Menu

ADI –ADI brings up an 'artificial horizon' that gives current speed on the left and height on the right.



ADI Menu

ACL (Automated Carrier Landing) – The ACL screen provides commands from a carrier during your approach for landing. What is displayed depends on if you are manually landing the aircraft or not. In FSX, it is more often used to provide information while the aircraft is in autopilot mode. You can adjust the scale of the map using the softkey at the top of the screen to change the scale (SCL) in nautical miles.



ACL Screen

S/A – The S/A option is intended to bring up the Situational Awareness screen. Again, since weapons are not implemented in FSX this simply brings up an inoperable display.



S/A Menu

ENG – The display on the left of the cockpit is set to the Engine (ENG) screen by default. When you start the engines, these displays will begin to reflect the change in engine status. The primary information you will want from this screen is ENG STATUS. When the engines are fully operational, this should read NORMAL for both LEFT and RIGHT.



ENG Menu

CHK – The *CHK* button brings up a list of checklists and controls and is the starting display for the bottom-center display. This is simply a reminder of what you need to do on landing and takeoff.



CHK Menu

BIT – These menus bring up the Built-In Test pages. Of particular note is the *GDI+* menu you can access on the lower right side. This allows you to adjust how the displays appear and their refresh rate. If you are getting 50-60 fps, you may want to consider upping the refresh rate to 4 or 5. Be aware that this will impose a hit on your FPS, but will result smoother displays.



BIT Menu



GDI+ Menu

Summary

That is a lot of information, so here's a quick look at how I set up my displays for flight. I begin by changing using my left display to adjust the GDI+ to fit my style. When I get it tweaked, I switch over to A/A Radar (RDR) to allow me to monitor all traffic around me. I will change this display to any other screen as the situation dictates. On the right, I leave the display in HSI mode and adjust the NAV display (lower-left softkey) to read 'ALL'. Finally, I set the bottom-center display to show the FPAS screen.

This set-up works for me as the display to my right shows my course, glideslope, waypoints, etc. at all times. It is the default setting for that display and is where most users are familiar with it being. I like the 'ALL' function, though it does tend to clutter up the display a bit (I'm used to it!). The display on my left functions as a supplemental one that I change as often as needed, though I do like the radar function. Finally, the bottom-center display of fuel status is out of the way, but available quickly should I need it.

Now that you understand the screens a little better, experiment until you have a set-up that works for you. It makes flying much more enjoyable.

Things you don't see everyday...



Simultaneous F-18 launches from catapults

Photo courtesy U.S. Navy

(public domain)

5.) Using the Up-Front Control Panel (UFC)

The Up-Front Control Panel (UFC) of the F/A-18 can be quite difficult to grasp, because it deviates from a civilian A/P quite a bit. *The majority of this chapter was written by Virtuali, an administrator for the FSDreamteam.com forums and remains copyright for him.* I have taken the liberty of updating and collating some information and screenshots.

COM Mode

The first thing to be noted is the UFC has basically two “levels” of operation. The “top” level is the COM mode. This is the mode the UFC is in by default, you know you are in this mode, because the indications will read:



FSX F/A-18 UFC in COM Mode

This mode is simplified compared to the real one, since we don't obviously have the capability to encrypt ATC communications in FSX. Several options “act” like the real ones, but will not have any impact on operation.

- GRCV (Guard Receive) – Aircraft emergency frequency reserved for emergency communications. The frequencies are 121.5 MHz for civilian and 243.0 MHz for military, no impact in FSX
- SQCH (Squelch) – Tone squelch allows audio only in the presence of the correct code, no impact in FSX.
- CPHR (Cipher) – Enable encryption of communications, no impact in FSX
- AM (Frequency) – Enable frequency for communication (AM/FM/AJ), no impact in FSX
- MENU – Enter UFC Menu, no impact in FSX

The most important controls in COM mode are the two channel selectors under the “1” and “2” Windows at the lower left and right of the UFC. These will control COM₁ and COM₂, respectively. In the real F/A-18, these knobs can either be pulled or rotated. Pulling them places the UFC into “Manual” mode allowing for a direct COM frequency selection; while rotating them, not implemented in FSX, selects preset channels.

Pull the selector and the corresponding radio will go into Manual mode, showing an "M" in its window and the current COM frequency in the UFC Scratchpad (which is the readout just above the numberpad). Now, the COM radio is ready to accept input from the keypad. The input system is smart enough to allow to use shortcuts so, for example:

to select 128.375, dial 1-2-8-3-7-5-ENT on the keypad

to select 128.35, dial 1-2-8-3-5-ENT

to select 128.3, dial 1-2-3-3-ENT

to select 128.00, dial 1-2-8-ENT

Illegal input will be flagged with a flashing "Error" message, and you can correct an input by pressing the CLR button.

By using the two "VOL COMM1" and "VOL COMM2" knobs on the left and right, you can select which COM you are transmitting to. When you click on one of the knobs, it activates that COM channel and silences the other. The active COM is signaled by the "ON" indication on the UFC Scratchpad, when the frequency is displayed.

To resume normal operation, pull/push the Channel selector knob again.

It's important to note that all the other modes are sub-menus of the main, top-level COM mode. You 'enter' a mode pressing the relevant mode key, and you 'exit' from it, by pressing the same button again, thus returning to the top-level COM mode.

A/P Mode - Autopilot

Pressing the A/P button will enter into Autopilot mode. The UFC Panel will now show:



FSX F/A-18 UFC in A/P Mode

It's important to note that, unlike civilian autopilots, the F-18 will immediately turn on and engage the A/P when the mode is selected. Of course, you can always manually turn on/off the A/P, by using the ON/OFF button when in Autopilot Mode. To better learn autopilot modes, I suggest putting the left DDI screen on the ACL page, so you will be able to see all the Autopilot Annunciators, and the right DDI screen on HSI mode (which should be there default).

