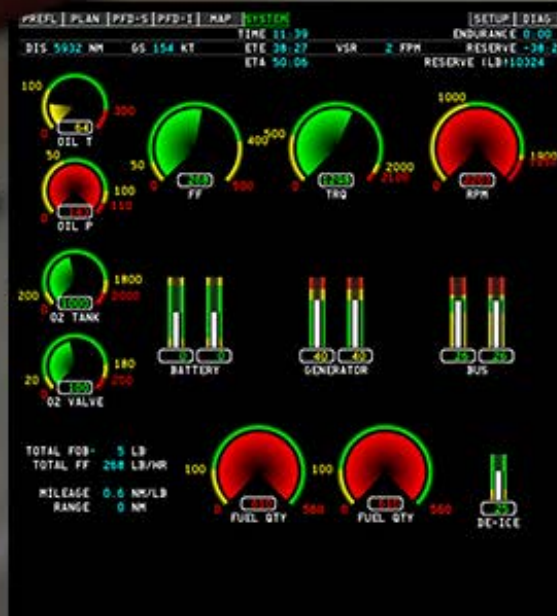
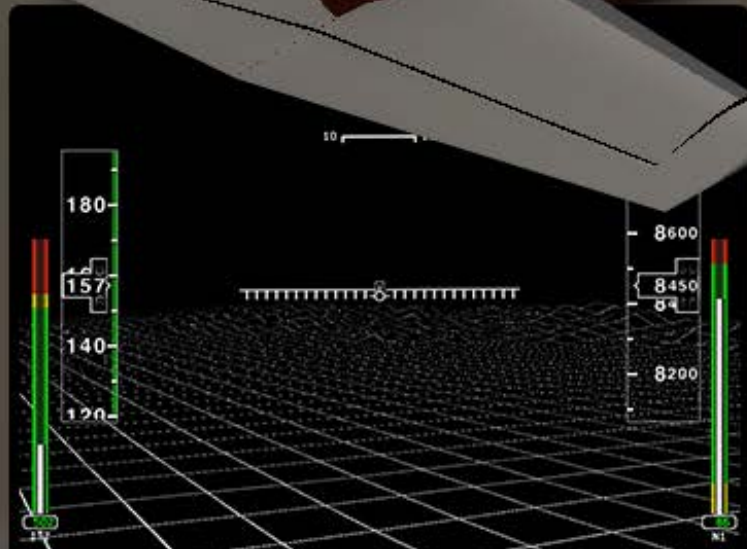


# EFIS App

*for iPad*



# EFIS App for iPad Operation Manual

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# 1. Introduction to EFIS App for iPad

EFIS App for iPad is the easiest, most cost-effective way to build a very high-quality home flight simulator. By transforming a regular iPad into an electronic flight instrument system (EFIS) display, the application provides a means of building a very convincing glass cockpit in your home with minimal effort.

Here's how it works:

Using EFIS App, an iPad (or two, or three, or four!) can be configured as one of a number of different EFIS displays. In the original release of the application, users can choose between a synthetic vision display, a wireframe view of the ground, and a steam gauge panel. Using the included PFD and MFD, a staggeringly powerful amount of information and control is available. This ranges from flight planning tools, to communications and navigation controls, to autopilots, to moving maps, to systems status displays.

EFIS App integrates seamlessly into a copy of X-Plane running on your Mac, Windows, or Linux machine—setup consists of nothing more than telling your desktop/laptop copy of X-Plane where to find the EFIS App iPad.

To really put the application to use, you can attach your iPad(s) to an instrument panel you build from plywood in your home, mount a “normal”-quality projector on your ceiling, and connect your Mac or PC to the projector. You would then have a simulator with spectacular visuals projected in front of you, cool EFIS instruments on the panel, and the best flight model in the industry—a simulator that would rival professional ones costing hundreds of thousands of dollars.

