

EMB-110 BANDEIRANTE v2

for  Microsoft
Flight Simulator

2024

Operations Manual

Version 2.0.0

June 2026



nextGen[®]
SIMULATIONS

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Introduction

Dear customer,

Thank you for purchasing the **EMB-110 Bandeirante v2 for Microsoft Flight Simulator 2024** product, from **NextGen Simulations**. I hope you enjoy this product as much as I enjoyed developing, testing, and updating it for you.

This **EMB-110 Bandeirante** add-on product for Microsoft Flight Simulator 2024 features the EMB-110P, EMB-110P1 (in passenger and cargo configurations) and the EMB-110P2 variants of this popular Brazilian-manufactured aircraft.

The EMB-110 Bandeirante (or *Bandit*, which is how it is affectionately known), whose name in Portuguese stands for **Pioneer**, is and remains being one of Embraer's most successful and most popular commercial aircraft programs, designed with the goal of creating a general-purpose light transport, suitable for both military and civilian duties, with a low operational cost and high reliability. This commercial aircraft program became the foundation of Embraer (or Empresa Brasileira de Aeronautica S.A.), which became established in 1969, with the development and production of the C-95 becoming one of the company's first responsibilities and whose first unit first flew on October 26th, 1968. The first production standard EMB-110 Bandeirante flew on August 9th, 1972, received its airworthiness certification the same year, and entered revenue service in April 1973.

Bandeirante models include the 12-seat transport EMB-110, the aerial photography EMB-110B and maritime patrol EMB-111 for the Brazilian Air Force; the initial airline version, the 15 seat EMB-110C; the seven seat EMB-110E executive transport; 18-seat enlarged EMB-110P; convertible passenger/freight EMB-110P1 with larger rear door; the EMB-110P1K and EMB-110K SAR military equivalents to the P1A; and the EMB-110P2 commuter with seating for up to 21.

Production of the Bandeirante ceased in May 1990, with the final aircraft being delivered to the Brazilian Air Force, as the company decided to halt production in order to shift focus to the development of its successor: the larger, faster, and pressurized 30-seat EMB-120 Brasília. Nevertheless, the Bandeirante aircraft remains popular within its operators to this day, thanks to its virtues of reliability and good operating economics.

This product is a highly detailed digital rendition of this popular aircraft, completely designed and remastered for Microsoft Flight Simulator 2024, foundationally built from most of the previous work done for the previous version of the present product designed for the game's immediate predecessor, Microsoft Flight Simulator (2020).

For this product, I have provided this comprehensive documentation in PDF format. The goal of this documentation is to help you, the end-user and simulator pilot, to familiarize yourself with the EMB-110 product, and provide you with the information required to operate the simulation in an effective way from an interface point of view. Throughout this documentation, we give a brief overview of the aircraft and its operating limitations, as well as the flight deck, instruments panels, switches, knobs, levers, and annunciator lights. Plus, I describe the distinct options and configurations included, especially in the avionics standpoint. This will help you both to understand how everything in the aircraft operates and to familiarize yourself with the product *per se*.

I hope you will find this information useful and that it will enhance your enjoyment of the EMB-110 v2 for MSFS 2024. Thank you very much for your continued support!

Kind regards,

Carlos Daniel González Gómez

C.E.O., Founder & Lead Developer

Information on the aircraft's history sourced from [Airliners.net](https://www.airliners.net) and [Wikipedia](https://en.wikipedia.org), as of December 2nd, 2025.



Product Features Summary

The **EMB-110 Bandeirante v2** aircraft is exclusively developed for use with **Microsoft® Flight Simulator® 2024**, that is published by **Xbox Games Studios** and developed by **Asobo Studio**.

The EMB-110 Bandeirante V2 product is not just an upgrade, but a whole new product, featuring an accurate, fully remastered digital rendition of the EMB-110 aircraft, foundationally built from its predecessor. It features accurately replicated, yet simplified systems, plus the full potential of the Garmin GNS avionics included by default with the flight simulation platform (from Working Title Simulations), as well as the great potential of the GTN avionics add-ons developed by [PMS50](#) and [TDS Sim Software](#), and the classic open-source KLN90B instrument by [Falcon71](#), allowing you to enjoy the most amazing flight-simming experience while also bringing you a high fidelity look-and-feel of this popular aircraft.

This package includes:

- Four accurately modeled variants of the EMB-110: EMB-110P, EMB-110P1 (passenger and cargo configurations) & EMB-110P2 (**NEW!**)
- Accurately rendered 3D virtual cockpit and respective cabin layouts included
- Full MSFS 2024 SDK-compliant development
- **NEW!** FPS-friendly, LOD-optimized, high-quality 3D models
- **NEW!** Fully upgraded, high-quality textures
- **NEW!** Native dirt & weathering support
- **NEW!** Accurate windshield rain effects with wiper lines and wiper cleaning effects
- **NEW!** Dynamic Tail Registration support for liveries
- Full Cockpit Integration of the GTN 750/650 from PMS50, the GTNXI Pro from TDS Sim Software, and the open-source KLN90B from Falcon71 (**NEW!**).
- **NEW!** Fully functional Electronic Flight Bag (EFB), featuring a tablet-like GUI, ground handling management, pushback controls, aircraft and tablet settings
- **NEW!** Navigraph Charts and SimBrief Integration in the EFB. MSFS2024's built-in LIDO charts support coming later in an upcoming update
- **NEW!** 36 different liveries from different worldwide operators (in total) across all variants, plus a full white livery on each variant
- **NEW!** Fuel, hydraulic, pneumatic, electric, air conditioning and ice protection systems, accurately replicated, yet simplified for normal operations, and upgraded to the simulator's standards
- **NEW!** Interactive checklists experience included and updated
- Custom-coded animations virtually everywhere in the aircraft, including doors and side windows in the flight deck
- **NEW!** Full Career Mode support, exclusive to Marketplace customers

- Fully modernized avionics for better modern flight operations, including an easy-to-use autopilot system
- **NEW!** Upgraded RDR2000 weather radar, featuring an accurate visual representation based on the real-life instrument, antenna tilt and stabilization, simulated gain, weather alert (WxA) and vertical profile (VP) modes
- **NEW!** Authentic & fully remastered PT6A-34 engine sounds, as well as cockpit ambiance
- **NEW!** Accurate sound insulation inside and outside
- Full compatibility with the MSFS 2024 Virtual Reality (VR) Mode Experience

Installation, Updates & Support

Please note that Microsoft Flight Simulator 2024 must be correctly installed on your PC, Xbox or PlayStation 5 console prior to the installation and use of this EMB-110 simulation. Remember that, by downloading and installing the product from whichever the store you chose to buy the product from, it is assumed that you accept all the terms of the End-User License Agreement (EULA), which you can find on [our main website](#).

Following are the pre-installation checklists for the corresponding target device, which will help you to avoid any potential problems that may prevent you from enjoying our product, independently of where you purchased from. We **strongly** recommend you follow these, prior to installing the product. Also, please take a moment to review the [recommended system requirements](#), to correctly install the product. Remember that **Microsoft Flight Simulator 2024** requires at least **Windows 10 version 1909** as a minimum for the operating system side.

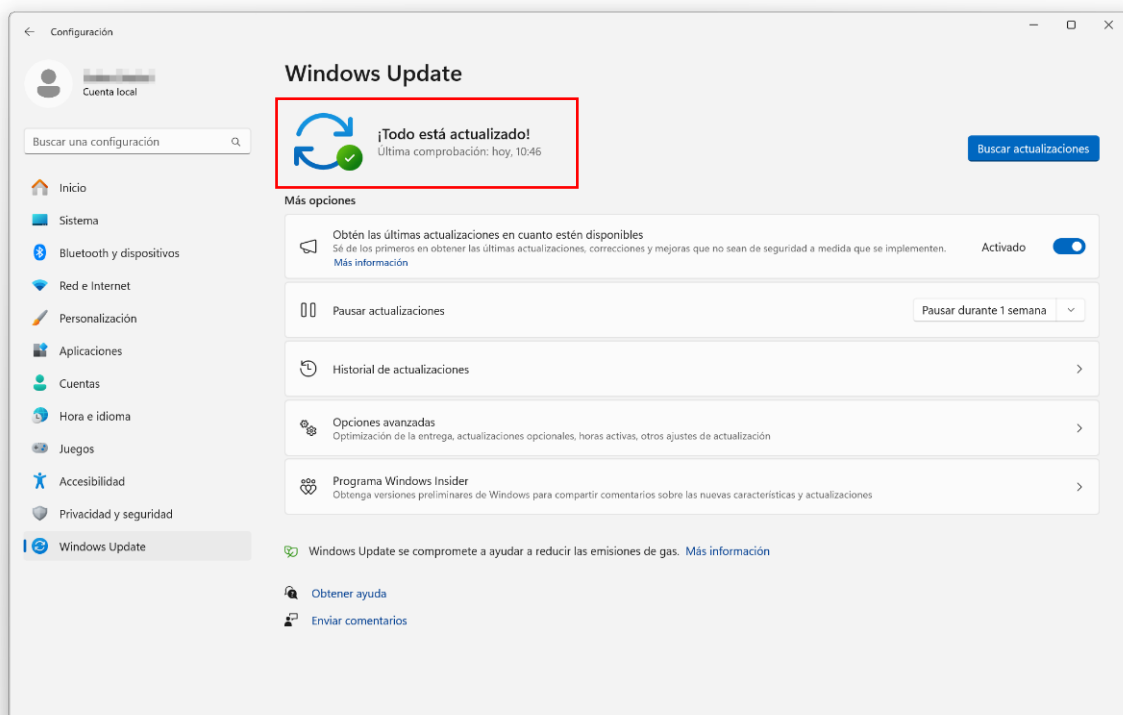
NOTE: Microsoft Flight Simulator 2024 can run on Windows 10 version 1909 and up. However, unless your PC is enrolled to the Extended Security Updates program (up until October 13th, 2026) or unless you have the most recent (and compatible) LTSC release of Windows 10 installed on your PC, it is recommended that you run the simulation platform on a more recent operating system, such as Windows 11 version 24H2 or 25H2, as Windows 10 is no longer supported by Microsoft since October 14th, 2025.

Pre-Installation Checklist for PC (Windows) Users

NOTE BEFORE PROCEEDING: If your PC has multiple user accounts, please make sure you are performing these operations from an account with administrator privileges. If you are not logged into a user account with such rights, please log into the administrator's account. Additionally, **DO NOT** put your PC in sleep or hibernation modes while performing the MSFS updates operations, as this will damage your MSFS setup!

1. Make sure your **Windows 10** or **Windows 11** installation is up to date. For this, go to the Settings app by pressing **Windows key + I**, or by clicking on the gear icon on the Start menu. Then go to *Updates & Security > Windows Update* (Windows 10) or the *Windows Update* tab (Windows 11), and check for updates from the Windows Update section.

If the Windows Update page does not read “**¡You’re up to date!**” like in the figure below, this means you have any pending updates. Please follow the on-screen instructions to install any pending mandatory updates in the queue and restart your PC if required. You can dismiss the optional updates.



NOTE: If you are up to date on Windows Update, but you get notifications about a newer feature update available or the availability of the Windows 11 upgrade (in case your system runs Windows 10), you can dismiss those if you would like. However, we strongly suggest you have the latest Windows feature update available installed on your system.

2. Make sure your PC drivers (especially graphics) are up to date, and that the drivers installed are supplied by the manufacturer.

If your PC is custom-built, and you need to update your graphics drivers, go to [NVIDIA](#) or [AMD](#) websites, search for your exact graphics card model, download the current drivers, and follow the on-screen instructions given to install or upgrade the graphics drivers. **If your PC (desktop or laptop) is pre-built by a manufacturer (such as Dell, Lenovo, etc.), you must go to the manufacturer's website into the respective Technical Support section, and follow the instructions given to upgrade your PC drivers.**

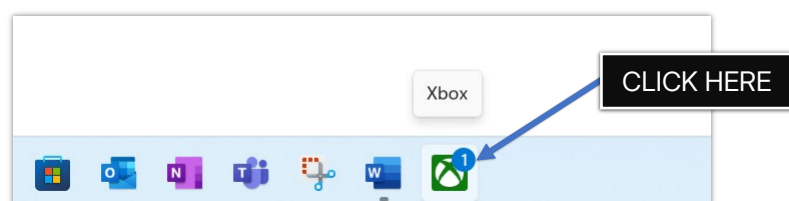
Please **DO NOT** let Windows Update install drivers under any circumstance, as these will cause you to run into unexpected issues, especially with the sim.

3. Temporarily disable your antivirus software, so that it will not cause any conflicts during the entire installation process. **Make sure to re-enable the antivirus once the product installation finishes.**
4. We **strongly** recommend you use the latest **stable** build of **Microsoft Flight Simulator 2024** instead of its beta builds, unless you want to help us, not just Microsoft & Asobo Studio, with valuable feedback to improve the overall product experience and/or fix potential issues before the release of a Sim Update. If you do not want to contribute with feedback nor participate in the MSFS beta-testing program, please follow the respective opt-out instructions given by Microsoft.
5. Make sure **Microsoft Flight Simulator 2024** is installed and up to date. Please follow the instructions given below, depending on where you acquired your MSFS2024 license from. Normally, there are times when the simulator gets automatically updated for you, especially after booting into Windows.

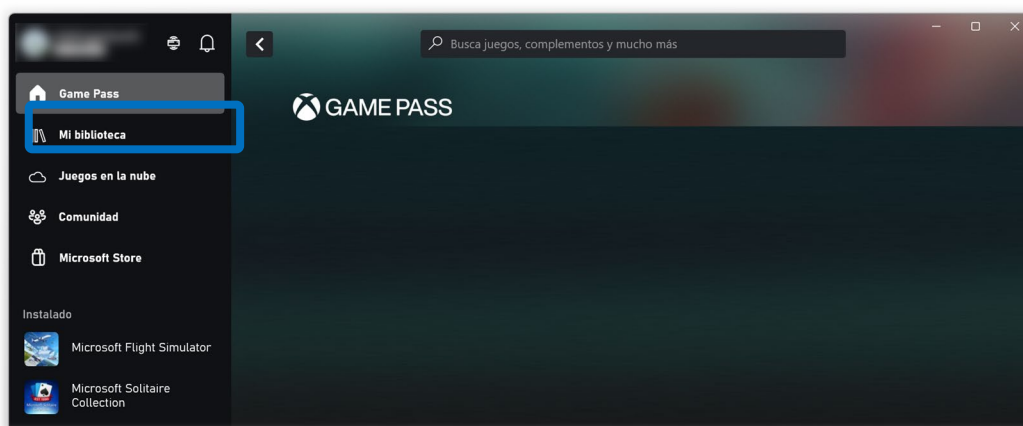
NOTE: If you have your MSFS2024 license from Microsoft Store, you can update the sim either from the Xbox app or from the Microsoft Store app. Remember to be logged into the same Microsoft account used at time of purchase of your MSFS2024 license, and where all the sim's data is synchronized.

For **Microsoft Store** users (Xbox app):

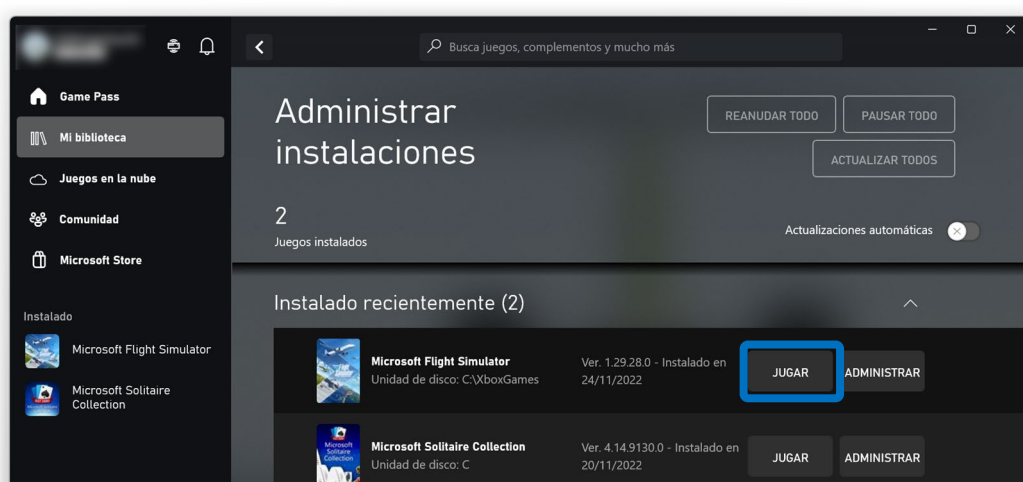
- Go to the **Xbox** app on your Windows 10/11 PC. You should find this icon on your taskbar, like in the figure below. If it is absent (maybe because it has been unpinned from the taskbar after installing Windows), open the Start menu, type **Xbox**, and hit Enter.



- Then, go to **My Library > Manage Installations**, and search for **Microsoft Flight Simulator 2024** on your library of installed games. Click on the Update button to download the update.

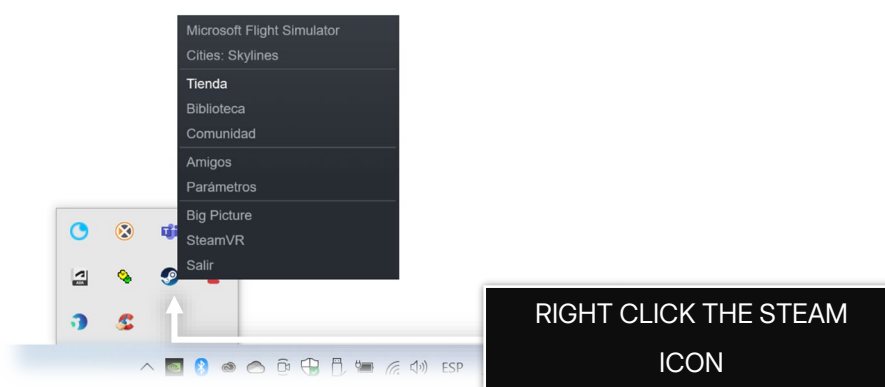


- Once the download has finished, click on **Play**, and proceed to the next step.

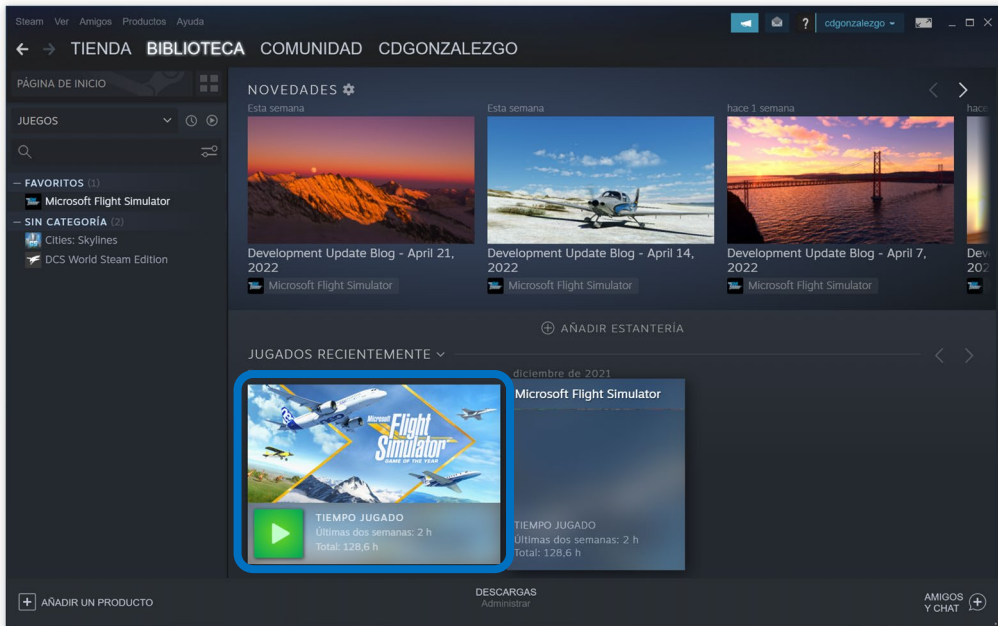


For **Steam** users:

- Go to the **Steam** main window, by right clicking the Steam icon on the system tray and select **Library** from the context menu.



- Click on **Microsoft Flight Simulator 2024**.



- If there is an update, you should see a blue button with a refresh icon. Click on the title logo, then click on **Update** and wait until the sim's update is fully downloaded and installed from the Steam's downloads queue.



- Once the download has finished from Steam, run the game by clicking on the **Play** button, or by clicking on the **Microsoft Flight Simulator** option from the system-tray's context menu. Then, proceed to the next step.
6. Once **Microsoft Flight Simulator 2024** has been updated from the Xbox app and/or Steam, run the simulator. All the sim's core dependencies should be up to date.

7. If you purchased our product from third-party stores, please make sure **Microsoft Flight Simulator 2024** is not running. In case it is running, close the sim by clicking on **Quit to Desktop** in the main menu and select **Yes** when prompted. Otherwise, if you purchased the product from the in-game Marketplace, please skip this step and proceed with the steps given in the **Installation & Upgrade from the In-game Marketplace** section.

NOTE: DO NOT CLOSE THE SIM BY PRESSING ALT + F4, BY CLICKING THE X BUTTON ON THE WINDOW'S TITLE BAR, NOR BY DOUBLE-CLICKING THE GAME'S ICON ON THE LEFT CORNER OF THE WINDOW'S TITLE BAR!

Pre-Installation Checklist for Xbox Users

1. Make sure your **Xbox Series X|S** console is connected to the Internet. We **recommend** you have your console online via **wired connection** (Ethernet) instead of a **wireless connection** (Wi-Fi), since this will enhance the connection bandwidth on your console and make the downloads faster in consequence. Then, perform the steps below for testing internet connectivity.
 - Press the **Xbox** button on your controller to open the guide. If you have a keyboard connected to the console, you can also press the **Windows** key to open it.
 - Go to the **Profile & system** tab and select **Settings**.
 - Go to **General > Network settings > Test network connection**.
 - It should read "**Your console is connected to the Internet**"; select **Continue** and go to the next step. If you do not read the previous message, you might need to review your networking setup.
2. Make sure your **Xbox Series X|S** console has the latest system software installed. The Xbox system updates are automatically downloaded and installed in the background unless you disabled automatic updates in your console. Please perform the steps below, regardless of whether you enabled or disabled automatic system updates for your Xbox console.
 - Press the **Xbox** button on your controller to open the guide. If you have a keyboard connected to the console, you can also press the **Windows** key to open it.
 - Go to the **Profile & System** tab and select **Settings**.
 - Go to **System > Updates** and wait until your Xbox console checks for updates. If your console reads "**No console update available**", this means your Xbox console is up to date and has the latest system software installed; proceed then with Step 3. Otherwise, if your console reads "**Console update available**", select the respective button to begin the update and follow the on-screen instructions given until the console is up to date.
3. Make sure **Microsoft Flight Simulator 2024**, as well as its accompanying **Addon Support** DLC, are both up to date on your Xbox console.
 - Press the **Xbox** button on your controller to open the guide. If you have a keyboard connected to the console, you can also press the **Windows** key.
 - On the guide, select **Home** to go to the Xbox main dashboard. Once you are on the dashboard, select **My games & apps > Manage > Updates**.
 - If MSFS appears automatically in the updates queue, this means MSFS is outdated. Press the **A** button from your controller to begin downloading the MSFS update and wait until it finishes, since this might take longer. Skip this step if MSFS does not appear in the queue.
4. Reboot your Xbox console once you have performed the steps above.

Pre-Installation Checklist for PlayStation 5 (PS5) Users

1. Make sure your **PlayStation 5** or **PlayStation 5 Pro** console is connected to the Internet. We **recommend** you have your console online via **wired connection (Ethernet)** instead of a **wireless connection (Wi-Fi)**, since this will enhance the connection bandwidth on your console and make the downloads faster in consequence. Then, perform the following steps below for testing Internet connectivity.
 - Make sure you are on the PS5's Home screen. For this, press and hold the PlayStation (PS) logo button on your controller for a few seconds.
 - Once on the Home screen, go to **Settings**. There, select **Network** and choose **Connection Status**.
 - Select **Test Internet Connection** from the list. Wait for the test to be completed, which may take a few moments. You should be able to review the download and upload speeds and whether there were any errors throughout the process. If so, you might have to review your networking setup. If the test was successful, go ahead with the next step.
2. Make sure your **PS5 (Pro)** console has the latest firmware installed. The console should automatically download and install the firmware updates for you in the background. But if it does not, please perform the following steps to update the console's firmware:
 - Make sure you are on the PS5's Home screen. For this, press and hold the PlayStation (PS) logo button on your controller for a few seconds.
 - Once on the Home screen, go to **Settings**. There, select **System Software > System Software Update and Settings**.
 - Select **Update System Software** if there is an update available. Then, select **Update Using Internet** to download and install the latest firmware version of your PS5 console.
3. Make sure **Microsoft Flight Simulator 2024**, as well as its accompanying **Addon Support** DLC, are both up to date on your PS5 console.
 - Go to the PS5's Home screen by pressing and holding the PlayStation (PS) logo button on your controller for a few seconds.
 - Navigate to the game on your Home screen or in the Game Library.
 - Hover over the **Microsoft Flight Simulator 2024** icon and press the **Options** button on your controller. Select **Check for Update** from the menu.
 - If an update is available, it will begin downloading and installing automatically. To check the download progress, press the PS logo button on your controller and go to the **Downloads** icon.
4. Reboot your PS5 (Pro) console once you have performed the steps above.

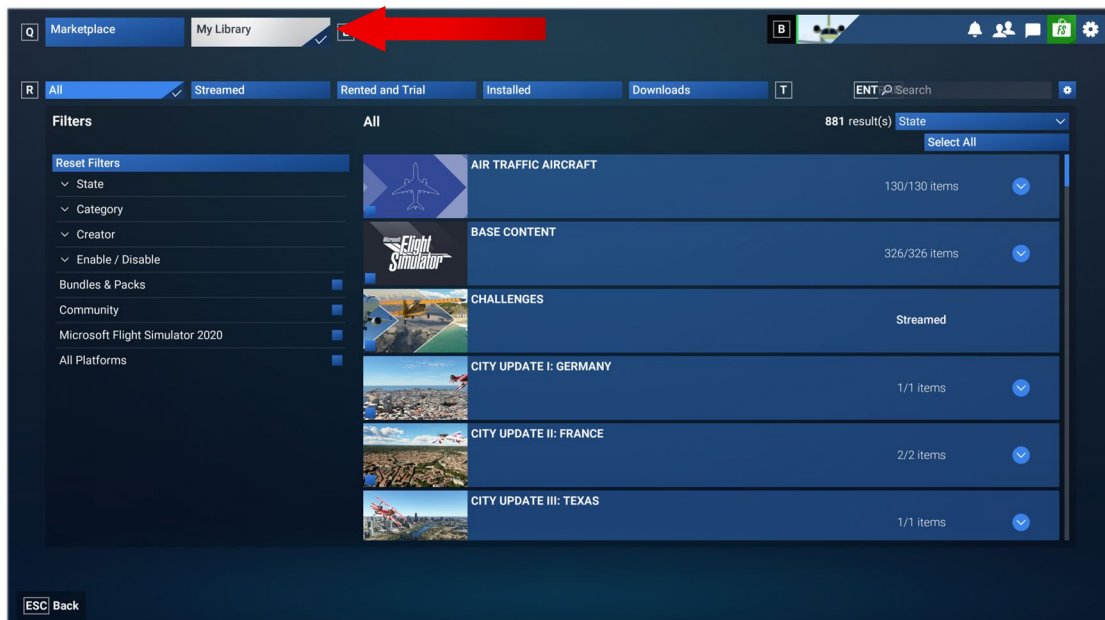
Installing & Updating from the In-game Marketplace

It is assumed that you have previously purchased the product from the simulator's in-game Marketplace before proceeding with the installation. Following are the instructions on how to enable the product and/or how to install it locally on your MSFS2024 setup.

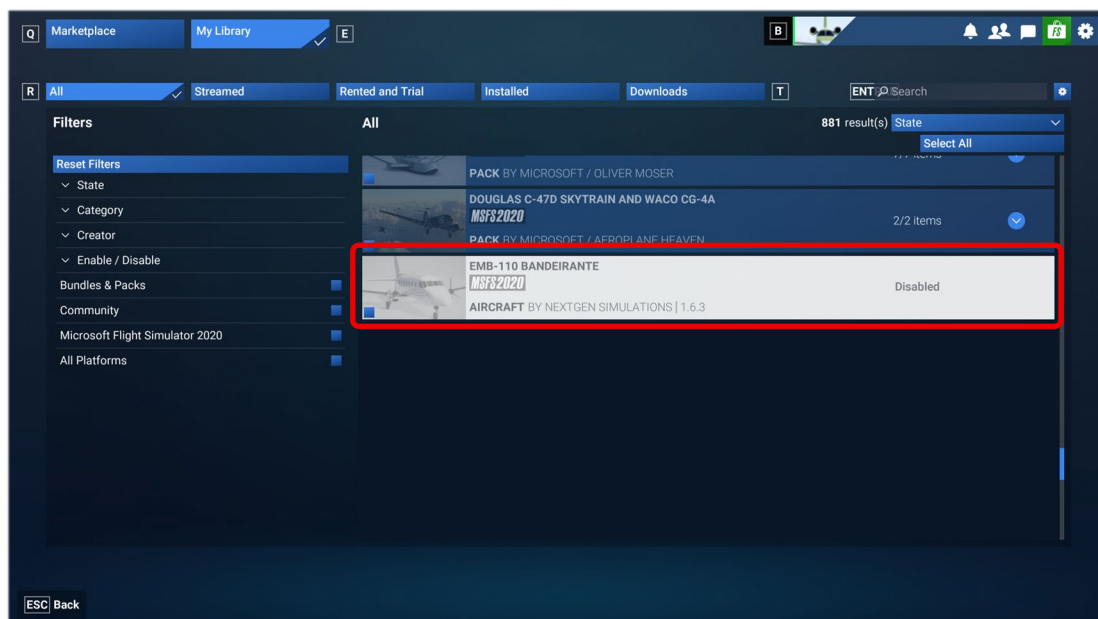
1. Make sure you are on the MSFS 2024 main menu. Then, click on the **Marketplace** button either on the bottom-left side or on the top-right side.



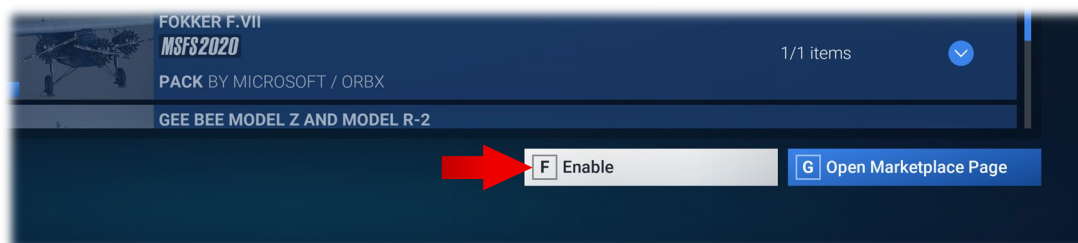
2. Then, go to the **My Library** tab.



3. Type 'EMB-110' on the Search box, or filter by Creator with the panel on the left, and look for 'NextGen Simulations'. Then, click the box titled **EMB-110 Bandeirante** on the My Library list.



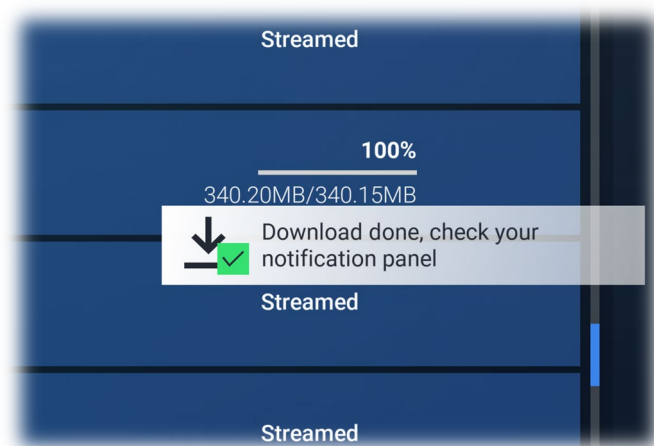
4. If it reads 'Disabled', you can enable it by clicking the box and then clicking on **Enable**. Wait for the package to be enabled by the sim. Once the product now reads 'Streamed', this means you can enjoy the product as the simulator automatically streams the package from the Internet. In order to get better streaming results, we **recommend** you have a faster Internet connection speed (around 50-100 Mbps as a minimum) at home or wherever you are enjoying the product.



5. In case you want to keep a copy of the product's package on your PC or console, or if your Internet connection is not as fast as the simulator recommends in its system requirements, you can have a local installation of the product instead. You must pre-enable the package before proceeding, by following the instructions from the previous step.

Once again, select the product from the **My Library** list. Then, click on **Download**. You can check the download progress on the same package box on the list. Wait for the download to complete until you see the download complete notification.

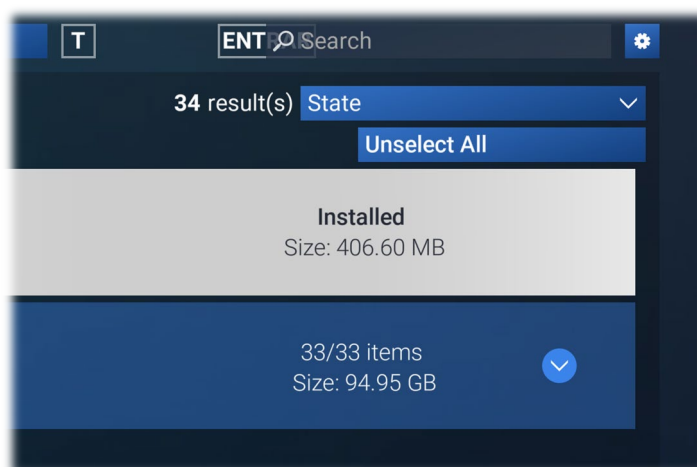




After downloading, you should read 'Ready to install'. Here, click now on **Install** and wait until the simulator installs the package on your device.



Once the simulator finishes installing the package, you should now read 'Installed' on the package's box on the list, and the installed package size below.

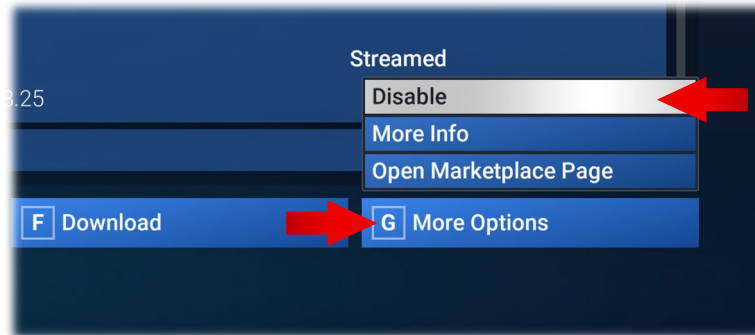


6. In case there is an update to our product:
 - If the simulator is streaming the package over the Internet, you do not have to do anything else because the simulator automatically streams the most current version of the product from the Marketplace servers.
 - However, if there is an update and you installed the product locally on your device, perform the same steps above but this time for updating the package, rather than installing it.
7. Once everything is ready, you are now ready to enjoy the product!

Uninstalling from the In-game Marketplace

If you want to uninstall the product, whichever the reason it is for doing so:

- If the product's package is streamed by the sim, you can simply click **More Options**, then click on **Disable** from the My Library interface. Wait for the sim to complete the process and the aircraft should no longer appear on the aircraft selection interface. It is possible that you may have to restart the sim for the changes to take effect.



- If the product's package is installed locally on the device (PC or console), you have to select the product again from the My Library list, then click on **Uninstall**. After the sim uninstalls the package, you must then perform the same steps above, which means disabling the package from being streamed by the sim.



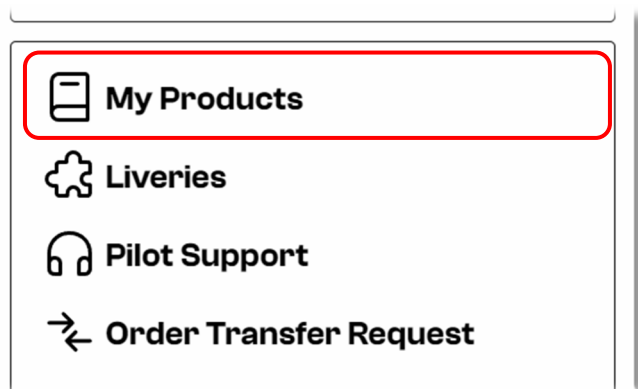
Once you have performed the steps above, the product will no longer be available to be used, but this does not mean however that it cannot be installed again in the future. You can install the product again at a later time by performing the same steps from the previous section.