- ATTH (Attitude Hold) – Maintain current Attitude
- HSEL (Heading Select) – Maintain the Heading selected with the HDG selection bug. The HDG and CRS selection bugs are just under the Fuel selector. You can check the current selected heading on the HSI under the HSEL readout, and there's a bug displayed on the HSI as well. Note also, on the HSI, a "CPL HDG" readout will appear close to the airplane symbol.
- BALT (Barometric Altitude Hold) – This will set Altitude Hold mode at the CURRENT Altitude. There's no way to manually pre select a different altitude, Altitude mode here will always lock at your current altitude.
- RALT (Radar Altitude Hold) – Not implemented
- CPL (Coupled mode) – This mode is a generic way to name all modes that are Coupled to something (TACAN, ILS or WAYPOINT). What you are coupled to depends on the mode that has been selected on the HSI screen. To change Coupling mode, select either "TCN", "ILS" or "WPT" on the HSI, to toggle between modes. NOTE: Of course, to use WPT mode, you first have to create a flight plan! Without a flight plan, the only modes available for coupling will be TCN and ILS.

Note the "CPL TCN" or "CPL ILS" on the airplane symbol. To select a Steering Course towards the station, use the CRS bug, and check the small "CSEL" readout on the HSI. By pressing the "CSEL" button on the HSI, instead, you can toggle on/off the visualization of the CRS indication for the HSI.

Pressing A/P button again, will exit from the Autopilot mode.

IFF Mode – Identification Friend or Foe

This is a cryptographic identification system that enables military aircraft to distinguish friendly aircraft, boats, and vehicles from enemies and to determine their bearing and range. Cryptographic services are not implemented in FSX so this has no effect.

TCN Mode –VOR (TACAN) Navigation

TACTical Air Navigation, or TACAN, is a more accurate version of VOR/DME navigation that provides range and bearing information for military aviation. TCN Mode places the UFC into a screen where you can enter VOR frequencies as either standard frequencies or TACAN channels. The radio is smart enough to figure out your intentions. FSX doesn't use TCN information, so all information is relayed in standard VOR/DME format.



FSX F/A-18 UFC in TCN/VOR Mode

To set a VOR frequency of 110.5 via TACAN, look at the chart in the appendix for a list of TACAN channel frequencies. You will see that 110.5 equals a TACAN channel of '42X'. Begin by setting the UFC in TCN mode. Press 4-2-ENTER on the UFC keypad and then select 'X' by pressing the little button to the left of the 'X' display. It should become active with a ':' symbol.

If you want to set the VOR frequency of 110.5 manually, just press 1-1-0-5-0-ENTER and it will automatically translate the frequency into the appropriate TACAN channel if you enter a recognized frequency. If you are having difficulty, try entering 5 full digits instead of 3 or 4.

To set course, you need to use the CRS knob close to the Fuel indicator in the lower left of the cockpit. It can be scrolled with the mouse wheel. To check the CRS, open the HSI screen on one of the displays and look at the CRS readout.

Notes: It is important to note that the F-18 only has one VHF radio so you can either use it for VOR or ILS navigation. There is no OBS2. You will also note that you cannot receive TACAN/VOR/ILS channels while on the ground, so the display will read 'OF' until you get airborne.

ILS Mode – Instrument Landing System

ILS consists of two independent sub-systems, one providing lateral guidance (Localizer), the other vertical guidance (Glideslope or Glide Path) to aircraft approaching a runway. Generally, the pilot will get the localizer lined up so they are flying the correct heading to land on the designated runway. They will then fly level until they intercept the glideslope and then begin descending toward the runway.



FSX F/A-18 UFC in ILS Mode

Rate-of-descent formula

Rate of Descent = Glideslope Angle × (Groundspeed / 60) × 100

* Rate of Descent is in feet per minute,

* Glideslope angle is in degrees from the horizontal (Usually 3 degrees)

* Groundspeed is in knots

If the glideslope is the standard 3 degrees then the formula can be further simplified to:

Rate of Descent = 5 × Groundspeed

You set the ILS frequency the exact same way as you do the TCN/VOR. Here is an example ILS approach: Runway 2 at Maui (PHOG) has an ILS approach frequency of 110.10 MHz on a course of 024 degrees. *By the way, you can find the most current ILS, VOR, & GPS approach plate online for free at <http://www.airnav.com/airport>.*

Press the ILS key, then press 1-1-0-1-0-ENTER. Set the proper course using the CRS switch in the bottom left of the cockpit near the fuel displays. Bring up the HSI screen on one of the displays (the left one is standard) and press the 'ILS' button. Check the actual course setting on the lower right of that display under the 'CSEL' text. You can adjust the HSI display with the upper left control on the center DDI display (lower-center of cockpit, in front of the flight stick) to either NORM or D-CTR. Fly to the CAMPS intersection and set up your approach at 3000 ft on a heading of 024, following the ILS approach plate. Intercept the localizer and glideslope and fly down to the runway and land.

Potential Problems & Fixes

Some people have noticed they still have problems tuning with the plane selecting the wrong TCN channel no matter how they input the channel. While this is rare, it can occur. If you get truly frustrated, one work around is to adjust the F-18 panel file to include a Cessna 172 Nav Radio stack. You can do this by:

1. Exit FSX
2. Navigate to the 'FSX/SimObjects/Airplanes/FA-18/panel' folder and open the 'panel.cfg' file with notepad.
3. At the top of the file, add the term:
Window04=Radio Stack
4. Scroll down to [Window 03] and find the end of this section.
5. Add the following section:

```
[Window04]
BACKGROUND_COLOR=2,2,2
size_mm=156,308
position=8
visible=0
ident=RADIO_STACK_PANEL
zorder=3
gauge00=Bendix_King_Radio!Bendix-King Radio Audio,    0, 0,156,31
gauge01=Bendix_King_Radio!Bendix-King Radio Nav-Comm 1,  0, 29,156,59
gauge02=Bendix_King_Radio!Bendix-King Radio Nav-Comm 2,  0, 86,156,59
gauge03=Bendix_King_Radio!Bendix-King Radio ADF,    0,142,156,41
gauge04=Bendix_King_Radio!Bendix-King Radio DME,    0,180,156,41
gauge05=Bendix_King_Radio!Bendix-King Radio Xpndr,   0,217,156,49
gauge06=Bendix_King_Radio!Bendix-King Radio AP,    0,262,156,48
window_size_ratio=1.000
window_pos=0.756,0.358
window_size=0.243,0.641
```