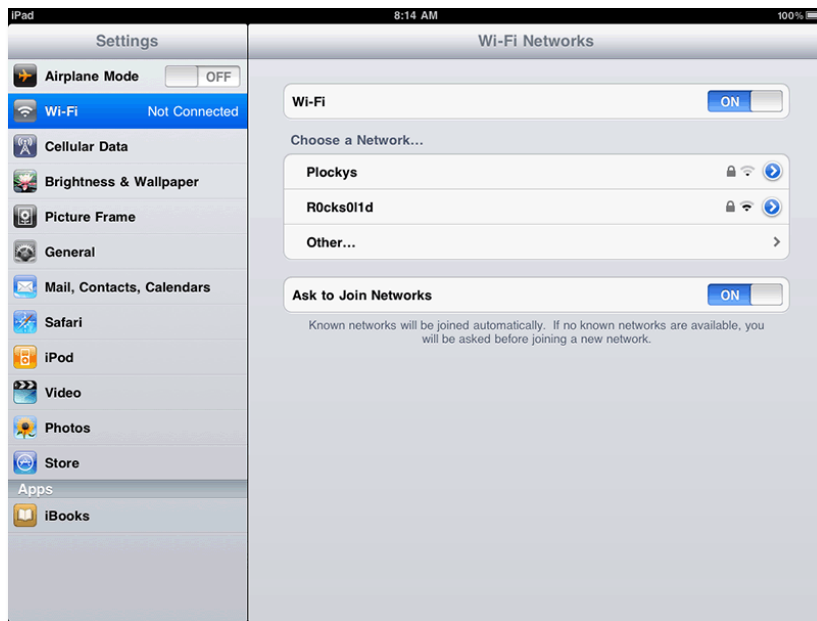
EFIS App for iPad will spark a revolution in homebuilt, no-hassle cockpits. What's stopping you from being a part of it?

## 2. Configuring the Device and Host

### I. Configuring the iPad

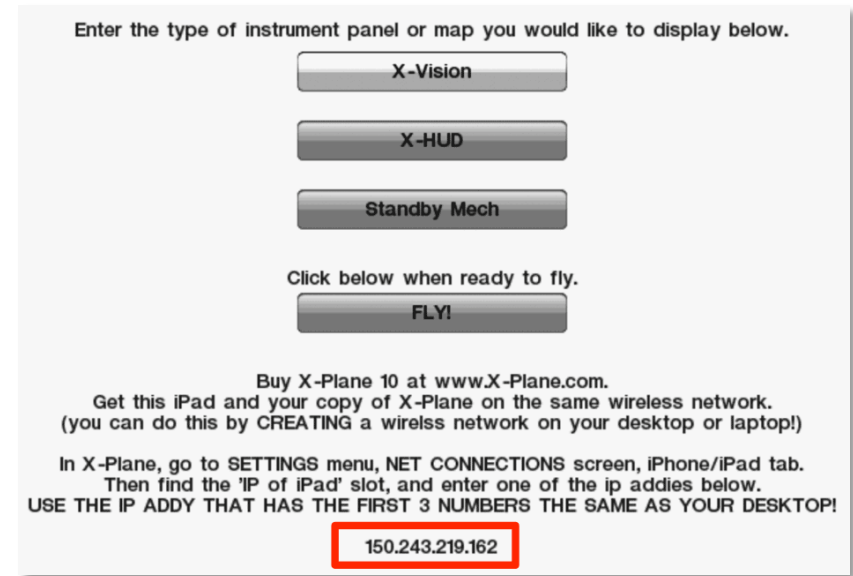
Each iPad that will run EFIS App must be connected to the same network as the host computer (the desktop/laptop running X-Plane), with no intervening subnetworks.

To connect the iPad to your wireless network, tap the Settings icon on the device's home screen. There, tap Wi-Fi and select your home network from the list (as seen in the following image).



Once connected, launch EFIS App from the iPad's home screen. Once the application loads, it will display the iPad's IP

address near the bottom of the screen. For instance, in the following screenshot, EFIS App is telling us that the iPad's IP address is 150.243.218.185.



Write down the number EFIS App gives you (or just keep your iPad running), as we will need this address when configuring the host computer.