Installing & Updating from the iniManager App (Windows only)

If you have purchased the product directly from **iniBuilds**, you first must download their **iniManager** application, which is iniBuilds' main platform for downloading and installing already purchased flight-sim products from their store.

NOTE: If you already have the iniManager app installed, you can skip ahead to the third step.

1. Download this app by navigating to <https://inibuilds.com/> > **iniManager** on your preferred web browser. Otherwise, if you already have the iniManager app installed on your PC, just launch it and skip to step 3.
2. After downloading and installing the app, log into your iniBuilds Store account and follow the on-screen instructions given on screen to finish the iniManager app installation.
3. Once you have signed in and the app is ready to use, click on the **My Products** link, as seen below.



4. Now, click on the **Aircraft** tab to filter your ordered products by aircraft add-ons, then click on the product on the iniManager's GUI.

Aircraft



5. Click on **Install**, to either install the product for the first time, or update the existing installation on your system, and wait until it finishes before launching the sim. If you are updating the product, do not forget to review the changelog before installing, so that you are informed about what has been

improved to the product. The installation from iniBuilds is automatically performed and does not require any additional user actions after clicking the Install button.



For any updates available for the product, you should be checking constantly for updates, as iniBuilds do not notify you when an update for the product is available, unless the developer (us, in this case) notifies about them via social media, newsletter or similar. Additionally, please remember that you must directly contact **iniBuilds** through their authorized support channels, should you have eCommerce issues on their storefront.

Uninstalling from the iniManager App (Windows only)

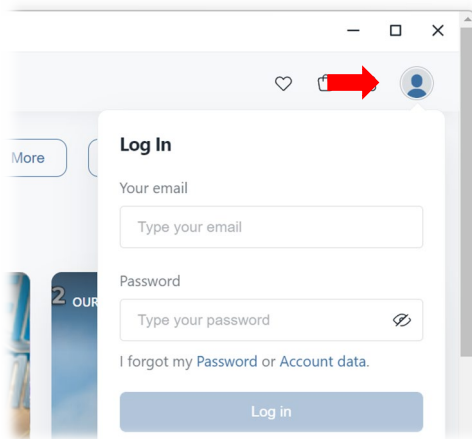
If you purchased the product from **iniBuilds**, and want to uninstall it from your PC, whatever the reason it is to do so, just open the product page on the iniManager app, by following the same instructions as in the installation process, and once there, simply click **Uninstall**, confirm when prompted, and you are done. Immediately after, the product will be completely removed from your PC.

Installing & Updating from the SimMarket app (Windows only)

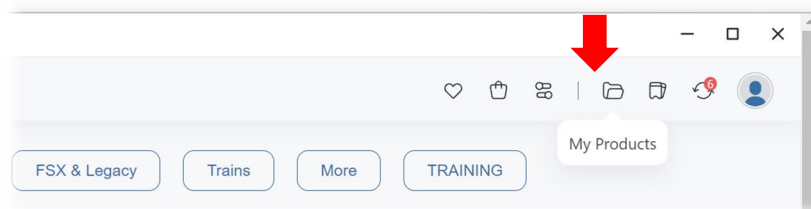
If you have purchased the product directly from **SimMarket**, you first must download their desktop application.

NOTE: If you already have the SimMarket app installed, you can skip ahead to step 2.

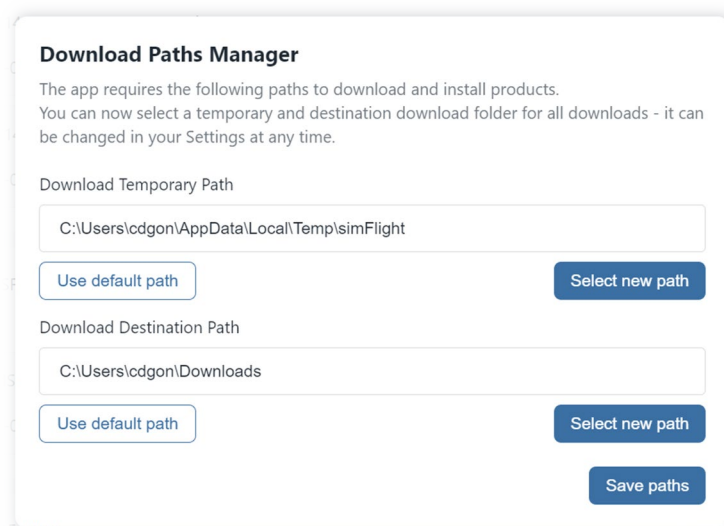
1. Browse to <https://www.simmarket.com> > Download App, and click on the **Download for Windows** button. Once downloaded, run the EXE file, and wait until the SimMarket app is installed. You should see the app's home page after a few seconds.
2. If the app is already installed or if the app does not automatically launch after installation, go to the Start menu, type **SimMarket** in the search box, and launch the app.
3. After launching, you should see the app's home page. If you are already logged into your SimMarket account, please skip ahead to **step 4**. Otherwise, you must log into the same account used when the product was purchased by clicking on the avatar icon.



4. Once you have logged into your account, go to **My Products** by clicking on the folder icon, like in the following screenshot.

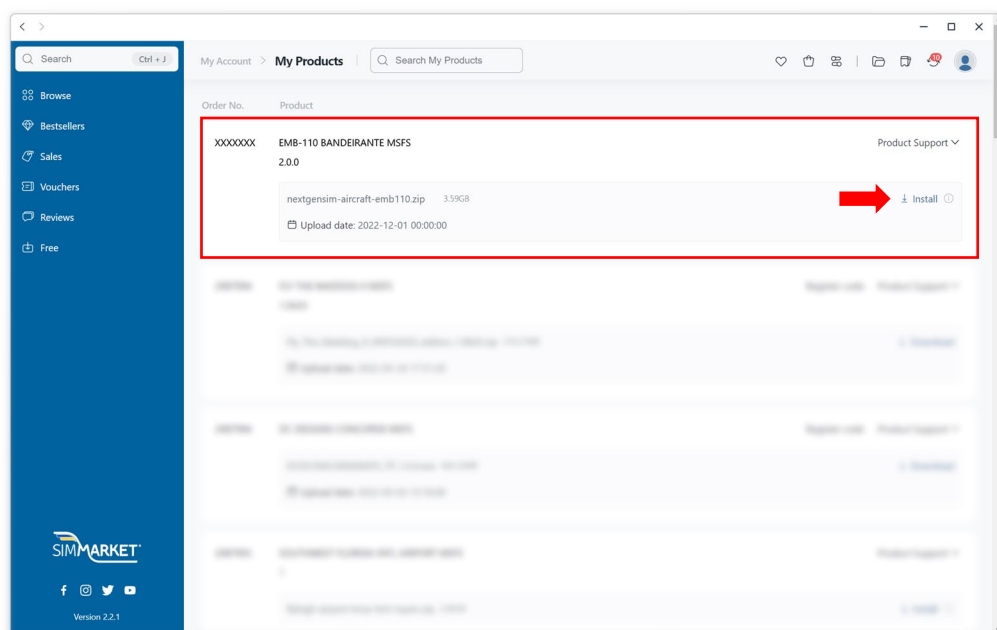


5. If this is your first time setting up the app, you must specify the default folders where the SimMarket app will download your products from now on. Please follow the on-screen steps given in the **Download Paths Manager** popup (like in the following screenshot) and click on the **Save paths** button once you have reviewed this information.



- Search for the product on the **My Products** page. You can also use the search box for this matter. For this product, you can type **BANDEIRANTE**, and you should see the product listed. Once you have found it, click on **Install**.

NOTE: If you also own the MSFS 2020 product, and purchased the MSFS 2024 product as an upgrade, please remember that both packages cannot coexist on your MSFS 2024 setup.



- Please wait until the product has been downloaded and installed into your **Community** folder and close the simMarket app once done. Then, run MSFS.

If you are upgrading the product to a newer release, the app automatically deletes the previous version and downloads/installs the newer version for you, in an equivalent way as how MSFS upgrades its base

packages to newer releases. In case you require easy access to our support channels, you can click on the **Product Support** hyperlink; this will open a flyout popup where it brings the URLs to the support channels that we have available for you.

For any updates published for the product, you should receive a notification via email to the same email address associated with your SimMarket account. Make sure you have granted SimMarket permission to send you such communications. Otherwise, if you have the SimMarket app running on the background on your PC, you should receive a push notification on Windows once SimMarket publishes the update to their servers.

Uninstalling from the SimMarket app (Windows only)

If you purchased the product from SimMarket, and want to uninstall the product from your PC, launch the SimMarket app and search for the product by following the same instructions given in the installation process above. Once you have located the product on the SimMarket app's GUI, click on the Uninstall button, confirm when you are prompted and you are done. Immediately after, the product will be completely removed from your computer.

Installation from the Installer EXE (Just Flight – Windows only)

1. Make sure you have downloaded the installer EXE from your Just Flight order history. Once downloaded, run the installer EXE. In case a SmartScreen protection dialog (with the “Windows protected your PC” title) appears, press the **More info** hyperlink, then click the **Run anyway** button. Accept the User Account Control (UAC) prompts if UAC is enabled on your system.
2. The installer will automatically detect your MSFS 2024 installation, as well as the path of your Community folder. The installer should also address the long-path issues. Please make sure that it points to where you want it to be.
3. Once installed, run MSFS 2024 and verify that you have the aircraft listed on the **Select Aircraft** dialog.
4. You are now ready to enjoy!

Standard Locations of the MSFS 2024 Installed Packages

For **Microsoft Store** users:

%LOCALAPPDATA%\Packages\Microsoft.Limitless_8wekyb3d8bbwe\LocalCache\Packages

For **Physical DVD** users:

%LOCALAPPDATA%\MSFS2024Packages

For **Steam** users:

%APPDATA%\Microsoft Flight Simulator 2024\Packages

Uninstallation from the Installer EXE (Just Flight – Windows only)

If you purchased the product from Just Flight, and want to uninstall the product from your PC, you can do so by either of the following ways:

- Through the **Control Panel**, under the **Programs and features** page, select the product from the list and click on **Uninstall**.
- Or, through the **Settings** app, by going to **Apps > Apps & features**, scroll down on the list to where the product is listed, click on the three dots button on the right side, and choose **Uninstall** from the drop-down menu. Click again on **Uninstall**.

Follow the on-screen instructions and if there were no errors, the product will now be completely uninstalled from your system.

Please DO NOT uninstall or delete this product in any other way, or else, it may cause problems when using this product in the future, or with your Windows installation.

Post-Installation Warning

The first load of the aircraft in the sim after product installation or upgrade may take 5 or more minutes, even on high-end PCs. If this happens, please **DO NOT** do anything! Sit back, relax, and take a break in the meantime. This is because MSFS needs to internally compile and cache the WebAssembly (WASM) code bundled with the aircraft for future re-usage. This will only happen once, when you (re)install the product or update it, after you (re)install the sim or after a sim's update. From the second time you load the aircraft and beyond, this will not take that long anymore. We really appreciate your patience in this regard. *If you are user of the **GTNXI Pro** gauge from **TDS Sim Software**, you might also experience this longer loading after (re)installing or updating that add-on package.*

Product Documentation Structure

This may seem like a lot of information, but the documentation was compiled and written for you to clearly understand how to use this aircraft. Following is the list of manuals included within the product, plus a summary about how to get the most out of these manuals:

- **Operations Manual (You are reading it now!):** In this document, we have collected as much information about how to use this EMB-110 simulation as possible in one place. The purpose of this manual is to bring you (the end-user) a document which serves as an aid to become familiar with this product, providing detailed information about the aircraft, systems and flight instruments. In addition, this document features development changes log, support details, among many other relevant items.
- **Checklists:** For those who are familiar with this aircraft or if you want to follow real procedures like the real pilots, this manual is for you. This section of the general product documentation should be thought of as a step-by-step guide to operating the aircraft. No matter if you start your flight in Cold & Dark condition or if you are on the runway and ready for takeoff, this guide gives you a step-by-step process to take you to the next phase of flight. Take note that you can even follow those procedures as well with the help of the Interactive Checklists feature bundled with the simulator's built-in EFB.
- **Repaint Kit Manual:** This document is a step-by-step on how to create a custom-made livery for this product, following the same standards for native MSFS 2024 content. It guides you on how to paint your desired livery, which master files you need to edit and export, and how to set up the final livery package for distribution (if you plan on publishing it and sharing it with other product users around the world).

Requesting Technical Support

Post-sale support for this product is done by us, **NextGen Simulations**. You can use either of the following authorized channels for Support, should you need assistance with any of our products, not just the one targeted on this manual. When you contact us for assistance, please note that we can answer any support inquiries only in English, Spanish and French. If you do not speak any of the aforementioned languages, please make use of Google Translator and translate your message from your native language to English, as well as our responses back from English to your native language.

Our online forums have been disabled due to major technical and legal issues that prevented its correct operation. If you require personalized assistance for the product and you do not want to use Discord, please reach out to our CEO via email to cdgonzalez@nextgensim.com.co

Our Discord Server, accessible via this URL: <https://www.nextgensim.com.co/Social/Discord>.

Use this channel when you require a faster response. For personalized attention, please use the support forum channels from the OFFICIAL SUPPORT category, and use the respective channel based on your language of preference (English, Spanish or French). Users around our Discord server can also answer your concern, while we are busy or sleeping. We also occasionally answer questions dropped on our Discord server, for knowledge of the entire users' community.

Before requesting support, please take a moment to review the guidelines found below. **SUPPORT REQUESTS MADE ON DIFFERENT CHANNELS THAN THE ONES MENTIONED IN THE PREVIOUS PARAGRAPHS, SUCH AS VISITOR'S POSTS, COMMENTS, OR DIRECT MESSAGES (DMs) ON FACEBOOK, INSTAGRAM, THREADS AND/OR YOUTUBE WILL BE COMPLETELY IGNORED.**

Additionally, when requesting support for the product for the first time, it is MANDATORY to provide the purchase information (i.e., where you purchased the product and its order number). Because this information is personal and sensitive to the public, this must be sent via private message. If this is NOT included, support will NOT be given. This is a measure to fight against software piracy. We DO ONLY bring support to legitimate users of the product. If the product was purchased from the Marketplace, you MUST supply the respective proof of purchase or a screenshot of the Content Manager and/or the product's description with the price tag reading OWNED.

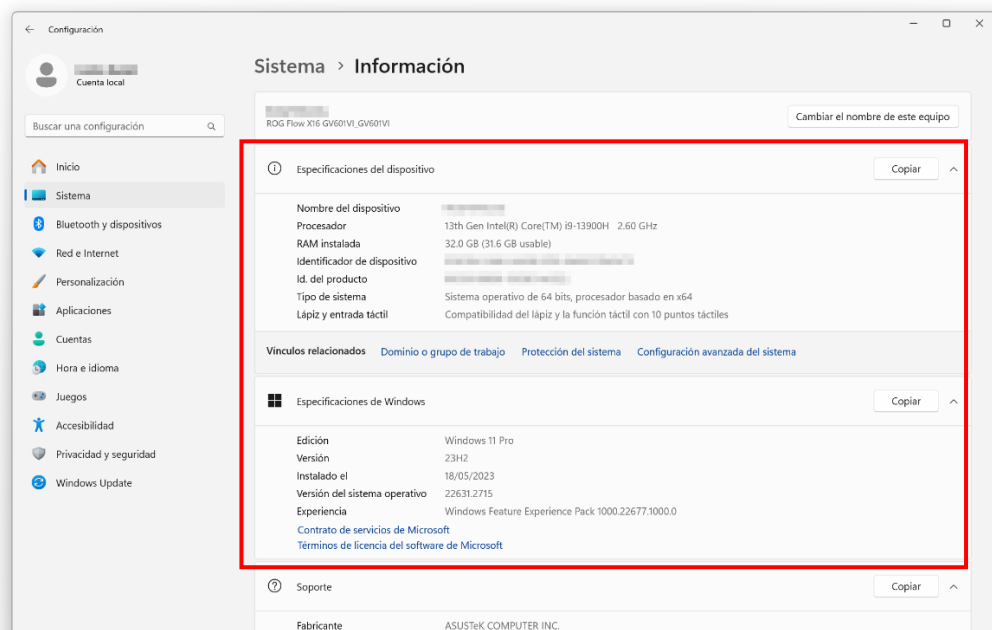
Also, if you can provide the following information with your support request, it will help a lot.

- Currently installed MSFS2024 version number (e.g.: 1.7.27.0), and platform (Microsoft Store, Steam, Physical DVD, Game Pass, Xbox Cloud Gaming, Xbox Series X|S, PlayStation).
- Currently installed version of Windows 10 or Windows 11 (if the support inquiry is for the PC version). To check which release and edition of those operating systems you have installed, please do the following:

- You can press **Windows key + R** on your keyboard, type "**winver**" and hit Enter. The **About Windows** dialog like the one in the next figure should appear, where you can check the version that you have installed. The information highlighted in the red-bordered rectangle is the most relevant for us.



- Or, you can go to the Settings app, then go to **System > About** and check on the **Windows specifications** group, just like in the figure below. Again, the information highlighted in the red-bordered rectangle is the most relevant for us.



- Your system specifications, including hardware info such as CPU and graphics card. You can also save the system information (as plain text or XML format) gathered by an application called

Specy, which you can download from <https://www.piriform.com>, and attach it in your support ticket.

- If you made recent changes to your PC hardware, upgraded the operating system (e.g.: from Windows 11 23H2 to Windows 11 24H2), updated MSFS, installed any OS update from Windows Update, performed any drivers' updates, or made any change to your PC in general, do not hesitate to let us know.

Help us help you. A vague description of your problem will hinder our ability to assist you and only cause delays in resolving them. Additionally, please be kind and respectful when requesting support. The use of rude or abusive language will cause the support team NOT to proceed with your request and terminate it without prior notice.

Read Before You Request for Support

This applies not only for this product but also for future aircraft products.

Dear user,

Developing this documentation and making it as easy to understand as possible for everyone was not an easy task, but we put a lot of time and effort into that matter. We are fully committed to helping you and improving our work every day, because communication between the development team and you (the customer, end-user, and flight-simulator pilot), is an important key for all of us at NextGen Simulations.

While you become familiar with the aircraft and the product in general, I invite you to carefully read and carefully review this documentation, even on your mobile device while you simultaneously have the sim running on your system. It is understandable that you only want to jump ahead into the action and start flying now, and we did a lot for you to do so, but all good pilots put in some level of preparation before every flight and reviewing the documentation can also help you troubleshooting even the most common mistakes on the road. The product's documentation is quite easy to understand, and you can also jump to a specific page from the Table of Contents.

Also, please look to the guidelines required for requesting support in case you need assistance to make the product work as expected, and do not forget to be polite on your communication with us, and follow the instructions given by the Support staff, to quickly help you to resolve your issue.

Thank you very much for your understanding and your support!

May God bless you!

Kind regards,

Carlos Daniel González Gómez

CEO & Lead Developer

Support Request Directives

The following directives apply not only for this product but also for any other of the NextGen's current and future MSFS 2024 aircraft products. Please take this into account before filing a support request:

- Make sure you have installed the latest available release of the product subject to the request, on your system. If not, please update the product to the most recent version.
- Make sure you have the most recent stable version of Microsoft Flight Simulator 2024 installed on your system (or console).
- Make sure you have the most recent updates from Windows Update installed, and that you are not enrolled in the Windows Insider Program (in the Beta or Experimental channels).
- If you are enrolled in the MSFS 2024's Sim Update Beta builds, do so only if you want to contribute feedback to both the simulator's developers and us, NextGen Simulations, in order to improve the product's performance and reliability with the sim's updates. If you do not want to contribute to such feedback, please follow the respective opt-out instructions from the MSFS official website and forums.
- Check the MSFS 2024's My Library page and search for the product there. If you own the product from the Marketplace, and it is listed but not enabled, please enable the package by following the instructions from the In-game Marketplace installation.
- Make sure you have tested with no third-party mods installed. It is possible that another add-on is conflicting with ours, or an unofficial mod for the product subject of the support request broke the product's functionality, either partially or in whole. If you are unsure if you have mods that override core files from the simulator, especially those belonging to the glass cockpit instruments framework, please perform a VFS (Virtual File System) scan using the //42's Simstaller utility, which you can download [from the //42 \(Parallel 42\) website](#).
- If you have the product from the Marketplace, streaming on your PC or console and the product does not work correctly, please try downloading it locally on your device and check once again if the issue still occurs.
- Make sure you have also tested with no external hardware plugged into your system.
- Try reinstalling the product, by uninstalling it first, and then installing it again.
- Try rebooting your computer. It is possible that something happened on the system or sim's sides and not on the product.
- If you experience an Avionics Black-Out (ABO) issue where even the EFB does not appear at all on your PC, please make sure you do not have any other add-on conflicting with ours and that can override base files of the simulator. For this, please review above how you can check the VFS. In case you have reviewed and you experience this issue, please report to Asobo Studio.
- If you experience an Avionics Black-Out (ABO) issue on console (Xbox or PS5), please report the case to Asobo Studio, either through the General Forums or from the Zendesk support page.

Please take note that these incidents are out of our control, and this must be assessed by the base simulator's developer.

- If you experience any issues with the aircraft on Career Mode, please try restarting the sim. If the issue persists despite the efforts, please let us know.
- Make sure you have the latest graphics drivers installed on your system, especially in case you experience a Crash To Desktop (CTD). If graphics drivers are installed from Windows Update, please uninstall them, download and install the official drivers from the manufacturer's website and make sure that Windows does not check for drivers updates from Windows Update.
- If the EFB does not work correctly, try restarting it using the provided Restart button from the Settings page. If this does not solve the problem, please try restarting the sim. If this does not solve the problem, then you can proceed and request support.
- In case the issue you are facing comes from third-party avionics, such as the PMS50 GTN750, the TDS Sim GTNXI or the Working Title GNS, please ask for assistance to the respective developers first, before requesting us for support.

When filing a support request:

- Be as specific as possible when describing the scenario that you experienced, and take note of every single step you performed, as this will help us to reproduce your issue and investigate what went wrong. **A vague description of your problem will hinder our ability to assist you and only cause delays in resolving them.** If you count with a video describing the problem, much better!
- If you made any change to your PC in general, do not hesitate to let us know.
- Please be kind and respectful when requesting support. The use of rude or abusive language will cause the support team not to proceed with your request and terminate it without prior notice.

Note About Software Piracy

Here at **NextGen Simulations**, we have invested significant amounts of time, effort, money, and licenses in developing, testing, manufacturing, and publishing all our flight-simulation products. This also includes rewarding programmers and artists, whose creativity, talent, and effort contribute so much to the products we enjoy.

Unfortunately, in the world of computers and technology, there are pirates (a.k.a. thieves) that make profit from the sale of others' hard work; even more than the publishers and developers from the sale of their original work, most of the time. Buying or downloading pirated software makes you to be a victim of software counterfeiting, as well as directly supporting these illegal operations. **DO NOT** be fooled by their "free file sharing" concepts. Those so-called "shared files" contain a copy of the product's files, nevertheless, the pirates can also include viruses and hidden threats among the product's files, making your PC to be harmed, damaged, or hijacked to take control of your personal files, with the excuse of helping to maintain this and other illegal operations they do, not to mention that the sites which host the shared files are usually funded by advertising.

The people who significantly suffer from this negative effect are the artists, programmers, and all committed developers, and not only us but also many other developers around the flight-simulation industry are impacted. Piracy and software counterfeiting causes a negative impact on us and our families, especially lots of people whose main incomes are from this work. Please think twice about this.

We kindly ask you to stop supporting those illegal operations and support our work by legitimately buying our products from our authorized resellers. And this applies not only to us, NextGen Simulations, but also to any other developer and publisher around in the flight-sim industry. **DO NOT** expose yourself to the risk of both losing your personal files and being criminally prosecuted.

Additionally, please take note that we **DO NOT** bring technical support to people who did not legitimately acquire the product. Why do we ask for the information on purchase when you request support, before proceeding? Because this is a measure where we check if the user is legitimate or not, regardless of the DRM measures taken. **So, no purchase information supplied means no support given.**

Product Overview

Exterior Models

Four different models are included in this product. All models are optimized for better performance while keeping good look and feel.



EMB-110P



EMB-110P1 (pax configuration)



EMB-110P1 (cargo configuration)



EMB-110P2

Liveries

This EMB-110 simulation for MSFS 2024 includes a total of 36 liveries from different worldwide operators, plus 4 white liveries with dynamic registration decal (one for each variant of the aircraft included in the product), for a total of 40. The number of liveries included for each variant is as follows:

- EMB-110P – 9
- EMB-110P1 (pax config) – 22
- EMB-110P1 (cargo config) – 5
- EMB-110P2 – 6

EMB-110P



Cubana de Aviación (CU-T1540)



Trans Brasil (PT-TBA)



Trans Brasil (PT-TBB)



Trans Brasil (PT-TBC)



Trans Brasil (PT-TBD)



Trans Brasil (PT-TBE)



Trans Brasil (PT-TBF)



VASP (PP-SBA)



Base White (Includes Dynamic Registration Support)

EMB-110P1 (Pax)



Aeropelican Air Services



Air Écosse (Royal Mail Datapost)



Air New Zealand Link (Circa 2001)



Air New Zealand Link (Circa 1994)



Air Rarotonga



Air UK



AIRES Colombia (Circa 1988)



AIRES Colombia (Circa 1993)



Atlantic Southeast Airlines (ASA) (Circa 1987)



CM Airlines



Dolphin Airlines



Fuerza Aérea Colombiana (Colombian Air Force)



Kenn Borek Air Ltd.



LeAir Charter



LIAT The Caribbean Airline (Circa 1986)



Loganair (Circa 1982)



Ryanair (Circa 1985)



TAG Airlines (Circa 2017)



United Express (Circa 1988)



Base White (Includes Dynamic Registration Support)

EMB-110P1 (Cargo)



Agape Flights



AirNow



Wiggins Airways (N117WA)



Wiggins Airways (N119WA)



Base White (Includes Dynamic Registration Support)

EMB-110P2



Air Littoral (Bleu)



Air Littoral (Vert)



Air Littoral (Rouge)



Air Littoral (Brun)



Air UK



Base White (Includes Dynamic Registration Support)

Flight Deck





The product features a visually and functionally accurate 3D virtual cockpit, with a tablet device serving as the Electronic Flight Bag for this aircraft.

Flight Management System

EMB-110 BANDEIRANTE V2 FOR MICROSOFT FLIGHT SIMULATOR 2024 is proud to feature the regular GNS 430W & GNS 530W replicas bundled with MSFS by default, ready for use at its maximum potential.



Also, **EMB-110 BANDEIRANTE V2 FOR MICROSOFT FLIGHT SIMULATOR 2024** is proud to feature full cockpit integration of the **GTN750 / GTN650** units developed by **PMS50**, the **GTN 750Xi / GTN 650Xi** units developed by **TDS Sim Software**, and the **KLN90B** developed by **FALCON71**. The aircraft features the respective GTN/GTN Xi/KLN bezels and each one interfaces to its respective instrument. For this to work, it is mandatory to have the PMS50's GTN pack installed on your system, which can be downloaded from <https://pms50.com>, the TDS GTNXI pack installed on your PC, which can be separately purchased from <https://tdssim.com>, or the KLN90B open-source instrument package found on the respective [GitHub repository](#). The console version of the product (Xbox and PlayStation) includes an embedded version of the KLN90B from Falcon71.





The GPSs interact with the autopilot to provide route lateral navigation (LNAV). The NAV mode of the autopilot, when switched to GPS navigation source in the Course Deviation Indicator (CDI), directs the Autopilot to fly the flight plan route automatically. Users can use the GNS 530/430, the GTN 750/650, the GTN 750/650 Xi, or the KLN90B to manually create flight plans without having to use the MSFS default flight planner built into the sim's EFB or make the sim's built-in EFB to send the flight plan to the GPS.

About the navigation database, the sim stock GNS 530W & GNS 430W, as well as the PMS50's GTN750 & GTN650 or the Falcon71's KLN90B (if installed) utilize the Microsoft Flight Simulator 2024 GPS database to maintain consistency with the world you are flying on. If you have the TDS Sim Software GTNXI installed and selected on our aircraft, it features a bundled release of the Navigraph AIRACs Cycle 2301. You can also make use of the Navigraph AIRACs designed for the sim and as a replacement for the default database. For this, you must have an active **Navigraph Ultimate** subscription and download the **Navigraph Hub** application. More information on this topic can be found with Navigraph, by visiting their website <https://www.navigraph.com/>.

Notes for Xbox & PS5 Users

- Previously, the EMB-110 product for MSFS 2020 included a special ("embedded") version of the PMS50 GTN750. However, effective since this product for MSFS 2024, the aforementioned instrument is no longer included within the base product, because the PMS50's GTN750 is currently available on the Xbox Marketplace (not yet available for PS5 at the time of writing this documentation). This change will soon impact on the MSFS 2020 product as well.
- The TDS GTNXI is not available on Xbox and PlayStation, because the aforementioned instrument heavily relies on the Garmin PC Trainer, for which it can only be run on top of the Microsoft Windows operating system.

- The KLN90B instrument is not yet included within the base package for console. This will change in the upcoming post-release updates.

Systems Programming

The real-life EMB-110 is a complex aircraft in terms of systems, but here this simulation has been simplified for you, so that you enjoy a greater flight-simming experience without being overwhelmed by a full-level simulation. Most of the essential systems have been simulated for normal conditions **ONLY**, in consequence, abnormal conditions such as engine fires or in-flight emergencies are not simulated here in this product.

Sounds

Thanks to the potential of Wwise, a product by Audiokinetic Inc., and bundled with Microsoft Flight Simulator 2024, this product features the most realistic sound rendition of the PT6A-34 engines, ever available. In addition to the engines, a mix of cockpit sounds has been included here, to provide a more comfortable feeling of being in the real-life aircraft. Listen to the sound of the aural warnings, buttons and switches clicks, like if you are in the real aircraft. Every essential sound is covered here.

Flight Dynamics

Invisible to the eye, but you can feel it when using your joystick, gamepad, or yoke. Based on real-life specifications, the Flight Dynamics will always bring you a great flight experience. Every single aspect of the airplane's flight characteristics has been carefully tuned and reviewed so that it matches the expected behavior in flight.

Flight-Sim Hardware Setup

This product has been tested using a standard Xbox Series X wireless controller on both Windows and Xbox environments. In addition, for Windows users of the product, we recommend using the **Alpha Flight Controls Yoke & Switch Panel** and **Bravo Throttle Quadrant with Autopilot & Annunciator Panel** hardware devices, both manufactured by [Honeycomb Aeronautical](#), for a better and pleasant experience with our EMB-110. If you have the **Bravo Throttle Quadrant**, please make sure you arrange your throttles setup for **General Aviation**. That is, with the respective throttle, propeller and mixture lever handles all set, like on the picture below.

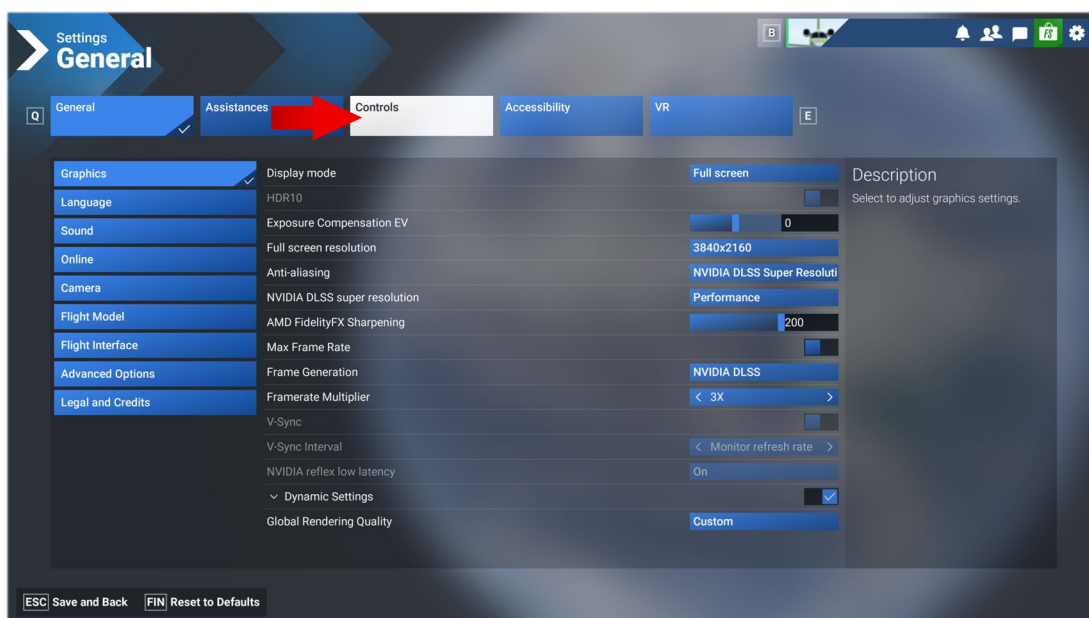


Pictures courtesy of Honeycomb Aeronautical

For both **Alpha** and **Bravo** devices, you must create a separate controls assignment profile in the sim, which can be used for this product, as you must **unbind** some assignments in order not to create conflicts with the product's code, especially on the electrical system side, as well as **bind** some other assignments that are appropriate for how the aircraft operates, especially the condition levers. Following are the instructions that you must follow to correctly set up the product's experience with this magnificent hardware from Honeycomb Aeronautical.

Setting up the Honeycomb Devices In MSFS2024 for This Product

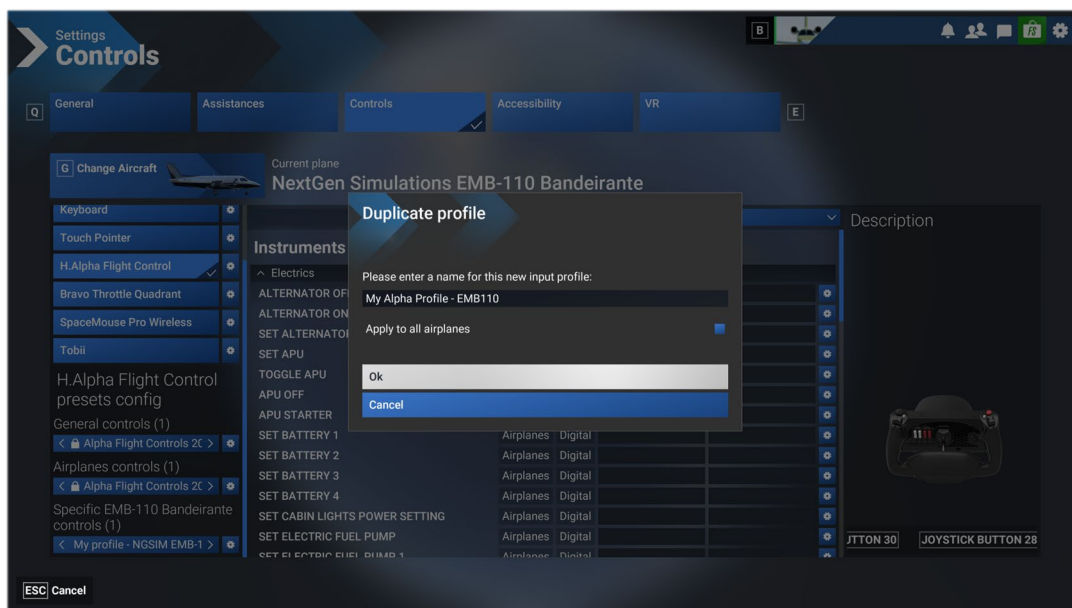
1. Launch MSFS2024 and make sure you are on the sim's main menu.
2. Go to **Settings** by clicking the gear cog icon, then click on **Controls**.