6. Save the file (Ctrl + S) using the original file name.
7. Restart FSX

Now, when you are flying the F-18, you can bring up a Radio Stack window that allows you to set the frequencies using a more familiar set of radios. This is a low-tech way of getting around this problem. Please note, you can also take the Radio Stack information from another aircraft's panel file (such as the Lear45 or one of the jumbo jets) if you want a more modern look and feel. Just copy over the pertinent information from their panel file.

You can also pause, switch planes in mid-flight, set the NAV radio, switch back to the F-18 and un-pause.

D/L Mode – Data Link

Data Link is used to securely upload & download navigational data. Since cryptographic services are not implemented in FSX: Acceleration, this button has no effect (it cannot even be pressed).

BCN Mode – NDB (Beacon) Navigation

A non-directional beacon (NDB) is a radio transmitter at a known location, used as an aviation navigational aid. As the name implies, the signal transmitted does not include inherent directional information (in contrast to VOR and TACAN). NDB signals follow the curvature of the earth, so they can be received at much greater distances at lower altitudes, a major advantage over VOR.

However, the NDB signal is affected more by atmospheric conditions, mountainous terrain, coastal refraction and electrical storms, particularly at long range. NDBs operate on a frequency between 190 kHz and 1750 kHz (190 kHz and 535 kHz in North America). Each NDB is identified by a one, two, or three-letter Morse code call-sign.

ADF equipment determines the direction to the NDB station relative to the aircraft. When tracking to or from an NDB it is expected that the aircraft track on a specific bearing. This is most commonly done using a Radio Magnetic Indicator (RMI) which combines a relative bearing indicator (RBI) with a compass card.

Enter an appropriate NDB frequency using the keypad on the UFC.



FSX F/A-18 UFC in BCN Mode

Summary

Confused yet? It's okay, just keep this section handy and refer back to it as often as needed. I've taken the liberty of including a sample flight plan example written by Virtuali. It is reproduced in the next chapter to give you concrete example of using the F-18 avionics.

Someone is about to have a very bad day!



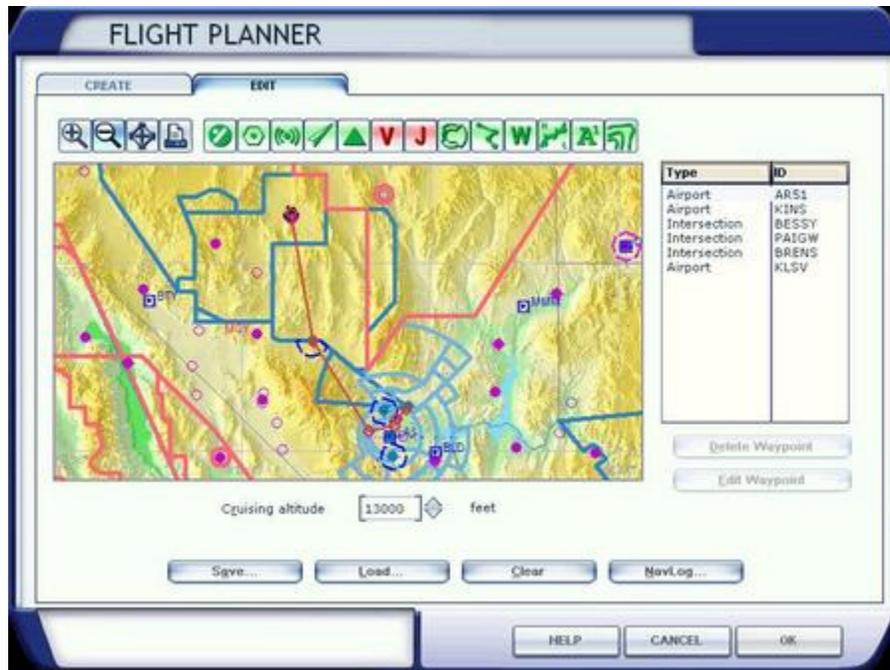
Stealth Bomber escorted by eight F-18 Hornets.

Photo courtesy U.S. Navy

(public domain)

6.) A Sample Flight Plan – by Virtuali

Let's start with a short test flight from Area 51 to Nellis AFB. As you can see, the flight goes through KINS, BESSY, PAIGW, BRENS, and ends at Nellis. Here's our plan in FSX...



Sample Flight Plan – Setup Using FSX Flight Planner

Load the F/A-18 and select the HSI on any of the displays. Press the WPT softkey (to activate Waypoint mode) and activate the SEQ options to display the route on the HSI screen. The screen should look like the one below, with KINS being the next active waypoint.