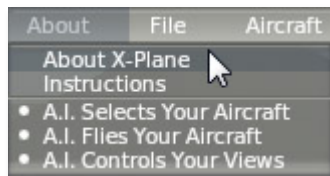
### II. Configuring the Host Computer

In order to interface with EFIS App for iPad, the X-Plane software installed on the host computer must be updated to version 9.61 or later.

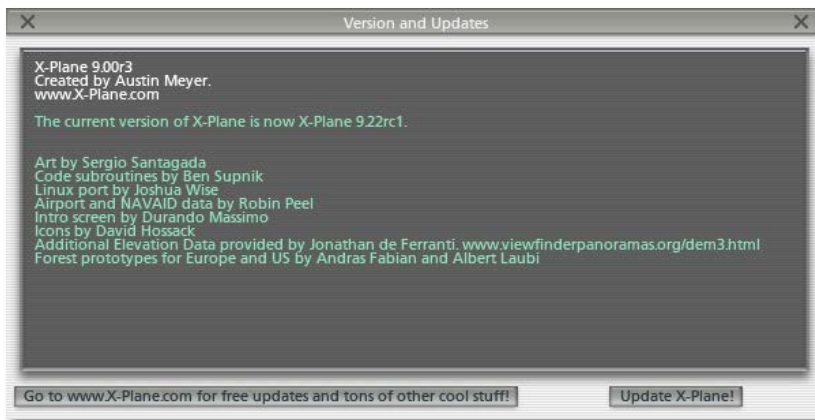
#### A. Updating X-Plane as Needed

To determine if X-Plane needs to be updated and, if required, perform the update:

1. Launch the copy of X-Plane on the host computer.
2. Once it opens, move your mouse to the top of the screen and click About, then click About X-Plane (as seen in the following image).



3. Check the version number listed at the top of the window that appears. If it reads anything prior to “X-Plane 9.61RC1,” the software needs to be updated.



4. If necessary, click the **Update X-Plane** button. This will cause X-Plane to automatically download the latest version of the updater program and launch it.

5. When the updater window appears, it will already have the correct copy of X-Plane selected (since it was launched from within the simulator). Click Continue.
6. Assuming there is enough disk space to download the required updates, click Continue to begin the installation.
7. The installation files will be downloaded and installed, after which the host system is ready to go.

Alternatively, you can use the updater downloaded from our website. For instructions on doing so, please see [this section](#) in the X-Plane Desktop manual. In particular, note that the **Check for new betas** box must be checked when searching for updates.

## B. Allowing X-Plane through Your Firewall

In order for your computer to “see” EFIS App running on your iPad, you must allow X-Plane to communicate through your firewall. If your computer is not running a firewall, you can skip this step entirely.

To allow a program through the firewall in Windows XP, follow Microsoft’s instructions in [Knowledge Base Article 842242](#).

To do this in Windows Vista and Windows 7,

1. Open Windows Firewall by clicking the Start button, clicking Control Panel, clicking Security, and then clicking Windows Firewall.
2. In the left pane, click **Allow a program through Windows Firewall**. If you are prompted for confirmation, click Allow.

3. (Windows 7 only:) Click **Change settings**, then click **Allow** if asked for confirmation.
4. Select the check box next to X-Plane, and then click **OK**.

To allow X-Plane through the firewall in Mac OS,

1. Open **System Preferences** from the **Apple** menu.
2. Click Security (called Security & Privacy in OSX Lion).
3. Click the Firewall tab.
4. Unlock the pane by clicking the lock in the lower-left corner and enter the administrator username and password.
5. Click **Advanced** to customize the firewall configuration.
6. Click the **+** (plus) button, then select your copy of X-Plane.app. This is found in the X-Plane 9 or X-Plane 10 installation directory, which is located by default on your desktop. With X-Plane selected, click **Add**.

### C. Configuring an Up-to-Date Copy of X-Plane

With the mobile device on the same network and desktop software updated to version 9.61 or later, it's time to configure the desktop software to interface with the device.

Before we begin, make sure that the iPad is on and running EFIS App. This will ensure that it is transmitting over the network so that the desktop copy of X-Plane can interface with it.

