

# PMS50 GTN750

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# Introduction

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The PMS50 GTN750 is a GPS instrument that looks similar as the original GARMIN GTN750.



It's intended to be used with Microsoft Flight Simulator 2020 (MSFS) and should stay a game level instrument. Don't use it for real navigation purpose or training.

This GTN750 is not an integration of the Garmin trainer. It has been built from scratch using the Asobo and Working Title development tools for full integration in the simulator. Don't expect an exact replication of the real instrument even if it provides most of its functionality. Since we master the code we can provide extra features not available in the Garmin trainer or in competitor products.

The GTN750 is available as a free package that provides all the necessary functionality for flying your flight plan and an optional premium activation key that provides extended features.

The GTN750 can replace the G1000 MFD of the base MSFS aircraft. It can also be used by aircraft providers to be fully integrated in their cockpit in a 3D bezel. There is an integrator's guide for this purpose.



# Installation

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The product is delivered as an MSFS package to be installed in the MSFS Community folder.

Get the GTN750 package from the [PMS50 site](#) . In the home page, click on the "Download latest version" button.

If you have a windows message "path too long" while installing the packages, please [read this](#).

Or use the [7-zip program](#)

Or unzip the package first in your disk root (ex C:/) and then copy (drag) the unzipped directory to the community folder.

Or try to use the [free MSFS Addons Linker program](#).

If you have any issue with the installation in your environment do the following:

- Empty the community folder.
- Install the last version of the GTN750 package.
- Test with the GTN750 toolbar panel (see Toolbar chapter).
- Put back one by one the other Mods into the community folder to see if there is a conflict with one of them.

**WARNING:** The official package is currently available only from our PMS50 site (<https://pms50.com>). If you download the software from any other site, you participate to a copyright violation and you risk legal actions. You may also have a non functional software and damage to your computer. If you have already installed the package from an alternative site, please replace it with the official package.

Any modification, reverse engineering or debugging of our Javascript obfuscated code is prohibited.

## Install GTN750 package

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The package name is "pms50-instrument-gtn750".

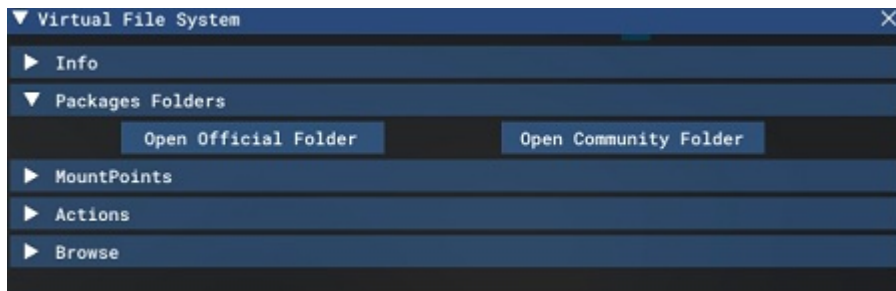
- Unzip the package into the Community folder
- Start MSFS

If you don't know the path of your community folder or if you can't see the package in the content manager after install or if it says "Not installed", do the following while running the sim:

- Go to Options / General
- Click on "Developers" which you will find at the bottom of the list on the left

- Switch Developers Mode on
- On the Dev Menu select Tools / Virtual File System

The community folder location can be found under "Packages Folders":



Click on "Open Community Folder".