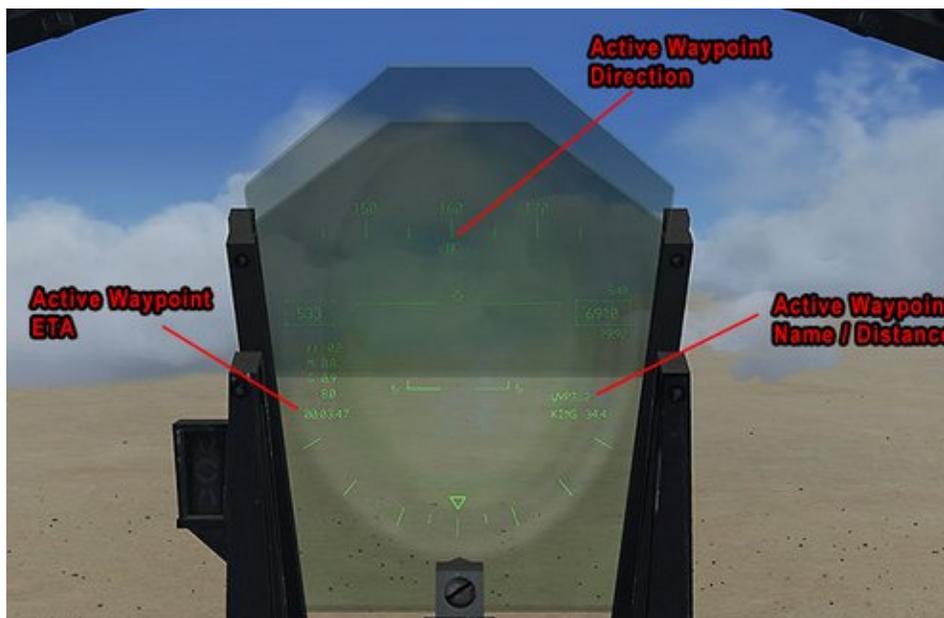
HSI Showing Flight Plan

By pressing the GPS softkey (at the top), a page will appear listing all the waypoints in the current flight plan with a >sign next to the active one. It's possible to cycle waypoints by using the UP/DOWN softkeys to the right.



GPS Mode Showing Waypoints

The HUD will also repeat waypoint information when the HSI is in Waypoint mode.



HUD – Flying Enroute to Waypoint KINS

When a waypoint is active, and the airplane is flying, it's possible to check for a fuel prediction on the FPAS page. Select the FPAS page on another display (upper left is recommended). In the image below, the FPAS is on the left display and the HSI is on the right. Also note that the HSI has been put into ARC mode (done by rotating the small knob on the top left of the center display to the D-CTR position). The active waypoint is labeled with a filled circle. Finally, note that we enabled visualization of all kinds of nav aids by using the lower left softkey on the HSI display and setting it to read "ALL". This cycles between OFF, TCN, NDB, FIX, APT, and ALL.



FPAS, HSI, and HUD Working Together

Note the FPAS screen which gives a useful prediction on the airplane's endurance to reach Bingo (set with the appropriate Bingo knob), to reach 2,000 lb of fuel and to reach zero fuel. Also, we get information about the Estimate Fuel on Board at the next waypoint, together with some information about fuel consumption.

Now we can turn the Autopilot on to follow the route automatically. Press the A/P button on the UFC Panel and press BALT to hold the current altitude. Press CPL to automatically follow the route. Since we are in Waypoint mode on the HSI the Autopilot will understand we are going to follow a waypoint. Since the SEQ button is turned on, the “Coupling” will be to the route in our plan. Note the HSI showing CPL SEQ. If SEQ is turned off, and WPT on, the HSI will show CPL WPT meaning it will follow a waypoint directly. What is the difference? In CPL WPT the Autopilot will fly straight/direct to the next waypoint. In CPL SEQ mode, it will intercept the planned route first, and then fly to the waypoint.



Autopilot (A/P) Engaged

You can get additional information on an active waypoint by pressing the DATA softkey button.



Additional Data on Active Waypoint – Submenu of HSI

At this point, we've reached the KINS waypoint. Since the AUTO option is selected, the airplane will automatically make the next waypoint (BESSY) active and turn toward it. If AUTO is turned off, we are free to select any waypoint and follow it.



F-18 Turning to Waypoint BESSY

The autopilot will progress through the entire flight plan until reaching the last waypoint. Please be aware that this tutorial is only valid for LATERAL navigation. You will be responsible to climb/descend according to the flight plan.

Congratulations on successfully entering and following a flight plan in the F-18. Once you get used to all of the additional information and the intricate displays, it's difficult to go back to OBS and RMI for cross country flights.

No matter what, you will find that a better understanding of the displays and navigation in the F-18 will make your flights more enjoyable, even if you are just sightseeing... supersonic and inverted!

Is that my house down there?



Getting disoriented with the pilots of the “Blue Angels”.

Photo courtesy U.S. Navy

(public domain)

7.) Standby / Backup Systems

The F-18 has several layers of safety built in. In addition to the triple redundancy for digital displays, there are two banks of standard instruments in the event of a catastrophic failure of the primary displays. These are located at the bottom of the cockpit.

On the left, the displays primarily deal with engine and fuel status. Beginning with the far left is a JETT Station panel. This is not implemented in FSX, but in real life it serves to provide a means to jettison stores, fuel tanks, etc. To the right of this is a panel that has engine information and includes: % Max RPM, Temperature, FF RPM, Nozzle position, and Oil Pressure. To the right of this is a Fuel Qty panel that shows current fuel stores and has a selector to set BINGO fuel notification. Just below this panel are two switches that activate selected Heading and Course.



Standby/Backup Systems, Left Side

On the right are located standard pneumatic gauges including an ADI with artificial horizon and slip indicator, Airspeed (in Kts x100), Altimeter (calibrated by barometric pressure), and Vertical Speed indicator. Below this is a Radar Altimeter with height provided in ft x100.



Standby/Backup Systems, Right Side

Um, how long did you say it would be for clearance?



Aircraft from the flight group pack the deck of a carrier at the end of the day.

Photo courtesy U.S. Navy

(public domain)

8.) The Rest of the Interactive Cockpit

Besides the various displays and dials visible in the front of the cockpit, there are numerous buttons, switches, and knobs on the left and right sides of the cockpit. Pan your view to see them. We will briefly discuss each interactive option. The remainder of the graphics serve only to improve realism. Each of the images below have the interactive portions circled in green.

Left Side

Beginning at the forward and top left, you will find the Landing Gear lever (up/down). On the panel below this, you will find Launch Bar (retract/extend), Flaps (Auto, Half, Full), and Emergency/Parking Brake (on/off).