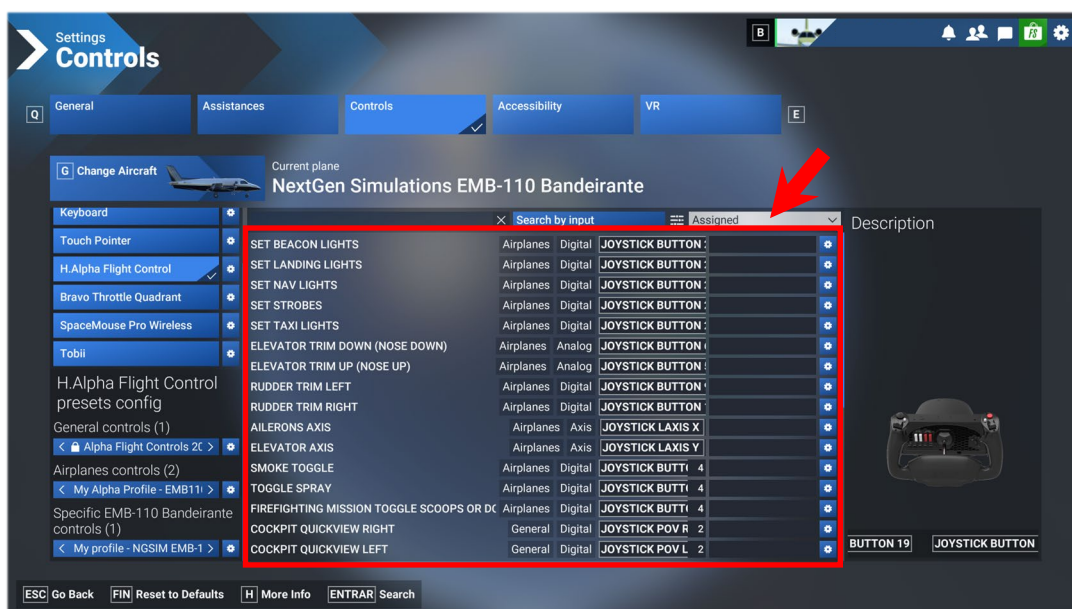
- There in the Controls Options menu, make sure you have selected our product. For this, click on **Change Aircraft**, select our aircraft from the Selection UI, and return back to the Controls Options. Next, click on the **H. Alpha Flight Control** button from the Devices List, if you have that device installed on your setup.



4. On the left side, where the Devices List is, scroll down to *Airplanes controls*. Then, click on the gear icon next to the profile selector button and click on **Create**. Name your new custom profile, and make sure you do not have ticked the *Apply to all airplanes* checkbox. Then click **OK** to save the new profile.

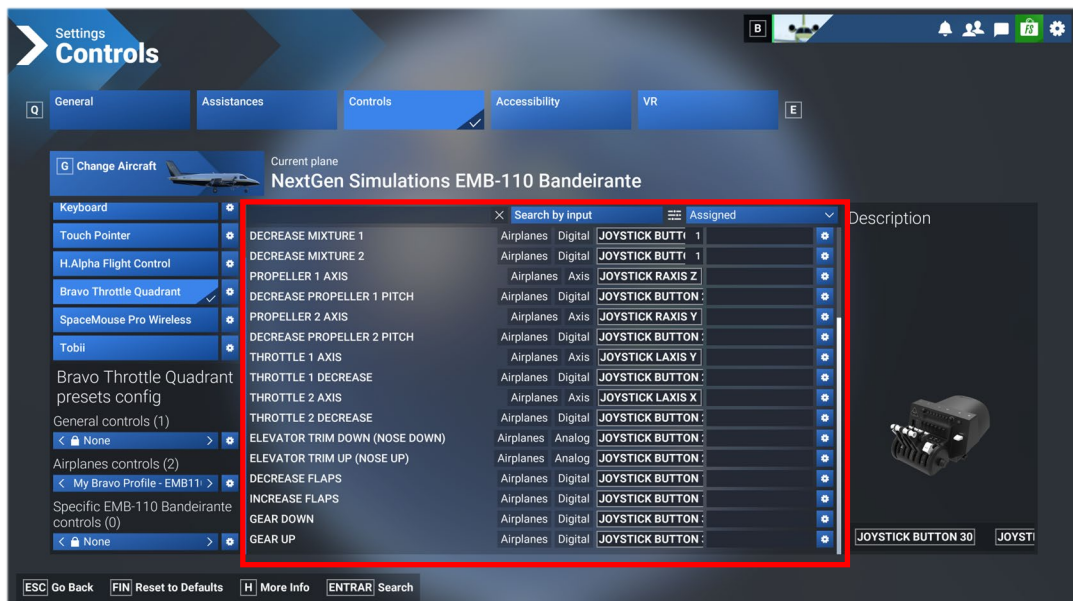
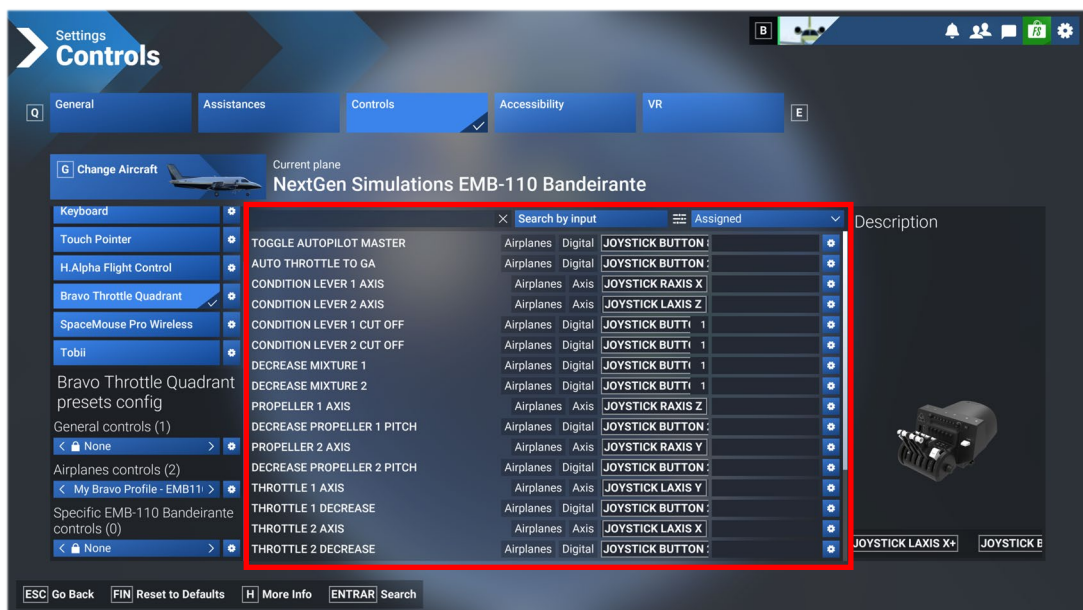
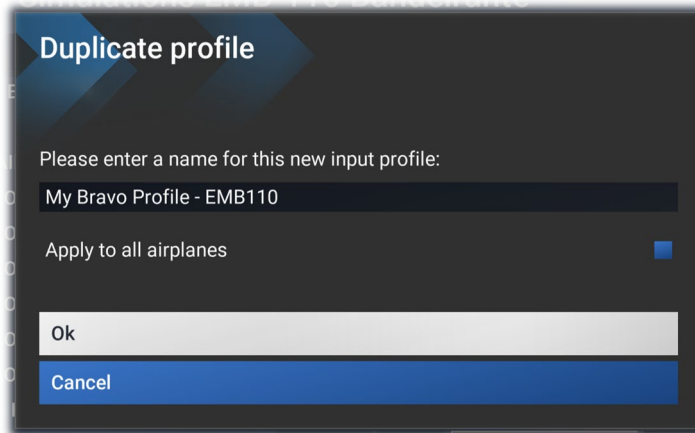


5. In this new profile, you must **unbind** some of the standard assignments, namely, the electrical switches, magnetos switch and exterior lights switches. You must unbind the following control assignments from the Alpha device: SET MASTER BATTERY, SET ALTERNATOR, SET AVIONICS MASTER 1 & 2, MAGNETOS START / RIGHT / OFF / LEFT / BOTH, TOGGLE AFTERBURNER, SET TAXI LIGHTS, SET STROBES, SET NAV LIGHTS, SET LANDING LIGHTS, SET BEACON LIGHTS, SMOKE TOGGLE, TOGGLE SPRAY. You can filter by Assigned just like in the figure below. Highlight each item and press the **Backspace** key from your keyboard to unbind the assignment.

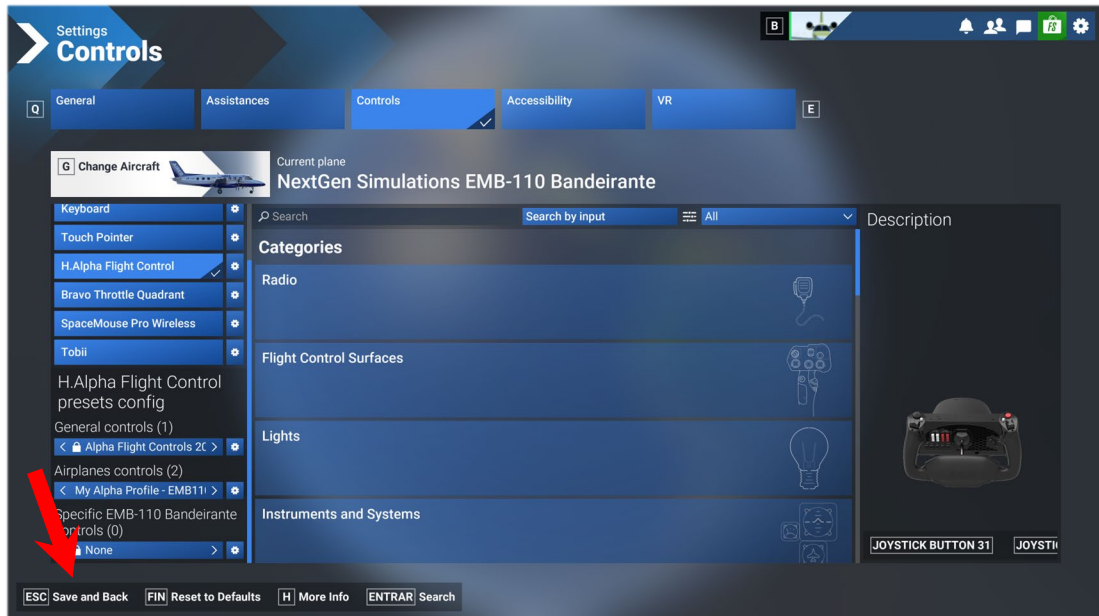


Unbinding the battery and avionics switches assignments will help not to cause functional issues with the GPS and other avionics. This is because the avionics bus must remain permanently connected as this aircraft does not have a dedicated avionics master switch.

6. Now, you must repeat the same unbinding process but this time for the Bravo device. Click on **Bravo Throttle Quadrant** from the Devices List. Then, unbind all assignments, **except the ones listed in the screenshots below**



7. For the Bravo device, make sure you have **CONDITION LEVER 1 AXIS** and **CONDITION LEVER 2 AXIS** assigned, instead of MIXTURE 1 AXIS and MIXTURE 2 AXIS. Otherwise, it will cause issues when manipulating the actual aircraft's condition levers from the external hardware.
8. Make sure you have the same modified profiles applied to all aircraft variations. For this, you must select each variation from the Select Aircraft > Configure page, then apply the same profiles from both devices to all variations, one by one. Not doing so will cause issues with the controls when you use the SPAD.neXt profile when you select any other variant of this aircraft to fly.



9. Once all has been done, click on **Save & Back** below.
10. **From now on, the next time you want to fly our EMB-110, make sure the corresponding profiles are selected before taking the aircraft for a ride.** Also, in case the ECU levers move in the opposite direction from where you are moving the physical levers, just make sure to (un)toggle the **REVERSE AXIS** checkbox, then save and test again until you see the levers move in the correct direction.

Complete the Experience and Take Advantage of Both Devices with SPAD.neXt

Now that you have configured the assignments in the sim, you might ask why the exterior lights, electrical and autopilot switches had to be unbound. This is because of two reasons: one, to prevent issues with the electrical system and the avionics bus when you use the product; and two, there are some incompatibilities on both the exterior lights logic and the autopilot system logic, as the logic is completely customized and fitted for this aircraft.

However, to complete this experience, we have added some local variables (also known as “LVars”), which can be specifically used for external hardware, namely, the Honeycomb devices, which can be used on third-party device setup utilities like [SPAD.neXt](#) and [Axis and Ohs](#).

In addition, we have created and tested a SPAD.neXt profile for you, for use with both the Alpha and Bravo devices, assigning the missing commands (autopilot, annunciator panel and exterior lights switches). This profile can be downloaded from our website, in the **Downloads > Miscellaneous** section.

If you want to create a customized **SPAD.neXt** or **Axis and Ohs** profile for another hardware device, you can review the LVARS list in **Appendix II**.

Aircraft Specifications

Operating Limitations

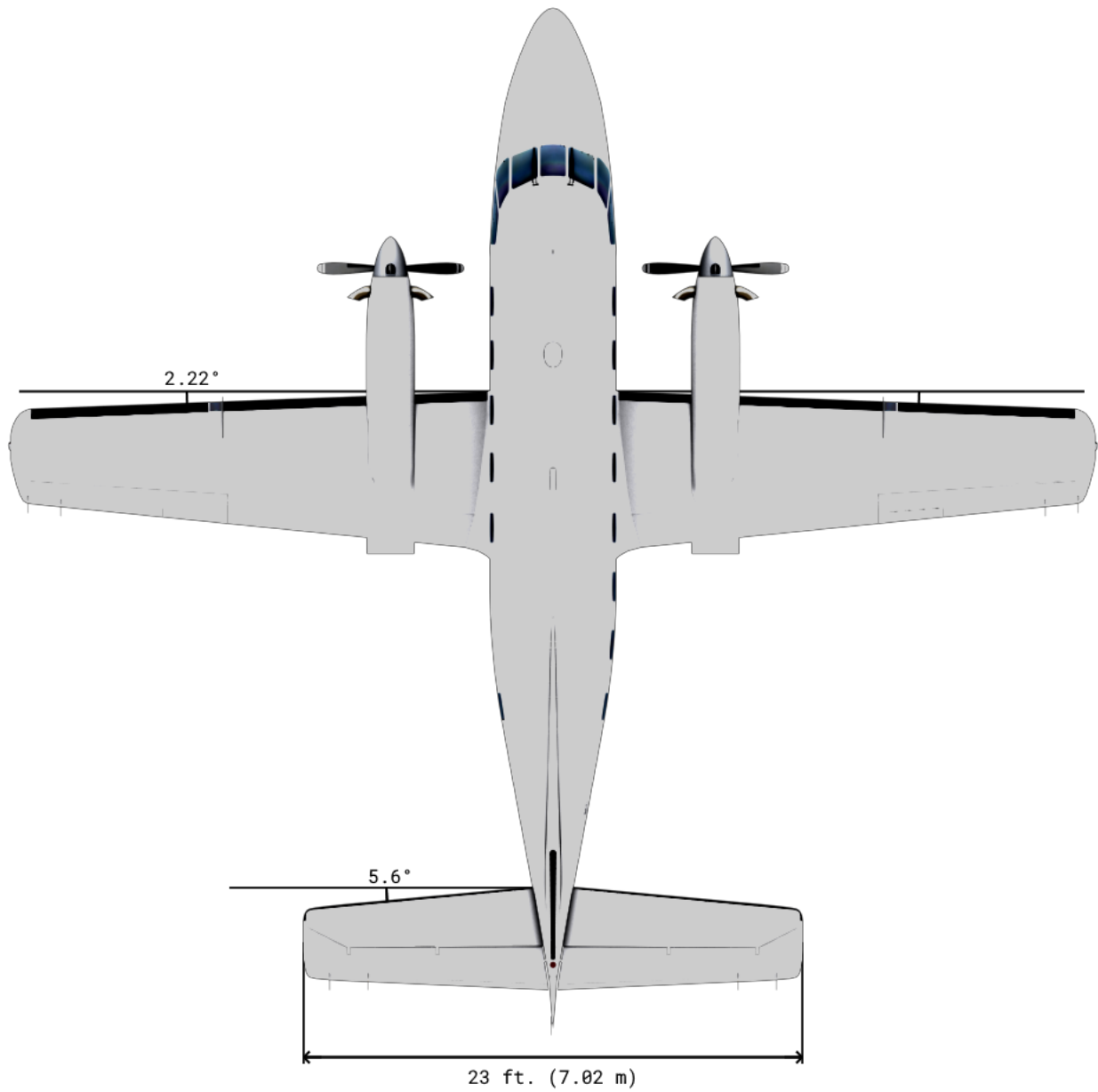
Design Weights & Capacities	
Maximum takeoff weight (MTOW)	13,250 lb. (5,789 kg)
Maximum landing weight (MLW)	12,566 lb. (5,591 kg)
Maximum zero fuel weight (MZFW)	9,913 lb. (4,411 kg)
Standard empty weight (including unusable fuel, full oil, standard interior and standard avionics)	7,750 lb. (3,449 kg)
Maximum payload weight	4,130 lb. (1,838 kg)
Usable fuel capacity (measured in fuel weight – Jet A-1, 6.70 lb./gal.)	3,044 lb. (1,355 kg)
Performance	
Takeoff field length	4,035 ft. (1,230 m)
Maximum altitude (Service ceiling)	21,000 ft. (6,705 m)
Range w/ max payload	1,058 NM (1,960 km)
Landing distance	4,461 ft. (1,360 m)
Speeds	
Maximum operating speed (V_{MO})	230 KIAS
Maximum flap extension speed (100%) (V_{FE})	148 KIAS
Maximum flap extension speed (25%) (V_{FE})	180 KIAS
Maximum landing gear operating speed (V_{LO})	148 KIAS
Maximum landing gear extended speed (V_{LO})	146 KIAS
Minimum control speed (V_{MC})	84 KIAS
Single engine best rate-of-climb speed (V_{YSE})	115 KIAS
Maximum cruise speed	229 KTAS (425 km/h)
Engine (PT6A-34)	
Overall length	61.89 in. (1.57 m)
Nominal diameter	18.29 in. (0.46 m)

Overall engine weight (dry)	340 lb. (151 kg)
Maximum shaft horsepower @ SL	750 shp.
Maximum output RPM @ SL	2,200 RPM
Maximum gas generator RPM @ SL	38,100 RPM
Maximum jet thrust @ SL	82 lbf. (364.75 N)
Maximum torque	1,970 ft-lb (2,671 N-m) @ 91% N _h 1,795 ft-lb (2,434 N-m) @ 100% N _h
Reduction gearbox ratio	0.663:1
Propeller (Hartzell HC-B3TN-3C/T10178H-8R)	
Propeller type	Fully-feathering, reversible-pitch, constant-speed
Propeller blades	Three (3)
Diameter	7 ft. 9 in. (2,362 mm)
Pitch range	-11° to +88.1°

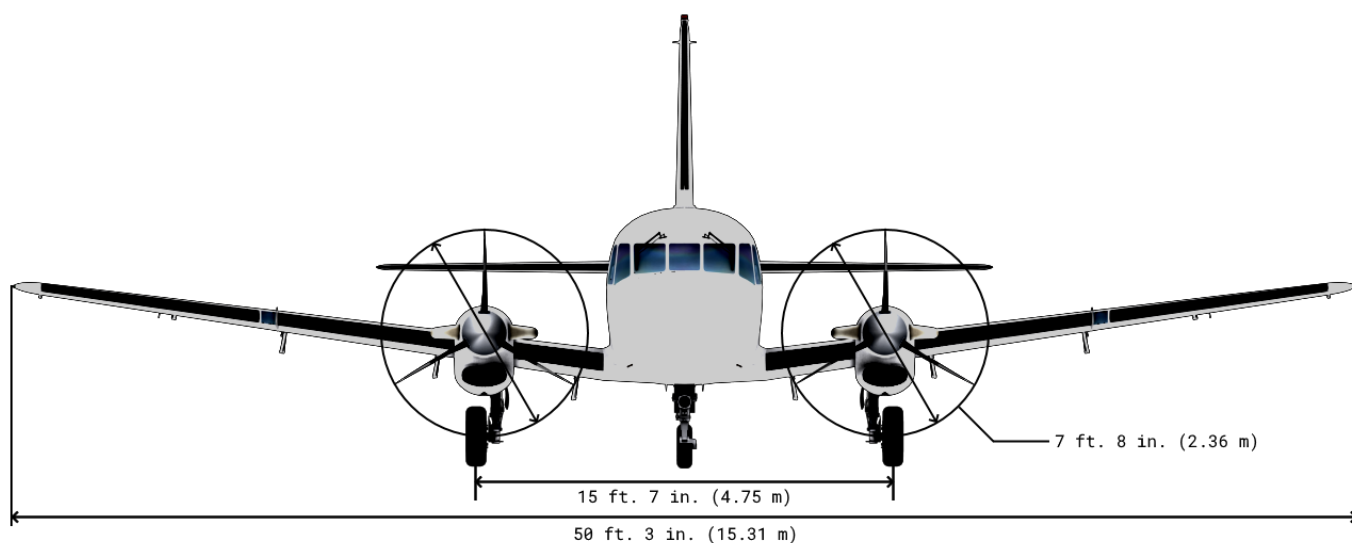
Dimensions

Overall Dimensions	
Total height	16 ft. 10 in. (5.14 m)
Total length	EMB-110P: 47 ft. 5 in. (14.44 m) EMB-110P1 / EMB-110P2: 49 ft. 10 in. (15.19 m)
Total width	50 ft. 3 in. (15.31 m)
Wing	
Wingspan (from tip to tip, without including lights on tip)	50 ft. (15.24 m)
Wing area	435.6 ft ² (40.47 m ²)
Wing sweepback @ 25% chord	2.22 deg.
Wing dihedral	7.5 deg.
Wing incidence	2.0 deg.
Wing twist	-1.5 deg.

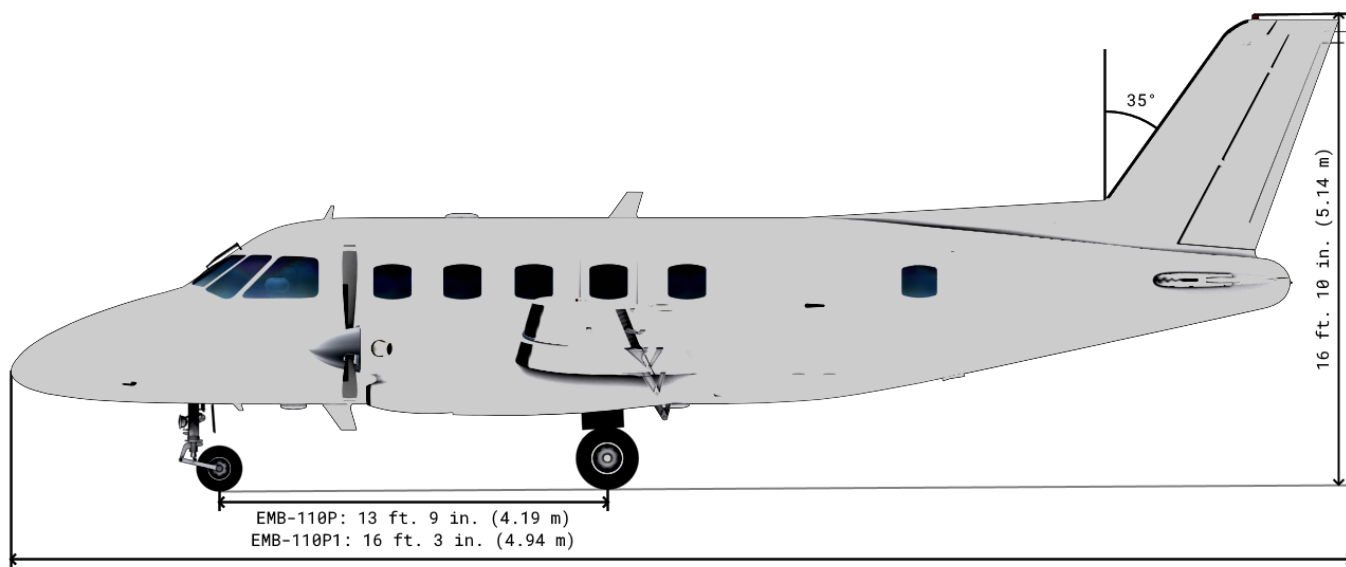
Horizontal Stabilizer	
H-Tail span	23 ft. (7.02 m)
H-Tail area	117.3 ft ² (10.9 m ²)
H-Tail sweepback at 25% chord	5.6 deg.
Vertical Stabilizer	
V-Stab height	9 ft. 4 in. (2.83 m)
V-Stab area	72.9 ft ² (6.77 m ²)
V-Stab sweepback at 25% chord	35 deg.
Cabin Interior	
Height	5 ft. 3 in. (1.6 m)
Width	5 ft. 3 in. (1.6 m)
Length	31 ft. 2 in. (9.5 m)
Maximum seat accommodation	18 seats (EMB-110P) 20 seats (EMB-110P1) 21 seats (EMB-110P2)
Landing Gear	
Landing gear tread (main to main)	15 ft. 7 in. (4.75 m)
Landing gear wheelbase (nose to main)	EMB-110P: 13 ft. 9 in. (4.19 m) EMB-110P1 / EMB-110P2: 16 ft. 3 in. (4.94 m)



EMB-110 - Top View

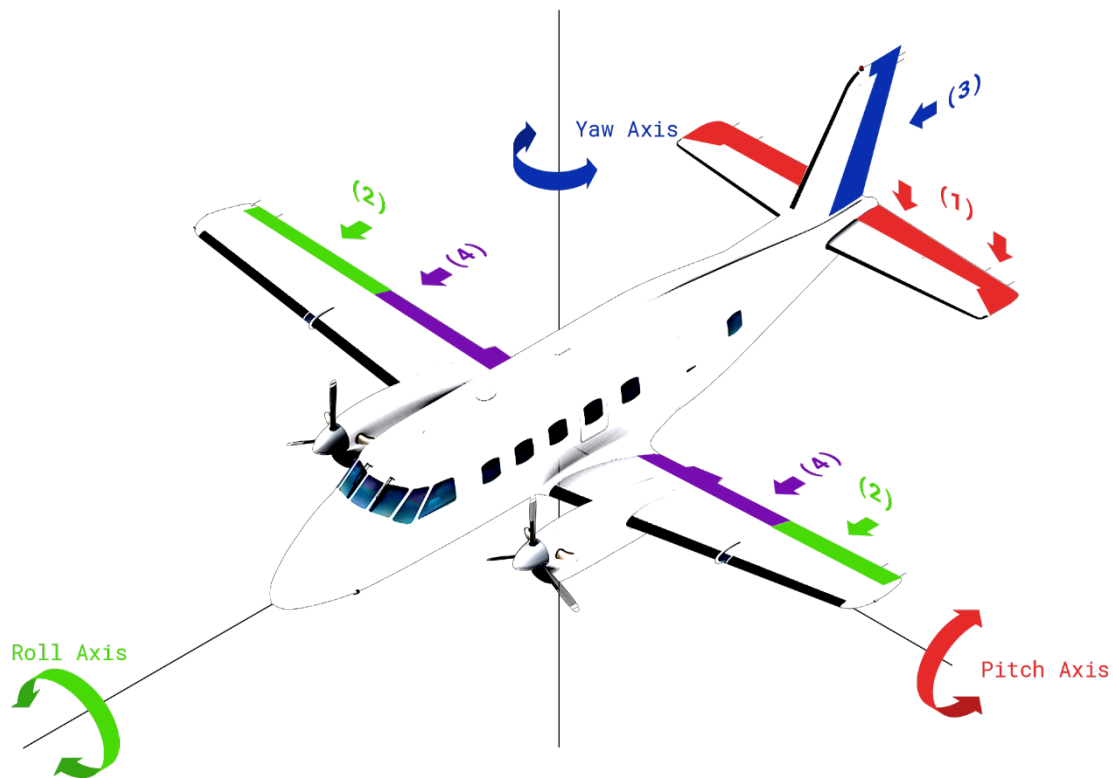


EMB-110 – Front View



EMB-110 – Side View

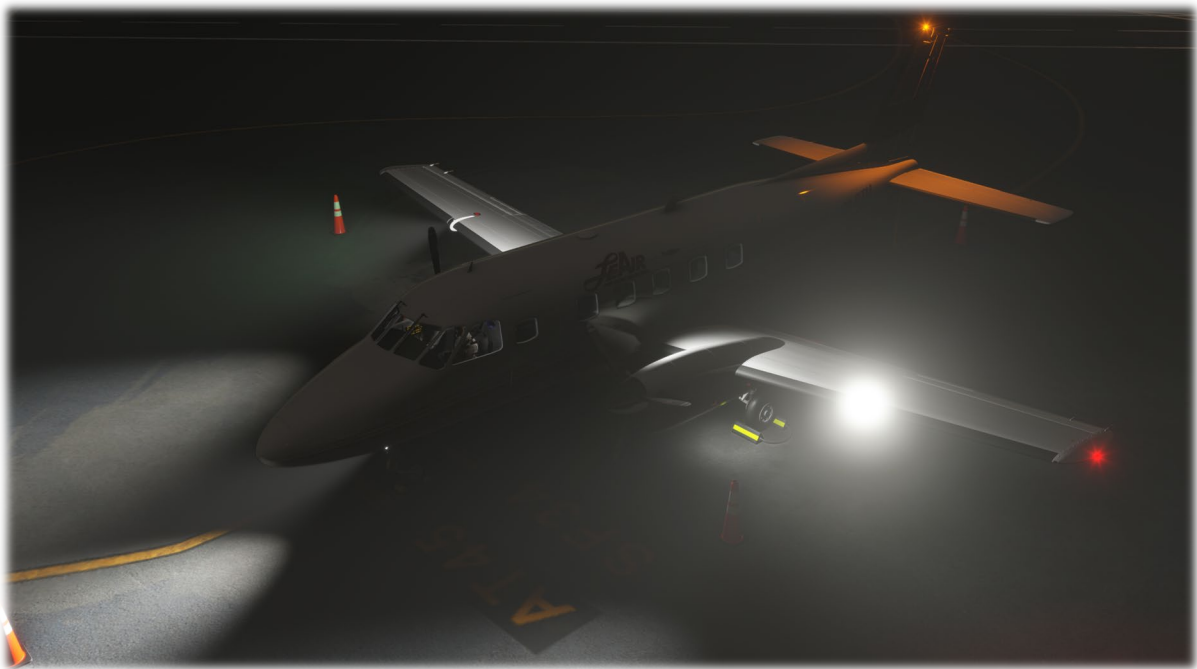
Flight Controls



Elevators (red)	Elevators control the aircraft's pitch along its lateral axis. Pitch is the Nose-Up and Nose-Down movement of the aircraft, also known as Attitude. The greater fins move for short-term attitude changes, while long-term pitch changes are controlled by the trim tabs. There is one elevator with trim fin on each horizontal stabilizer. The elevators move UP and DOWN to make the aircraft climb or descend. For instance, when you push the control column forward, the elevators move down making the aircraft's nose pitch downward. Instead, if you pull the control column backward, the elevators will move up, thus making the nose pitch upward. Elevators are controlled either manually by the pilot or automatically by the Autopilot and they are cable operated. Pitch can be monitored through the Attitude Indicator.
Ailerons (green)	Ailerons control the aircraft's roll along its longitudinal axis. There is one aileron with trim tab on each wing. Ailerons move in opposite directions to each other to make the aircraft turn. For instance, when you turn the control wheel to the left, the left aileron raises to 'dip' the left wing, while the right aileron 'raises' the right wing. Elevators are controlled either manually by the pilot or automatically by the Autopilot and they are cable operated. Roll can be monitored through the Attitude Indicator.
Rudder (blue)	A single cable-operated rudder controls the aircraft yaw along its directional/vertical axis. Yaw is the side-to-side movement of the aircraft. The rudder is located at the vertical stabilizer. It counts with a trim tab and is

	controlled via the pedals. For instance, when you push the left pedal forward, the rudder moves to the left, causing the aircraft's nose to turn to the left. Be aware that rudder movements may induce rolls, so if the rudder is fully deployed to the left, the aircraft will turn to the left in the same way as described in the previous example. This is because the right wing speeds up a bit, so that increases lift on that wing. Rudder is controlled either manually by the pilot or automatically by the Autopilot and Yaw Damper.
Trailing-Edge Flaps / Wing Flaps (purple)	Flaps modify the aerodynamic configuration of the airplane to improve performance during specific flight conditions. With them, takeoff and landing characteristics are greatly improved, and greater maneuverability is provided to meet climb and descent requirements. The flap system consists of a flap control surface mounted on each wing that extends from the trailing edge of the latter. Both Trailing-Edge flaps are hydraulically actuated by the main hydraulic system and are electrically controlled. Normal flap travel is from 0 to 38 degrees, with intermediate detents at 25%, 50% and 75%, installed for take-off, approach and landing configurations.

Exterior Lights



This aircraft counts with the following external lights emulated:

Taxi Light	A single brighter light located in the nose landing gear main strut. It serves as light for taxiing.
Landing Lights	Two brighter lights located in the middle of each wing's leading edge. They serve as lights for runway approaching.
Navigation Lights	Two lights (one on each wing), and one on the fuselage's rear tip. Standard red light on the left wingtip and green light on the right wingtip. Standard white light on the empennage's tip near the rudder.
Strobe Lights	Two anti-collision and white flashing lights (one on each wing). Coupled to the beacon lights circuit, as they are anti-collision lights.
Beacon Lights	Two flashing red lights: one on the vertical stabilizer tip and one on the belly, under the fuselage.
Wing, Nacelle & Gear Inspection Lights	A white light located in the fuselage, illuminating the leading edge of the wings and the engine nacelles. In addition, two lights illuminating the main landing gear, one inside each engine's gear compartment.

Ground Service, Doors & Preflight Inspection



Thanks to the new preflight flow featured in Microsoft Flight Simulator 2024, this EMB-110 simulation includes a preflight inspection (walkaround) simulation, which allows you to perform a visual inspection of the aircraft structure, as well as the condition of the aircraft's landing gear, tires, brakes and flight control surfaces, which is crucial for all your missions, whether you fly the aircraft in Free Flight mode or in the simulator's new Career Mode. In addition, this EMB-110 simulation features a Preflight Inspection Checklist for both outside and inside the aircraft, where all items are sourced from the real-life checklists. For this, you must open the sim's built-in EFB and go to the Checklists section.

Following is a description of the ground service and safety elements included, which can all be controlled via the product's Electronic Flight Bag (EFB) tablet, or removed in the preflight walkaround mode. A visual representation of each element can be seen in the screenshots located in the next pages, describing the preflight inspection pinpoints.