In the desktop copy of X-Plane, move the mouse to the top of the screen, making the menu bar appear. Click Settings, then select Net Connections, as seen in the following image.



In the window that appears, click the iPhone/iPad tab (labeled Advanced in X-Plane 9) at the top of the window.

Found in the lower half of this window is a box labeled **IP of iPad running EFIS App**. Check this box and enter the IP address that we found in Section I of this chapter, Configuring the iPad.

In the image above, the iPad being used happened to have an IP address of 150.243.218.185. A typical home network may use IP addresses like 192.168.x.x.

At this point, the mobile device and the desktop copy of X-Plane are ready to work together. After entering the correct IP address, EFIS App on the iPad will confirm that it is getting data from the desktop/laptop copy of X-Plane—the yellow text at the bottom of the screen will read “Getting data from X-Plane now! We are ready to fly!”

### D. Troubleshooting Network Issues

If you have trouble with networking between X-Plane and EFIS App for iPad, check the following:

- Ensure that the ports used by X-Plane (ports 49,000 through 49,002) are not being blocked by any firewall. A firewall may be software running on your computer (e.g., Windows' built-in firewall) or a part of your network hardware (e.g., built into your router).

- Ensure that the computer running X-Plane is on the same subnet as your iPad. Note that it is very common for corporate networks to split their wired and wireless networks into different subnets, so it may help to connect your computer to the wireless network like your iPad.

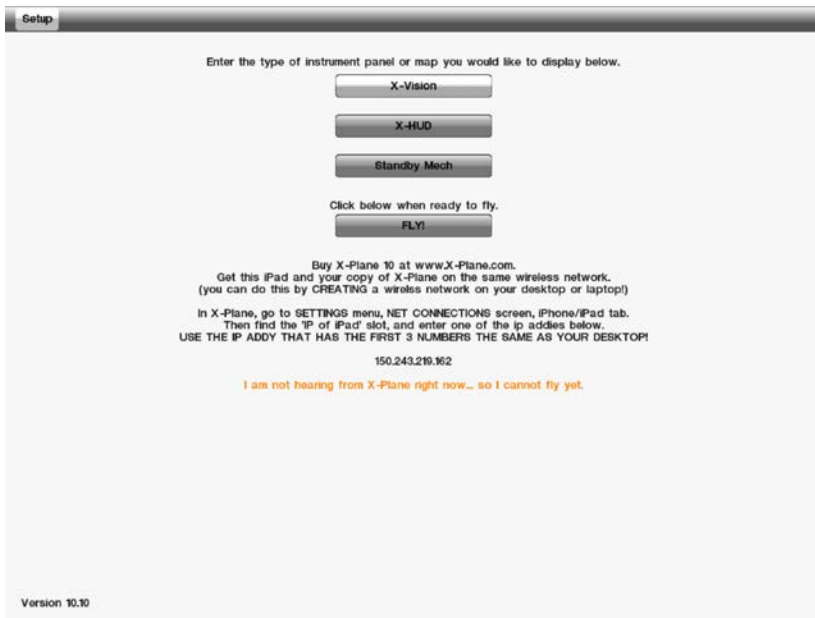
Because of the wide variability in network setups, if you have trouble networking X-Plane and EFIS App together, we recommend you consult an IT professional.



### 3. Using the Application

Once both EFIS App and X-Plane have been properly configured, it's time to fly.

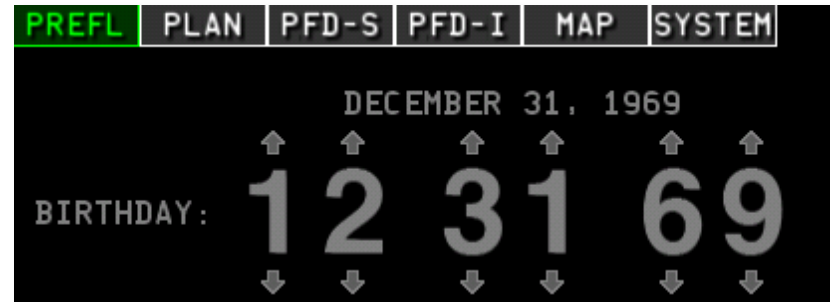
Upon launching EFIS App on the iPad, users are greeted with the screen seen below.