Interactive Cockpit, Left Side

Below this, you will find a series of panels. The first one back contains the interactive Throttle Controls for the left and right engines. These can be slid forward and back by clicking and holding the mouse cursor and dragging them in the desired direction. At the very front of the panel is a little switch labeled Test A/Test B (Test A/ Test B/ off) which is clickable, but I have no idea of its function. Moving the throttles fully forward reveals two more that control Strobe Light (on/off) and Rotating Beacon Light (on/off).

Moving to the next panel back, you will find Refueling probe (extend/retract), and Fuel Dump (on/off). Below this is a panel with Rudder trim (left/neutral/right). To the left of these panels is one that has APU (on/off), and Engine starter (left/right/off). Moving to the last panel, you will find two options for communications. These include TCN/ILS volume (low/high) and an Audio

Control Panel (comm1/comm2/off). The remainder of the left side is non-interactive graphics placed there for realism.

Right Side

On the right side, there are very few interactive options. Forward and top, you will find the Arresting/Landing Hook lever (up/down) and Wing Fold lever (open/folded).



Interactive Cockpit, Right Side

Below this is a panel with three switches. These are the Left Alternator (on/off), Battery (on/off/override), and Right Alternator (on/off). To the right of this panel is a small switch against the side of the cockpit which is the Canopy switch (open/closed).

Moving down one panel, you will find two options for Anti-Ice measures... the Pitot Heat (on/off) and De-Ice (on/off). The third panel down contains knobs that control Instrument Panel Lighting (on/off) and Cabin Lighting (on/off). There is a switch for Light Test (test/off) which has no useful function in FSX that I know of. The remainder of the right side is non-interactive graphics placed there for realism.

9.) Appendix - TACAN Frequency Chart

CHAN	FREQ MHz
17X	108
17Y	108.05
18X	108.1
18Y	108.15
19X	108.2
19Y	108.25
20X	108.3
20Y	108.35
21X	108.4
21Y	108.45
22X	108.5
22Y	108.55
23X	108.6
23Y	108.65
24X	108.7
24Y	108.75
25X	108.8
25Y	108.85
26X	108.9
26Y	108.95
27X	109
27Y	109.05
28X	109.1
28Y	109.15
29X	109.2
29Y	109.25
30X	109.3
30Y	109.35
31X	109.4
31Y	109.45
32X	109.5
32Y	109.55
33X	109.6
33Y	109.65
34X	109.7
34Y	109.75
35X	109.8
35Y	109.85
36X	109.9
36Y	109.95
37X	110
37Y	110.05
38X	110.1
38Y	110.15
39X	110.2
39Y	110.25
40X	110.3
40Y	110.35
41X	110.4
41Y	110.45

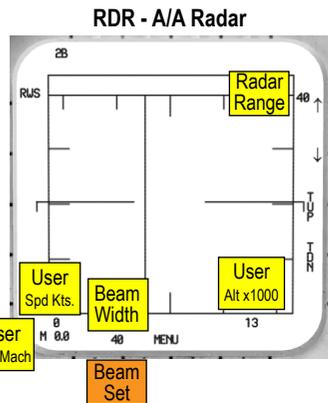
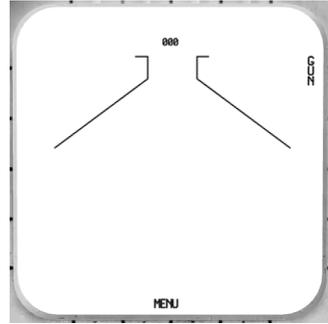
CHAN	FREQ MHz
42X	110.5
42Y	110.55
43X	110.6
43Y	110.65
44X	110.7
44Y	110.75
45X	110.8
45Y	110.85
46X	110.9
46Y	110.95
47X	111
47Y	111.05
48X	111.1
48Y	111.15
49X	111.2
49Y	111.25
50X	111.3
50Y	111.35
51X	111.4
51Y	111.45
52X	111.5
52Y	111.55
53X	111.6
53Y	111.65
54X	111.7
54Y	111.75
55X	111.8
55Y	111.85
56X	111.9
56Y	111.95
57X	112
57Y	112.05
58X	112.1
58Y	112.15
59X	112.2
59Y	112.25
70X	112.3
70Y	112.35
71X	112.4
71Y	112.45
72X	112.5
72Y	112.55
73X	112.6
73Y	112.65
74X	112.7
74Y	112.75
75X	112.8
75Y	112.85
76X	112.9
76Y	112.95

CHAN	FREQ MHz
77X	113
77Y	113.05
78X	113.1
78Y	113.15
79X	113.2
79Y	113.25
80X	113.3
80Y	113.35
81X	113.4
81Y	113.45
82X	113.5
82Y	113.55
83X	113.6
83Y	113.65
84X	113.7
84Y	113.75
85X	113.8
85Y	113.85
86X	113.9
86Y	113.95
87X	114
87Y	114.05
88X	114.1
88Y	114.15
89X	114.2
89Y	114.25
90X	114.3
90Y	114.35
91X	114.4
91Y	114.45
92X	114.5
92Y	114.55
93X	114.6
93Y	114.65
94X	114.7
94Y	114.75
95X	114.8
95Y	114.85
96X	114.9
96Y	114.95
97X	115
97Y	115.05
98X	115.1
98Y	115.15
99X	115.2
99Y	115.25
100X	115.3
100Y	115.35
101X	115.4
101Y	115.45