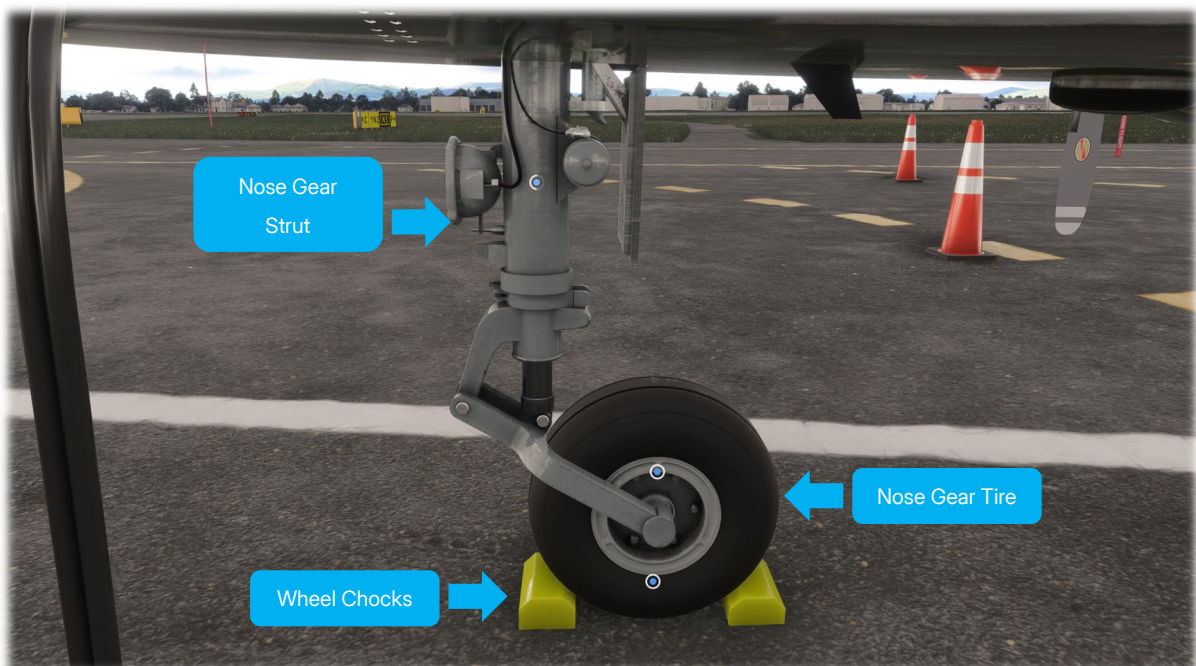
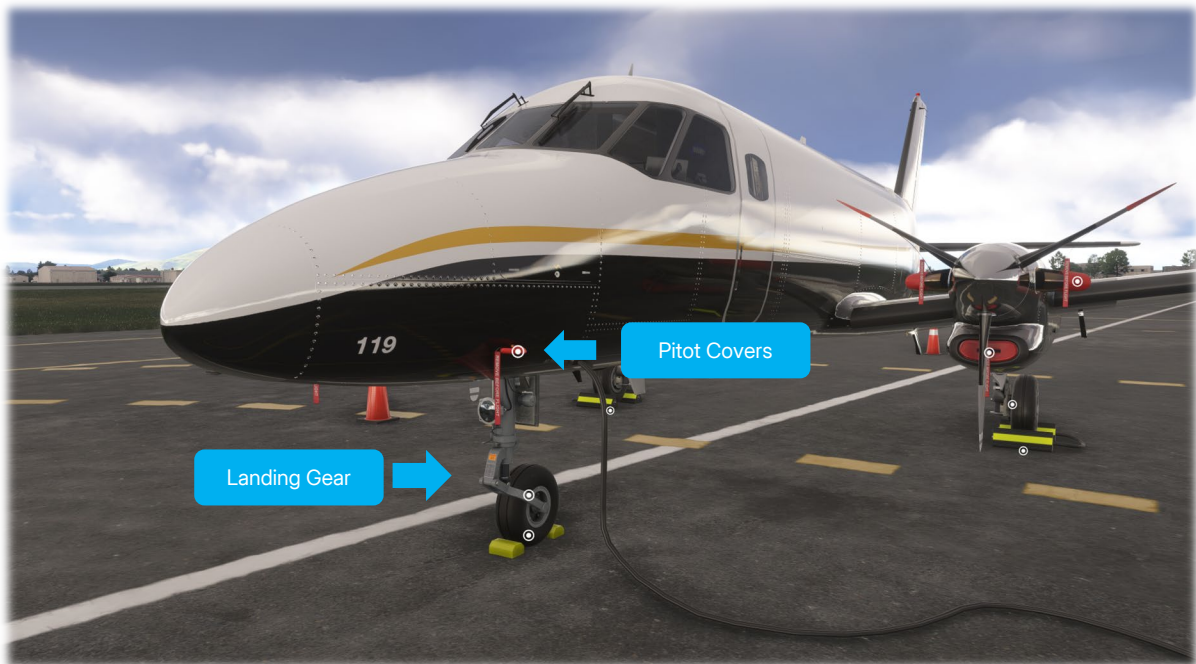
Pitot Covers	These covers protect the pitot tubes from dust or any other foreign object. They have a distinctive REMOVE BEFORE FLIGHT red tag. When they are placed, airspeed indicators will not work correctly unless they are removed.
Static Port Covers	These covers protect the static pressure ports (located at the rear of the aircraft) from dust, foreign objects or any other particles. They have a distinctive REMOVE BEFORE FLIGHT legend painted on them. When they are placed, altimeters will not work correctly unless they are removed.

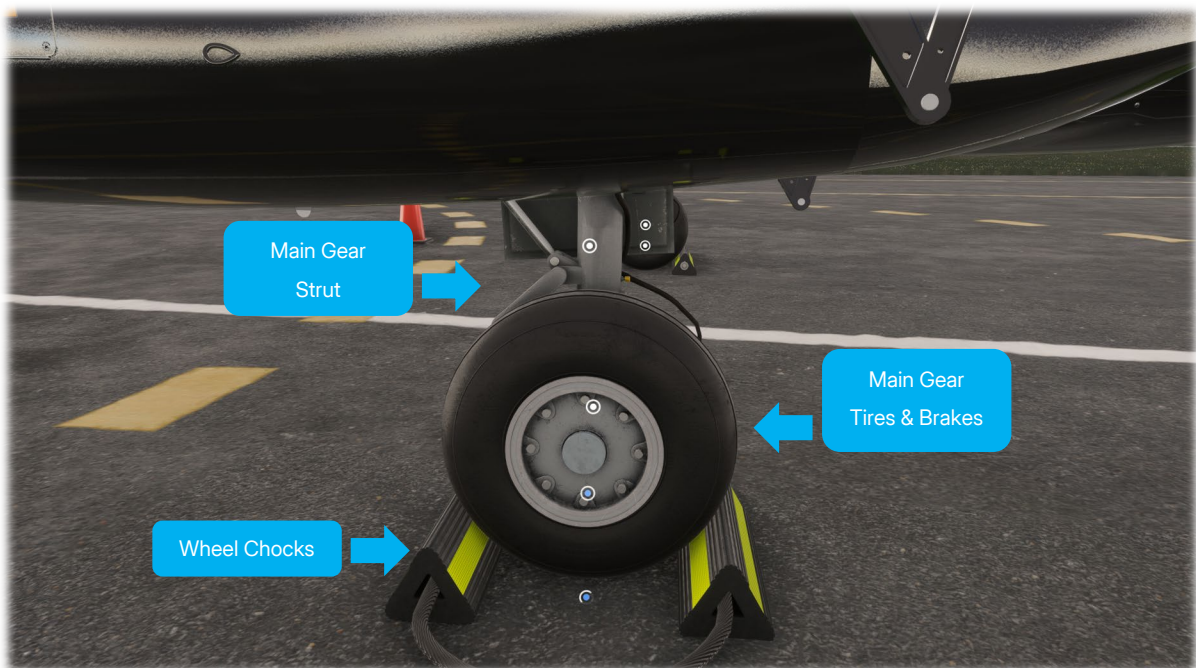
Engine Covers	Used to cover the engines inlet and nozzle and protect them from foreign objects when the aircraft is parked on ground. Remove them prior to starting your flight.
Propeller Covers	Used to cover the engines propellers and maintain them stationary. Remove them prior to starting your flight.
Wheel Chocks	When parked on ground, use the chocks to ensure the aircraft is completely still and not moving. Remove them prior to starting your flight.
Safety Cones	The cones are used as a warning for ground personnel and the pilots, placed around the aircraft's and away from the hazard zones.
Tail Support	When parked on ground, use the tail support to prevent the aircraft from going backwards due to weight unbalancing issues.
External Power (GPU)	This item does not have an influence on the preflight inspection, but can be toggled on or off, in order to provide an auxiliary electrical source to the aircraft's main bus while on ground.

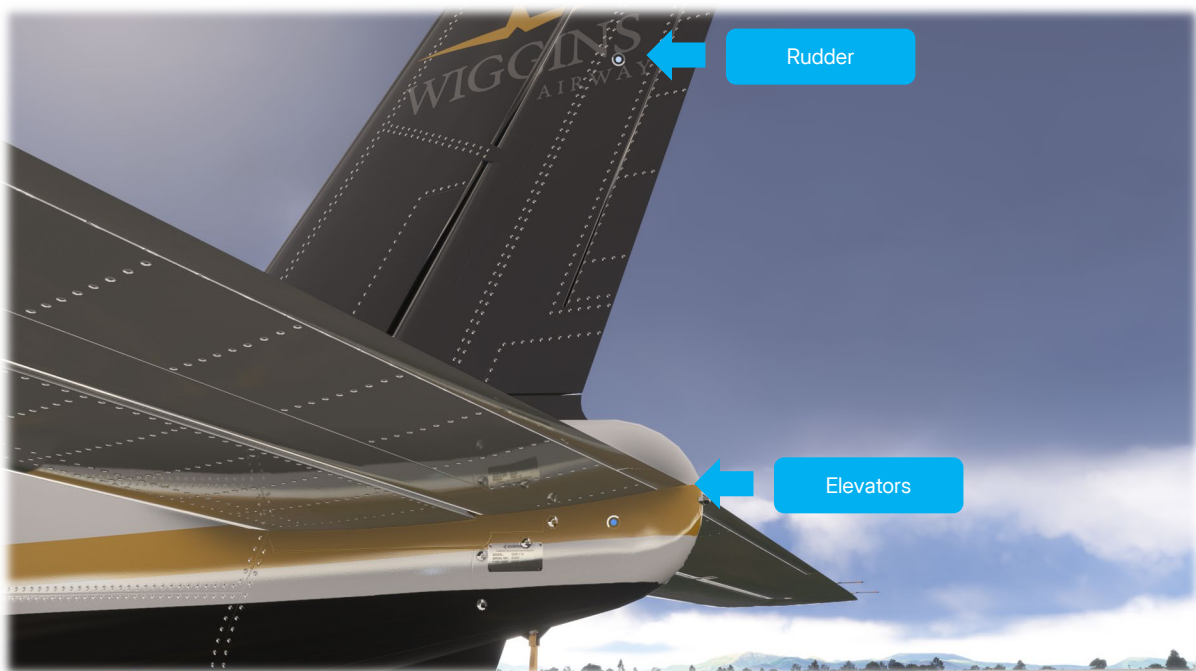
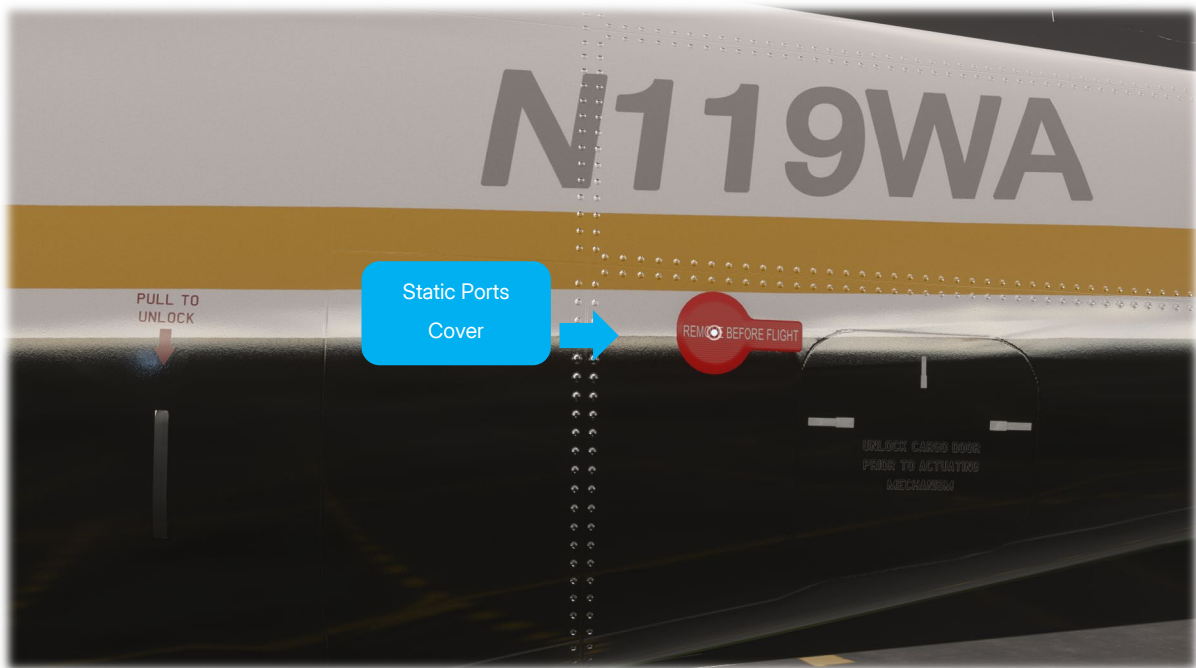
Each door can also be opened or closed when the sim is in avatar mode (preflight checks), by clicking on the respective handle. The EMB-110P counts with just one openable main entry door located at the rear-left side, while the EMB-110P1 and EMB-110P2 variants count with two openable doors located at the left side of the airplane: one main entry door in the front-left side, plus a cargo door (110P1) or a rear passenger entry door (110P2) on the rear-left side. Additionally, the aircraft features emergency exits over the wings, and a front emergency exit on the front-right side (110P1 & 110P2), which are not simulated in this product.

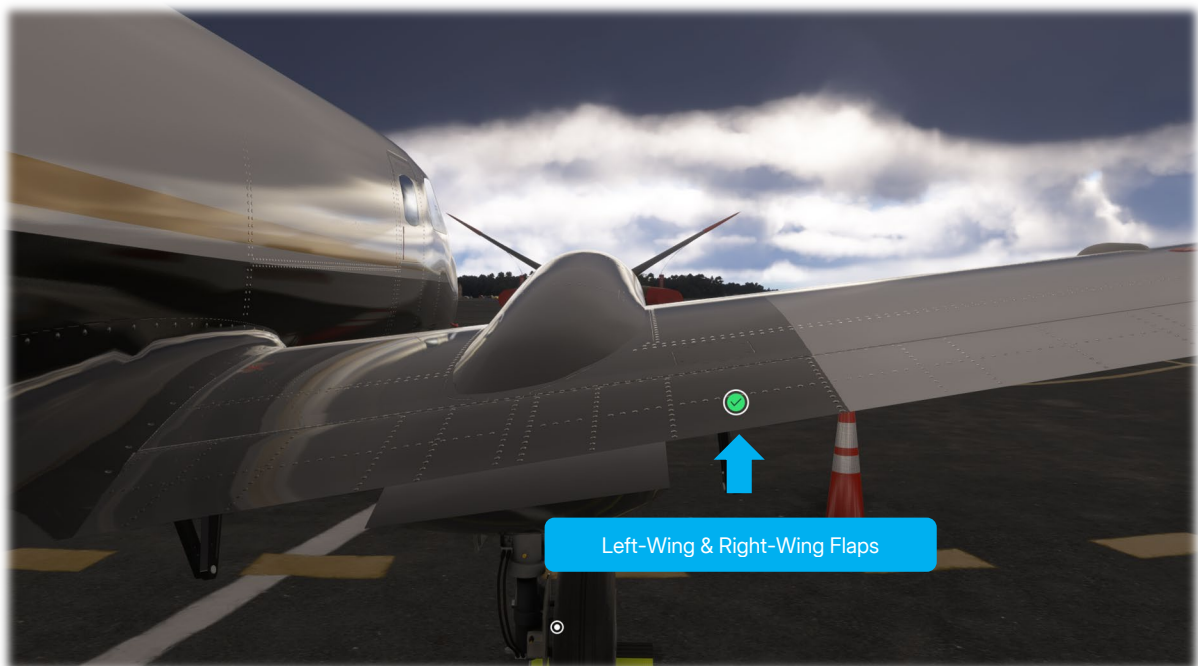
All doors can be opened or closed from either the preflight (walkaround) mode, or the EFB. For more information, please review the EFB section of this document.

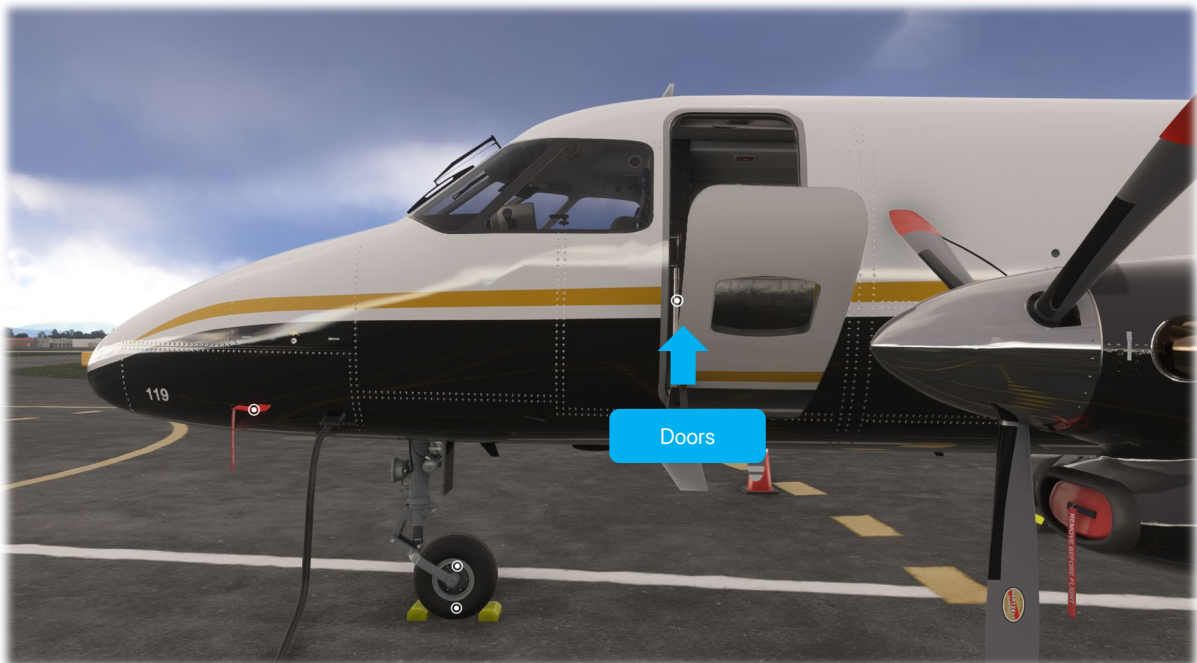
Following are the preflight inspection points to where you should check before getting inside the aircraft, every time you start your flight with the aircraft parked on the apron.











Flight Instruments

Main Instrument Panel

Pilot & Copilot Instruments



1. Battery Temperature Panel
2. EFB Tablet Access Panel
3. Fire Horn Cutout Panel
4. Air Speed Indicator (ASI)
5. Radio Magnetic Indicator (RMI)
6. Turn & Slip Coordinator
7. Autopilot Annunciator Panel
8. Attitude Direction Indicator (ADI)
9. Horizontal Situation Indicator (HSI)
10. Clock
11. Altimeter
12. Vertical Speed Indicator (VSI)
13. Radio Altimeter
14. Emergency Lights Panel (Pilot Side Only)
15. Aircraft's Tail Registration Placard
16. Stall Warning Gauge
17. Operating Limitations Placards



Battery Temperature Panel

The Battery Temperature Panel, installed at the left of the pilot's position, provides control of the aircraft's battery temperature. This panel consists of:

- A temperature scale on the right side with a needle moving along the scale, representing the current aircraft's battery temperature readout, graduated in Fahrenheit degrees.
- A warning light and a test pushbutton on the left. The warning light illuminates either when the TEST button is pressed, or when the battery temperature exceeds 150°F.



EFB Tablet Access Panel

The EFB Tablet Access Panel, installed at the pilot's position above the Stall Warning gauge, contains a button which allows you to show/hide the NextGen's own EFB tablet equipped with the aircraft. More details in the respective section of this document.



Fire Horn Cutout Panel

The Fire Horn Cutout Panel, installed at the pilot's position to the left of the Airspeed Indicator (ASI), contains a button which allows you to mute the fire alarm sound should the aircraft detect fire on either of its engines. This only works when the simulation detects fire, it does not take effect when testing the fire system.



Air Speed Indicator (ASI)

The Air Speed Indicator (ASI) displays information about the current Indicated Air Speed (IAS). This gauge consists of:

- A scale which ranges from 40 to 300 knots.
- Red markers at 85 knots (V_{MU}) and 230 knots (V_{MO}).
- A green arc marker ranging from 90 to 230 knots, marking the operating air speed regime for this aircraft in a clean configuration (no flaps nor gear extended).
- A white arc marker ranging from 70 to 150 knots, marking the operating air speed regime for this aircraft when the flaps and/or landing gear are extended.
- A needle indicating the current Indicated Air Speed (IAS) reading.
- A U/C (undercarriage) flag which displays only if the aircraft flies below 120 knots and the landing gear is not down and locked.



Radio Magnetic Indicator (RMI)

The Radio Magnetic Indicator (RMI) is a combination of magnetic compass and VOR/ADF indicators into one single instrument, which displays the current aircraft heading and magnetic headings to either VOR or ADF stations. This instrument consists of:

- A compass card, plus 8 small triangles at the outer radius of the card, each separated every 45 degrees, starting from the North.
- Two different bearing pointers, one green and one yellow. The green pointer points in the direction of the VOR/ADF station beacon tuned into channel/index 1. The yellow pointer points in the direction of the VOR/ADF station beacon tuned into channel/index 2.
- A pair of flags on each side of the instrument, one for each respective pointer. This switches between VOR and ADF bearing mode.
- An orange lubber at the top, indicating the current aircraft's magnetic heading.
- A pair of pushbuttons, one on each side, to switch between VOR and ADF bearing mode for the respective pointer. The left pushbutton serves the green pointer. The right pushbutton serves the yellow pointer.
- A red flag which is visible only when either the aircraft's electric system is turned off or when there is a reading error/failure with the instrument.



Turn & Slip Coordinator

The Turn & Slip Coordinator gauge is powered by a gyroscope and shows how fast the aircraft is changing heading. This gauge consists of:

- A turn indicator needle which displays the rate of turn that the aircraft exhibits.
- An inclinometer, in the form of a ball inside a liquid-filled tube, representing the quality of the turn, indicating if it is coordinated, slipping or skidding. This inclinometer uses gravity and centrifugal force to show the balance between the two.

Autopilot Annunciator Panel



The Autopilot Annunciator Panel, installed at the top of the Attitude Direction Indicator (ADI), provides the pilot with continuous information on the autopilot system operating status. It displays modes in operation, as well as armed modes. It also displays Marker Beacon lights and a Trim Fault warning. Following are the indicators displayed in this panel.

FLT DIR	Flight director is ON.
HDG SEL	Selected heading command.
ALT HOLD	Selected altitude hold command.
AUTOPILOT	Autopilot Master is ON.
NAV	Navigation mode is selected.
ARM	Visible when either the approach mode or the navigation mode is selected but not yet captured.
ALT ARM	Selected altitude armed.
GO AROUND	TO/GA mode commanded from the pushbutton of the left power lever.
APPR	Approach mode is selected.
CPLD	Coupled navigation/approach mode.
GS CPLD	Coupled glideslope.
BACK CRS	Back-course mode selected.
A	Inner marker.
O	Outer marker.
M	Middle marker.
TRIM	Trim fault warning.

Attitude Direction Indicator (ADI)

The Attitude Direction Indicator (ADI) informs the pilot of the aircraft orientation with respect to the Earth's horizon and gives immediate indication of the smallest orientation change. This instrument consists of:

- A horizon ball, divided into two colors: blue to represent the sky and brown to represent the ground. This ball moves with the gyroscope gimbal to represent the aircraft's pitch and bank angles. Both angles are expressed in degrees. A reference line in the middle of each half indicates the degree of pitch (up or down) and bank (left or right), relative to the horizon.
- A bank index at the top displays the aircraft's bank angle.
- A delta-wing-shaped, symbolic miniature aircraft mounted to make it appear flying relative to the horizon.
- A pair of V-steering bars, representing the Flight Director, which provides information about the desired flight path, sourced from data on the Autopilot and Navigation systems.
- A Course Deviation Indicator (CDI), consisting of a lateral deviation scale and green pointer, which determines the aircraft's lateral position in relation to a course to or from a radio navigation beacon, or to or from a GPS waypoint (if the GPS governs the CDI, normally when a flight plan is loaded). A LOC OFF flag shows when the LOC or GPS data is invalid.
- A Glide Slope Indicator (GSI), consisting of a vertical deviation scale and green pointer, which determines the aircraft's vertical position in relation to the ILS's glideslope signal, which commands the vertical guidance. A GS OFF flag shows when the GS data is invalid.
- Two annunciators, one for the Decision Height (DH) when the aircraft is within the decision height to start a go-around maneuver, and one for the RNAV (Area Navigation) status, which illuminates when the aircraft's Autopilot Master is ON, the Navigation mode is set to ON and there is a GPS flight plan being followed.
- A test pushbutton that serves the purpose of testing the ADI.
- A small inclinometer like the one from the Turn & Slip Indicator, representing the quality of the aircraft's turn.
- Red flags that appear when either the aircraft's electric system is turned off, or when the attitude data is invalid.





Horizontal Situation Indicator (HSI)

The Horizontal Situation Indicator (HSI), installed below the Attitude Direction Indicator (ADI), provides not only the current aircraft's heading, but also provides information about VOR, ILS and DME systems. This instrument consists of:

- A full 360° compass card, rotating around the center aircraft symbol on the instrument's glass.
- A white lubber line, representing the current aircraft's heading.
- A lime-colored, single-arrow course pointer with a lateral deviation scale

rotating with the compass card around the aircraft symbol. The pointer represents the selected navigation course and features a lateral deviation bar in the middle, which moves left and right of the aircraft symbol to indicate the relative lateral deviation from the selected/desired course.

- A green, chevron-like bearing pointer, receiving data from the VOR or ADF bearing source, depending on which is selected.
- A dark-green-colored VOR or ADF bearing flag, located at the right side above the Heading selection knob, showing which is selected.
- An orange heading bug, rotating with the compass card around the aircraft symbol, displaying the selected heading in the Autopilot system.
- A vertical deviation scale and pointer, representing the relative vertical deviation from the ILS's glideslope signal.
- A GS OFF flag showing either when the aircraft's electric system is off, or when the data is invalid.
- A red flag showing either when the aircraft's electric system is off, or when the data is invalid.
- A pair of knobs on the instrument's bezel. One for the selected navigation course, represented by a lime-colored, single-pointer arrow, and one for the selected heading in the Autopilot system, represented by the same orange pointer in the physical compass card. Rotate the knob to, respectively, select the desired course or heading.
- A bearing selection knob, behind the heading selection knob, with two positions to select the desired bearing mode.
- A rectangular, orange-red-colored display, providing information on distance to go, ground speed, time to station (or ETE to the current waypoint in the GPS flight plan) and a TO-FROM course arrow indication.



Clock

The clock displays the actual simulation time. It can be either the local time or the UTC time, depending on the chosen mode from the product's EFB settings.

Altimeter

The altimeter provides information on the current aircraft's altitude, which is determined based on the measurement of the atmospheric pressure. This instrument consists of:



- A 100-foot scale, and a pointer moving around the center of the scale.
- A window with the current altitude reading from the position of the moving stripes inside it.
- Three moving stripes for the altitude readout (from right to left): one for hundreds of altitude units, one for the thousands of altitude units, and one for the ten-thousands of altitude units. The latter contains a NEG flag, showing only when the aircraft's barometric altitude is below zero. The stripes range from 0 to 80,000 feet in the positive altitude scale, and 0 to 9,900 feet in the negative scale. The left stripe displays a zebra-like pattern when the aircraft is between 0 and 9,999 feet of altitude.

- Two windows for barometric setting: one on the left for the current barometric setting in MB (millibars) or hPa (hectopascals), and one on the right for the barometric setting in inHg (inches of Mercury), with their respective digit stripes.
- A barometric setting adjustment knob on the bezel.
- An ALT light illuminated when the aircraft is closer to the selected altitude in the Autopilot system.
- A red-and-white-colored, zebra-like flag showing either when the aircraft's electric system is off or when the altitude data is invalid.

Vertical Speed Indicator (VSI)

The Vertical Speed Indicator (VSI) provides information about the current aircraft's rate of climb (or descent), and the selected climb/descent rate from the Autopilot system. The display consists of:

- A scale from 0 to 6,000 ft/min, positive and negative, and a pointer moving around the center of the scale, representing the current aircraft's rate of climb/descent.
- A magenta bug rotating around the center, showing the selected rate of climb/descent.



Radio Altimeter

The Radio Altimeter gauge measures the altitude above the terrain presently beneath the aircraft. This gauge consists of:

- A non-linear scale in hundreds of feet, ranging from 0 to 2,000 feet.
- A yellow-colored, triangle-shaped bug rotating around the gauge's scale, displaying the selected Decision Height (DH).
- A DH light illuminated when the aircraft is descending and below DH, allowing the pilot to decide whether the aircraft should execute a go-around maneuver or should continue the landing, based on environmental (weather) conditions.
- A test pushbutton to test the gauge.



Emergency Lights Panel (Pilot Side)

The Emergency Lights Panel, installed below the pilot's Radio Altimeter, contains a three-position switch (ARM, OFF, ON/TEST) and an indicator light which illuminates when the emergency lights switch is in the ON/TEST position.

Placards

The main instrument panel features two aircraft tail registration placards, one for each pilot, as well as a set of three operating limitations placards, following the specifications given in the aircraft's POH.



Stall Warning Gauge

The Stall Warning gauge is a small instrument which senses the aircraft's angle of attack, with the help of the stall detector vanes located on each side of the wings, providing the pilot with information on whether the aircraft is within a stall condition or not. When the aircraft stalls, a red light illuminates, followed by an aural beep coming from the gauge's speaker.

Engines & Avionics Instruments



1. BETA Annunciators
2. Automatic Feathering System (Autofeather) Panel
3. Inter-Turbine Temperature Indicators (T_5)
4. Torque Indicators
5. Propeller Tachometers (N_H) & Gas Generator Tachometers (N_G)
6. Engine Oil Temperature Indicators
7. Engine Oil Pressure Indicator
8. Engine Inlet Temperature Indicator (T_2)
9. Propeller Sync System Panel
10. GMA350 Audio Panel
11. Working Title GNS530W/430W / PMS50 GTN750/650 / TDS Sim GTN 750/650 Xi / Falcon71 KLN90B + Dual KX165A COM/NAV Units
12. Dual KR87 ADF Tuners
13. GTX330ES Transponder Unit
14. Cockpit Voice Recorder (CVR) Panel (not simulated here)
15. RDR2000 Weather Radar
16. Fuel System Panel
17. Emergency Locator Transmitter (ELT) Panel
18. Cargo Smoke Detector System Panel (not simulated here)
19. Multiple Alarm Panel
20. Hot Mic & DME Volume Panel (not simulated here)

BETA Annunciators



The BETA annunciators illuminate when the respective engine's propeller pitch is 2 degrees below primary low pitch level, with the power lever below MIN.

Automatic Feathering System (Autofeather) Panel



The Autofeather panel controls the automatic feathering system of the aircraft. This panel consists of a three-position switch (SET-OFF-TEST), and two indicator lights, one for each engine.

- When the switch is in the OFF position, the automatic feathering system is de-energized.
- When the switch is in the (momentary) TEST position, this performs an operational check-out of the system by simulating feathering conditions as if the system were set, without having to take the power lever to 90% of power.
- When the switch is in the SET position, it arms the system, but the system will only be fully set when both power levers are advanced over 90% N_g . In this condition, the system will be ready for immediate action in case of failure of one engine during take-off or go around.



Engine Inter-Turbine Temperature (T_5) Indicators

The two indicators provide indication on engine temperature, graduated in Celsius degrees ($^{\circ}\text{C}$).



Engine Torque Indicators

The two indicators provide indication on the torque produced by the power turbine on each engine, graduated in foot-pounds (ft.lb).



Engine Propeller Tacho-Generators (N_h) & Gas Tacho-Generators (N_g)

Each engine is provided with two tachometers, one for the propeller speed and one for the gas generator (compressor shaft) speed. The N_h tachometers indicate the respective propeller's speed graduated in percents of its maximum speed, with 100% on the instrument representing 33,000 RPM of the free turbine and corresponding to 2,200 RPM of the propeller. The N_g tachometers are graduated in percents of the compressor shaft's maximum speed, with 100% on the instrument representing 37,500 RPM of the compressor. Both tachometers incorporate a small decimal scale, whose pointer allows for precise percentage reading.



Engine Oil Temperature Indicators

The two indicators provide indication of the respective engine's oil temperature sensor located at the accessories gear box of the engine. These indicators are graduated in Celsius degrees ($^{\circ}\text{C}$).



Engine Oil Pressure Indicator

This dual indicator provides indication of the engines' oil pressure. This indicator is graduated in pounds per square inch (psi).

Engine Inlet Temperature Indicator (T₂)

This indicator provides indication of the compressor inlet temperature of the right engine, graduated in Celsius degrees (°C). This temperature is a measurement of the outside air temperature.



Propeller Sync System Panel

This panel controls the aircraft's propeller synchronizing system. The panel features an ON-OFF switch, and an indicator light.

- When the switch is in the OFF position, the system is de-energized, and the indicator light goes off.

- When the switch is in the ON position, the system energizes the electronic synchronizer that equalizes the right engine speed with that of the left engine.

During take-off and landing, this system must be OFF.

GMA350 Audio Panel

This product features a simulation of the GMA350 Audio Panel, as part of the modern avionics upgrades featured in this EMB-110 simulation. There are some buttons and/or knobs that are not simulated in this unit, due to limitations with the simulator. The table below the figure shows an explanation on what the function of each button and knob is from this Audio Panel unit.



Controls

MKR/MUTE

Selects marker beacon receiver audio. Mutes the currently received marker beacon receiver audio. Deactivates automatically and marker beacon audio

	is heard when the next marker beacon signal is received. Also, stops play of recorded COM audio.
COM1	When selected, audio from the #1 COM receiver can be heard. Press and hold to enable/disable monitored COM muting during primary COM reception.
COM2	When selected, audio from the #2 COM receiver can be heard. Press and hold to enable/disable monitored COM muting during primary COM reception.
NAV1	When selected, audio from the #1 NAV receiver can be heard.
NAV2	When selected, audio from the #2 NAV receiver can be heard.
MUSIC/PHONE PUSHBUTTON	Not emulated here.
MUS1	Selects and deselects music entertainment audio. Press and hold to enable/disable MUS1 muting during reception.
MUS2	Selects and deselects music entertainment audio. Press and hold to enable/disable MUS2 muting during reception.
MAN SQ	Manual Squelch annunciator. When lit, squelch is controlled manually.
VOLUME INDICATOR	Indicates volume/squelch setting relative to full scale.
MIC1	Selects the #1 transmitter for transmitting. COM1 receive is simultaneously selected when this key is pressed allowing received audio from the #1 COM receiver to be heard. COM2 receive can be added by pressing the COM2 Key. Selection of a second MIC button initiates Split-COM mode. When in Split-COM mode, the pilot is using COM1, the copilot is using the COM2.
MIC2	Selects the #2 transmitter for transmitting. COM2 receive is simultaneously selected when this key is pressed allowing received audio from the #2 COM receiver to be heard. COM1 receive can be added by pressing the COM1 Key. Selection of a second MIC button initiates Split-COM mode. When in Split-COM mode, the pilot is using COM1, the copilot is using the COM2.
PLAY	Not emulated here.
AUX	When selected, audio from the AUX inputs can be heard.
PILOT	Controls the pilot intercom system. Press and hold to toggle 3D Audio on/off for all headset positions.

COPLT	Controls the copilot intercom system. Press and hold to toggle copilot configuration between crew and passenger.
PASS	Controls the passenger intercom system. Press and hold to enable/disable passenger muting during reception.
SPKR	Selects and deselects the cabin speaker. COM, NAV, AUX, and MKR receiver audio can be heard on the speaker. Press and hold for 2 seconds for Passenger Address (PA). The SPKR key flashes during PA.
Cursor (CRSR) Control Knob	Turn to move the cursor (flashing white or blue annunciator) to the desired source.
Volume (VOL) Knob	Turn the smaller knob to control volume or squelch of the audio panel.

GNS 530W/430W

Developed by **Working Title Simulations** and included with the Microsoft Flight Simulator 2024's core packages, the GNS 530W/430W dual units can be enabled from the EFB, by selecting the *WT GNS530W/430W* option from the *Selected GPS Model* combo box in the Aircraft Settings.

The GNS 530W/430W is the most popular GPS option often found on small General Aviation aircraft. However, it is also retrofitted on some real-life EMB-110s to this day, allowing a significant navigation capabilities upgrade.

The GPS's autopilot coupling will be enabled when the CDI pushbutton is pressed, and the 'GPS' legend is read above the aforementioned pushbutton. Distance and course information will also be sent only to the pilot's HSI, unless the option to *Allow governing of the CDI/GSI on the Copilot's HSI* is enabled from the EFB. Additionally, the flight plan built from either the sim's World Map interface or the simulator's built-in EFB (after pressing the Send to Avionics button there) will be automatically imported.

Please read the documentation on the GNS530W/430W units from the [Working Title Simulations website](#), should you need more information about how to effectively operate both GPS units.

Following is a visual representation of both units, as well as a table with an explanation of the distinct controls both units feature.



Controls

COM Flip-Flop Pushbutton

Swaps the active and standby COM frequencies. Press and hold to select emergency channel (121.500 MHz).

COM Power/Volume Knob

Controls unit power and communications radio volume. Press momentarily to disable automatic squelch control.