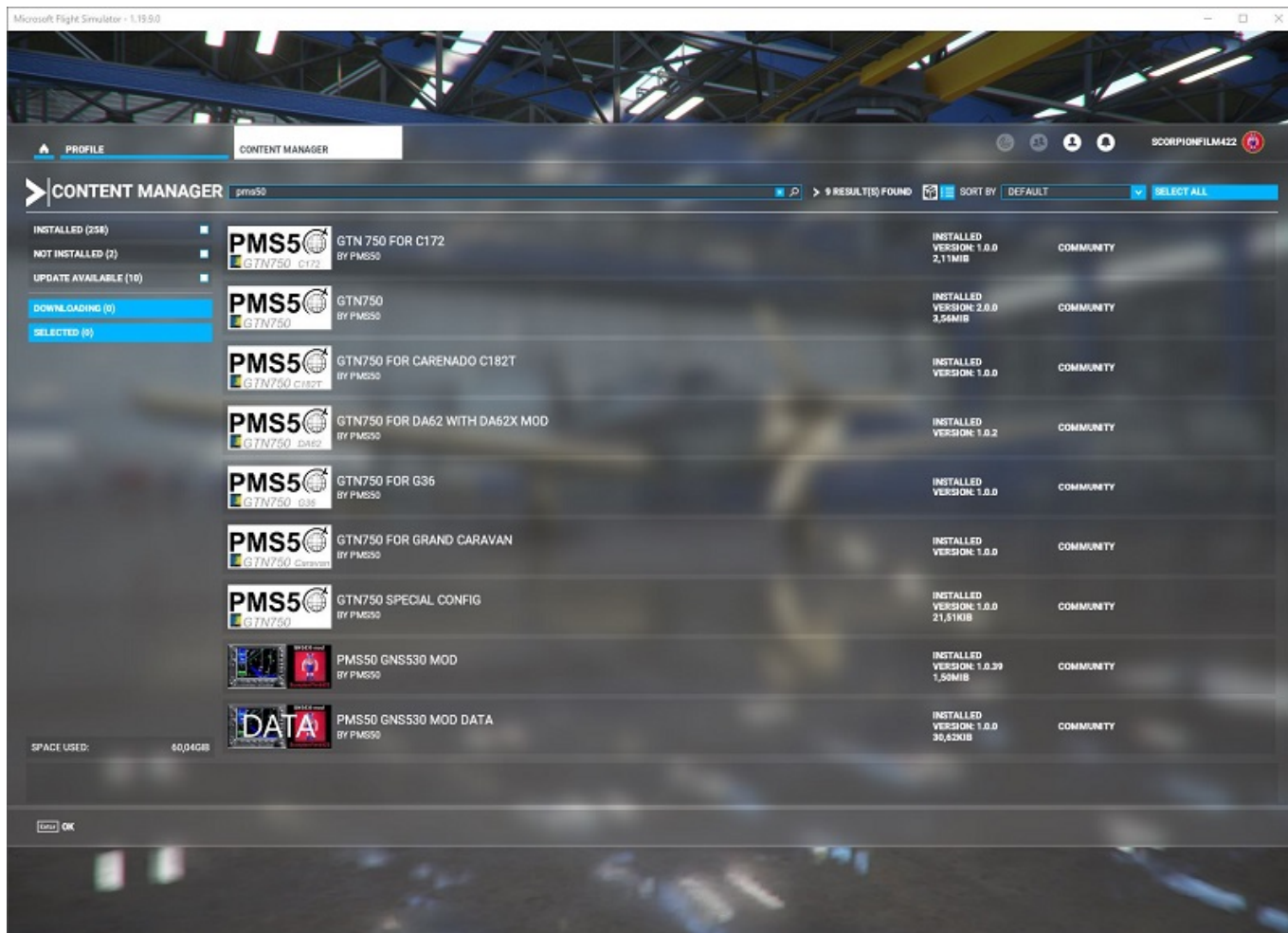
The GTN750 package requires to use a third party aircraft with the GTN750 integrated or one of the standard MSFS aircraft with a G1000 (see next section). Check the aircraft documentation for the way to activate the GTN750. You can also use the panel version that is available in any aircraft.

## Verifying the installation

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To verify the correct installation, go the sim content manager and search for "pms50".

You should then see the main GTN 750 packages and the optional specific aircraft packages (if you installed some):



## The GTN750 doesn't display / power on

- First of all, verify the installation as described above. You must have the latest GTN750 version. Your aircraft must be at the latest release too.
- Run the GTN750 toolbar panel (see chapter "Toolbar panel") after starting your aircraft in Ready to Take Off mode. If it's not working, this is probably an installation issue or an old version of the software running. Remove the GTN750 package from the community folder and install it again.

If the toolbar panel is still not working, go to the GTN750 package folder in the community folder and run "verify.bat". This should create a local file named "report\_pms50-instrument-gtn750.txt". This file should show somewhere "NO ERRORS". If you have some errors please contact the support and post this file.

If the toolbar panel works, go to its System / System Status page and verify the version and the WTT mode. If you contact the support, please post a screenshot of this page.

- Some aircraft require the GTN750 selection from a tablet or a cockpit switch (ex Carenado tablet). Verify if it's selected. The GTN750 bezel should be displayed when selected even if it's black or white.
- Test by removing any other Mod from your community folder (move them to a temporary folder). Keep only the aircraft and the GTN750 package. Also verify that no external

program involved with MSFS runs (ex FSUIPC, TDS, etc...). Restart the sim.