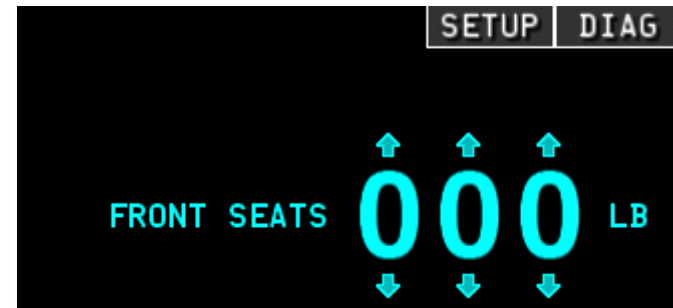
Here, users can select the view they will use by tapping one of the four buttons in the top half of the screen. When a button is colored white (as the **X-Vision** button is in the image above), it is selected, and the iPad will go into this mode when the **FLY!** button is pressed. Read on for a description of what each mode does.

### I. The X-Vision Display

X-Vision is the primary flight display (PFD) included with EFIS App. It has six main tabs, found in the top left of the screen, seen in the image below.



In addition to these, it has two auxiliary tabs for setup and diagnostics, found in the top right of the screen, seen in the following image.



To return to the main menu, go to the DIAG tap in the top right of the screen and tap the **MAIN MENU** button found at the bottom of the window.



## A. The PREFL Tab

The PREFL tab contains pre-flight records as well as weight and balance tools. To change a value of a field, tap the arrow above or below a digit to increase or decrease it, respectively. The fields on the left side of the screen here set the pilot's date of birth, date of last biennial flight review (BFR), and dates for insurance, medical review, and annual flight review. The fields on the right side of the screen set the center of gravity by means of the weight in the front seats, rear seats, baggage compartment, and fuel tanks.

Note that the corners of the center of gravity envelope may be specified by selecting the SETUP tab from the top of the screen, then clicking the **W-B ENV** (that is, weight and balance envelope) button from the bottom of the screen.

## B. The PLAN Tab

The PLAN tab is used for flight planning. Tap the **D->** button to add a destination. Use the keyboard that appears below to type the destination or waypoint identifier. Use the **ADD** button to add another destination, and the **INSERT** button to insert a waypoint between two destinations. Finally, use the **DELETE** button to remove a waypoint between two destinations.

Directly to the right of each point in the flight plan is the magnetic course heading, the distance from the previous waypoint (or the current location, in the case of the first waypoint on the list), and the total trip distance to that waypoint.

In the bottom of the screen, EFIS App will "score" the efficiency of the whole flight in terms of fuel economy (selected using the **ECO** button), speed (selected using the **SPEED**

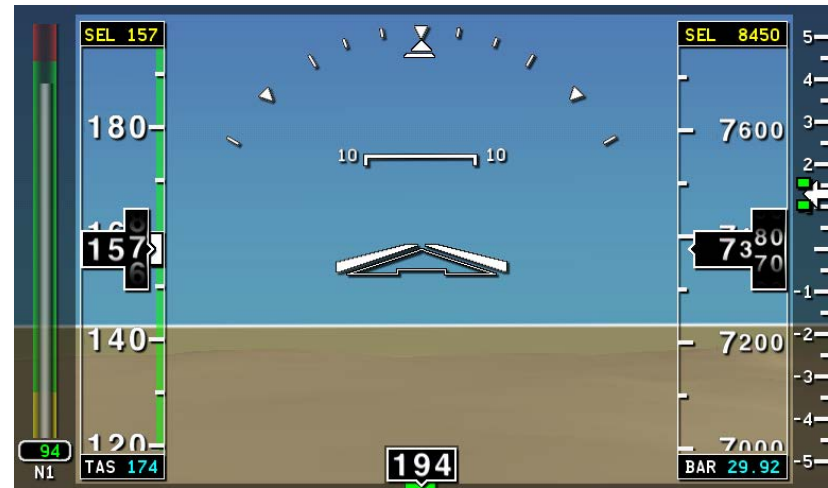
button), or both (using the **BOTH** button) for a number of different altitudes and engine power percentages, estimating the fuel burn and time for each scenario. The scenario with the highest score is the most efficient for the criteria selected.