VLOC Flip-Flop Pushbutton	Used to swap the active and standby VLOC frequencies (i.e., make the selected stand-by frequency active).
VLOC Volume Knob	Controls audio volume for the selected VOR/Localizer frequency. Press momentarily to enable/disable the ident tone.
Small & Large COM/VLOC Knobs	The small knob is used to tune the kilohertz (kHz) value of the standby frequency for the communications transceiver (COM) or the VLOC receiver, whichever is currently selected by the tuning cursor. Press this knob momentarily to toggle the tuning cursor between the COM and VLOC frequency fields. The large knob is used to tune the megahertz (MHz) value of the standby frequency for the communications transceiver (COM) or the VLOC receiver, whichever is currently selected by the tuning cursor.
Range (RNG) Keys	Allow the pilot to select the desired map range. Use the up arrow to zoom out to a larger area, or the down arrow to zoom in to a smaller area.
Direct-To Pushbutton	Provides access to the direct-to function, which allows the pilot to enter a destination waypoint and establishes a direct course to the selected destination.
MENU Key	Displays a context-sensitive list of options. This options list allows the pilot to access additional features or make settings changes which relate to the currently displayed page.
CLR Key	Used to erase information, remove map detail, or to cancel an entry. Press and hold the CLR key to immediately display the Default NAV Page.
ENT Key	Used to approve an operation or complete data entry. It is also used to confirm information during power on.
Small & Large CRSR Knobs	The small knob is used to select pages within one of the page groups. Press this knob momentarily to display the on-screen cursor. The cursor allows the pilot to enter data and/or select from a list of options. When entering data, the small right knob is used to select the desired letter or number, and the large right knob is used to move to the next character space. The small right knob is also used to move the target pointer up (turn clockwise) or down (counterclockwise) when the map panning function is active. The large knob is used to select page groups: NAV, WPT, AUX, or NRST. With the on-screen cursor enabled, the large right knob allows the pilot to move the cursor about the page. The large right knob is also used to move the target pointer right (turn clockwise) or left (counterclockwise) when the map panning function is active.
CDI Key	Used to toggle which navigation source (GPS or VLOC) provides output to an external HSI or CDI.

OBS Key	Used to select manual or automatic sequencing of waypoints. Pressing the OBS Key selects OBS mode, which retains the current 'active to' waypoint as the navigation reference even after passing the waypoint (i.e., prevents sequencing to the next waypoint). Pressing the OBS Key again returns the unit to normal operation, with automatic sequencing of waypoints. When OBS mode is selected, the pilot may set the desired course to/from a waypoint using the Select OBS Course pop-up window, or an external OBS selector on the HSI or CDI.
MSG Key	Used to view system messages and to alert the pilot to important warnings and requirements.
FPL Key	Allows the pilot to create, edit, activate, and invert flight plans, as well as access approaches, departures, and arrivals. The closest point to flight plan feature is also available from the FPL Key.
PROC Key	Allow the pilot to select and remove approaches, departures, and arrivals from the flight plan. When using a flight plan, available procedures for the departure and/or arrival airport are offered automatically. Otherwise, the pilot may select the desired airport, then the desired procedure.
VNAV Key (GNS 530W only)	Allows the pilot to create a three-dimensional profile which provides guidance to a final (target) altitude at a specified location.

GTN 750/650

Developed by **PMS50**, the GTN 750/650 dual units can be enabled from the EFB, by selecting the *PMS50 GTN750/650* option from the *Selected GPS Model* combo box in the Aircraft Settings.

In addition to the GNS530W/430W, the GTN 750/650 is the most popular GPS option often found on small General Aviation aircraft. However, it is also retrofitted on some real-life EMB-110s to this day, allowing a significant navigation capabilities upgrade.

In the same way as the GNS530W/430W, the GPS's autopilot coupling will be enabled when the CDI pushbutton is pressed from the touchscreen, and the 'GPS' legend is read at the bottom of the GTN screen. Distance and course information will also be sent only to the pilot's HSI, unless the option to *Allow governing of the CDI/GSI on the Copilot's HSI* is enabled from the EFB. Additionally, the flight plan built from either the sim's World Map interface or the simulator's built-in EFB (after pressing the Send to Avionics button there) will be automatically imported.

For PC users, the PMS50 GTN750 add-on can be downloaded from [the PMS50 website](#). For users of Xbox and PS5 (once available), the PMS50 GTN750 can be found on the sim's in-game Marketplace. Please read the documentation on the PMS50 GTN750/650 units from [the PMS50 website](#), should you need more information about how to effectively operate both GPS units. Additionally, the free version

contains an extremely limited number of features, in which case you should have a Premium license of this GPS add-on. For more information on those features and the Premium license, please visit [the PMS50 website](#).

Following is a visual representation of both units, as well as a table with an explanation of the distinct physical knobs and pushbuttons that both units feature.



Common controls between both units	
COM Volume/Push Squelch Knob	Controls communications radio volume. Press momentarily to disable automatic squelch control.
HOME Pushbutton	Press to go to the main menu. Press and hold for 3 seconds to go to the World Map.
Direct-To Pushbutton	Provides access to the direct-to function, which allows the pilot to enter a destination waypoint and establishes a direct course to the selected destination.
Small & Large Knobs	The small knob is used to tune the kilohertz (kHz) value of the standby frequency for the communications transceiver (COM) or the VLOC receiver, whichever is currently selected by the on-screen cursor. Pressing the small knob activates the on-screen cursor to switch between COM or VLOC tuning mode, long pressing the knob swaps either the COM or NAV active/standby frequencies. The large knob is used to tune the megahertz (MHz) value of the standby frequency for the communications transceiver (COM) or the VLOC receiver, whichever is currently selected by the on-screen cursor.
Touch Screen	This is the main screen area to operate the GTN unit.
GTN750 Screen Controls	
Active COM1 Frequency	Displays the tuned value of the active frequency for the communications transceiver (COM1).
Standby COM1 Frequency	Displays the tuned value of the standby frequency for the communications transceiver (COM1).
Audio Settings	Controls the audio panel through the buttons on the screen.
Transponder (XPDR) Settings	Controls the main transponder state (ON/STBY/ALT/OFF) and the squawk given by the ATC.
Active NAV1 Frequency	Displays the tuned value of the active frequency for the navigation (VOR/LOC NAV1) receiver.
Standby NAV1 Frequency	Displays the tuned value of the standby frequency for the navigation (VOR/LOC NAV1) receiver.
CDI Mode & Knobs Hint	Provides information on the navigation source (GPS or VLOC) output to an external HSI or CDI. The hint is used to bring information on how to operate the bottom-right knobs.

GTN650 Screen Controls	
Active COM2/NAV2 Frequency	Displays the tuned value of the active frequency for the communications transceiver (COM2) or the VLOC receiver (NAV2).
Standby COM2/NAV2 Frequency	Displays the tuned value of the standby frequency for the communications transceiver (COM2) or the VLOC receiver (NAV2).
Transponder (XPDR) Settings	Controls the main transponder state (ON/STBY/ALT/OFF) and the squawk given by the ATC.
CDI Mode & Knobs Hint	Provides information on the navigation source (GPS or VLOC) output to an external HSI or CDI. The hint is used to bring information on how to operate the bottom-right knobs.
Up/Down Touch Buttons	Used to scroll the working area up or down, depending on the content displayed.

GTN 750/650 Xi (PC Users Only)

Developed by **TDS Sim Software**, the GTN 750/650 Xi dual units can be enabled from the EFB, by selecting the *TDS GTNXI 750/650* option from the *Selected GPS Model* combo box in the Aircraft Settings.

In the same way as the GTN750/650, the GTN 750/650 Xi is the most popular GPS option often found on small General Aviation aircraft. However, it is also retrofitted on this EMB-110 simulation, offering more functions than the standard GTN.

The GPS's autopilot coupling will be enabled when the CDI pushbutton is pressed from the touchscreen, and the 'GPS' legend is read at the bottom of the GTN screen. Distance and course information will also be sent only to the pilot's HSI, unless the option to *Allow governing of the CDI/GSI on the Copilot's HSI* is enabled from the EFB.

Please take note that this GPS option is available exclusively to PC users because the TDS GTNXI add-on heavily relies on the Garmin's Aviation Trainer for Windows, which is one of the main dependencies of the aforementioned third-party GPS add-on, and as such it runs on Windows as an external program in the background and which communicates with the sim. This is the main reason this unit is not selectable on the console version of this product. Please read the documentation on the GTN Xi units from [the TDS Sim Software website](#), should you need more information about how to effectively operate both GPS units.

Following is a visual representation of both units, as well as a table with an explanation of the distinct controls both units feature.



Common controls between both units

COM Volume/Push Squelch Knob

Controls communications radio volume. Press momentarily to disable automatic squelch control.

HOME Pushbutton	Press to go to the main menu. Press and hold for 3 seconds to go to the World Map.
Direct-To Pushbutton	Provides access to the direct-to function, which allows the pilot to enter a destination waypoint and establishes a direct course to the selected destination.
Small & Large Knobs	The small knob is used to tune the kilohertz (kHz) value of the standby frequency for the communications transceiver (COM) or the VLOC receiver, whichever is currently selected by the on-screen cursor. Pressing the small knob activates the on-screen cursor to switch between COM or VLOC tuning mode, long pressing the knob swaps either the COM or NAV active/standby frequencies. The large knob is used to tune the megahertz (MHz) value of the standby frequency for the communications transceiver (COM) or the VLOC receiver, whichever is currently selected by the on-screen cursor.
Touch Screen	This is the main screen area to operate the GTN unit.
GTN750 Xi Screen Controls	
Active COM1 Frequency	Displays the tuned value of the active frequency for the communications transceiver (COM1).
Standby COM1 Frequency	Displays the tuned value of the standby frequency for the communications transceiver (COM1).
Audio Settings	Controls the audio panel through the buttons on the screen.
Transponder (XPDR) Settings	Controls the main transponder state (ON/STBY/ALT/OFF) and the squawk given by the ATC.
Active NAV1 Frequency	Displays the tuned value of the active frequency for the navigation (VOR/LOC NAV1) receiver.
Standby NAV1 Frequency	Displays the tuned value of the standby frequency for the navigation (VOR/LOC NAV1) receiver.
CDI Mode & Knobs Hint	Provides information on the navigation source (GPS or VLOC) output to an external HSI or CDI. The hint is used to bring information on how to operate the bottom-right knobs.
GTN650 Xi Screen Controls	
Active COM2/NAV2 Frequency	Displays the tuned value of the active frequency for the communications transceiver (COM2) or the VLOC receiver (NAV2).
Standby COM2/NAV2 Frequency	Displays the tuned value of the standby frequency for the communications transceiver (COM2) or the VLOC receiver (NAV2).

Transponder (XPDR) Settings	Controls the main transponder state (ON/STBY/ALT/OFF) and the squawk given by the ATC.
CDI Mode & Knobs Hint	Provides information on the navigation source (GPS or VLOC) output to an external HSI or CDI. The hint is used to bring information on how to operate the bottom-right knobs.
Up/Down Touch Buttons	Used to scroll the working area up or down, depending on the content displayed.

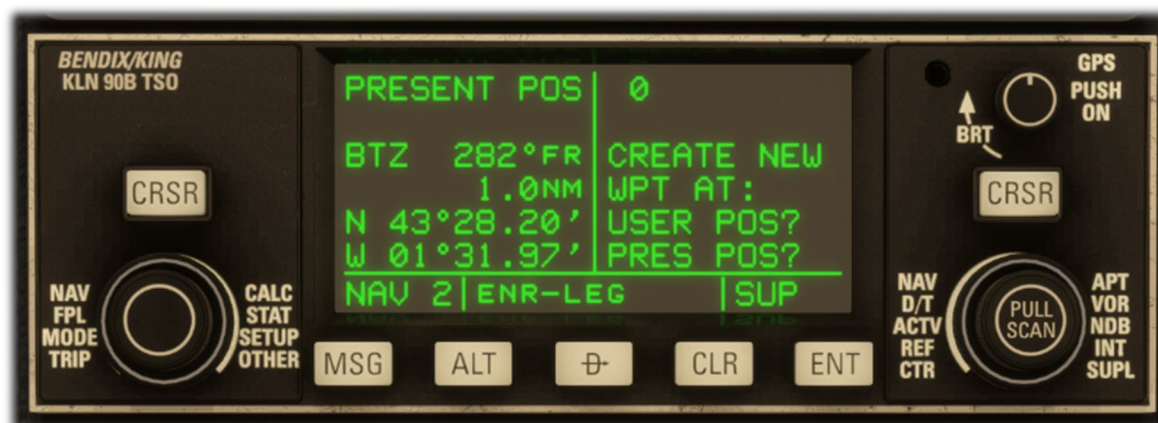
KLN90B GPS & KX165A COM/NAV Radios

Developed by **Falcon71** as an open-source package, the KLN90B can be enabled from the EFB, by selecting the *Falcon71 KLN90B* option from the *Selected GPS Model* combo box in the Aircraft Settings.

The KLN90B is a GPS unit from the early 1990's era, which, by that time when the real-life EMB-110 ceased production, brought a significant avionics upgrade to all aircraft from the 1970's, 1980's and 1990's, and allowed for more modern navigation operations so pilots did not have to rely on the conventional VOR-based navigation.

For more information on how to operate the Falcon71's KLN90B, please refer to the respective resources found on [the GitHub repository of the instrument](#), should you need more information about how to effectively operate this GPS unit. Additionally, this GPS is not included in the product for PC users, so it is required to download the separate package from the same GitHub repository link above.

Following is a visual representation of the KLN90B, as well as a table with an explanation of the distinct controls the unit features.



Controls	
CRSR (Cursor) Pushbuttons	Activates the respective cursor (left or right) to select a field. When active, turning the respective inner knob enters text or changes settings.
Power/Brightness Knob	Use this knob to turn the unit on. When the knob is pushed in, the unit is turned on, and when the knob is pulled out, the unit is turned off. Rotate the knob to adjust the screen brightness.
Dual Concentric Knobs (Left & Right)	The outer knob is used to scroll through main pages or menu fields. The inner knob is used to change values, select characters (letters/numbers), or toggle sub-pages.
MSG (Message) Pushbutton	Alerts you to system status messages, which appear on the bottom status line.
ALT (Altitude) Pushbutton	Brings up the altitude page to update the barometric pressure information.
Direct-To Pushbutton	Navigates directly to a specific waypoint. Press once, enter the identifier with the knobs, and press ENT to confirm.
CLR (Clear) Pushbutton	Deletes characters, clears messages, or removes waypoints from a flight plan.
ENT (Enter) Pushbutton	Used to confirm selections and execute actions.

Since the KLN90B does not feature COM/NAV tuning capabilities just like the more modern, third-party GPS units supported in this product, it was necessary to install a pair of COM/NAV tuners matching the KLN90B, which are the KX165A units. Following is a visual representation of the KX165A arrangement, as well as a table with an explanation of the distinct controls both units feature.



Communication (COM) Controls (Left)

Power/Volume Knob	Rotate to turn the unit on and adjust volume. Pull the knob out to disable the automatic squelch for testing or listening to weak signals.
Dual Concentric Knobs	Two concentric knobs. The outer knob adjusts the MHz frequency, and the inner knob adjusts the kHz. Pull the knob to switch COM channel spacing from 25 kHz to 8.33 kHz, and push the knob to switch back from 8.33 kHz to 25 kHz.
Frequency Transfer Pushbutton	Swaps the active and standby COMM frequencies.
Channel (CHAN) Pushbutton	Allows you to access and store up to 32 programmable pilot frequencies using the frequency select knobs.
Transmit/Receive Indicators	A lighted 'T' indicates transmission, and an 'R' shows the unit is receiving an active signal.

Navigation (NAV) Controls (Right)

Dual Concentric Knobs	The outer knob changes 1 MHz steps; the inner knob changes 50 kHz steps.
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Frequency Transfer Pushbutton	Swaps active and standby NAV frequencies. When held for two seconds, it enters Direct Tune Mode, allowing direct adjustment of the active frequency.
NAV MODE Pushbutton	Toggles the NAV display between the default Active/Standby format and various display modes including CDI, Radial, Bearing-To, and a built-in Timer.
Volume Knob	Rotate to turn the unit on and adjust volume. Pull to hear the navigation ident in Morse Code.

KR87 TSO ADF Tuners (ADF1 & ADF2)

This simulation includes two identical KR87 TSO units, distinct for tuning ADF1 and ADF2 frequencies, allowing for ADF-based navigation when required. The KR87 TSO tuner is the most common ADF tuner unit featured in General Aviation aircraft and certain turboprop aircraft from the 1970's-1990's eras.

The KR87 instrument included in this product is based on the standard instrument featured in Microsoft Flight Simulator 2024. However, it has been enhanced with more visually accurate digits, letters, colors and elements arrangement, and also includes more functions, such as the capability of tuning frequencies with decimals on certain worldwide regions. This custom implementation does not conflict with the sim's standard instrument.

Following is a visual representation of the KR87 TSO units, and an explanation of the distinct controls found, as well as a brief explanation of how to operate the units.



Controls	
Power/Volume Switch	This knob controls ON / OFF / VOL for the respective unit.
Frequency Select Knobs	The active frequency is displayed in the left side of the window, with a standby frequency displayed in the right side when FRQ is annunciated. Pull the small inner knob out to tune 1's, push in to tune 10's. The outer knob tunes the 100's and the 1000's, up to 1799. When the <i>Allow ADF tuning frequencies with decimals</i> option is toggled from the EFB's Aircraft Settings: Pull the small inner knob out to tune decimals (0.1's), push in to tune 1's. The outer knob tunes 10's when the small inner knob is pulled out, and the 100's when the small inner knob is pushed in.
ADF Key	Use the ADF mode (in position) for navigation. Use the ANT (Antenna) mode (out position) for improved audio reception. When in ANT mode, the RMI and HSI ADF bearings are positioned to 90 degrees, regardless of the correctly tuned NDB. When in ADF mode, the bearing needles point towards the NDB (if tuned correctly) or to the east (90 degrees) if the ADF frequency is out of range.
BFO Key	This is used in some countries other than the USA to allow the Morse code identifier to be heard on unmodulated stations.
FRQ Key	Pressing this button 'flip-flops' frequency displays, switching between pre-selected 'standby' and 'active' frequencies. It's also used to retrieve the 'standby' frequency in the timer modes.
FLT/ET Key	Use this button to select flight time (FLT), counted since the beginning of the flight session in the sim, or elapsed time (ET).
SET/RST Key	Use this button to start/stop/reset the Elapsed Timer.

GTX 330ES Transponder

This simulation includes a GTX330ES transponder unit. The GTX330 transponder is the most common unit installed on General Aviation aircraft, and also retrofitted on certain turboprop aircraft where an avionics upgrade is required for modern operations.

The GTX330ES instrument included in this product is based on the standard implementation included in Microsoft Flight Simulator 2024. However, it has been enhanced with more accurate visuals on digits,

letters, colors and elements arrangement, and includes the missing Flight ID page when cycling between functions. This custom implementation does not conflict with the sim's standard instrument.

Following is a visual representation of the GTX330ES unit, and an explanation of the distinct controls found, as well as an explanation of how to operate the unit.



Controls	
ON / STBY / ALT / OFF Keys	Pressing STBY, ON, or ALT keys powers on the transponder displaying the last active identification code. Pressing the ON pushbutton allows the transponder to reply to interrogations, as indicated by the Reply Symbol (R) . Replies do not include altitude information. Pressing the STBY pushbutton selects the standby mode. When in standby mode, the transponder will not reply to any interrogations. Pressing the ALT pushbutton activates the ALT mode, where the transponder replies to identification and altitude interrogations as indicated by the Reply Symbol (R) . Replies to altitude interrogations include the standard pressure altitude received from an external altitude source, which is not adjusted for barometric pressure. The ALT mode may be selected in aircraft not equipped with an optional altitude encoder; however, the reply signal will not include altitude information. Pressing the OFF pushbutton powers off the GTX 330.
Code Selection Keys	Code selection is done with eight keys (0 – 7) providing 4,096 active identification codes. Pushing one of these keys begins the code selection sequence. Digits that are not yet entered appear as dashes. The new code is activated when the fourth digit is entered. Pressing the CLR key moves the cursor back to the previous digit. Pressing the CLR key when the cursor is on the first digit of the code, or pressing the CRSR key during code entry, removes the cursor and cancels data entry, restoring the previous code. You may press the CLR key up to five seconds after code entry is complete to return the cursor to the fourth digit. The numbers 8 and 9 are not used for code entry, only for entering a Count Down time.
IDENT Key	Pressing the IDENT key activates the Special Position Identification (SPI) Pulse for 18 seconds, identifying your transponder return from others on the

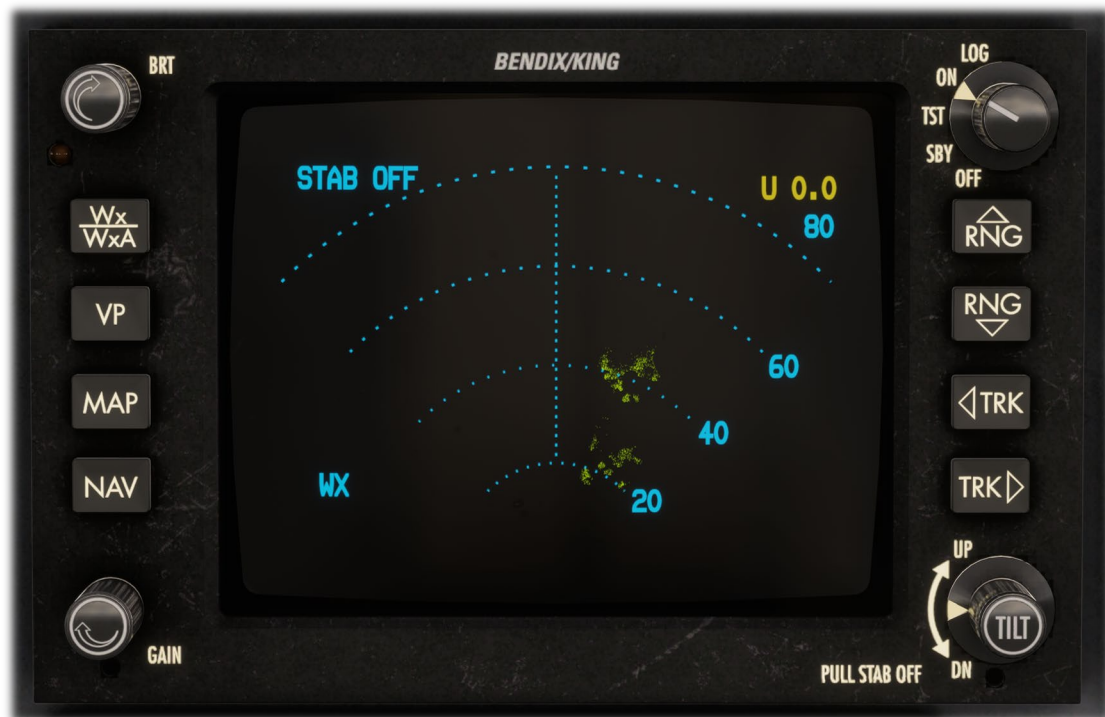
	air traffic controller's screen. The word IDENT will appear in the upper left corner of the display during this time.
VFR Key	Sets the transponder code to the pre-programmed VFR code selected during installation configuration (this is set to 1200 at the factory). Pressing the VFR key again restores the previous identification code. If the VFR Key is pressed when disabled (dependent upon installation configuration) a VFR Key Disabled message appears to indicate that no operation took place.
FUNC / START STOP / CRSR / CLR Keys	FUNC pushbutton changes the page shown on the right side of the display. Display data includes Pressure Altitude, Flight Time, Altitude Monitor, Count Up, and Count Down timers. Also displays Outside Air Temperature, Density Altitude, Contrast, Display, and ADS-B Operation (dependent upon installation configuration). START/STOP pushbutton starts and stops the Altitude Monitor, Count Up, Count Down, and Flight timers. CRSR pushbutton initiates starting time entry for the Count Down timer and cancels transponder code entry. CLR pushbutton resets the Count Up, Count Down, and Flight timers. Cancel the previous keypress during code selection and Count Down entry. Returns cursor to the fourth code digit within five seconds after entry.
FLT/ET Key	Use this button to select flight time (FLT), counted since the beginning of the flight session in the sim, or elapsed time (ET).
SET/RST Key	Use this button to start/stop/reset the Elapsed Timer.

RDR2000 Weather Radar

This EMB-110 simulation features the RDR2000 weather radar, which is the most common weather radar display found on General Aviation aircraft, and also retrofitted on certain turboprop aircraft from the 1970's-1990's eras.

The weather radar instrument was made as accurate and functional as possible, taking the simulation features from Microsoft Flight Simulator 2024 into consideration, including antenna tilt, stabilization, return colors + rain rates and scanning rate, which are all calibrated according to the real-life RDR2000 system's specifications.

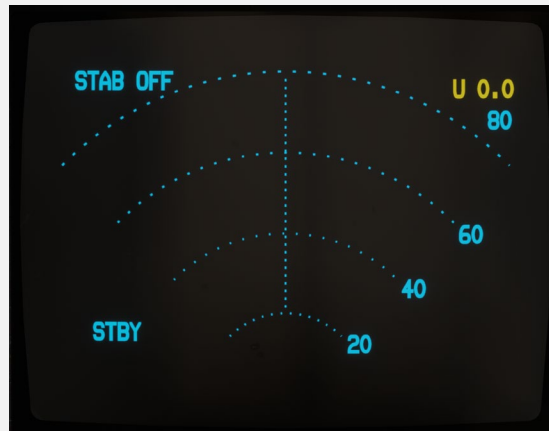
Following is a visual representation of the RDR2000 weather radar, as well as an explanation of the distinct physical controls found on this unit, and a description of how to operate the weather radar.



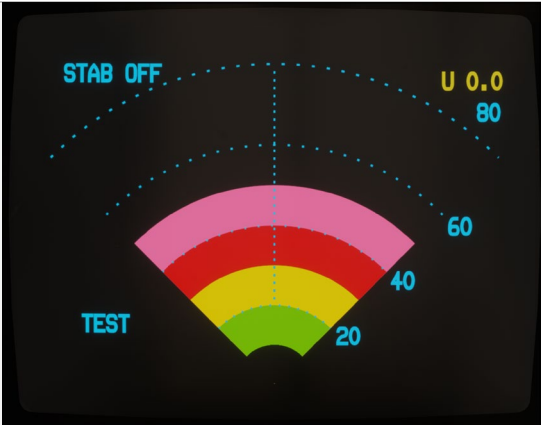
Controls

WXR Mode Knob

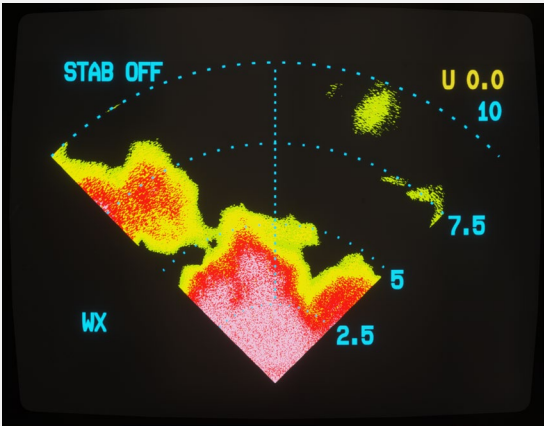
Rotating this knob makes the weather radar change its functionality mode. There are five modes: OFF (self-explanatory), STBY, TEST, ON, LOG.



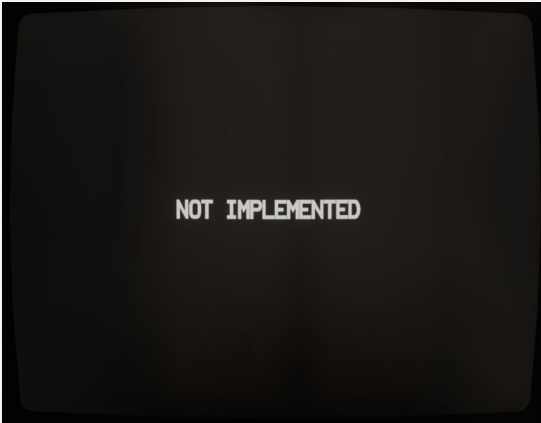
Visual representation of the STBY mode



Visual representation of the TEST mode. The test-colored arcs are dynamically resizable based on the instrument’s selected range.



Visual representation of the ON mode



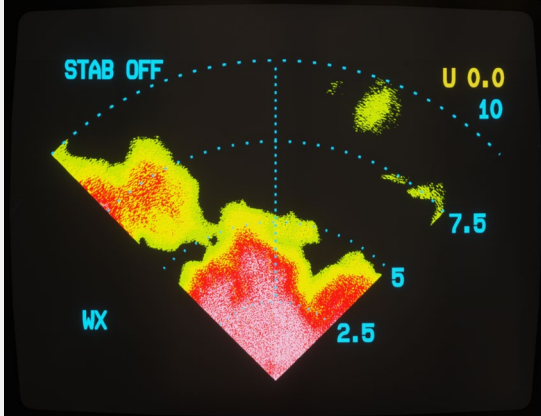
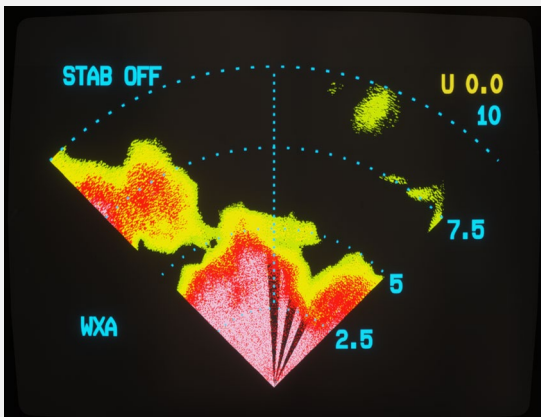
Visual representation of the LOG mode (NOT IMPLEMENTED legend)

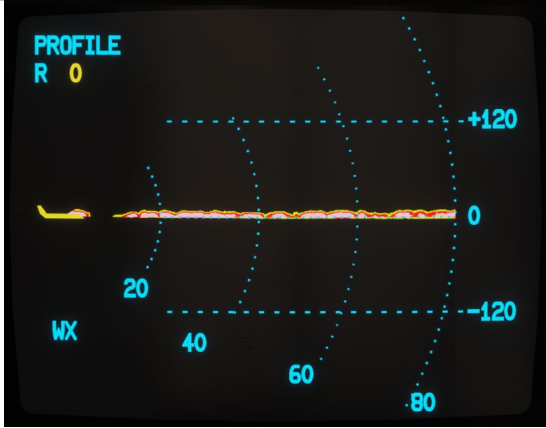
Brightness Knob

Adjust the brightness of the WXR display.

Gain Knob

Adjusts the weather radar returns gain. This adjusts the receiver’s sensitivity. More frequently used when flying through storms, to capture the severe precipitation cells. Based on how it is set, it is also reflected in the returns output.

	In the screenshot below, you can see the returns with the maximum gain on the left, and the returns with the minimum gain on the right. 
Antenna Tilt Knob	Adjusts the weather radar antenna tilt. This can be set upwards or downwards, depending on the aircraft's current altitude and climb/descend rate.
Wx/WxA Key	Partially simulated. Enables or disables the WxA (weather alert) mode. When enabled, it causes the magenta (extreme precipitation) returns to flash to black at a rate of 1 second (1 Hz). 
VP (Vertical Profile) Key	When the WXR mode is set to ON, press this button to switch between horizontal (standard) visualization or the vertical visualization.

	
MAP Mode Key	Places the WXR in ground mapping mode. Not simulated here.
NAV Mode Key	Places the unit in navigation mode, so that preprogrammed waypoints may be displayed. Not simulated here.
Range UP/DN Keys	Adjusts the weather radar range. Possible ranges are: 10, 20, 40, 80, 160 and 240 nautical miles (NM).
TRK L/R Keys	Provide a yellow track centerline for vertical profile. This function is not simulated here due to sim limitations, but you can see the current track azimuth on the WXR display, as well as on the top-left corner of the WXR display when in VP mode.
STAB OFF Legend	Tells whenever the WXR antenna stabilization is off, especially when the aircraft is not airborne.
STAB LMT Legend	Tells that the WXR's antenna stabilization is beyond the allowed limits ($\pm 30^\circ$), computed by the sum of both the aircraft's pitch and bank angles.
Screen Components	
WXR Mode Legend	Tells the current WXR mode set, based on the WX mode knob's position.
Current Antenna Tilt Angle Legend	Tells the current tilt angle of the WXR antenna. If the antenna points upwards, it will display <i>U</i> followed by the tilt angle. If the antenna points downwards, it will display <i>D</i> followed by the tilt angle.
Range Legends	There are four range legends within each return arc, starting from the range selected down to the one closest to the aircraft.
Returns Display	It displays the return of the weather depiction captured by the simulation. It displays black if there are no returns or if the WXR mode is set to STBY, as there is no radar transmission in this mode. If the WXR mode is set to TEST, it displays the multi-colored arc test patterns (green, yellow, red, magenta). When in LOG mode, no radar transmission nor display arcs will be represented, and instead there will be a NOT IMPLEMENTED legend.



Fuel System Panel

This panel takes control of everything related to the aircraft's fuel system. The panel consists of the following:

- A fuel totalizer gauge, which reads how much fuel both engines consumed (in pounds) since they were running. It accumulates with every engine startup. Additionally, it features a reset pushbutton, which resets the gauge to zero.
- Two fuel flow indicators, calibrated in pounds per hour, one for each engine.
- A fuel pressure indicator, calibrated in PSI, with two needles on the same gauge, reading the fuel pressure from the main and auxiliary pumps, as well as the engine pumps, of the respective side.
- Two switches, on each side, for the operation of the main and auxiliary pumps. Auxiliary pump switches count with 3 positions (OFF, AUTO, ON), instead of 2

positions for the main pumps (OFF, ON). The auxiliary pumps operate only if the main pumps do not supply the required minimum of 12 PSI for the fuel system to work properly.

- A bigger switch in the middle for the cross-feed system, which feeds fuel between one side and the other.
- Two fuel quantity indicators, calibrated in pounds, one on each side, which measure the quantity of fuel in the respective tank.
- Five light indicators, one in the middle and two on each side, which indicate the operation of the cross-feed valve, and the main and auxiliary pumps.



Emergency Locator Transmitter (ELT)

The Emergency Locator Transmitter (ELT) is a critical aviation safety device that automatically or manually broadcasts distress signals during a crash. Integrated into the international COSPAS-SARSAT satellite system, modern ELTs transmit a 406 MHz signal to quickly pinpoint the aircraft's location for search and rescue operations. The switch on the panel serves to enable the ELT system, which is replicated in MSFS 2024. Pressing the button and switching it to ON will cause the aural siren to play like in the real-life unit. Remember to make responsible use of this system, even in a flight simulator.



Multiple Alarm Panel

The Multiple Alarm Panel is where the relevant failure or warning indications in the aircraft are centralized. The panel features:

- A BRIGHT/DIM dimming switch on the lower-right side of the panel.
- A TEST pushbutton, used to test all indicators in the main instrument panel, not just the ones from the centralized Multiple Alarm Panel.

Below is the list of annunciators that belong to the Multiple Alarm Panel, and a brief explanation about when they respectfully get illuminated, outside of their testing condition.

L FUEL	Illuminated when the fuel pressure on the left side (engine pump and/or electric pumps) is lower than 12 PSI.
R FUEL	Illuminated when the fuel pressure on the right side (engine pump and/or electric pumps) is lower than 12 PSI.
L OIL	Illuminated when the left engine's oil pressure drops below 40 PSI or when the oil temperature exceeds 100°C.
R OIL	Illuminated when the right engine's oil pressure drops below 40 PSI or when the oil temperature exceeds 100°C.
HYD FAIL	Illuminated when the pressure of the hydraulic system pumps drops below 1000 PSI or exceeds 4000 PSI.
LND GEAR	Illuminated when the aircraft flies dangerously below 120 KIAS, with either flaps fully retracted or extended and the undercarriage (landing gear) is not down and locked.
GEN 1	Illuminated when the left engine's electric generator is not turned on or when the generator's load is insufficient to provide electricity to the main electrical bus.
GEN 2	Illuminated when the right engine's electric generator is not turned on or when the generator's load is insufficient to provide electricity to the main electrical bus.
INV 1	Illuminated when the inverter 1 is not turned on or its respective load is insufficient to provide AC electricity to the main electrical bus.
INV 2	Illuminated when the inverter 2 is not turned on or its respective load is insufficient to provide AC electricity to the main electrical bus.