If the GTN750 works in these conditions, you probably have a mod conflict. Try to re-add your mods one by one to identify the culprit. Don't forget to restart the sim after changing something in your community folder.

This step is important because most of the issues come from a Mod conflict (ex livery or other GPS). Any mod that modifies the aircraft's panel.cfg file may prevent the GTN750 from running or displaying.

- If your aircraft has a hot GPS swapping feature including the GNS 530, verify that you have the latest version of the WT GNS530 from the marketplace. Test by cycle GNS/GTN selection if you still have an issue with the latest WT GNS530.
- If your aircraft has a WTT additional package available, install it. See the "Working Title Technology" chapter above.
- Try with another aircraft if you have one available with the GTN750 in the cockpit. This could help to identify an aircraft-specific issue.
- Unplug your hardware. Some specific hardware (ex Honeycomb) may have a switch that could disable the avionics.
- Contact the support if you still have an issue after all these checks. Please provide the screenshot of the System / System Status page. Give us detailed information. Read the section "Before reporting a bug" on our [support page](#).

## Premium extension activation

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The premium extension requires a paid license. Get it on the [PMS50 site](#) .

You need to be connected to the internet at least when you start your flight but more generally to take advantage of all the features of the premium extension.

If you have trouble to register on the pms50 site or to get your purchase receipt, please contact us. Some emails may be in your spam directory or rejected by your email provider. Currently all ATT and Bellsouth domains reject our transactional emails so don't use these emails to register on our site.

Once you have your license, do the following to activate it:

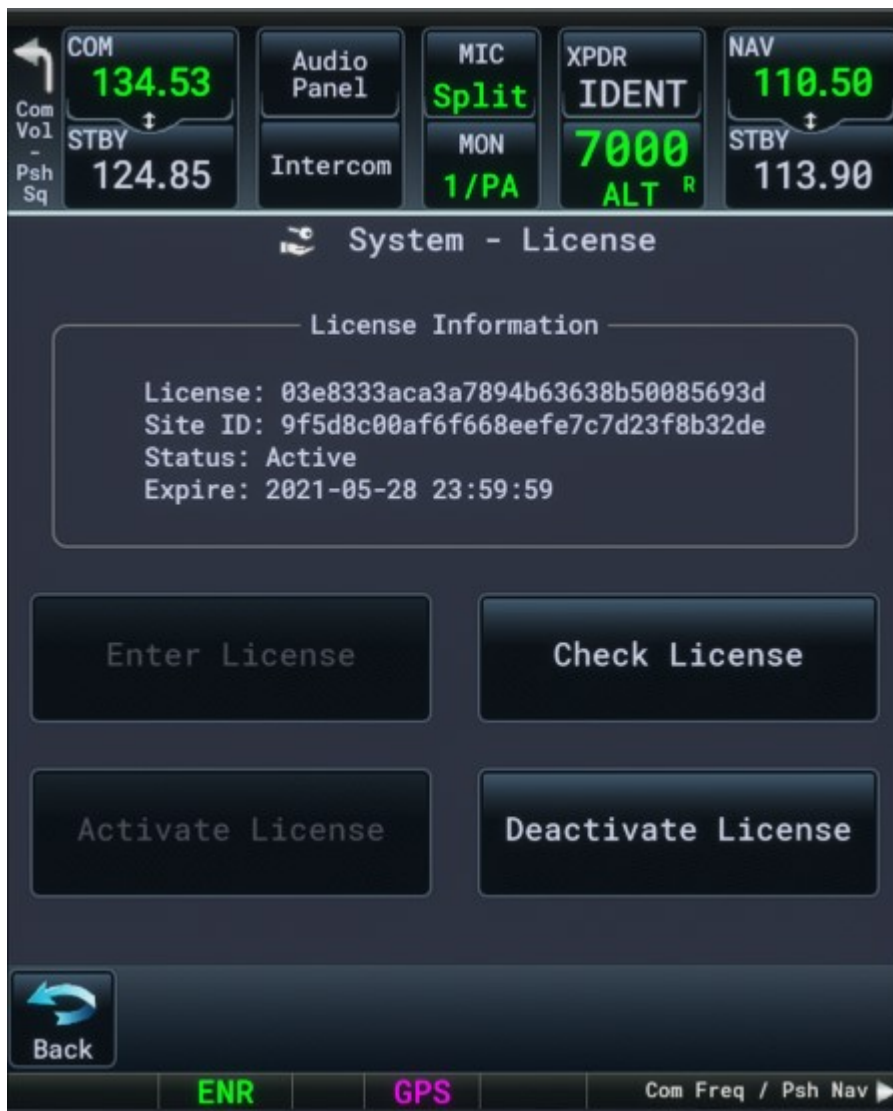
- Start the sim, choose your airplane, start it and go to the GTN750 System/Setup/License page.
- Enter your license key and activate it. This operation will occur only one time.