## C. The PFD-S Tab

The PFD-S tab is one of the primary flight displays included in EFIS App. This tab uses a synthetic vision display.

### i. The Artificial Horizon

Most prominent in the top half of the screen is the synthetic vision display, as seen in the following image.



On the far right is the engine's power output, labeled N1, which is represented as a percentage of maximum. To the right of this is the airspeed indicator (reading 157 knots in the image above). Below the airspeed indicator is the true

airspeed, labeled TAS and reading 174 knots in the image above.

In the center of the synthetic vision display is the artificial horizon. The large triangle in the center indicates the aircraft's pitch and roll attitude. This is situated atop horizontal bars indicated degrees of pitch attitude. For instance, in the image above, the aircraft is pitched less than 10 degrees up.

If the aircraft's autopilot is engaged, two bars forming a V will be visible here representing the commanded pitch and roll from the flight director.

Above the attitude indicator is a simplified view of a turn coordinator. The center of the three triangles represents a level wing attitude, and the outer two triangles represent 30 degrees of roll.

To the right of the artificial horizon is the altimeter. In the image above, the aircraft is about 7375 feet above mean sea level. To the right of the altimeter is the variometer, displaying the rate of the aircraft's climb or descent in hundreds of feet per minute. For instance, in the image above, the aircraft was climbing at around 100 feet per minute.

Finally, beneath the altimeter is the barometric pressure of the outside air.

## ii. The Directional Gyro and Other Indicators

Beneath the synthetic vision display is the directional gyro and other systems information.



On the left side is:

- the aircraft's fuel quantity (604 pounds in each fuel tank in the previous image),
- the aircraft's speed as a decimal of the speed of sound (0.27 Mach in the previous image),
- the outside air temperature (2° C in the previous image),
- the current time (11:40 in the previous image),
- the wind direction and speed (-13° and 0 mph in the previous image), and
- the amount of flaps set (none, in the previous image).

Beneath the systems information and to the left of it are two black bars with light blue arrows, one bar horizontal and one vertical. The vertical bar is a glideslope indicator and the horizontal bar a localizer indicator. Both are used in navigating runway approaches.

To the right of the LOC indicator are three round dots, indicating landing gear status—the top dot corresponds to the front landing gear, the bottom two to the left and right gears. When the dots are lit green, the gear is down, and when they are gray, the gear is up. When the dots are lit red, the gear is being toggled.

In the center is a directional gyro, indicating which direction the aircraft is pointing (in the previous image, 194° from north, or nearly south).

On the right is a box for operational warnings—for instance, in the previous image, the aircraft’s engine RPM, oil pressure, and fuel quantity are all high.

### iii. The Autopilot Tab

With the AUTO tab selected in the bottom right of the screen, as in the following image, controls for the autopilot will fill the bottom third of the screen.



Before the autopilot can be used, it must be turned on. Tapping the **FDIR** button in the bottom right of the screen (seen in the previous image) will turn on the flight director only. In this case, the autopilot will not physically move the airplane controls, but will rather move little target wings on your synthetic vision display that you can try to mimic as you fly. At that point, the flight director is following whatever autopilot modes are selected, and you, in turn, are following the flight director as you fly the plane. If you also tap the **SERVO** button (found just to the right of the **FDIR** button), then the autopilot

servos will actually fly the airplane according to the autopilot mode you have selected.

Note that the autopilot will receive input from whichever navigation source is selected in the bottom center of the screen, whether the NAV1 radio, NAV2 radio, or GPS.

Tapping the **HOLD VVI** button will cause the aircraft to hold the specified vertical rate of ascent or descent (in feet per minute) by pitching the aircraft’s nose up or down, leaving the throttle constant.