26V AC	Illuminated when the electrical inverters do not provide at least 26VAC to the main electrical bus.
CB	Illuminated when any of the circuit breakers have been pulled or automatically disconnected due to failures.
OXY	Illuminated only on testing, as there is no simulation of oxygen supply.
HYD FLUID	Illuminated when the hydraulic system's reservoir capacity drops below 4 liters.
SMOKE	Illuminated only on testing, as there is no simulation of cabin smoke detection system.
DOOR	Illuminated when any of the aircraft doors are open.
MASTER	Illuminated and blinking every second, when any of the annunciation indicators previously described get illuminated.
BETA	Illuminate when the respective engine's propeller pitch is 2 degrees below primary low pitch level, with the power lever below MIN.

Lower Panel



1. Parking Brake Lever
2. Panel Dimming Knobs. From left to right: Pilot, Central, Overhead & Circuit Breakers, Copilot
3. Hydraulic Booster Pump Switch
4. Brakes Pressure Indicator
5. Hydraulic Pumps Pressure Indicator
6. Landing Gear Position Indicator & Control Switch
7. Flaps Position Indicator & Control Switch
8. Flaps Asymmetry Annunciator
9. Air Conditioning Control Panel
10. Pedal Adjustment Levers (not functional in this simulation)

Parking Brake Lever

This lever controls whether the parking brake is applied or not. Pushed in means **SET** and pulled out means **RELEASED**.



Panel Dimming Knobs

These knobs control how illuminated the panel decals on the respective side are. The pilot knob controls panel decals and illuminable flight instruments of the pilot's instrument panel, while the copilot knob controls the same but for the copilot's instrument panel. The central knob controls the panel decals from the middle of the main instrument panel, as well as the engine instruments. The OVERHEAD & CB knob controls the panel decals and illuminable gauges from both the Overhead Panel and the Circuit Breakers Panels on each side.





Hydraulic Booster Pump Switch & Indicator

This switch controls the hydraulic system's "BOOSTER" (electric) pump, whose function is to provide hydraulic power when required for maximum demand operations, especially from take-off roll to landing gear retraction (take-off), and from landing gear extension (landing) to parking (landing), where those are critical flight phases. The switch has two positions: ON and OFF. When set to ON, the booster pump is energized through the main 28 V DC bus bar. The indicator light, located above the switch, indicates whenever the booster pump is energized.

Landing Gear Position Indicator & Control Switch



The landing gear position indicator is provided with three green arrows (each associated to one of the landing gear legs), which illuminate to indicate that the corresponding leg is downlocked; a red rectangle provided in the indicator, when illuminated, indicates that the gear is in transit, or else means that at least one of the legs is neither up or downlocked. The possible set-up of these lights and what they indicate in each situation is explained as follows:

- All lights off – All three oleo struts are uplocked.
- Three green lights on – All three oleo struts are downlocked.
- Red light on and all green lights off – At least one of the legs is not uplocked and none is downlocked.
- Red light off and one or two green lights on – The oleo struts corresponding to the lights on are downlocked. The oleo struts for which the green lights did not illuminate are uplocked.

The landing gear position indicator incorporates a light dimmer, which is controlled by a two-position switch: + (bright), - (dim). Moreover, the indicator lights can be tested by pressing the switch.

The control switch, located alongside the position indicator, is a miniature wheel-shaped switch used for landing gear normal operation. When the switch is in the UP position, it sends a signal, through the main electrical bus bar, to the gear motor (solenoid) and operates the hydraulic gear actuator to retract the gear and uplock it. When the switch is in the DOWN position, it sends a signal, through the main electrical bus bar, to the gear motor (solenoid) and operates the hydraulic gear actuator to extend the gear and downlock it. The landing gear panel box also features an emergency switch; however, it does not function in this simulation.



Flaps Position Indicator & Control Switch

The flap control switch allows the flap positioning at any desired position between 0% and 100%, being provided with notches at 0%, 25%, 50%, 75% and 100%. The flap position indicator, located alongside the control switch, is an instrument graduated in percents of deflection, where 100% corresponds to a flaps' deflection of 38 degrees.

Flaps Asymmetry Indicator

This indicator illuminates when it is detected a 5° difference in deflection between the left and right flaps.

Air Conditioning Control Panel



The air conditioning system uses engine compressor hot bleed air to promote the cabin air conditioning (heating and cooling). It also features an alternate ventilation system providing outside air to the cabin interior, through a ventilation inlet located on the dorsal fin. When the alternate ventilation system is closed, the outside air is routed into the tail cone. There, an air-cycle-type refrigeration package is installed, comprising a dual heat exchanger, turbo-refrigerator, water separator, water collector, heating valve, overheat and overpressure switches, duct temperature sensor, cabin temperature sensor, manual control and other components that constitute the bleed air and distribution systems. This package receives both the hot bleed air coming from the engine compressors, as well as the outside ventilation air coming from the inlets in the structure (located in the tail, as well as the fuselage front, 110P1/P2 exclusively). The package then cools down the air from the engines and the outside air from the inlets, and routes it to the

cabin, as well as the de-icing system, when it is required (for example, for windshield de-icing and defogging).

The air conditioning system control is achieved through this control panel, with the following parts:

- The **AIR CONDITIONING MASTER SWITCH**, a three-position switch where: ON position means the refrigeration package shutoff valve will be opened and the outside air valve closed; VENT position means the refrigeration package shutoff valve will be closed and the outside air valve open; OFF means both valves will be closed.
- Two **SHUTOFF** switches, each corresponding to the hot bleed air shutoff valve of the respective engine. Both switches must be turned on for the correct operation of the air conditioning system when the master switch is ON.
- The temperature controller selector, in the form of a MAN-AUTO switch, that selects the mode of the temperature control system. It normally remains in AUTO position. MAN should be used as a backup.
- The **WARM-COOL** rotary selector knob, which is used to adjust the temperature inside the cabin, functions only when the temperature controller switch is set to AUTO. This knob should be operated in a moderate way.
- The **WARM-COOL** switch, only functioning when the temperature controller switch is set to MAN, which allows to set the temperature in cabin when the automatic regulator does not operate correctly.
- The GROUND light that illuminates when the AC MASTER switch is set to ON, and the following conditions are met: Right landing gear shock absorber compressed, and left & right engines' N_g is below 90%.
- The AUTO TRIP light that illuminates when the refrigeration package senses an overpressure (above 39 PSI) or over-temperature (above 224°C), hence interrupting pneumatic supply and closing its shutoff valve.
- The Cabin Temperature indicator, which provides reading in Celsius degrees (°C) and indicates the average temperature within the cabin.
- The **DEFOG** two-position (ON-OFF) switch, which provides electric power to the windshield defogging fan motor, whose function is to prevent the windshield inner transparent surfaces from becoming fogged because of condensed moisture on them.

Glareshield (Fire Protection) Panel



1. Fire Alarm Annunciators & Bottle Discharge Handles
2. Fire System Test Pushbuttons
3. Shutoff Valve Switches
4. Master Warning & Door Annunciators (see more information on the Multiple Alarm Panel section)
5. Shutoff Valves Indicator Lights

Fire Alarm Annunciators & Bottle Discharge Handles



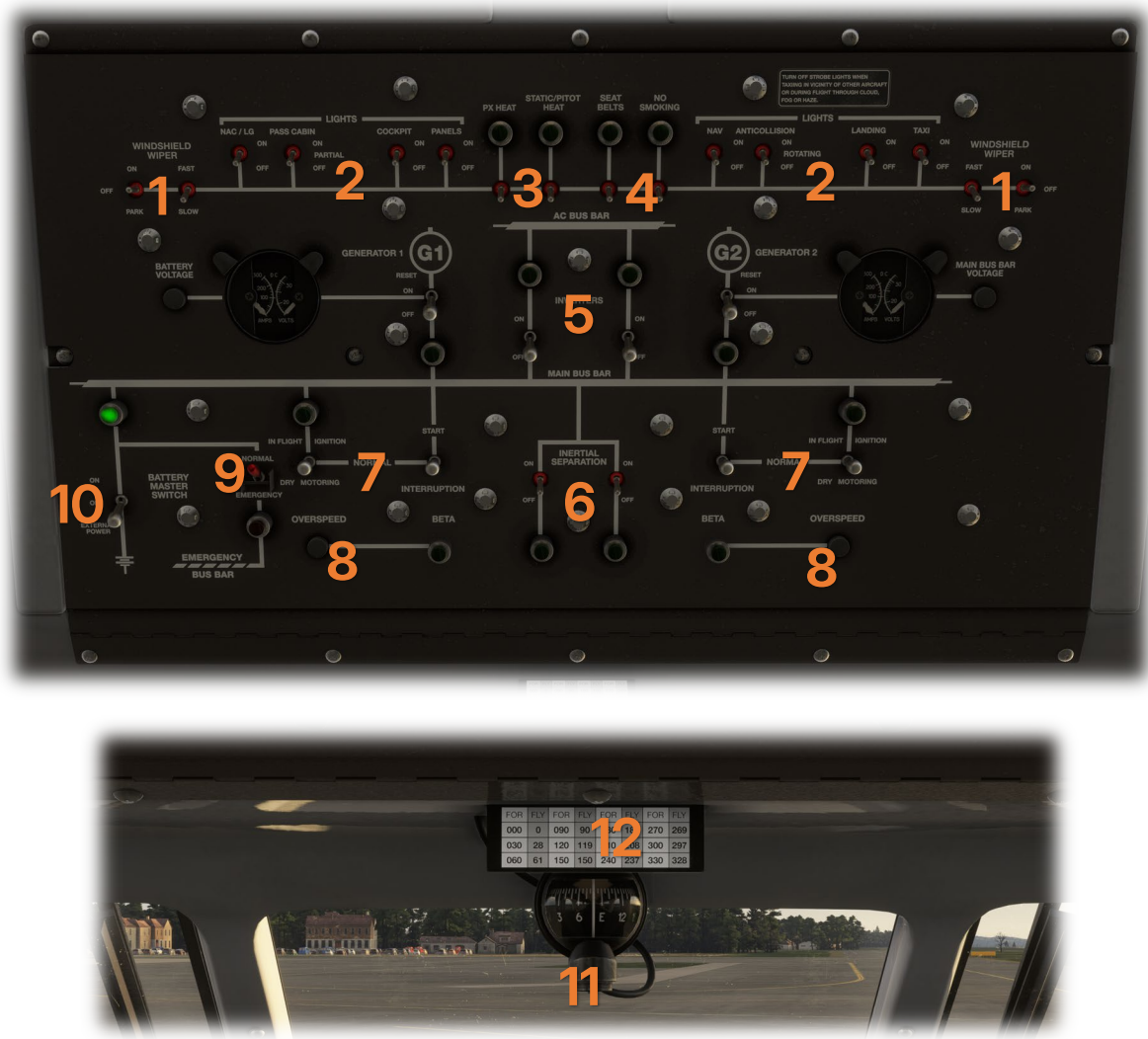
The discharging functionality only works when the simulation indicates fire in the engine, so it can discharge the extinguisher bottle at that moment. Otherwise, it will not work since it was coded as that to prevent an accidental shutdown in normal flight conditions. The test pushbuttons allow for testing of the annunciators (located in the handle) and aural warning.

Shutoff Valve Switches



These two-position switches allow the fuel and hydraulic pumps shut-off valves, located in the engines, to be opened or closed. These must remain in the OPEN position in normal flight conditions, as closing them in flight will cause the hydraulic system not to function correctly, and the engines to shut down due to the valve that allows fuel to flow to the engines being closed. The indicator lights will illuminate only when the respective valves are in transit.

Overhead Panel



1. Windshield Wiper Switches
2. Aircraft Lighting System
3. PX Heat & Static/Pitot Heat Switches
4. Passenger Signs Switches
5. Electrical System – Voltammeters, Inverters & Generators
6. Inertial Separation Switches
7. Ignition & Starter Switches
8. BETA Overspeed Test Pushbuttons
9. Electrical System – Emergency Bus Bar Switch (not functional in this simulation)
10. Electrical System – Master Battery Switch
11. Magnetic Compass
12. Magnetic Compass Placard

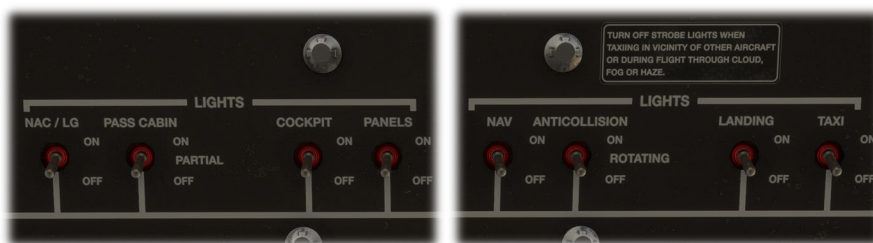


Windshield Wiper Switches

The aircraft is equipped with two windshield wipers, one for each windshield front panel. There are two pairs of switches, one for each pilot, installed on the overhead panel, each comprising a three-position switch (ON/OFF/PARK) and another two-position switch (FAST/SLOW). The first is used to turn the wiper on and off, with the PARK position used to take the wipers to the windshield side. The second selects the operation at faster or slower speed.

Aircraft Lighting System

For more information on the exterior lights, please refer to the respective section in this document.



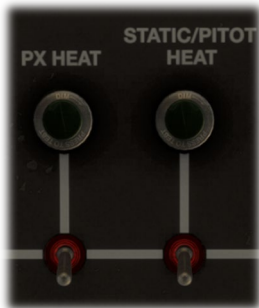
EXTERIOR LIGHTS

- **Navigation Lights:** Two-position switch (ON/OFF) to turn the navigation lights on or off.
- **Anticollision Lights:** Three-position switch (ON/ROTATING/OFF) to control both the rotating beacon and strobe lights. OFF means the anticollision lights (rotating beacon and strobes) will both be off. ROTATING means that the rotating beacons will be on, but the strobe lights will be off. ON means that both the rotating beacons and the strobe lights will be turned on.
- **Landing Lights:** Two-position switch (ON/OFF) to turn the 450W landing lights, located on the wings' leading edge, on or off.
- **Taxi Lights:** Two-position switch (ON/OFF) to turn the 450W taxi light, located on the nose landing gear strut, on or off.
- **Nacelle / Landing Gear (Inspection) Lights:** Two-position switch (ON/OFF) to turn the inspection lights on or off, illuminating the engine nacelles, wing leading edges and landing gear.

INTERIOR LIGHTS

- **PASS CABIN Switch:** This three-position switch controls cabin general lighting. OFF means all cabin lights are fully turned off. Lights are uniformly distributed in the lighting channels.
- **COCKPIT Switch:** This two-position switch (ON/OFF) controls the energization of the lights located on the ceiling above each piloting station, as well as the central light located at the cockpit entrance, illuminating the cockpit and electrical rack (not simulated) located at the copilot's side.

- **PANELS Switch:** This two-position switch (ON/OFF) controls energization of the panel lighting system, comprised of instrument lights, and main panel, overhead and circuit breakers panels.



PX Heat & Static/Pitot Heat Switches

The PX HEAT switch controls energization of a special heater (not simulated here in this product) controlling the engine compressor discharge pressure when the aircraft is operating with ambient temperatures below 5°C (41°F). The STATIC/PITOT HEAT switch controls energization of the pitot and static ports heaters to prevent ice formation and water condensation from happening during flight.

Passenger Signs Switches

These two two-position switches control the illumination of the corresponding placards in the passenger cabin, to make them visible when the warning is necessary.



Electrical System

The aircraft's electrical power supply consists of two 28VDC, 200A generators, connected independently and in parallel with the main bus bar. A 24V, 34A/h alkaline (nickel-cadmium) battery, also connected to the main bus bar, constitutes the emergency power source. The generators are installed in the engine accessory gear box. A secondary system, consisting of an alternate power source and respective bus bar, is used to power the AC equipment onboard this aircraft. Power for it is supplied by one of the two static inverters, fed by DC current from the main bus bar, and generating 115V/400Hz and 26V/400Hz alternating current.



- **GENERATOR 1 and GENERATOR 2 switches:** These three-position switches (RESET/ON/OFF) control the respective engine-driven generators. Positions OFF and ON control the circuit generators to either disconnect or connect them to the main bus bar. The momentary RESET position permits to reconnect the generator, which for an occasional failure might have been disconnected from the bus bar.
- **INVERTERS 1 & 2 switches:** These two-position switches (ON/OFF) control the relays of the respective inverters, to connect or disconnect them from the main bus bar.

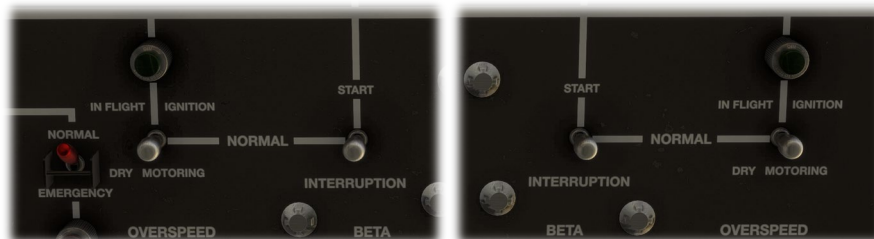
- **Voltmeters, BATTERY VOTAGE and MAIN BUS BAR VOLTAGE pushbuttons:** Two DC voltmeters with dual scale indicate the voltage and amperage of the current supplied by the generators. The pushbuttons located beside the voltmeters, when depressed, allow for the corresponding voltage and amperage to be read on the same instrument.
- **BATTERY MASTER switch:** This battery change-over master switch allows the battery (BATTERY position) or the external power source (EXTERNAL POWER) to be connected to the main bus bar, or still, both to be disconnected (OFF position). The change over is made through relays.



Inertial Separation Switches

An inertial separation system is installed at each engine air inlet, to minimize either the ingestion of dust when operating the aircraft from unpaved runways, or of frozen water and snow particles in icing conditions. This is accomplished through a device that forces a sudden deflection of engine air flow supply; dust, water and snow particles are discharged overboard through a bypass duct. Two two-position switches, located on the overhead panel, control the operation of the inertial separation system of the respective engine.

Ignition & Starter Switches



The three ignition selector switches, one for each engine, have three positions:

- **NORMAL** – In this setting, electrical power is routed to both spark igniters whenever the starter is actuated and the ignition is automatically disconnected by the system automation when the starting cycle ends.
- **IN-FLIGHT IGNITION** – Used for ready in-flight engine relighting when N_2 has not yet dropped below 50%, starting without starter aid (engine windmilling), or as a precautionary measure against eventually faulty combustion, during flights in adverse conditions. In this position, electrical power is provided to maintain the spark igniters of the corresponding engine continuously energized.
- **DRY MOTORING** – This setting is used in engine ventilation which is required to eliminate fuel or fumes accumulated in the engine or combustion chamber fire, as for instance after an aborted start.

De-Icing (Ice Protection System) Panel

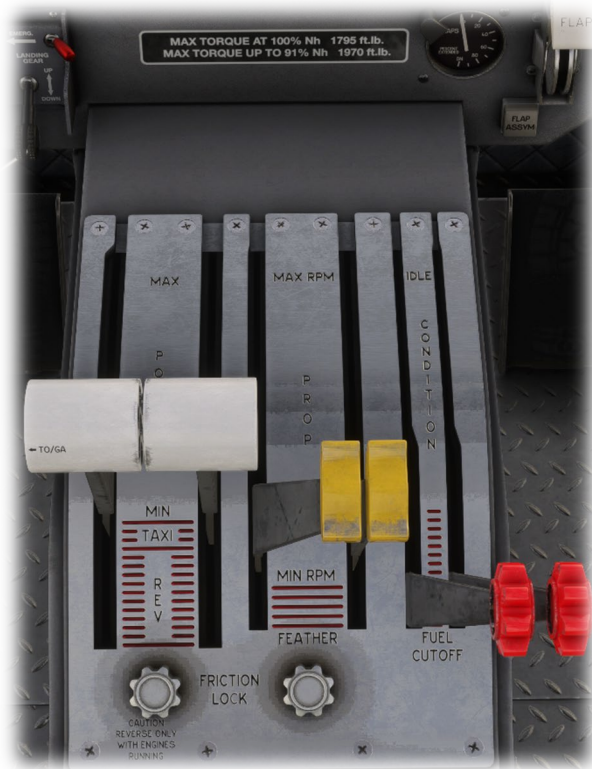


1. Propeller De-ice Switch
2. Propeller De-ice Amperemeter
3. Windshield De-ice Switches & Indication Lights
4. Engine Air Inlet De-ice Boot Switches
5. Pneumatic De-ice Switch (Wings & Empennage)

Throttle Quadrant & Trim Panel



1. Engine Control Box
 - a) Power Control Levers (Throttle)
 - b) Propeller Speed Control Levers
 - c) Fuel Condition Levers
2. KMC321 Autopilot Panel & KAS297C Altitude Selector Panel
3. Gear Horn Cutout Panel
4. Trim Tab Controls
 - a) Pitch Trim Wheel
 - b) Rudder Trim Knob
 - c) Aileron Trim Knob



Engine Control Box

The Engine Control Box features three pairs of levers (one lever per engine), and a pair of friction lock knobs (not simulated).

- **POWER CONTROL LEVERS:** The two engine power control levers provide engine power ratings from maximum take-off power to maximum reverse power. The actuating ranges of the power control levers are limited by designations *MAX*, *MIN*, *TAXI* and *REV*.

- *MAX* and *MIN* – These positions indicate the limits of power application, with propeller thrust, from maximum power to the lower corresponding to the low idle setting.

- *TAXI* – From *MIN* to *TAXI* range and beyond, the pilot must lift lever in a definite movement. Pitch values below low pitch at low

idle can be obtained in this range, to reduce thrust when required for taxi maneuvers.

- *REV* – In this range, engine power is applied with propeller blades in reverse pitch, as the lever is retarded.

Each power lever actuates three microswitches inside the engine control box: one for the secondary low pitch stop (opened when the power lever is carried to the taxi range), one for the automatic feathering system (closed with the power lever in a position corresponding to N_g 90%) and one for the landing gear safety warning system (opened with the power lever in a position corresponding to N_g above 75%).

- **PROPELLER SPEED CONTROL LEVERS:** The two propeller speed control levers operate the respective propeller governor speed from maximum to minimum RPM positions, actuating over the pilot-valve spring. In feather position, the pilot-valve spring is raised, causing the oil to be completely drained from the servomechanism, which takes the propeller to feathered pitch.

- **FUEL CONDITION LEVERS:** The fuel condition levers have the following three positions:

- **FUEL CUT-OFF** – Fuel supply to the engine is cut-off. Fuel flow to both manifolds is obstructed, while drainage of fuel existing in the manifold is allowed.
- **LO IDLE** – It is the position for FCU (Fuel Control Unit) normal operation and supplies a value of 52% N_g .
- **HI IDLE** – Idle power can be adjusted at 65% N_g when engine compressor bleed air is required for operating the air conditioning system or for the supply of mechanical power, for instance during assisted start.

Trim Tab Controls

The elevator, aileron and rudder trim tab wheels are mounted on the control pedestal, and their rotation produces a trimming action in the same direction. The position indicators, next to the trim wheels, show on a graduated scale the relative position between the trim tab and the respective control surface. The elevator trim wheel has a green band between marks 0 and 1 "nose up".



Autopilot System (KMC321 & KAS297C)



KMC321 Controls	
DN/UP Pushbutton	This button allows for adjustment of the vertical speed setting or the IAS setting, if the IAS mode is selected on the autopilot.
Annunciators Panel	There are two annunciator panels on the KMC321 unit. One on top and one on bottom. They represent the selected autopilot setting.
HDG Pushbutton	Toggles the autopilot heading mode.
NAV Pushbutton	Toggles the autopilot navigation mode, depending on what drives the Course Deviation Indicator (CDI). It can follow a preprogrammed flight plan from the GPS or a VOR beam.

APR Pushbutton	Toggles the autopilot approach mode, making the aircraft follow the localizer and glideslope when the aircraft is on approach to destination and an ILS frequency and course have been preset.
BC Pushbutton	Toggles the autopilot back-course mode.
YD Pushbutton	Toggles the yaw damper on/off.
AP Pushbutton	Toggles the autopilot master on/off.
ALT Pushbutton	Toggles the autopilot altitude hold.
IAS Pushbutton	Toggles the autopilot flight level change mode, i.e., climbing or descending to the desired altitude by maintaining a constant airspeed based on the aircraft's thrust setting.
FD Pushbutton	Toggles the flight director on/off.
SOFT RIDE Pushbutton	Not simulated here.
HALF BANK Pushbutton	Toggles the autopilot half bank mode, limiting the max bank angle from 30° to 15° when enabled.
TEST Pushbutton	Performs a test of the autopilot unit.
KAS297C Controls	
Selected ALT/VS Digits	This section represents the selected altitude or vertical speed selection, formatted with a thousand's comma separator. Altitude selection ranges from 0 to 50,000 ft. VS setting ranges from 0 to 5,000 ft/min, in either direction (upwards or downwards).
VS Annunciation	Lighted up when the autopilot vertical speed hold is selected.
ALERT Annunciation	Lighted up when the aircraft is close to reaching the desired altitude.
ARM Annunciation	Lighted up when the autopilot altitude selection is armed.
CAPT Annunciation	Lighted up when the aircraft is flying at the desired altitude preset in the KAS297 unit.
FT / FT/MIN Annunciation	Lighted up to FT when the KAS297 unit is set to altitude selection mode. Lighted up to FT/MIN when the unit is set to climb/descent rate selection mode.
VS Arrows	Based on the VS selection. The upper arrow will illuminate with a positive (climb) vertical speed setting. The lower arrow will illuminate with a negative (descend) vertical speed setting.

ENG Pushbutton	This engages the altitude vertical speed hold mode, by commanding the autopilot to follow a selected rate of climb/descend.
ARM Pushbutton	This engages the autopilot altitude selection mode and follows a desired VS/IAS setting.
Dual Concentric Knobs	The outer knob has a pull function. When pushed, the KAS297 is in altitude selection mode. When pulled, the unit is in vertical speed selection mode. The outer knob sets altitude or vertical speed by 100's increments. The inner knob sets altitude or vertical speed by 1000's increments. Below is a representation of the altitude selection mode and vertical speed selection mode from the actual instrument featured on this product. 

Electronic Flight Bag (EFB)



According to real-life aviation glossary, an electronic flight bag (EFB) is an electronic device that helps flight crews to perform flight management tasks more easily and efficiently, providing the reference material often found in the pilot's carry-on flight bag. In addition, those devices can host purpose-built software applications to automate other functions normally conducted by hand, such as performance calculations.

This product features a virtual EFB, which consists of a tablet-like device with a unique application's User Interface (UI), providing some pages with useful functions. Following are the main user interface parts:

1. **Top Bar** – It provides information about the simulation's date and time, as well as the virtual device's battery (charging status and percentage) and a notifications pane (toasts) for informative messages.
2. **Main Content Pane** – This provides the interface of the respective EFB pages featured on this simulation.
3. **Bottom Bar** – This panel contains the buttons of the available EFB pages, whose description is explained later on this section. The available pages are: The pages included within the EFB user interface are **Ground Services** (the truck icon), **Fuel Planning** (the gas pump icon), **Weight & Balance** (the chessboard-like icon), **Flight Performance** (the calculator icon), **Flight Briefing** (the pilot icon), **Navigation Charts** (the foldout map with the pin icon) and **Settings** (the gear icon).



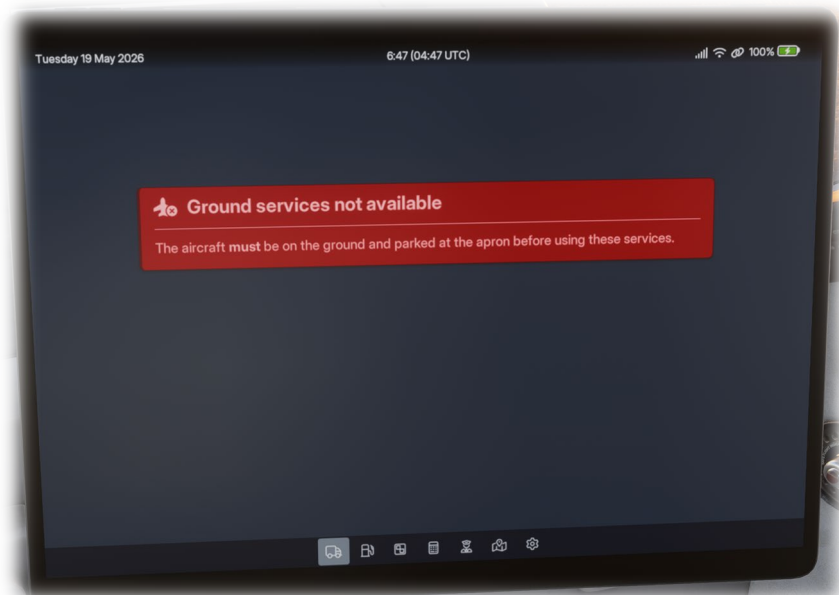
The functions included within the EFB can be found from the navigation bar on the bottom side of the EFB screen, like in the figure above. The first time you start flying the aircraft, you will see the EFB visible. You can make the EFB not to appear every time the flight starts, by toggling off the respective check on the EFB settings, more on that later. Whenever you want to show or hide the EFB itself, you can press the button below the **EFB TABLET** decal, which is located on the left side of the main instrument panel above the Stall Warning Gauge. Once it appears, you can start interacting with it.

Following is an explanation of each page from the EFB user interface (UI).

Ground Services

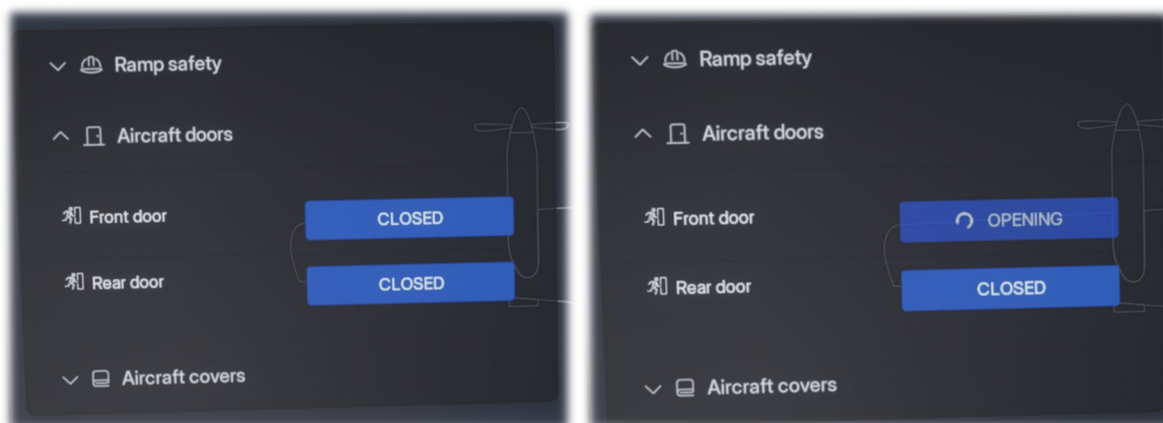


This page contains controls for opening/closing doors and placing the ramp safety elements such as wheel chocks and traffic cones, or engine covers. In addition, this section contains controls for requesting pushback, eliminating the necessity for requesting pushback from the ATC menu. This panel only works when the parking spot where you are located has a pushback tug available. When the aircraft is not on ground nor fully stopped, you will see a message indicating that Ground Services are not available until the aircraft is fully stopped, just like in the figure below.



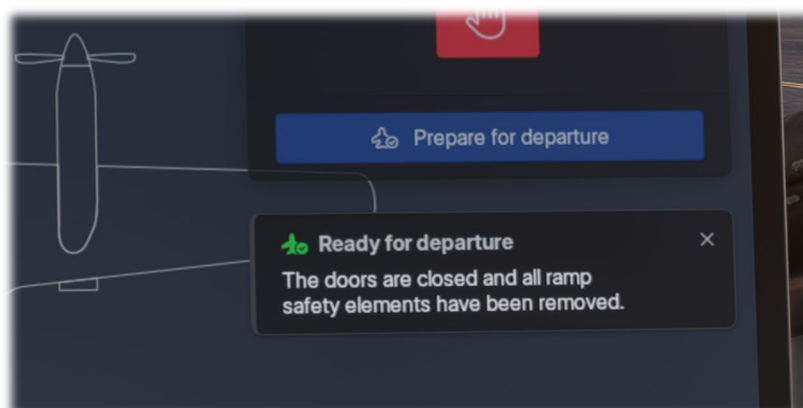
This page contains the selected aircraft variant, livery and tail number (1). Below that, there is an accordion (2) with options to open/close doors and toggle ramp safety elements and/or aircraft covers. The doors pane of the accordion is dynamically initialized based on the selected aircraft variant. For the EMB-110P, you will see only the toggle button to open/close the rear door. For the rest of the variants included, you will see two toggle buttons: one for the main (front) door and another for the rear door.

When opening or closing the doors, you will see the toggle buttons dynamically disable and enable, depending on the current door position. If the door is opening or closing, you will see a spinner, meaning that the door opening or closing operation is in progress.



If the aircraft's parking brake is released accidentally, all the doors will automatically close, the ramp safety elements will be taken out, the battery switch will automatically move to the BATTERY position, the GPU will be disconnected, and the "Invalid state" message will pop up.

The pushback control panel (3) contains buttons to begin pushback and controlling the steering direction. Plus, there is a button below the control buttons, where you can make the EFB to automatically prepare the aircraft for departure. By pressing this **Prepare for departure** button, doors are automatically closed, the ramp safety elements are taken out of place, any unremoved covers are removed from the aircraft before flight, and the Battery Switch is automatically moved to the **BATTERY** position, in case it was set to **EXTERNAL POWER**. A message like the one below will be displayed, confirming the aircraft is ready for departure. You can dismiss it by clicking on the **Close** button.



When you request pushback, you will see a warning message in case the parking brakes are not released yet. This is for situational awareness, where it will notify you to get ready before the pushback tug is attached to the aircraft.

Fuel Planning



This page allows you to visualize the current fuel quantity in real time, as well as performing a quick refuel operation. The three quantity panels (1) are located at the top of the screen, showing the fuel quantity on the left and right tanks, as well as the total fuel onboard, combining the quantity from both tanks. The totalizers do not take the unusable fuel quantity into consideration, but only the usable fuel.

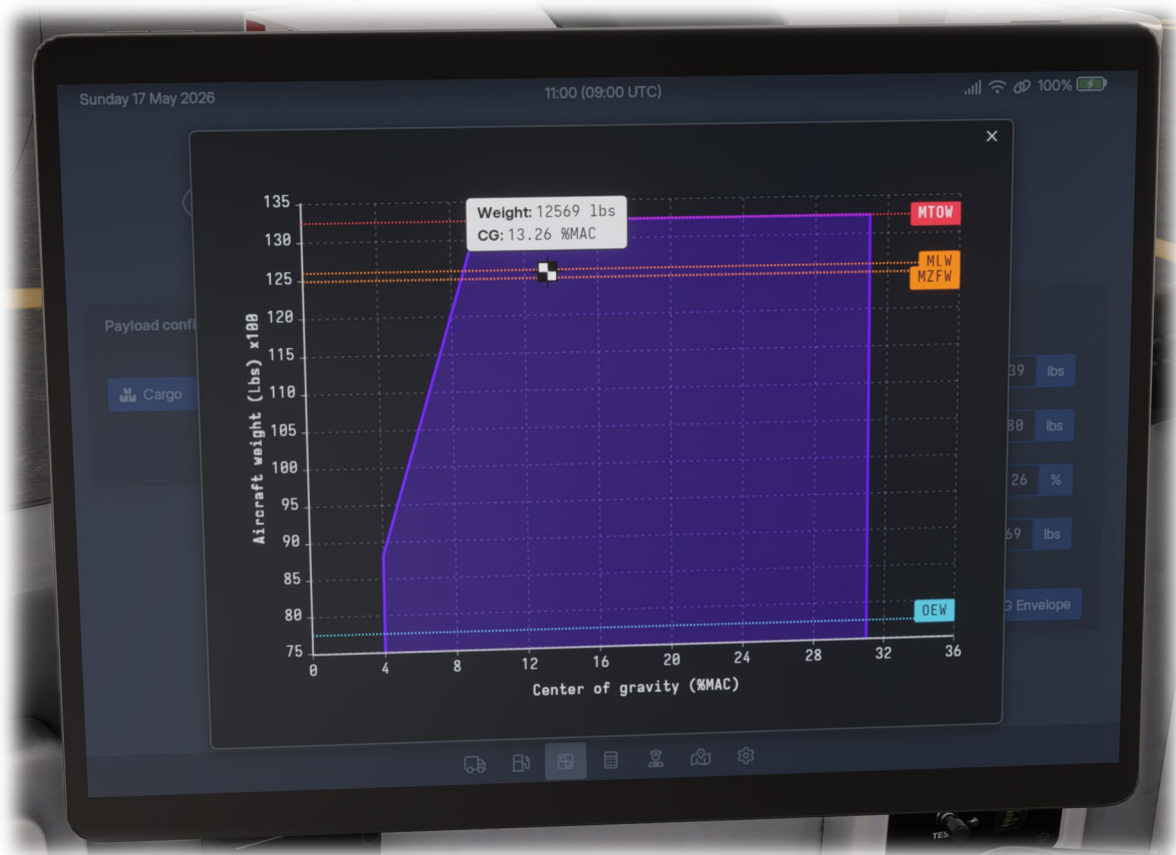
To perform a refuel operation, we have the refueling panel (2). Move the slider (3) to set the fuel quantity in percentage of the total allowable fuel quantity for this aircraft. If you created a flight plan from SimBrief (more details on this later), you can click on the Import from SimBrief button (4), and the EFB will automatically adjust the refuel percentage. Once you are happy with the results, click on the Send to Simulation button (5).