### IMPORTANT

Restart MSFS after license activation. Exit MSFS via the Welcome screen "quit to desktop". If you kill it hardly or by the windows top right cross or by alt f4, you may have to enter your license again or the license may be blocked with a message **"site\_inactive"** the next time

you run the sim.

If this occurs, please see the chapter "License deactivation / reactivation" below to recover.



You need to be connected to the internet to activate your license.

The License is a long string and it's easy to have a typo error. The license contains only characters "0 to 9" and "a to f".

If you have an error "license invalid" this is a typo error on your side. The most common error is to type a letter "O" instead of the digit "0".

If you have an error "site invalid" please recover as described in the chapter "License deactivation/reactivation" below.

If you ordered via Paypal, be sure to not confuse the Paypal transaction key with your license key.

The license is for one MSFS installation only. You just have to install it once and it will work for all your compatible aircraft.

# Updates

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To update the GNT750 package, stop the sim, re-download the new package from [PMS50 site](#) , remove the old one and unzip the new package in the community folder.  
Restart the sim.

Be careful to save the content of the flight plan import folder if you have one before removing the package. The same for import waypoint, and checklist folders.

It is not necessary to re-enter your license after an update.

When there is an update available, you will receive a message directly in the GTN750 instrument.

## License deactivation / reactivation

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If you change your computer or if you have any trouble, you may need to deactivate and reactivate your license.

In such a situation you could get a message "**site\_inactive**" in the GTN750 screen. That means that your license is not linked anymore to your installation (site). Don't panic and follow the procedure described below under "From your account" to deactivate the license. You will then be able to reactivate it from the GTN750.

If you want to transfer your license to another MSFS installation, first deactivate it from the old installation and then reactivate it on the new one.

If you forgot to restart the simulator after entering the license and had to leave hardly the simulator (ex CTD), your license may not be recorded locally. The message "Your license cannot be checked. Reason: site\_inactive" is then displayed in the GTN750. Follow the procedure described below under "From your account" to deactivate the license. You will then be able to reactivate it from the GTN750.

### From your aircraft

You can deactivate your license directly in your aircraft in the System/Setup/License page of the GTN750.

### From your account

You can also deactivate your license from your account settings on the [PMS50 site](#) .

- Login to your account
- Go to MyAccount

- Click on the link "View Licenses" of your order ID.
- Click on Manage Sites
- Click on Deactivate Site

Now you can reactivate your license from your aircraft in the System/Setup/License page of the GTN750.

## By contacting us

If you can't deactivate your license or if you have any trouble, please contact support.

## License renewal

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If your license is expired you can renew it by doing the following:

- Login to your PMS50 account
- Go to My Account menu
- In the purchase section, click on "View Licenses"
- Click on "Extend license"
- Proceed to checkout

You can renew your license before its expiration date. It will then be renewed for one year at its anniversary date. For example if the first purchase date is Nov 12 2020, if you renew the license on Sept 20 2021 it be valid until Nov 11 2022.

## License upgrade to lifetime

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If you currently own a per year license, you can upgrade it to a lifetime license by doing the following:

- Login to your PMS50 account
- Go to My Account menu
- In the purchase section, click on "View Licenses"
- Click on "View upgrades"
- Click on "Upgrade license"
- Proceed to checkout

**Important:** your license must be valid so don't wait the expiration date for upgrading. Anyway, if your license has expired and you want to upgrade it to lifetime, please contact us.



# License removing

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If you have decided to not renew your license, you should remove the local licensing data to avoid a license inactive message when starting the instrument.

This can be done by pressing the "Clear License" button in the Setup License page.

If you pressed this button by error, you will have to re-enter your license.

## Get version

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You can get the product version at different places:

- From the Content manager: search for "pms50".
- From the splash screen when you start the instrument "cold and start" or when switching off/on avionics.
- From the GTN750 System / System Status page.

## Working Title Technology (WTT)

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Some aircraft have an in-cockpit bezel that works with the WTT technology. This may require an extra package.