Tapping the **HOLD KTS** button will cause the autopilot to maintain the specified airspeed, in knots, by pitching the nose up or down, leaving the throttle constant. This is identical to the **SPD** button in other autopilot systems.

Tapping the **HOLD HDG** button will cause the autopilot to bank the aircraft left or right to maintain the specified heading, in degrees.

Tapping the **HOLD ALT** button will cause the autopilot to hold either the current or pre-selected altitude by pitching the nose up or down.

The **ARM APP** and **ARM NAV** buttons are used to arm the autopilot so that it automatically captures and flies a given command. It can be set to capture and fly either an approach or a NAV source, such as a VOR radial (in which case it would be following the displacement of an HSI needle) or GPS (in which case it would be following an electronic CDI and turning to track a specified heading).

### iv. The Navigation Tab

With the NAV tab selected in the bottom right of the screen (as in the following image), two sets of numbers appear. These are the NAV1 and NAV2 frequencies.



When a radio is selected as the navigation source using one of the three buttons in the bottom center of the screen, its frequency will be lit in green. For instance, in the previous image, the NAV1 radio was selected, so the NAV1 frequency was green. Note that neither of these frequencies will be lit when navigating using GPS data (which is controlled using the PLAN tab at the top of the screen).

The values on the right (one for NAV1 and one for NAV2) are the standby frequencies. Tuning these will not affect navigation until the <--- button is pressed, at which point the active and standby frequency for that radio will switch.

### v. The Communication Tab

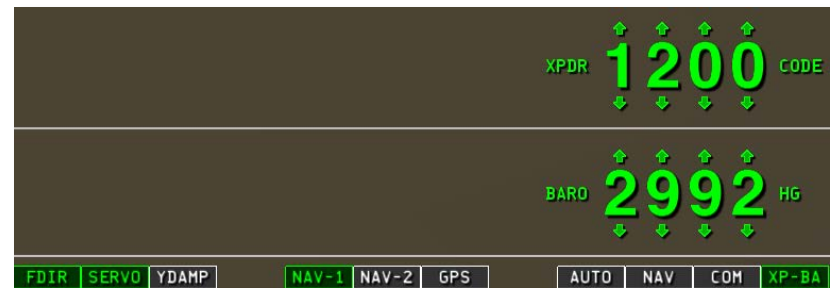
With the COM tab selected in the bottom right of the screen, as in the following image, the communications radios can be tuned just like the navigation radios (see the previous subsection).



### vi. The Transponder/Barometer Tab

With the XP-BA tab selected in the bottom right of the screen, the transponder code and barometer setting can be modified using standard arrows above and below each digit.

In the real world, the ground-level barometric pressure setting, labeled BARO here, must be modified regularly by the pilot in order to calibrate the altimeter, which gives a reading based on the difference between the air pressure around the aircraft and the pressure on the ground. Note that standard pressure is 29.92 inches mercury, represented here at 2992.



### D. The MAP Tab

The MAP tab displays a moving map of the area around the aircraft. Touch two fingers to the screen and “pinch” them together to zoom out, or slide them apart to zoom in.

### i. Airports in the Map Tab

Airports on the moving map are designated as either light purple or light blue dots with crosses through them (as seen in the following image). Beneath this dot is the airport’s ICAO-designated identifier.



Airports colored light blue can be toggled on or off using the **APT 1** button in the bottom left of the screen, and airports colored light purple can be toggled on or off using the **APT 2** button.

Touching the dot representing an airport in the map display will display its name, identifier, elevation, runway(s), and runway length(s). For instance, in the following image, the KFLV identifier was tapped in the map display. This is the identifier

for Sherman Army Airfield, whose elevation is 772 feet above mean sea level, and whose runway 15/33 is 5900 feet long.



### ii. NAVAIDs in the Map Tab

NAVAIDs work in a similar way to airports. They are shown in white, with a tight group of dots representing the transmitter. Tapping on this transmitter will display the NAVAID’s data in the top left of the screen. For instance, in the following image, an ILS transmitter was tapped, so EFIS App displays its name (KSTJ), its associated runway (35), its type (Category I ILS), its identifier (ISTJ), and its frequency (110.30 MHz).