Weight & Balance



This page allows you to review the current aircraft's weight and the current position of the aircraft's Center of Gravity with relation to the MAC (Mean Aerodynamic Chord), as well as setting up the payload (passengers and/or cargo loaded onto the aircraft for your mission).

You can review the payload settings from the schematic diagram (1), how many passengers are seated and how much cargo has been loaded onto the aircraft. If you are not happy with the payload arrangement, you can adjust it from the sliders (2) on the left panel, perform a quick loading operation through the quick load buttons (3), or also update the payload information with the one from your SimBrief flight plan by clicking the Import from SimBrief button (4). Once you are happy with the final setup, click on the Send to Simulation button (5). The totals and numbers are located at the right panel (6); here, you have the fuel weight total, payload total, aircraft's gross weight and CG location. You can also review the CG Envelope Diagram by clicking the button titled View CG Envelope (7).



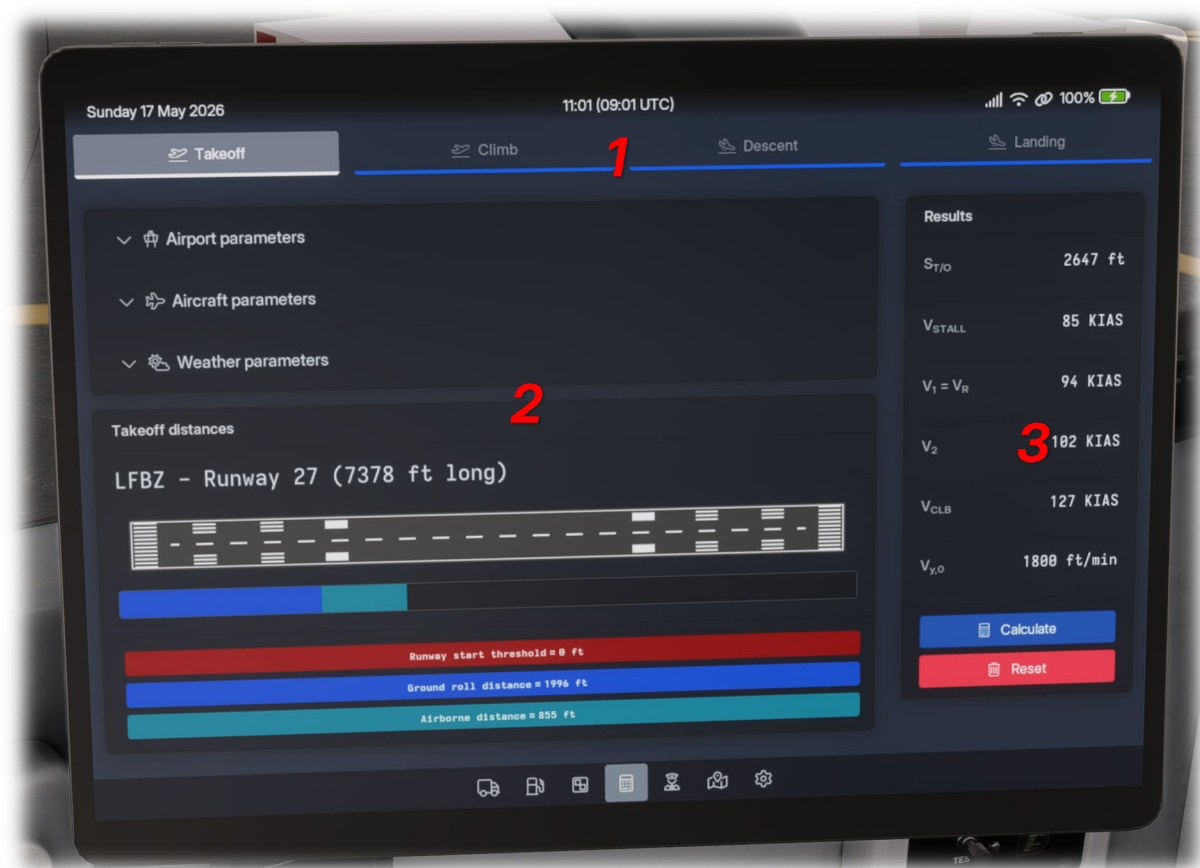
This will bring you the CG Envelope diagram, which has been sourced and calibrated from the real-life aircraft's POH (Pilot Operating Handbook), including the weight limits, as well as the forward and rear CG limits.

The purple area represents the aircraft's normal operating limits as certified for such operations, ranging from the operating empty weight (OEW) to the maximum take-off weight (MTOW) in the vertical (weight) axis, and from CG's forward limit to CG's aft limit in the horizontal (center of gravity) axis.

The Chessboard-like icon with a cross behind the square represents the CG location on the aforementioned diagram. This will help you understand the weight setup and also perform any modifications should they are required for a proper takeoff. Hover the mouse cursor over the chessboard-like icon to reveal the exact aircraft weight and CG location, like in the figure above.

The dashed lines represent where the aircraft weights are: MTOW (maximum take-off weight), MLW (maximum landing weight), MZFW (maximum zero fuel weight), and OEW (operating empty weight).

Flight Performance



This page serves the main function of helping you perform the required flight performance calculations, for optimum takeoff, climb, descent and landing throughout your mission. You have the current flight phase on the navigation bar to the left of the screen (1). For each flight phase, you have different panels for the inputs required (2), and you have a result panel (3) on the right. Following is an explanation of the required inputs for each phase.

Takeoff

This sub-page of the Flight Performance section of the EFB serves to calculate the required takeoff distances (ground roll and airborne distance from liftoff to safe passing over a 50ft obstacle), as well as the speeds (stall speed, decision & rotation speed or $V_1 = V_R$, liftoff speed or V_2 and optimum climb speed) and the optimum rate of climb.

In order to perform the takeoff calculations, you need to fill out the required groups of inputs: airport parameters, aircraft parameters and weather parameters. Following is an explanation of the required inputs to perform the takeoff calculations.

The screenshot shows the 'Airport parameters' panel. It contains the following fields and controls:

- Airport ident:** A search box with 'LFBZ' entered and a magnifying glass icon.
- Runway:** A dropdown menu showing '27'.
- Runway heading:** A numeric input field with '269' and a degree symbol.
- Runway elevation:** A numeric input field with '231' and 'ft'.
- Runway slope:** A numeric input field with '0.28' and a percentage sign.
- Runway length:** A numeric input field with '7378' and 'ft'.
- Runway condition:** A dropdown menu showing 'Dry'.
- Import from SimBrief:** A button with a cloud icon.
- Aircraft parameters:** A collapsed section indicated by a downward arrow.
- Weather parameters:** A collapsed section indicated by a downward arrow.

First group corresponds to the airport parameters. Here, you will fill out the runway heading, elevation, slope, length and condition (wet or dry) of the airport you are taking off from. This is the base of the calculations. You can type in the airport's ICAO ident on the search box and select the runway from the dropdown menu. The information is extracted automatically from the simulator's database and automatically filled out into the instrument. You can also import the airport information from the SimBrief flight plan, by clicking **Import from SimBrief**.

The screenshot shows the 'Aircraft parameters' panel. It contains the following fields and controls:

- Aircraft weight:** A numeric input field with '12569' and 'lbs'.
- Flaps configuration:** A dropdown menu showing '25%'.
- Inertial separation:** A dropdown menu showing 'OFF'.
- Sync from simulation:** A button with a circular arrow icon.
- Weather parameters:** A collapsed section indicated by a downward arrow.

Next group corresponds to the aircraft parameters. Here, you fill out the aircraft's current gross weight, flaps configuration (0%, 25% or 50%) and inertial separation switch state (ON or OFF). Aircraft's gross weight, flaps setting and inertial separation switch state have a significant impact on the results, as the inertial separation (for example) will slightly subtract power from the engines requiring more distance to takeoff for instance. Flaps have an impact as well because with flaps fully up, the aircraft may need even more distance to take off. Also, the heavier the aircraft is on takeoff, the longer the takeoff distance will be. You can click on **Sync from simulation** to make the EFB automatically fill out these inputs for you.



Finally, the third inputs group corresponds to the weather parameters. In this group, you will insert the weather information, specifically the wind direction and speed, outside ambient temperature and the altimeter QNH. You can also click on **Import from METAR** so that the EFB automatically retrieves the most recent METAR report, decodes it and fill out the inputs for you. In case something goes wrong when sourcing the METAR, the EFB will fall back to the simulation variables. These inputs also have an impact on the calculations' results. Depending on the wind direction and the runway you are departing from, you will have a shorter distance (if headwind) or a longer distance (if tailwind). Also, as per thermodynamics concepts and the ideal gas law, distance will decrease proportionally with pressure and increase proportionally with temperature.

Once all input parameters have been filled out on the screen, you click on **Calculate** and you instantly get the results of the calculations. For take-off, you get not only the numeric results on the right side panel, but also a graphical schematical representation of the runway, highlighting the required take-off distances (ground roll and airborne), as well as how much the available runway length is decreased due to the runway start threshold. In case the runway length is insufficient for take-off, you will see a filled progress bar in red indicating that the runway is not long enough for take-off with the specified conditions, in which case you

might have to review weather or even the aircraft's total weight and flaps configuration, in order to allow for a safer, smooth takeoff.



Climb



This section of the Flight Performance page allows you to calculate the horizontal distance flown throughout the climb phase from the current altitude to the target altitude, the fuel consumption, time to reach the target altitude regime starting from the current altitude, and the optimum rate of climb.

The required inputs are the aircraft's current gross weight, current altitude, target altitude, current indicated air speed (IAS) and outside air temperature (OAT) at the time of beginning the calculation. Clicking on the **Sync from simulation** button will make the EFB automatically fill out the aforementioned input parameters from the simulation variables.

Descent



This section of the Flight Performance page allows you to calculate the horizontal distance flown throughout the descent phase from the current altitude to the target altitude, the fuel consumption, and time to reach the target altitude regime starting from the current altitude.

The required inputs are the current altitude, target altitude, current indicated air speed (IAS), current rate of descent (vertical speed) and the propellers' maximum RPM percentage at the time of beginning the calculation. Clicking on the **Sync from simulation** button will make the EFB automatically fill out the aforementioned input parameters from the simulation variables.

Landing



This sub-page of the Flight Performance section of the EFB serves to calculate the required landing distances (airborne distance from safe passing over a 50ft obstacle to touchdown and ground roll from touchdown to a safe stop), as well as the approach speed and stall speed. For landing calculations, the inputs are pretty similar to those from the takeoff calculations section, because they have the same input groups. However, with the exception of the gross weight, the aircraft parameters are slightly different from those on the takeoff calculation.

In the airport parameters group, similarly to the takeoff calculations, you will fill out the runway heading, elevation, slope, length and condition (wet or dry) of the airport where you will land. You type in the airport's ICAO ident on the search box and select the runway from the dropdown menu, and the information will be extracted automatically from the simulator's database and automatically filled out into the corresponding fields. Also, you can import the destination airport information from the SimBrief flight plan, by clicking **Import from SimBrief**.

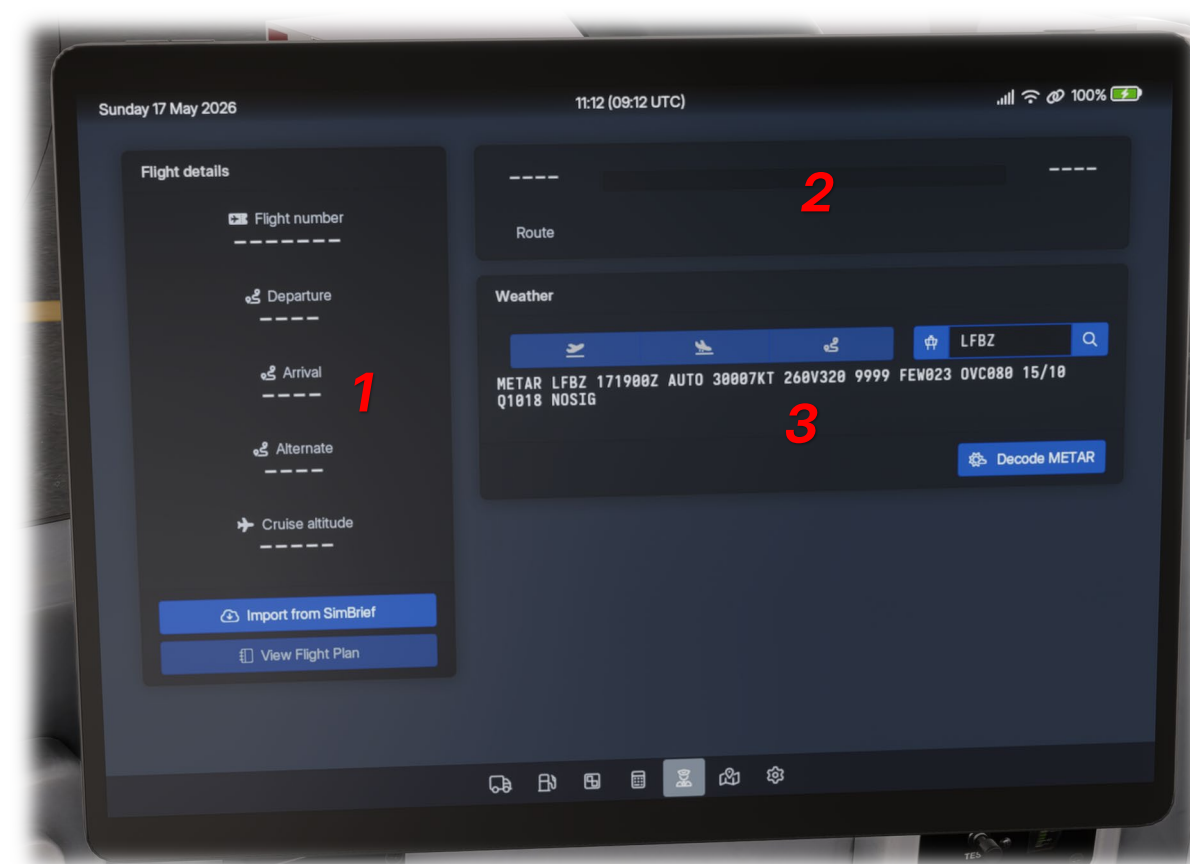
In the aircraft parameters group, you are also prompted to fill out the aircraft's current gross weight and flaps configuration (0%, 25%, 50%, 75% or 100%), but this time you are selecting whether you are using thrust reverser or not after touchdown. You will not be prompted to set whether you have the inertial separation on or off, because it is assumed that the inertial separation is turned off in order to achieve

maximum engine performance during the final approach phase in the event of a go-around maneuver. You can click on **Sync from simulation** to make the EFB automatically fill out these inputs for you.

And in the weather parameters group, similar to the takeoff calculations, you insert the wind direction and speed, outside ambient temperature and the altimeter QNH of the destination airport. You can also click on **Import from METAR** to make the EFB automatically retrieve the most recent METAR report, decode it and fill out the inputs for you. Also, the EFB will fall back to the simulation variables should an error occur when sourcing the METAR.

Once all input parameters have been filled out on the screen, and after clicking on **Calculate**, you get both the numeric results on the right side panel, and a graphical schematical representation of the runway, highlighting the required landing distances (airborne and ground roll), as well as how much the available runway length is decreased due to the runway start threshold. You will see a filled progress bar in red indicating that the runway is not long enough for safely landing should the runway distance is insufficient with the specified conditions, in which case you might have to review weather or even the aircraft's total weight and flaps configuration, in order to allow for a safer landing.

Flight Briefing

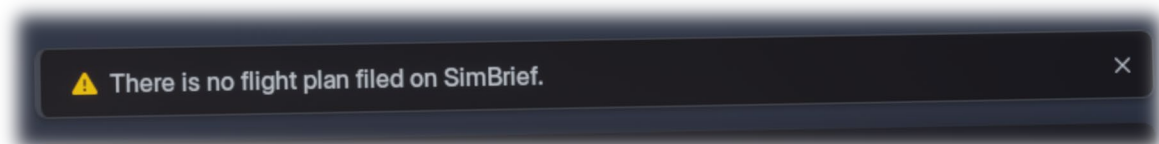


This page brings you information about the flight in general. The left panel (1) displays flight number, origin, destination, alternate airport and cruise altitude, only if you have a flight plan imported from SimBrief, as

well as the flown distance progress panel (2) measuring how far the aircraft has flown between origin and destination. Also, below the previous panel, you also have the weather panel (3), which allows you to check for the latest weather forecast report (METAR) for either origin or destination, or any other airport that you need weather information about.

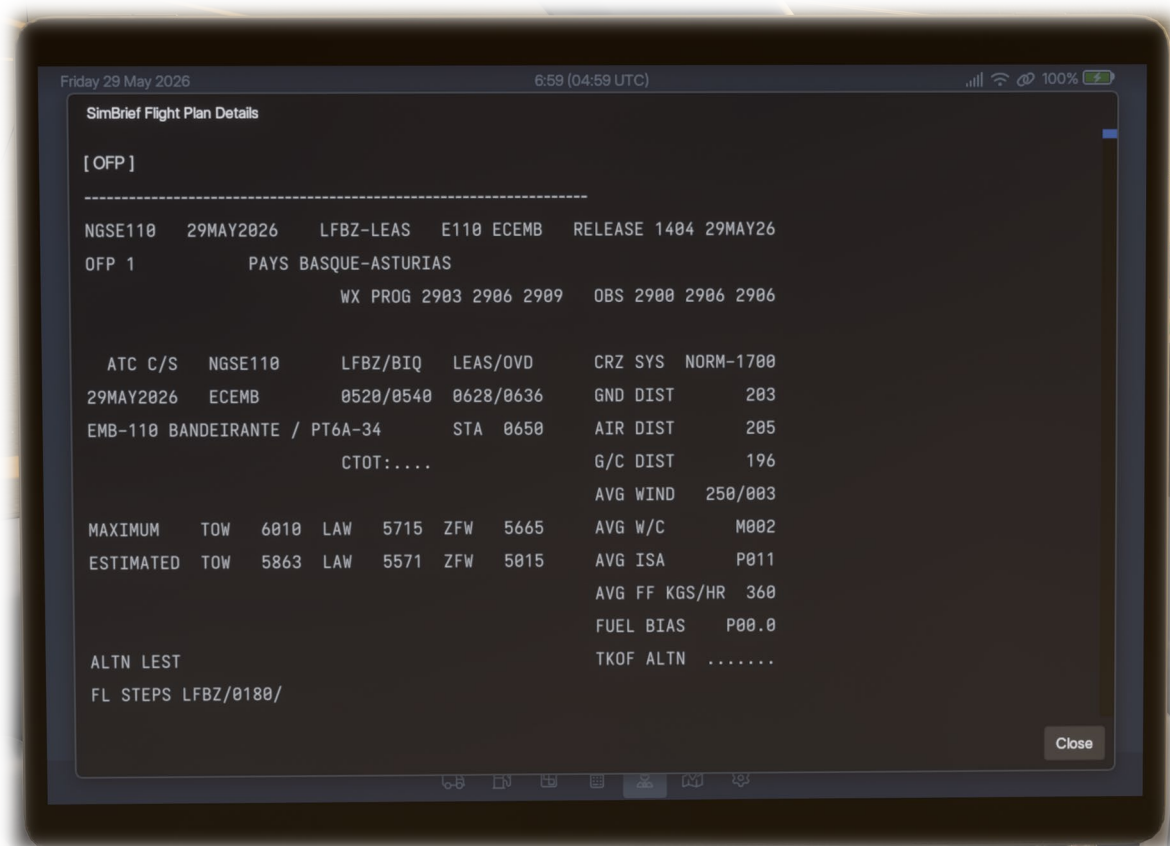


To import a flight plan from SimBrief, you simply have to click the **Import from SimBrief** button on the left panel. The EFB will automatically display the flight plan details, and will also allow you to update fuel quantity and total weights into the simulation, making your mission even more realistic. If there is no flight plan available on SimBrief, you will get this warning message:



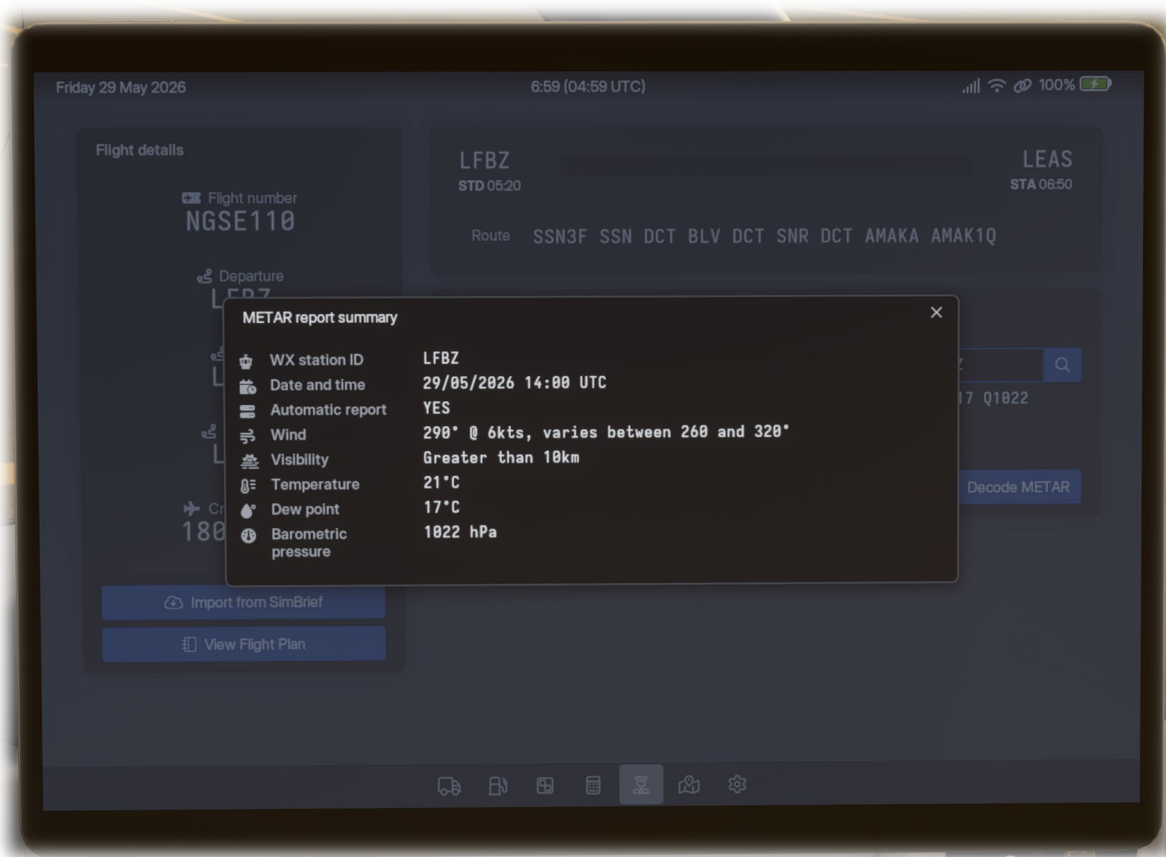
Similarly, you will get an error message if you have not inserted the SimBrief username or if it has not been correctly typed. This is resolved by going to the Settings page on the SimBrief user input.

Once the flight plan has been imported correctly into the EFB, you will see flight information and distance flown progress. Additionally, if you want to review the whole Operational Flight Plan (OFP) report, you can click on the **View Flight Plan** button, bringing you another window like in the figure below, and showing you the whole report, including weights, times, route details, METAR report for origin, destination and alternate airports, and more.



Whenever you have to check for the weather forecast at a specific airport, you can use the Weather panel. There, you type the airport's ICAO ident on the search box, and you will instantly get the last METAR report. In case the METAR search fails, you will get an error message. This would normally be due to unavailability of the reports at the specified airport or failures with the service itself.

Once you get the METAR report, you will have it in raw format on the EFB screen. However, if you would like to get a basic summary of the report (that is, decoded), including information about the wind direction and speed, visibility, ambient temperature and dew point, and barometric pressure, you can click on the Decode METAR button and a popup dialog like the one in the figure below will show up.



Finally, once you have landed onto your destination airport, you will receive a notification telling you that you have arrived.

Navigation Charts



This page allows you to visualize Navigation Charts so that you can check how you must perform a departure, arrival, approach, or where your parking stand is located, frequencies, where in the virtual world you are located, etc. Initially, this feature requires you to have a current **Navigraph Ultimate** subscription, as this product relies on the **Navigraph** services to bring the navigation charts you need for the flight. However, the simulator's built-in LIDO/FAA charts service will be integrated in a future post-release update of the product.

To begin using this service, you must sign in to Navigraph. Click on the **Sign in** button to open the authentication popup, then perform the following steps to authenticate with your Navigraph account.

A QR code and an 8-digit alphanumeric token will be displayed on the screen. Both have a validity of 30 minutes from the moment the popup is opened. If you close the login window, both the QR code and token will be refreshed when re-opened, and the previous ones will no longer be valid. **Please make sure not to close the popup while you perform the login process or else the EFB will not recognize the session, even if the login was successful, and you would have to start the process all over again as a result.**



For signing in to Navigraph, you can either scan the QR code using your physical smartphone or tablet. Or you can click on the navigraph.com/code link (PC only) and copy the 8-digit token to the clipboard, using the clipboard button to the right of the token box, and paste it on the browser when prompted by Navigraph. Once signed in, give consent to access the required information. If the Navigraph authentication process was successful on the browser, you should see the successful authentication message on the Navigraph website, and also see a successful authentication message on the EFB.

Once successfully authenticated, the EFB internally automates the session refreshing, keeping the session saved on your PC or console, as well as refreshing it every time you start a new flight with the aircraft. This way you can keep your Navigraph session open for as long as you click on the **Sign Out** button on the Settings page, or as long as there are no request failures leading to an automatic sign-out (e.g., when there was an Internet connectivity interruption), whichever occurs first.

Inside the charts user interface, you are presented with a left panel **(1)** and a moving map **(2)**, where you can find a toolbar with some controls for the map **(3)** at the lower right side of the EFB screen.



From the floating toolbar on top of the map, you can zoom in or out, toggle between light and dark mode layers (except OpenStreetMap layer), show or hide the left panel, lock the map to center on the aircraft position, and change the map layer, among the options available from the contextual menu shown in the figure to the left of this paragraph.

The left panel contains the controls from the Charts experience itself. On top of the panel (a), you can find three buttons and a search box. The three buttons, respectively **Departure**, **Arrival** and **Alternate**, are only available if you import a flight plan from SimBrief. Otherwise, you can make use of the search box and type the ICAO ident of the airport of your interest, like in the figure

above. Below the search box, you find basic information (b) about the airport that you searched for, such as IATA / ICAO ids, airport name and location in the world.

Below the airport information fields, you can find a button group (c) for categorizing the charts, in a similar way to how you can filter them in the Navigraph Charts app, filtered by STAR (standard arrival procedure charts), APPR (approach charts), TAXI (ground/airport diagram charts), SID (standard departure procedure charts) and REF (reference/informational charts). Choose among the aforementioned categories by

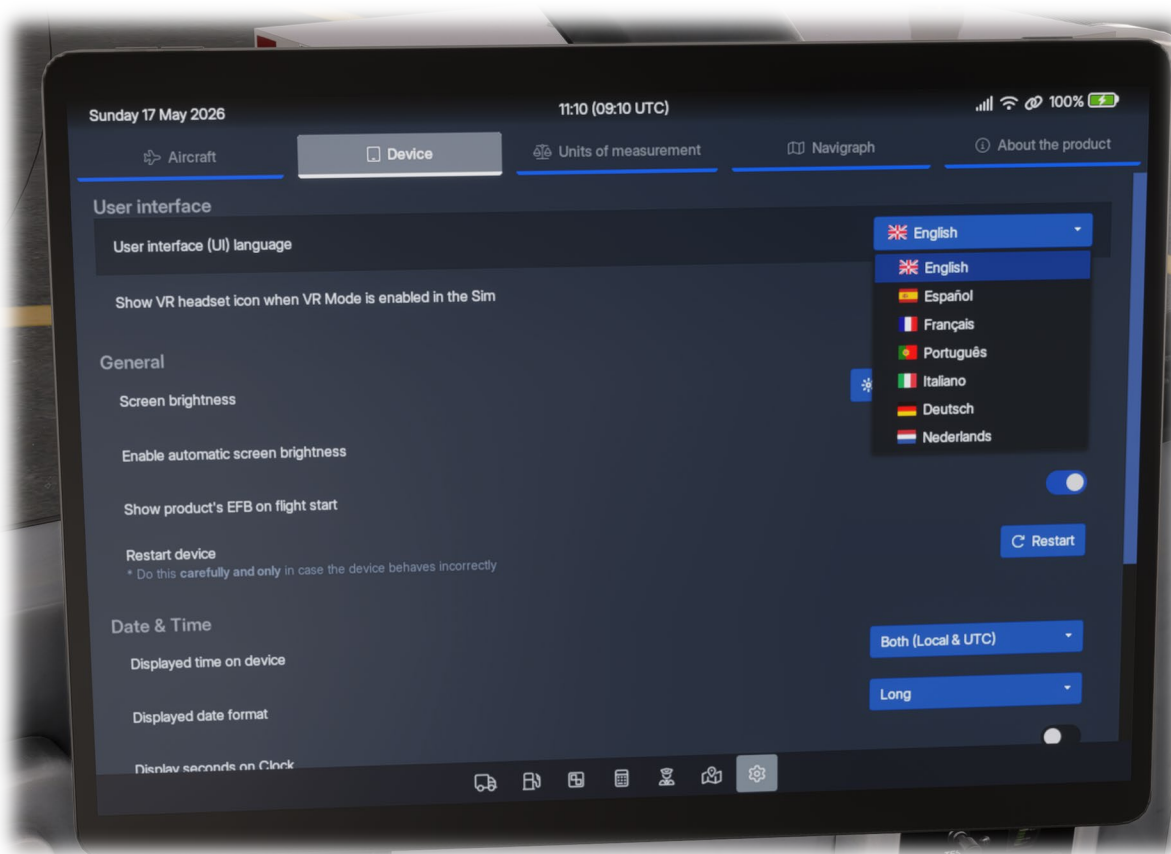
pressing the respective button, and the list (d) will be populated with the respective charts. Each item of the list contains the chart name, index (red badge), a VFR or IFR badge (indicating whether the chart is for IFR or VFR usage), and the date of latest revision reported from the Navigraph servers and the charts *per se*.

Once you click on the chart you are interested in reviewing, you are then presented with a canvas (1) where the chart image is rendered, and a floating toolbar (2), just like the map but contextually with the selected chart.



You can move the chart by holding the left-click and moving the mouse to where you want within the EFB screen bounds. From the floating toolbar, you can toggle between light and dark mode (chart image), make the canvas render the current aircraft position (only on geo-referenced charts like the one on the figure above this paragraph), show or hide the left panel, zoom in or out, rotate the chart to the left or right, or adjust the chart zoom to fit to the horizontal or vertical sides of the EFB screen. If you want to return to the moving map, you can simply click the Close button.

Settings



This page allows you to customize the aircraft and device configuration to how you would like it.

Aircraft Settings



It contains all the available settings for the aircraft, which can be saved and reloaded on every flight session with our product in the sim. Following are the options available for you with this product:

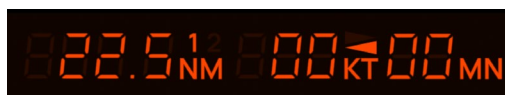
Livery-specific settings

- *ATC callsign:* Here, you can specify the ATC callsign for your aircraft for usage on the sim's ATC engine.
- *ATC flight number:* Specify here the ATC flight number to be used throughout the sim's ATC communications.
- *Tail registration number:* Specify here the aircraft's registration number to be used. Please take note that the tail registration number you assigned will only be visible on the cockpit (if you fly the aircraft with a pre-repainted tail number), unless you fly the aircraft with a livery featuring the dynamic registration decal support. For more information on liveries with Dynamic Registration support, please review the Repaint Kit manual.

Avionics

- *Selected GPS model:* From the drop-down menu as shown in the figure above, you can select which GPS duo you would like to use on the aircraft. Please take note that this setting is shared across all variants and not stored on a per-livery basis. Choose between the Working Title's GNS 530W/430W (the default GPS in the sim), the PMS50's GTN 750/650, the TDS Sim Software's GTN 750Xi/650Xi, or the Falcon71's KLN90B.
- *Displayed time on main panel's clock:* Choose between local time and Zulu (UTC) time (this is the normal configuration even in real life).
- *Disable avionics' automatic brightness (UNREALISTIC):* This option allows you to disable the automatic avionics brightness engine, calibrated from the sim's ambient lighting variables, where it emulates the photocell that you can find on glass cockpit instruments, which is the reason why it is marked as unrealistic if you toggle this logic off.
- *Allow GPS to govern copilot's HSI/CDI/GSI if the GPS drives the CDI:* Toggle this option to make the GPS govern the copilot's HSI instrument (i.e., the course needle, Course Deviation Indicator and Glide Slope Indicator), when the CDI mode is set to GPS. This option was restricted to the Working Title's GNS in the MSFS 2020 product, but it now works across all GPS options in this product.
- *Enable automatic transponder state switch to ON once airborne:* This feature only works if the aircraft is airborne. Toggling this to ON makes the aircraft change the transponder state to ON, if it was not set to ON before takeoff, preventing the ATC from nagging you about "resetting the transponder due to a malfunction".
- *Allow ADF frequency tuning with decimals (UNREALISTIC):* When enabled, this feature allows you to tune NDB frequencies with decimals on the KR87 ADF tuner unit. This option is marked as unrealistic because the real-life unit does not allow tuning frequencies with decimals but only frequencies with no fractional part.

- *Pad zeroes in DME display readout:* Toggling this setting will make all the numbered readouts of the KPI553A DME display show at least two digits and not one (like in the real-life unit), when the variable readout in question reads less than 10 units. An example of this setting can be represented below in the screenshots:



Setting set to ON



Setting set to OFF

- *Allow YD to be engaged on ground:* Toggling this setting to on allows you to engage the yaw damper, even if the aircraft is on ground. If this setting is set to OFF, the yaw damper will be automatically turned off if you attempt to engage it on ground.

General

- *Play passenger signs sound when clicking the respective switches:* If this toggle is checked, the simulation can play a passenger sign sound every time you switch the pax signs (No Smoking & Fasten Seatbelts) on/off.
- *Allow the sim to dynamically adjust the HUD's airspeed color tapes:* When enabled, this aircraft will accordingly adjust the airspeed colored tapes from the simulator's HUD, so that they match with the aircraft's actual speeds.
- *Play a sound when an ECU lever reaches a detent:* When enabled, the aircraft will play a click sound when you reach a throttle or propeller lever detent. This is especially useful, for example, when flying in VR or when you cannot look away from the horizon and you need to adjust the aforementioned levers.

Device Settings



This page allows you to take control of how the EFB should work, based on the settings available for you. Following is a brief description of each setting.