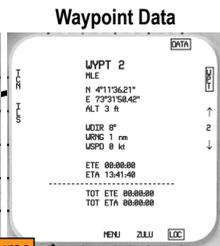
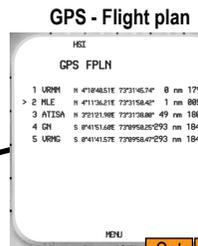
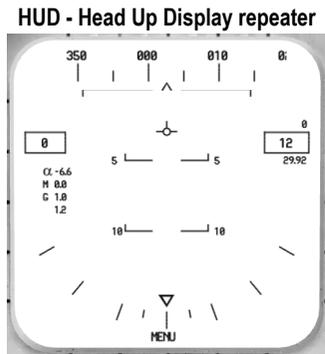
CHAN	FREQ MHz
102X	115.5
102Y	115.55
103X	115.6
103Y	115.65
104X	115.7
104Y	115.75
105X	115.8
105Y	115.85
106X	115.9
106Y	115.95
107X	116
107Y	116.05
108X	116.1
108Y	116.15
109X	116.2
109Y	116.25
110X	116.3
110Y	116.35
111X	116.4
111Y	116.45
112X	116.5
112Y	116.55
113X	116.6
113Y	116.65
114X	116.7
114Y	116.75
115X	116.8
115Y	116.85
116X	116.9
116Y	116.95
117X	117
117Y	117.05
118X	117.1
118Y	117.15
119X	117.2
119Y	117.25
120X	117.3
120Y	117.35
121X	117.4
121Y	117.45
122X	117.5
122Y	117.55
123X	117.6
123Y	117.65
124X	117.7
124Y	117.75
125X	117.8
125Y	117.85
126X	117.9
126Y	117.95

This information was taken from the US DoD Flight Information Handbook.
 Channels 1X thru 16Y and Channels 60X thru 69Y are not listed
 because there are no paired frequencies for those channels.

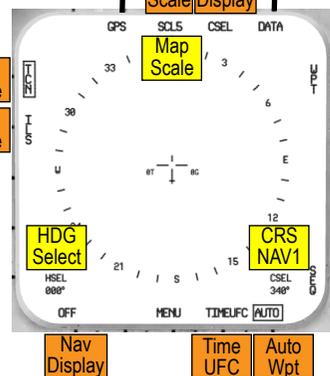
FSX Acceleration - F/A-18 Avionics Map



- Range Inc.
- Range Dec.
- Prev. Target
- Next Target



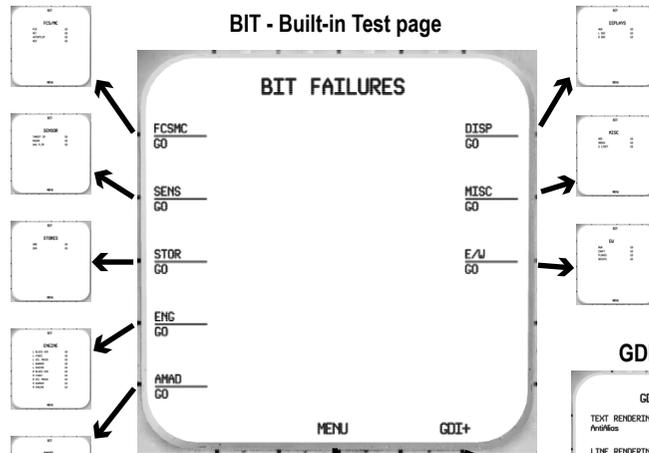
- Prev. Wpt
- Next Wpt



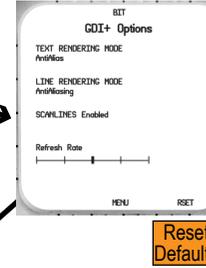
- TCN Mode
- ILS Mode

- Nav Display
- Time UFC
- Auto Wpt

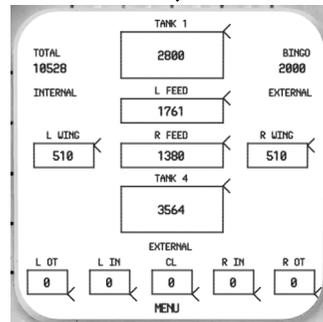
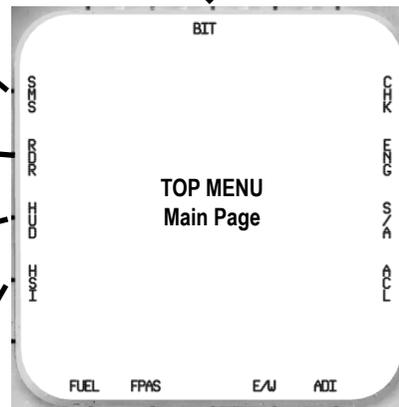
Route Mode