In the following image, an NDB was selected in the map, so EFIS App displays its name (Amazon), its type (NDB), its identifier (AZN), and its frequency (2.33 MHz, or 233 kHz).



A localizer was selected in the following image, so as with the ILS, EFIS App displays its name (KHHR), its associated runway (25), its type (LOC), its identifier (IHHR), and its frequency (109.10 MHz).



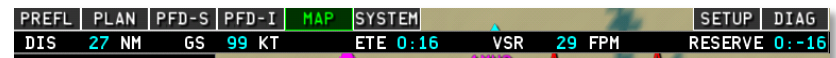
The fourth and final type of NAVAID shown in the maps is a VORTAC transmitter. In the following image, the STJ VORTAC was touched in the map, so EFIS App displays its

name (St. Joseph), its type (VORTAC), its identifier (STJ), and its frequency (115.50 MHz).



### iii. Miscellaneous Navigation Information

At the top of the Map display is an information bar for flight planning, as seen in the following image.



If the Plan tab has been used to set a destination, the bar will display, in order from left to right:

- the distance to the destination, in nautical miles,
- the aircraft's ground speed, in knots,
- the estimated time en route (that is, the time remaining in the trip at the present velocity), in hours:minutes,
- the vertical speed required, in feet per minute, and
- the fuel reserve, in hours:minutes.

For instance, in the previous image, the aircraft was 27 NM from its destination, moving at 99 kts, with an ETE of 16

minutes. It had a VSR of 29 FPM and a fuel reserve of -16 minutes.

If the Plan tab has *not* been used to set a destination, only the ground speed will be displayed here.

## E. The SYSTEM Tab

The SYSTEM tab displays gauges for various systems in the aircraft. These include oil temperature, oil pressure, fuel flow, engine torque, engine RPM, and fuel quantity, among other things.

## F. The SETUP Tab

The SETUP tab is used to specify various operational constants. This includes the pilot's viewpoint, critical speeds in the aircraft's operation, weight and balance details, fuel capacity, systems information constants, and the aircraft's performance information. Use the tabs at the bottom of the window to view each category.

## G. The DIAG Tab

The DIAG tab is useful for diagnosing problems in connecting to the desktop/laptop copy of X-Plane. It lists, in descending order:

- the iPad's IP address,
- the IP address of the copy of X-Plane from which it is receiving data,
- the type of data being received, and
- the time since the last data packet was received.

Additionally, use the **Clean screen for 30 seconds** button to have the application ignore all input in order to clean the screen.

Finally, to return to the main menu, tap the **MAIN MENU** button found at the bottom of this window.

## II. The Standby Mechanical Gauges

The Standby Mechanical Gauges view displays four steam gauge-style instruments. From top to bottom, these are:

- the directional gyro, indicating the aircraft's heading;
- the airspeed indicator, showing the aircraft's indicated airspeed;
- the attitude indicator, showing the aircraft's pitch and roll relative to the earth; and
- the altimeter, displaying the aircraft's altitude in feet above mean sea level.



## 4. Tech Support

The only technical issue that X-Plane customer support has yet encountered with the X-Plane Mobile applications is caused by the hardware exceeding its RAM allocation.

Many users leave their iPod, iPhone, or iPad on for literally months at a time (as the hardware appears to be off when in fact it is in standby mode). In some cases, this can cause too much “garbage” to be stored in the RAM. The X-Plane app is so demanding on the hardware that it comes within 2% of crashing every device every time it is launched. This isn’t normally a problem. However, if the “garbage” isn’t cleaned out of the RAM periodically by restarting the device, it is possible that X-Plane will exceed the available RAM, causing a crash.

To perform a reboot of the device, hold the top power button down for six seconds, then use your finger to slide the power switch on the screen to off. Leave the unit off for two to three minutes before turning it back on.

The issues described above happen very infrequently, and in all cases are fixable by restarting.

For additional assistance, please e-mail [info@x-plane.com](mailto:info@x-plane.com) or call 913-269-0976 (Central Standard Time).