User interface

- *User interface language:* From this drop-down menu, you can choose your preferred language for the EFB's user interface. This is independent from the simulator's UI language. As of the time of writing, the product's EFB includes localizations in English, Spanish, French, Portuguese, Italian, German and Dutch.
- *Show VR headset icon when VR mode is enabled in the sim:* Toggle this option on to show a VR headset icon on the top bar, every time you enter into VR mode in the simulator.

General

- *Screen brightness:* From this slider, adjust the EFB's manual screen brightness percentage. This option will work only if you have the next toggle switched off.
- *Enable automatic screen brightness:* Toggle this to ON to allow the sim to automatically adjust the EFB's screen brightness, based on the ambient lighting conditions. Toggle this OFF to override the brightness setting with the slider from the previous setting.
- *Show product's EFB on flight start:* When enabled, the EFB will be visible and ready to use at the moment you begin the flight. Remember that you can always make the EFB visible or hidden by pressing the EFB TABLET pushbutton on the main panel, located above the Stall Warning gauge.
- *Restart device:* This pushbutton has been designed specifically to restart the EFB instrument and re-initialize it, especially when the instrument does not work correctly. Please be careful when doing this restart process, and do so only when the instrument behaves incorrectly. This may lead to the simulator's crashing to desktop if not used properly.

Date and time

- *Displayed time on device:* Choose between local time, UTC (Zulu) time or both for the time displayed at the center of the top bar.
- *Displayed date format:* Choose between short, medium or long formats for the date displayed on the left side of the screen's top bar.
- *Display seconds on clock:* When enabled, the clock at the top bar will also display the seconds.
- *Display local time in 12 hour format:* When enabled, the clock will display the local time in 12-hour format.

Battery

- *Simulate device battery discharge:* When enabled, the EFB will simulate a battery discharging condition when there is no electrical power on the aircraft.

- *Show battery charge percentage:* When enabled, the EFB screen will display the battery's percentage to the left of the battery icon.

On-screen keyboard

- *Enable on-screen keyboard:* When enabled, the EFB will fully make use of its own keyboard for text input. Otherwise, the EFB will prevent sending keystrokes to the simulation itself in order to input any text on the EFB instrument.
- *Match OSK distribution with the EFB UI language:* When enabled, the EFB's on-screen keyboard will display all keycaps corresponding to the respective UI language. Otherwise, it will display the keyboard in US English distribution.

Units of Measurement



This page allows you to select the units of measurement for most of the numeric inputs, especially weights, as well as for the outputs, like distances or temperatures, for example. You can select the units for **weight** (in pounds or kilograms), **volume** (in US gallons or liters), **barometric pressure** (in hectopascals or inches of mercury), **temperature** (Celsius or Fahrenheit), **altitude** (in feet or meters), **distance** (in nautical miles or kilometers), and **speed** (in knots or kilometers per hour).

Navigraph Settings



Here in this page, you can specify the settings that are specific to the Navigraph services (SimBrief and the Charts experience). Following is a brief description of each setting.

- *SimBrief user:* Specify here on the input box your username on SimBrief for the OFP fetching feature on the Flight Briefing page.
- *Navigraph account:* Here, you can perform the authentication process with Navigraph for the Charts experience, or you can also sign out from Navigraph, if you are already signed in. Your username will appear to the left of the Sign Out button if you are already authenticated.
- *Position icon for map and georeferenced charts:* Choose between the arrow and the airplane icon by clicking on the toggle button. You may have to either restart the EFB from the Restart button on the Device page, or restart the sim so that the changes can take effect.
- *Enable streamer mode:* When enabled, this will allow you to hide both the SimBrief user input and the username to the left of the Sign Out button, so that you can hide your username when performing a livestream to improve privacy. This option is extremely useful for streamers and content creators in the flight-sim community.
- *Always add a watermark on top of the charts:* When enabled, the EFB will display a watermark on the top-left corner of the chart you are viewing. This follows a recommendation from Navigraph. If the streamer mode is not enabled, the watermark will read "This chart is linked to Navigraph account <you>". Otherwise, if the streamer mode is enabled, the watermark will read "This chart is linked to the Navigraph account of a streamer".
- *Enable auto import of SimBrief's OFP on flight start:* When enabled, the EFB will automatically fetch the SimBrief's OFP when you start your flight session with this aircraft.

- *Abort SimBrief OFP import if the OFP is not for this aircraft:* When enabled, the EFB will not load the latest OFP you have on SimBrief if it was not created for this aircraft in mind. If this option is disabled, the EFB will prompt you if you want to import the flight plan anyway.

About the Product



This sub-page of the Settings page shows the basic information about the product, its version number, copyright statement, as well as information about the sim (version number and where our product is running from: Windows, Xbox or PlayStation). Additionally, you can click on the social media icons on the bottom and those will take you to the respective website, so that you can follow us and not miss on our announcements, updates and ask for assistance (Discord only).

Acknowledgements

For this development to succeed, there must be a great commitment to delivering a high-quality, fully functional product.

Primarily, the fruits of our labor are dedicated to God, our Almighty Lord, Our Lord Jesus Christ, the Holy Virgin Mary and the Holy Spirit for their help and constant inspiration and illumination throughout the development process and every day this company has been operating. Without them, this product would not have been possible, and even this company would not operate and succeed as it is now, especially in the hardest times.

I also want to thank my family and close friends for their constant motivation and inspiration, as well as everyone in the developers' community for their feedback and technical help and expertise.

I would also like to thank the following individuals, which deserve a special mention, for their time, feedback, patience, and assistance throughout the development and updating process.

- Manecas Cris and Robert Schumacher (followers of ours on Facebook) for contributing with the aircraft's technical documentation, which made this product and its updates possible.
- Fabio Lagattolla, product user of the 2020 release, for his feedback of the product, contributions in technical aspects, constant support, and his amazing liveries artwork for the 2020 release, which you can find at **Flightsim.to**. His feedback made possible the updates of the product, and his artwork available to the community made this product to be so popular among the flight-sim community! Thank you so much, Fabio!
- Alan Michael Koenig (Discord user *Sonosusto*), product user, for his feedback on the product, explanations of what was missing on the first release, and suggestions of features that were included on the road, as well as for making possible to enhance the user experience of not just the 2020 product but also this the 2024 product.
- Alec Roberts, product user, for his feedback on the product and contributions to technical aspects from the 2020 product and which shaped the 2024 product's codebase.
- Product users Marco Köhler (a.k.a. JayDee), Paulo Marcelo Soares and Tim Wright, for their contributions that significantly improved critical areas of the product that could not been noticed internally during the 2020 product's initial development, such as radios, systems, flight model, etc.
- Product users Marco Köhler (a.k.a. JayDee) and Cristiano Veloso (a.k.a. Conexão Gamer), both streamers of the flight sim community, for their help in beta-testing this product.
- All the team at Navigraph, particularly Markus, Derek and Jason, for their help with the successful integration of Navigraph Charts and SimBrief services, as well as their feedback and marketing of the product on Navigraph's socials and news portal.

- All the team at PMS50 for their feedback and tremendous help integrating their GTN gauge and their autopilot gauge module (APGA).
- All the team members at TDS Sim Software, for their feedback and immense help integrating their GTNXI gauge.
- All YouTubers, Twitchers and streamers in the flight-sim community worldwide, for their feedback on the product (including the initial release for MSFS 2020), as their perspectives and reviews helped to shape the product to what it is now. Thank you for your honesty and your help!

A special mention to the Navigraph team and big thanks for being honored as an official partner effective since the Flight Sim Community Survey 2026. Without their help and experience, this would not have been possible.

Finally, a special mention to the teams at Microsoft and Asobo Studio, for their constant dedication to bringing such great flight simulation software, maturing it with every update, and for the care they have to users and developers, listening to our feedback and requests. They deserve a big applause!

Without any of the previous individuals, it would not be possible to bring you such an excellent product.

Thank you all very much! May God bless you all!

Sincerely,

Carlos Daniel González Gómez

C.E.O., Founder & Lead Developer

Appendix I – Product’s Release Notes

2.0.0.2605 (May 28th, 2026)

Initial release of native product for Microsoft Flight Simulator 2024.

Following is the list of changes from the MSFS 2020 product, whose changelog is not included in this document. To review the MSFS 2020 product changelog, please refer to the respective User Manual.

- [General] Product fully remade and fully rebuilt with the MSFS 2024 SDK, as a Modular Aircraft.
- [Artwork] Remastered Exterior and Interior visuals with textures compiled at high resolution for better quality: up to 8K for exterior and up to 4K for interior.
- [Artwork] All models now include LODs as per mandatory requirements from the simulator’s SDK.
- [Artwork] Aircraft structure rivets are no longer geometry-based decals, meaning that all are now baked into the normal maps.
- [Artwork] Improved occlusion, roughness and metallic maps everywhere in the aircraft.
- [Artwork] Improved overall wear visuals across the whole aircraft, especially in the cockpit and landing gear mechanisms.
- [Artwork] Windshield and passenger windows now visually include micro-scratched details for better visual fidelity.
- [Artwork] Fully reworked flap lever and ECU lever handles to match the ones from the real-life aircraft.
- [Variants] Added EMB-110P2 variant.
- [Artwork] Added improved windshield rain effects, including wipers’ dirt lines and water cleaning effects.
- [Artwork] Added dirt, leaks and wear effects according to the MSFS 2024 SDK specifications, as part of including support for native weathering and wear-&-tear support.
- [Artwork] Updated icing visual effects to the aircraft structure.
- [Artwork] Updated decals and visual effects draw order, so that they do not flicker when the sim renders all of them.
- [Artwork] Added clearcoat visual effects on the aircraft structure (where the livery paint is applied) for all variants.
- [Artwork] Added dynamic exterior tail registration decal on compatible liveries. More information on third-party liveries including this feature is available on the Repaint Kit manual.
- [Artwork] Added missing details in the cockpit, such as fire extinguishers, oxygen cylinders, and the landing gear’s emergency extension panel on the floor (between the copilot’s seat and the pedestal) in the cockpit.
- [Artwork] Added missing strobe lights placard on the overhead panel.
- [Artwork] Added INOP decal on top of the passenger signs switches (visible only on the EMB-110P1F).

- [Artwork] Updated aircraft's materials to be compliant with the simulator's guidelines, such as propellers, where its motion blur is much more natural thanks to the sim's shaders.
- [Artwork] Updated seatbelts modelling and texturing.
- [Artwork] Fixed cockpit light knob placards where they should not have emissive properties.
- [Model Behaviors] Added moving steering tiller knob animation.
- [Model Behaviors] Added yoke's pitch trim button switch animation and logic.
- [Model Behaviors] Added seatbelts logic and seated passengers according to the MSFS2024 SDK standards.
- [Model Behaviors] Disabled passenger signs switches logic on the EMB-110P1F.
- [Model Behaviors] Added visible cargo pallets on the EMB-110P1F cabin, as well as visible luggage suitcases on the EMB-110 pax variants.
- [Model Behaviors] Added preflight walkaround capability and logic, following the sim's standards.
- [Artwork] Improved wheel chocks and safety cones modelling and texturing.
- [Artwork] Remastered modelling and texturing of pitot tube and engine covers.
- [Artwork] Added much more detailed static ports and added their respective cover.
- [Artwork] Added propeller covers.
- [Artwork] Added missing HF wired, tail-to-front antenna to all variants, toggleable from the EFB on a per-livery basis.
- [Artwork] Reworked cockpit sunshades' modelling and texturing.
- [Model Behaviors] Cockpit sunshades are now movable and interactable.
- [Exterior & Interior Lights] Improved cockpit lights.
- [Exterior & Interior Lights] Added missing tail navigation light.
- [Exterior & Interior Lights] Light FXs are all customized based on the standard ones from the simulator, and included within the product's package with the aircraft folder. This applies to both exterior and interior lights.
- [Exterior & Interior Lights] Cockpit panels' illumination has been adjusted in colors and intensity to match as accurately as possible, based on footages and reference material shared by the community on social media.
- [Artwork] Garmin GNS and GTX emissive colors have been adjusted to accurately match the ones from the real-life counterparts.
- [Model Behaviors] Fixed inverted parking brake lever positions.
- [Model Behaviors] The landing gear position indicator now includes a dimming knob, as well as a test pushbutton, as per reference from the POH.
- [Model Behaviors] Improved doors animation and behavior, as well as the openable cockpit side windows animation and behavior.
- [Liveries] Added 27 more worldwide liveries distributed across all 4 variants, in addition to the 9 included in the initial release for MSFS 2020.
- [Liveries] Updated resolution and revised liveries included in the initial release for MSFS 2020.

- [Avionics] Added full cockpit integration of the Falcon71's KLN90B open-source instrument.
- [Avionics] Added KX165A COM/NAV tuner instruments, only visible with the KLN90B selected, as they are the matching units for the GPS unit.
- [Avionics] The product no longer includes an embedded version of the PMS50 GTN750 on Xbox, in favor of the standalone product found on the in-game Marketplace.
- [Avionics] Added gliding speed automatic calculation as per specification from the POH and gliding ratio, in order to enable the TDS GTNXI's Autoland function.
- [Systems] Added functionality to the Stall Warning gauge, both sound and light.
- [Systems] Added missing U/C (undercarriage) flag in the airspeed indicator, and its accompanying logic and Gear Horn sound, when the landing gear is not downlocked under certain conditions.
- [Flight Dynamics] Revised and tweaked engines parameters, including but not limited to propellers' beta angle and power, matching their values from the real-life aircraft's POH, as close as possible.
- [Flight Dynamics] Adjusted landing gear extension and retraction times to match the ones from the real-life aircraft, with the help of footage shared by the community on social media.
- [Model Behaviors] Added propeller pitch animation and logic.
- [Model Behaviors] Adjusted Power and propeller levers to match the corresponding lower detents.
- [Model Behaviors] Added logic to prevent power levers from being moved below 8% when the aircraft is airborne, coinciding with the MIN/FLT IDLE detent.
- [Model Behaviors] Propeller levers can now be fully lowered to the FEATHERED position.
- [Model Behaviors] Fixed flap lever positions with the correct 5 detents (0%, 25%, 50%, 75%, 100%).
- [Systems] Improved automatic feathering system logic.
- [Flight Dynamics] Updated aerodynamics and flight dynamics parameters for all variants, according to the MSFS 2024 SDK guidelines.
- [Flight Dynamics] Added body contributions (fuselage and engines) to the aircraft's aerodynamics.
- [Flight Dynamics] Fixed airplane geometry parameters, in order to properly address distribution and visualization of aerodynamic forces in the sim, based on the sim's logic.
- [Flight Dynamics] Adjusted aerodynamic coefficients and carefully adjusted parameters related to the propwash effect.
- [Systems] Updated fuel, electrical, hydraulic and pneumatic systems to the MSFS2024 standard, and their logic has been revised, updated and improved.
- [Systems] Improved air conditioning, hydraulic brakes and ice protection systems, thanks to the overall systems improvements in MSFS 2024.
- [Artwork / Systems] Added custom-modelled Ground Power Unit (3D geometry, textures and logic), especially useful in case the aircraft is parked where there is no external power truck available.

- [Systems] Added invisible click-spot on the Overhead Panel, at the left of the Master Battery switch, to quickly change between BATTERY and EXTERNAL POWER positions and vice-versa.
- [Avionics / EFB] Added options to automatically adjust the EFB and digital instruments' screen luminosity, based on daylight conditions, or override it to their maximum brightness.
- [Settings] EFB and GPS settings are now shared across all variants and liveries, instead of being saved on a per-variant basis.
- [EFB] Fully reworked product's own EFB from the ground up, including a fully revised user interface.
- [EFB] Added on-screen keyboard and support for physical keyboard input on editable EFB inputs.
- [EFB] Added sim-independent multi-language support to the EFB, with English, Spanish, French, Portuguese, Italian, German and Dutch being the initial languages included. More coming based on user feedback.
- [EFB] Added Weight & Balance, Fuel Planning and Performance Calculator pages to the EFB, based on data from the real-life aircraft's POH.
- [EFB] Weight & Balance and Fuel parameters synchronize with the information from the sim's built-in EFB.
- [EFB / Navigraph] Added Navigraph Charts and SimBrief integration on the product's own EFB. Support for the sim's built-in LIDO/FAA charts is coming in subsequent post-release updates.
- [EFB] Added METAR gathering feature to the EFB, sourced from the sim, allowing to review the current weather forecast at the desired airport.
- [EFB] Added flight briefing page, with flight plan progress data. Only available when importing a flight plan from SimBrief.
- [EFB] Added option to abort loading OFP from SimBrief if the OFP is not for this aircraft, as well as an option to automatically load the SimBrief's OFP when loading the aircraft.
- [EFB] Improved Ground Services options panels.
- [EFB] Fixed Ready for Departure internal checks logic, causing a bug where the "Invalid state detected" message appeared on the previous version of the EFB.
- [EFB] The About the Product section, located now on the Settings page, now includes information about the Navigraph's AIRAC package installed, or the sim's own AIRACs included, in case the Navigraph package is not installed.
- [Systems] Fully remade RDR2000 instrument from scratch in WebAssembly (WASM), to take advantage of the added capabilities in MSFS 2024 Sim Update 5.
- [Systems] Fixed RDR2000 issue where the electric power was not correctly restored when the mode knob was not in the OFF position and the aircraft's electric system was re-energized.
- [Systems] Updated RDR2000 scan rate from the sim's default of 72 deg/sec (12 RPM) to the one from the real-life antenna's specifications (25 deg/sec or ~4 RPM).
- [Systems] RDR2000's tilt functionality now affects the WXR return, thanks to improvements on the weather radar visualization in MSFS2024's Sim Update 5.

- [Systems] Added RDR2000 track azimuth line and value representation. This, however, does not have an impact on the WXR return, as this is not yet simulated in MSFS2024.
- [Systems] RDR2000's Vertical Profile is now functional on all WXR operating modes (STBY, TEST, ON/WX).
- [Systems] Added RDR2000 test colored arcs representation on Vertical Profile.
- [Systems] Fixed RDR2000 test colored arcs representation scaling, based on selected range of returns visualizations, as per specifications of the real-life unit.
- [Systems] Added missing range and altitude indications on RDR2000's Vertical Profile.
- [Systems] Updated RDR2000 display colors to more accurately match the ones from the real-life unit.
- [Systems] Fixed RDR2000's WXR return cone on both Horizontal and Vertical Profile modes to the corresponding angles from the real-life unit (90° for Horizontal instead of 120°, and 60° for Vertical Profile instead of 50°).
- [Systems] Fixed RDR2000's rain rates for all colors, as well as gain factors. They are all calibrated based on values from the real-life display.
- [Systems] Fixed RDR2000's tilt angles. They are now $\pm 15^\circ$, instead of $\pm 30^\circ$.
- [Systems] Added automatic return stabilization functionality to the RDR2000, as well as the corresponding annunciations. Stabilization only works if the aircraft is airborne and the aircraft does not exceed $\pm 30^\circ$ of pitch and bank angles (combined).
- [Artwork] Improved visuals and fonts on radios and instruments.
- [Systems] Fixed annunciators' logic, matching their behavior as described in the aircraft's POH.
- [Systems] Fixed Master Warning annunciator not turning on when there was at least one annunciator illuminated.
- [Career Mode] Added full Career Mode support. Available only for Marketplace customers.
- [Soundscape] Fully remade engines' sound-set using more accurate recordings.
- [Soundscape] Performed general fixes to the aircraft's soundscape and eliminated most (if not all) of the sound glitches everywhere.
- [Soundscape] Adjusted volume, pitch, high-pass tones and low-pass tones on engines' sound wave files, in order to improve experience on different audio devices.
- [Soundscape] Fixed sound insulation between exterior and interior, thanks to the fixes performed to the aircraft doors and openable windows.
- [Soundscape] Propeller, jet whine and combustion sounds are all separated and correctly adjusted to play within the 3D space accordingly.
- [Soundscape] Added feathered propeller sound.
- [Soundscape] Added sounds to the covers and preflight elements.
- [Soundscape] Addressed sound-playing issues on certain cockpit elements.
- [Soundscape] Added reverse sound based on the propeller's pitch.
- [Soundscape] Fixed flap lever sound not correctly working since the initial release for MSFS 2020.

- [Repaint Kit] Added a new repaint kit. It will be downloadable separately from the NextGen's website, starting from the release day of the product.
- [Docs & Tutorials] Added tutorial videos in the form of a playlist on the NextGen's YouTube channel.
- [Docs & Tutorials] User manual updated reflecting the changes made.
- [Docs & Tutorials] The user manual now includes deeper explanations on the systems, flight instruments and the aircraft in general.
- [Docs & Tutorials] Updated product documentation's visual layout.
- [Docs & Tutorials] Changed paper format of the product's documentation in PDF to A4 (European standard).
- [General] General minor bugfixes from the MSFS 2020 product.

Appendix II – Product’s Local Variables That Can Be Used For Controlling The Aircraft Through External Hardware

Following is the list of local variables (LVARS) defined in our aircraft, which allow you to control parts of the aircraft systems. These can be used to create your own **SPAD.neXt** profile for an autopilot hardware device or any other flight-sim hardware device not listed in this document, such as the Stream Deck.

If you would like to get a list of the variables defined in this product, first make sure that you have Developer Mode enabled in MSFS 2024. Once you have DevMode enabled, go to **Tools > Behaviors** on the DevMode’s menu bar on top of the screen, then select our aircraft from the drop-down of simulation objects rendered in the sim’s virtual scene, and go to ‘Function_Interior_XXXXX’ in the attachments drop-down below. Select the **Variables** tab, and make sure the **Show only variables set by this model** checkbox is unchecked. All local variables defined by us are prefixed with **XMLVAR_NGSE110V2_**.

Below is the list of common/frequently used local variables that can be used for setting up commands to your external hardware setup on SPAD.neXt or Axis and Ohs. Not all local variables defined on the product are writable, because, otherwise, this can cause unexpected and erratic behavior of the product.

Local variable (L: Var)	Writable	Description
(L:XMLVAR_NGSE110V2_IsEMB110P, Bool)		Is EMB-110P?
(L:XMLVAR_NGSE110V2_IsEMB110P1, Bool)		Is EMB-110P1?
(L:XMLVAR_NGSE110V2_IsEMB110P1F, Bool)		Is EMB-110P1 (cargo)?
(L:XMLVAR_NGSE110V2_IsEMB110P2, Bool)		Is EMB-110P2?
(L:XMLVAR_NGSE110V2_SentPrepareForDeparture, Bool)		Set to 1 (true) to send the Prepare for departure command, just like the pushbutton from the EFB UI.
(L:XMLVAR_NGSE110V2_OpenMainDoor, Bool)		Set to 1 (true) to send the command of opening the main door
(L:XMLVAR_NGSE110V2_CloseMainDoor, Bool)		Set to 1 (true) to send the command of closing the main door
(L:XMLVAR_NGSE110V2_OpenRearDoor, Bool)		Set to 1 (true) to send the command of opening the rear door (except EMB-110P)

(L:XMLVAR_NGSE110V2_CloseRearDoor, Bool)	✓	Set to 1 (true) to send the command of closing the rear door (except EMB-110P)
(L:XMLVAR_NGSE110V2_AnnunciatorsDimmed, Bool)	✓	Toggles on/off the alarms' annunciators dimming
(L:XMLVAR_NGSE110V2_GearIndicatorDimmed, Bool)	✓	Toggles on/off the gear position indicator's light dimming mode
(L:XMLVAR_NGSE110V2_TcasDisplay_1_Brightness, Number)	✓	Sets the brightness percentage of the pilot's VSI gauge.
(L:XMLVAR_NGSE110V2_TcasDisplay_2_Brightness, Number)	✓	Sets the brightness percentage of the copilot's VSI gauge.
(L:XMLVAR_NGSE110V2_KNI582_1_Ptr1Mode, Number)	✓	Pilot's RMI Pointer 1 mode 1 = VOR, 2 = ADF
(L:XMLVAR_NGSE110V2_KNI582_1_Ptr2Mode, Number)	✓	Pilot's RMI Pointer 2mode 1 = VOR, 2 = ADF
(L:XMLVAR_NGSE110V2_KNI582_2_Ptr1Mode, Number)	✓	Copilot's RMI Pointer 1 mode 1 = VOR, 2 = ADF
(L:XMLVAR_NGSE110V2_KNI582_2_Ptr2Mode, Number)	✓	Copilot's RMI Pointer 1 mode 1 = VOR, 2 = ADF
(L:XMLVAR_NGSE110V2_KPI553A_1_BearingMode, Number)	✓	Toggles the pilot's HSI bearing mode 1 = ADF, 2 = NAV
(L:XMLVAR_NGSE110V2_KPI553A_2_BearingMode, Number)	✓	Toggles the copilot's HSI bearing mode 1 = ADF, 2 = NAV
(L:XMLVAR_NGSE110V2_EngInletAntiIceSwitch, Bool)	✓	Toggles on/off the engine inlet anti-ice
(L:XMLVAR_NGSE110V2_PneumaticDeiceSwitchPos, Number)	✓	Controls the pneumatic de-ice switch position 0 = OFF, 1 = FAST, 2 = SLOW
(L:XMLVAR_NGSE110V2_MainFuelPumpL, Bool)	✓	Toggles on/off the main left fuel pump
(L:XMLVAR_NGSE110V2_AuxFuelPumpL, Number)	✓	Toggles the auxiliary left fuel pump 0 = OFF, 1 = AUTO, 2 = ON
(L:XMLVAR_NGSE110V2_MainFuelPumpR, Bool)	✓	Toggles on/off the main right fuel pump
(L:XMLVAR_NGSE110V2_AuxFuelPumpR, Number)	✓	Toggles the auxiliary right fuel pump

		0 = OFF, 1 = AUTO, 2 = ON
(L:XMLVAR_NGSE110V2_FuelXFeedSwitch, Bool)	✓	Toggles on/off the fuel cross-feed valve
(L:XMLVAR_NGSE110V2_ResetFuelConsumedPressed, Bool)	✓	Set to 1 (true) to reset the fuel totalizer gauge
(L:XMLVAR_NGSE110V2_FireShutoffLSwitch, Bool)	✓	Toggles on/off the left shutoff valves switch 0 = valves open 1 = valves closed
(L:XMLVAR_NGSE110V2_FireShutoffRSwitch, Bool)	✓	Toggles on/off the right shutoff valves switch 0 = valves open 1 = valves closed
(L:XMLVAR_NGSE110V2_HydBoosterPump, Bool)	✓	Toggles on/off the hydraulic booster pump
(L:XMLVAR_NGSE110V2_AirCondShutoffLSwitch, Bool)	✓	Toggles on/off the air conditioning system's left shutoff valve (left engine bleed air shutoff valve)
(L:XMLVAR_NGSE110V2_AirCondShutoffRSwitch, Bool)	✓	Toggles on/off the air conditioning system's right shutoff valve (right engine bleed air shutoff valve)
(L:XMLVAR_NGSE110V2_AirCondMasterSwitchPos, Number)	✓	This variable controls the position of the air conditioning system's master switch 0 = OFF, 1 = VENT, 2 = ON
(L:XMLVAR_NGSE110V2_AirCondDefogSwitch, Bool)	✓	Toggles on/off the air conditioning system's windshield defogging fan
(L:XMLVAR_NGSE110V2_AnticollisionLightSwitchPos, Number)	✓	This variable controls the position of the anti-collision lights. 0 = OFF, 1 = BEACON, 2 = BEACON+STROBE
(L:XMLVAR_NGSE110V2_CabinLightsSwitchPos, Number)	✓	This variable controls the position of the passenger cabin lights. 0 = OFF, 1 = PARTIAL, 2 = ON
(L:XMLVAR_NGSE110V2_MasterBatterySwitchPos, Number)	✓	This variable controls the position of the battery switch.

		0 = EXT PWR, 1 = OFF, 2 = BAT
(L:XMLVAR_NGSE110V2_WiperLPowerSwitchPos, Number)	✓	This variable controls the position of the left windshield wiper switch. 0 = PARK, 1 = OFF, 2 = ON
(L:XMLVAR_NGSE110V2_WiperRPowerSwitchPos, Number)	✓	This variable controls the position of the right windshield wiper switch. 0 = PARK, 1 = OFF, 2 = ON
(L:XMLVAR_NGSE110V2_WiperLSpeedFast, Bool)	✓	Toggles between slow or fast wiper speed (Left)
(L:XMLVAR_NGSE110V2_WiperRSpeedFast, Bool)	✓	Toggles between slow or fast wiper speed (Right)
(L:XMLVAR_RDR2000_ScreenBrightness, Number)	✓	Value between 0 and 100 for the weather radar display brightness
(L:XMLVAR_NGSE110V2_PxHeatSwitch, Bool)	✓	Toggles on/off the PX Heat switch
(L:XMLVAR_NGSE110V2_StaticPitotHeatSwitch, Bool)	✓	Toggles on/off the static port and pitot heat switch
(L:XMLVAR_NGSE110V2_Generator1SwitchPos, Number)	✓	Controls the left generator switch position 0 = OFF, 1 = ON, 2 = RESET
(L:XMLVAR_NGSE110V2_Generator2SwitchPos, Number)	✓	Controls the right generator switch position 0 = OFF, 1 = ON, 2 = RESET
(L:XMLVAR_NGSE110V2_Inverter1, Bool)	✓	Toggles on/off the Inverter 1
(L:XMLVAR_NGSE110V2_Inverter2, Bool)	✓	Toggles on/off the Inverter 2
(L:XMLVAR_NGSE110V2_LIgnitionSwitchPos, Number)	✓	Controls the position of the left engine ignition switch 0 = DRY MOTORING, 1 = NORMAL, 2 = IN-FLIGHT IGNITION
(L:XMLVAR_NGSE110V2_WindshieldDeiceLSwitch, Bool)	✓	Toggles on/off the left windshield de-ice switch
(L:XMLVAR_NGSE110V2_WindshieldDeiceRSwitch, Bool)	✓	Toggles on/off the right windshield de-ice switch
(L:XMLVAR_NGSE110V2_LIgnitionSwitchPos, Number)	✓	Controls the position of the left engine ignition switch

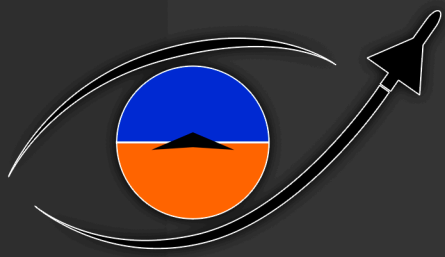
		0 = DRY MOTORING, 1 = NORMAL, 2 = IN-FLIGHT IGNITION
(L:XMLVAR_NGSE110V2_RIgnitionSwitchPos, Number)	✓	Controls the position of the right engine ignition switch 0 = DRY MOTORING, 1 = NORMAL, 2 = IN-FLIGHT IGNITION
(L:XMLVAR_NGSE110V2_IsEFBVisible, Bool)	✓	Toggles EFB visibility
(L:XMLVAR_NGSE110V2_YokeL_Hidden, Bool)	✓	Toggles left yoke visibility
(L:XMLVAR_NGSE110V2_YokeR_Hidden, Bool)	✓	Toggles right yoke visibility
(L:XMLVAR_NGSE110V2_PilotSeat_ArmrestOpenL, Bool)	✓	Toggles pilot seat's left armrest position 0 = FULL DOWN, 1 = FULL UP
(L:XMLVAR_NGSE110V2_PilotSeat_ArmrestOpenR, Bool)	✓	Toggles pilot seat's right armrest position 0 = FULL DOWN, 1 = FULL UP
(L:XMLVAR_NGSE110V2_CopilotSeat_ArmrestOpenL, Bool)	✓	Toggles copilot seat's left armrest position 0 = FULL DOWN, 1 = FULL UP
(L:XMLVAR_NGSE110V2_CopilotSeat_ArmrestOpenR, Bool)	✓	Toggles copilot seat's right armrest position 0 = FULL DOWN, 1 = FULL UP
(L:XMLVAR_NGSE110V2_EmergencyLightsSwitch, Number)	✓	Controls the emergency light switch position 0 = ON/TEST, 1 = OFF, 2 = ARM
(L:XMLVAR_NGSE110V2_AutofeatherSwitch, Number)	✓	Controls the auto feather switch position 1 = OFF, 2 = ARM
(L:XMLVAR_NGSE110V2_HCBravoAPSelMode, Number)	✓	This variable controls the position of the Honeycomb Bravo AP selection mode knob. 0 = NOT CONNECTED, 1 = ALT, 2 = VS, 3 = HDG, 4 = CRS, 5 = IAS
(L:XMLVAR_NGSE110V2_HCBravoAPIncKnob, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. If set to 1 (true), triggers the increase event of the AP

		variable (based on the previous LVar value).
(L:XMLVAR_NGSE110V2_HCBravoAPDecKnob, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. If set to 1 (true), triggers the decrease event of the AP variable (based on the previous LVar value).
(L:XMLVAR_NGSE110V2_HCBravoHDGPressed, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. Setting to 1 (true), this variable command the heading selection mode.
(L:XMLVAR_NGSE110V2_HCBravoNAVPressed, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. Setting to 1 (true), this variable command the navigation selection mode.
(L:XMLVAR_NGSE110V2_HCBravoAPRPressed, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. Setting to 1 (true), this variable command the approach course mode.
(L:XMLVAR_NGSE110V2_HCBravoREVPressed, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. Setting to 1 (true), this variable command the back-course navigation mode.
(L:XMLVAR_NGSE110V2_HCBravoALTPressed, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. Setting to 1 (true), this variable command the altitude hold mode.
(L:XMLVAR_NGSE110V2_HCBravoVSPressed, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. Setting to 1 (true), this variable command the altitude arm mode and climb/descent through vertical speed selection mode.

(L:XMLVAR_NGSE110V2_HCBravoIASPressed, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. Setting to 1 (true), this variable command the altitude arm mode and climb/descent through indicated speed selection mode.
(L:XMLVAR_NGSE110V2_HCBravoAPPressed, Bool)	✓	Used for Honeycomb Bravo's AP panel increase/decrease knob. Setting to 1 (true), this variable command the autopilot master toggle.
(L:XMLVAR_NGSE110V2_HCAAlphaLandLightsOn, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the "turn landing lights on" command.
(L:XMLVAR_NGSE110V2_HCAAlphaLandLightsOff, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the "turn landing lights off" command.
(L:XMLVAR_NGSE110V2_HCAAlphaTaxiLightsOn, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the "turn taxi lights on" command.
(L:XMLVAR_NGSE110V2_HCAAlphaTaxiLightsOff, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the "turn taxi lights off" command.
(L:XMLVAR_NGSE110V2_HCAAlphaNavLightsOn, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the "turn navigation lights on" command.
(L:XMLVAR_NGSE110V2_HCAAlphaNavLightsOff, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the "turn navigation lights off" command.
(L:XMLVAR_NGSE110V2_HCAAlphaBeaconLightsOn, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true),

		this variable sends the “turn beacon lights on” command.
(L:XMLVAR_NGSE110V2_HCAAlphaBeaconLightsOff, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the “turn beacon lights off” command.
(L:XMLVAR_NGSE110V2_HCAAlphaStrobeLightsOn, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the “turn strobe lights on” command.
(L:XMLVAR_NGSE110V2_HCAAlphaStrobeLightsOff, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the “turn strobe lights off” command.
(L:XMLVAR_NGSE110V2_HCBravoPitotSwitchOn, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the “turn pitot heat on” command.
(L:XMLVAR_NGSE110V2_HCBravoPitotSwitchOff, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the “turn pitot heat off” command.
(L:XMLVAR_NGSE110V2_HCBravoPaxSignsOn, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the “turn passenger signs on” command.
(L:XMLVAR_NGSE110V2_HCBravoPaxSignsOff, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the “turn passenger signs off” command.
(L:XMLVAR_NGSE110V2_HCBravoTOGAPressed, Bool)	✓	Used for Honeycomb light switches. Setting to 1 (true), this variable sends the “turn TOGA mode on” command.
(L:PMS50_APGA_SELECTED_ALTITUDE, Feet)	✓	Used in the autopilot system. Please use this variable for selected altitude, instead of the standard simvar.
(L:PMS50_APGA_SELECTED_VS, Feet/minute)	✓	Used in the autopilot system. Please use this variable for

		selected vertical speed, instead of the standard simvar.
(L:XMLVAR_NGSE110V2_ADF1_AntennaMode, Bool)	✓	Sets ON/OFF the antenna mode of the ADF1 receiver.
(L:XMLVAR_NGSE110V2_ADF2_AntennaMode, Bool)	✓	Sets ON/OFF the antenna mode of the ADF2 receiver.



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SIMULATIONS