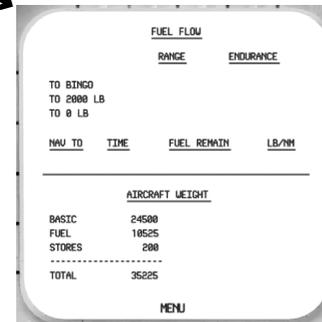
GDI+ Options



- Set Text AA
- Set Line AA
- Toggle Scanlines
- Set Refresh
- Reset Defaults



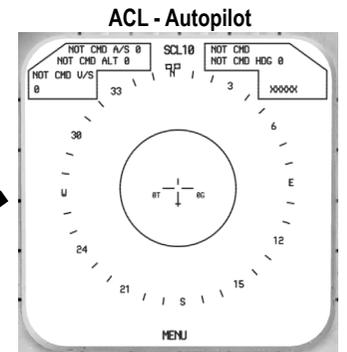
Fuel Page



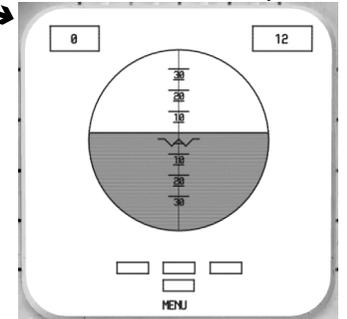
FPAS Advisory System



ENG - Engine Status



ADI - Artificial Horizon repeater



FSX W/ ACCELERATION PACK – KEYBOARD COMMANDS



* **Make sure NUM LOCK is OFF before using this chart**

SIMULATOR

Pause	P or BREAK / PAUSE
Full Screen Mode	ALT + ENTER
Menus (display/hide)	ALT
Reset Current Flight	CTRL + ; (Semicolon)
Save Flight	; (Semicolon)
End Flight	ESC
Exit Flight Sim (Normal)	CTRL + C
Exit Flight Sim (Immediately)	CTRL + BREAK / PAUSE
Select Item 1	1
Select Item 2	2
Select Item 3	3
Select Item 4	4
Select Time Compression	R
Increase Selection	= (Equal Sign)
Increase Selection Slightly	SHIFT + = (Equal Sign)
Decrease Selection Slightly	SHIFT + - (Minus Sign)
Decrease Selection	- (Minus Sign)
Cycle Coordinates/Frame Rate	SHIFT + Z
Capture Screenshot	V
Joystick (On/Off)	CTRL + K
Sound (On/Off)	Q

GENERAL (No default key mapped for Floats, enter your own)

Brakes (Apply/Release)	. (Period)
Brakes, Left (Apply/Release)	Num Pad * (Star)
Brakes, Right (Apply/Release)	Num Pad - (Minus)
Brakes, Parking (Set)	CTRL + . (Period)
Landing Gear (Extend/Retract)	G
Landing Gear (Manual Extend)	CTRL + G
Floats (Extend) ** not set by default	
Floats (Retract) ** not set by default	
Tail Wheel (Lock/Unlock)	SHIFT + G
Pushback (Start/Stop)	SHIFT + P (then 1 or 2 → R/L)
Fuel Truck (Request)	SHIFT + F
Doors – Select (Open/Close)	SHIFT + E
Jetway (Attach/Detach)	CTRL + J
Tow Plane (Request)	CTRL + SHIFT + Y
Tow Plane (Release)	SHIFT + Y
Fuel Dump	CTRL + SHIFT + D
Kneeboard (display/hide)	SHIFT + F10
Flying Tips (display/hide)	CTRL + SHIFT + X
Flying Tips Action Trigger	CTRL + X
Release Droppable Objects	SHIFT + D
Aircraft Labels	CTRL + SHIFT + L
Aerobatic Smoke (On/Off)	I
Slew Mode (On/Off)	Y

MISSION COMMANDS

Compass Pointer (On/Off)	U
Compass Objective (Next)	K
Compass Objective (Previous)	SHIFT + K

CONTROL SURFACE

Ailerons (Bank Left)	Num Pad 4
Ailerons (Bank Right)	Num Pad 6
Aileron Trim (Left)	CTRL + Num Pad 4
Aileron Trim (Right)	CTRL + Num Pad 6
Rudder (Yaw Left)	Num Pad 0
Rudder (Yaw Right)	Num Pad ENTER
Rudder Trim (Left)	CTRL + Num Pad 0
Rudder Trim (Right)	CTRL + Num Pad ENTER
Flight Controls (Center All)	Num Pad 5
Elevator (Pitch Down)	Num Pad 8
Elevator (Pitch Up)	Num Pad 2
Elevator Trim (Down)	Num Pad 7
Elevator Trim (Up)	Num Pad 1
Flaps (Retract Fully)	F5
Flaps (Retract Incrementally)	F6
Flaps (Extend Incrementally)	F7
Flaps (Extend Fully)	F8
Arm Spoilers (Autoextend on Landing)	SHIFT + / (Forward Slash)
Spoilers (Extend/Retract)	/ (Forward Slash)
Water Rudder (Up/Down)	CTRL + W

ENGINE (Commands affect all engines unless you select one)

Select Engine	E + engine number (1-4)
Engine Auto-start	CTRL + E
Throttle (Cut)	F1
Reverse Thrust (Turboprop/Jet)	F2 (press and hold)
Throttle (Decrease)	F2 or Num Pad 3
Throttle (Increase)	F3
Throttle (Full)	F4
Propeller (Low RPM)	CTRL + F1
Propeller (Decrease RPM)	CTRL + F2
Propeller (Increase RPM)	CTRL + F3
Propeller (High RPM)	CTRL + F4
Mixture (Idle cutoff)	CTRL + SHIFT + F1
Mixture (Lean quickly)	CTRL + SHIFT + F2
Mixture (Enrich)	CTRL + SHIFT + F3
Mixture (Full rich)	CTRL + SHIFT + F4
Carb Heat/Anti-Ice (On/Off)	H
Magnetos (select)	M
Master Battery/Alternator (select)	SHIFT + M
Cowl Flaps (open incrementally)	CTRL + SHIFT + V
Cowl Flaps (close incrementally)	CTRL + SHIFT + C
Nitrous Oxide (On/Off)	SHIFT + C
Reheat/Afterburner (On/Off)	SHIFT + F4
Anti-detonation Tank Valve	SHIFT + X

AIRCRAFT CARRIER OPERATIONS

Launch Bar (Extend/Retract)	SHIFT + U
Attach to Catapult (Arm/Disarm)	SHIFT + I
Fire Catapult (Trigger)	SHIFT + SPACEBAR
Tail Hook (Up/Down)	SHIFT + Q

HELICOPTER OPERATIONS

Helicopter Rotor Clutch (On/Off)	SHIFT + . (Period)
Helicopter Rotor Gov'nr (On/Off)	SHIFT + , (Comma)
Helicopter Rotor Brake (On/Off)	SHIFT + B
Hoist Arm (Extend/Retract)	CTRL + U
Hoist Cable (Lower)	J
Hoist Cable (Raise)	K
Hoist Hook (Attach/Release)	O

INSTRUMENTS/PANELS

Virtual Cockpit	F9
2D Cockpit	F10
2D Cockpit (Cycle Panels)	W or SHIFT + W
Snap to Panel View	SHIFT + Num Pad 0
2D Panel Transparency	CTRL + SHIFT + T (then + or -)
Panel Window #	SHIFT + Number (0-9)
Heading Indicator (Reset)	D
Altimeter (Reset)	B
Pitot Heat (On/Off)	SHIFT + H

RADIO

ATC Window (Display/Hide)	SCROLL LOCK or ` (Accent)
VOR 1 Ident (On/Off)	CTRL + 1
VOR 2 Ident (On/Off)	CTRL + 2
MKR Beacon Ident (On/Off)	CTRL + 3
DME Ident (On/Off)	CTRL + 4
DME (Select)	F
ADF 1 Ident (On/Off)	CTRL + 5
ADF (Select)	CTRL + SHIFT + A
Standby Frequency (Swap)	X
COM Radio (Select)	C
NAV Radio (Select)	N
OBS Indicator (Select)	SHIFT + V
Transponder (Select)	T

AUTOPILOT

Autopilot Master (On/Off)	Z
Flight Director (On/Off)	CTRL + F
Wing Leveler (On/Off)	CTRL + V
Yaw Damper (On/Off)	CTRL + D
Attitude Hold (On/Off)	CTRL + Z
Attitude Bug (Select)	CTRL + SHIFT + Z
Heading Hold (On/Off)	CTRL + H
Heading Bug (Select)	CTRL + SHIFT + H
Airspeed Hold (On/Off)	CTRL + R
Mach Hold (On/Off)	CTRL + M
Autothrottle (Arm)	SHIFT + R
Autothrottle Engage (TOGA)	CTRL + SHIFT + G
NAV 1 Hold (On/Off)	CTRL + N
Approach Mode (On/Off)	CTRL + A
Back Course Mode (On/Off)	CTRL + B
Localizer Hold (On/Off)	CTRL + O
Autorudder (On/Off)	CTRL + SHIFT + U

LIGHTS

Aircraft Lights, All (On/Off)	L
Panel Lights (On/Off)	SHIFT + L
Landing Lights (On/Off)	CTRL + L
Landing Lights (Tilt Down)	CTRL + SHIFT + Num Pad 2
Landing Lights (Tilt Up)	CTRL + SHIFT + Num Pad 8
Landing Lights (Tilt Left)	CTRL + SHIFT + Num Pad 4
Landing Lights (Tilt Right)	CTRL + SHIFT + Num Pad 6
Landing Lights (Center)	CTRL + SHIFT + Num Pad 5

VIEWS

Locked Spot View	F11
Top Down View	F12
View (Next Category)	S
View (Next Within Category)	A
View (Previous Within Category)	SHIFT + A
View (Previous Category)	SHIFT + S
View (Previous View Toggle)	CTRL + S
Look (Snap to Direction)	SHIFT + Num Pad Number
Look (Default Forward View)	SHIFT + Num Pad Delete
Look Using Mouse (On)	SPACEBAR or SHIFT + O
Zoom (In)	= (Equal)
Zoom (Out)	- (Hyphen/Minus)
Zoom (Default – 1x)	BACKSPACE
Chase Distance (Increase)	CTRL + - (Hyphen/Minus)
Chase Distance (Decrease)	CTRL + = (Equal)
Eyepoint (Move Back)	CTRL + ENTER
Eyepoint (Move Forward)	CTRL + BACKSPACE
Eyepoint (Move Up)	SHIFT + ENTER
Eyepoint (Move Down)	SHIFT + BACKSPACE
Eyepoint (Move Left)	CTRL + SHIFT + BACKSPACE
Eyepoint (Move Right)	CTRL + SHIFT + ENTER
Eyepoint (Reset)	CTRL + SPACEBAR
Window (Open New)	[(Left Bracket)
Window (Open New Top-Down)	SHIFT +] (Right Bracket)
Window (Select Next)	CTRL + TAB
Window (Select Previous)	CTRL + SHIFT + TAB
Window (Bring Selected to Front)	' (Apostrophe)
Window (Close Selected)] (Right Bracket)

MULTIPLAYER

Chat Window (Display/Hide)	CTRL + SHIFT + ENTER
Chat Window (Make Active)	ENTER
Voice (Start Transmit)	CAPS LOCK
Voice (Stop Transmit)	^ CAPS LOCK
Voice (Start Transmit to All)	SHIFT + CAPS LOCK
Voice (Stop Transmit to All)	^ SHIFT + CAPS LOCK
Transfer / Accept Control	SHIFT + T
Follow Other Player	CTRL + SHIFT + F
Cycle Through Other Players	CTRL + SHIFT + O

Design by K. Copeland (a.k.a. RxWookie)
 Logo & Screenshot copyright Microsoft®, keys compiled from FSX Acceleration
 Screenshot is F-18C Hornet (freewidescreeenwallpapers.blogspot.com)

10.) Conclusion & Credits

I hope that this brief manual is able to help you begin to understand the intricate systems and cockpit of the FSX F/A-18 aircraft. I want to take a moment to applaud and thank the designers at Microsoft and FSDreamteam.com for providing an amazingly realistic (and fun) experience. This aircraft must be flown to be appreciated, and you can be certain that I will be appreciating it for a long time.

Credits: First off... I'd like to thank my Savior and Lord, Jesus Christ, for giving me the time and ability to do this daunting and time consuming task. I'd also like to thank my wife and children for indulging the hours I've spent flying in FSX.

I'd also like to thank the FSDreamteam administrators and programmers for doing myself and the rest of the FSX community a great service in bringing one of the best aircraft for the MS Flight Sim series in a long time!

I have taken information from so many sources... it is impossible to thank everyone by name. The vast majority of this information was taken from the FSDreamteam forums and the wonderful people who post there. There is a fountain of knowledge to be had and I want to thank each and every one of you who have extended gracious assistance to others in learning about the F/A-18 aircraft. The closeness of the FSX community is an amazing thing. Thank you for sharing.

FSX: Acceleration “ Unofficial ” F-18 Cockpit Manual

by K. Copeland (a.k.a. RxWookie)



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