**It is recommended to install the additional WTT package in the community folder when there is one available to your aircraft.**

The WTT is a framework developed by the Working Title company that completely overrides the stock flight plan and autopilot management. It brings more features than the stock framework (better flight planner, holds, visual approaches, missed approaches, vectors to final, etc...).

The WT engine can be internal or external.

The internal WT engine requires an additional package for compatible aircraft ([see here](#), second section, to get the additional package for your aircraft).

The external WT engine is part of another WT GPS currently in the cockpit and running. Then the GTN750 is able to detect it and to use it. You can see that in action by using the GTN750 as a toolbar panel with the WT G1000Nxi or the WT GNS530. In this situation, the GTN750 brings some extra features to the WT GPSs: user waypoints, flight plan import, etc...

Check the GTN750 System / System Status page to see the current detected WTT mode (internal, external or none).



The aircraft behavior may be different when using the WTT mode. In the rest of this document you should find some remarks about differences between Stock mode and WTT mode. Stock mode stands for the sim behavior with a plane not using the Working Title Technology.

## MSFS G1000 Aircraft packages

The GTN750 can be used as a MFD replacement of the following MSFS aircraft:

- C172
- DA40NG
- DA40NGX (DA40NX with DA40NGX MOD)
- DA62
- DA62X (DA62 with DA62X MOD)
- G36
- Grand Caravan
- G58 (no GTN sound)
- Carenado C182T (no GTN sound)
- SR22 (no GTN sound)
- Pilatus PC6 porter
- SWS Kodiak 100



You can get the packages for the compatible aircraft [from here](#).

Copy one or several of these packages into your community folder for the aircraft you want to use (and restart the game).

Some of the aircraft packages may be exclusive if they are for the same aircraft. For example, install the PMS50 DA40NGX package if you have the DA40NGX MOD (from mrtommymxr), but do not install the PMS50 DA40NG package in this case. If you don't have the DA40NGX MOD, install the PMS50 DA40NG package but not the PMS50 DA40NGX package.

#### *Compatibility with other Mods*

If you have any MOD that modifies the panel.cfg file of your aircraft, the GTN may not be compatible. In this case, there is always a possibility to manually edit the panel.cfg file of the MOD in order to call the GTN750 instead of the G1000 MFD.

See the integrator's guide chapter "G1000 replacement". The integrator's guide is available in the Integration subdirectory of the GNT750 package.

All the G1000 buttons have been deactivated except the right knob, the CLR button (acts as the GTN750 Home button) and the DirectTo button. The Range button also works but should not be used since it doesn't exist in the real GTN750.

## WT G3X compatibility

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The GTN750 is compatible (as an external navigator) with the Working Title G3X instrument. This requires some specific configuration from the aircraft provider. The GTN750 will then work with its full functionality.

However, when flying an ILS, be sure to arm the LOC mode (autopilot approach mode) before flying the FAF leg otherwise, the VLOC auto switch will turn the AP to ROLL mode when starting the FAF leg.

If the GTN750 is not defined as an external navigator it will not sync with the G3X unless you set the flight planner ID to "g3x" in the GTN750 system/setup/options page (button "Flight Planner ID").

In this case, the GTN750 synchronizes to the internal G3X flight plan. When the G3X is not driven by an external navigator, it only flies under VFR so certain features of the GTN750 are disabled (e.g. no procedures).

# Product use

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The use of the GTN750 is intuitive. This chapter describes only specific items. You can refer to the official GARMIN GTN750 for further information.

However, this is not the real product here. Don't expect all the real instrument functionalities. You may also have some differences because a game simulation cannot reproduce exactly all the real things. The official documentation will just help you to understand how it works.

## Flight plan

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The flight plan page displays your flight plan and procedures in the following order:

- Origin
- Departure procedure
- Enroute waypoints
- Arrival procedure
- Destination
- Approach

The destination will always appear as the last waypoint before the approach. in WTT mode, you have to manually activate the approach when ready to fly it.

If you remove the destination, the simulator will remove the approach and the arrival if there are some.

## Flight plan cleaning

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A startup, the GTN750 cleans the sim flight plan created from the world map if not already done. The purpose of flight plan cleaning is to remove some hidden unrealistic waypoints added by the sim (ex TIMECLI and TIMEAPP) because these waypoints are confusing and create issues in the flight plan management.

To do that, the GTN750 creates a copy of the flight plan, deletes the current flight plan and recreates it from the copy.

## Flight plan catalog

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This is a premium feature.

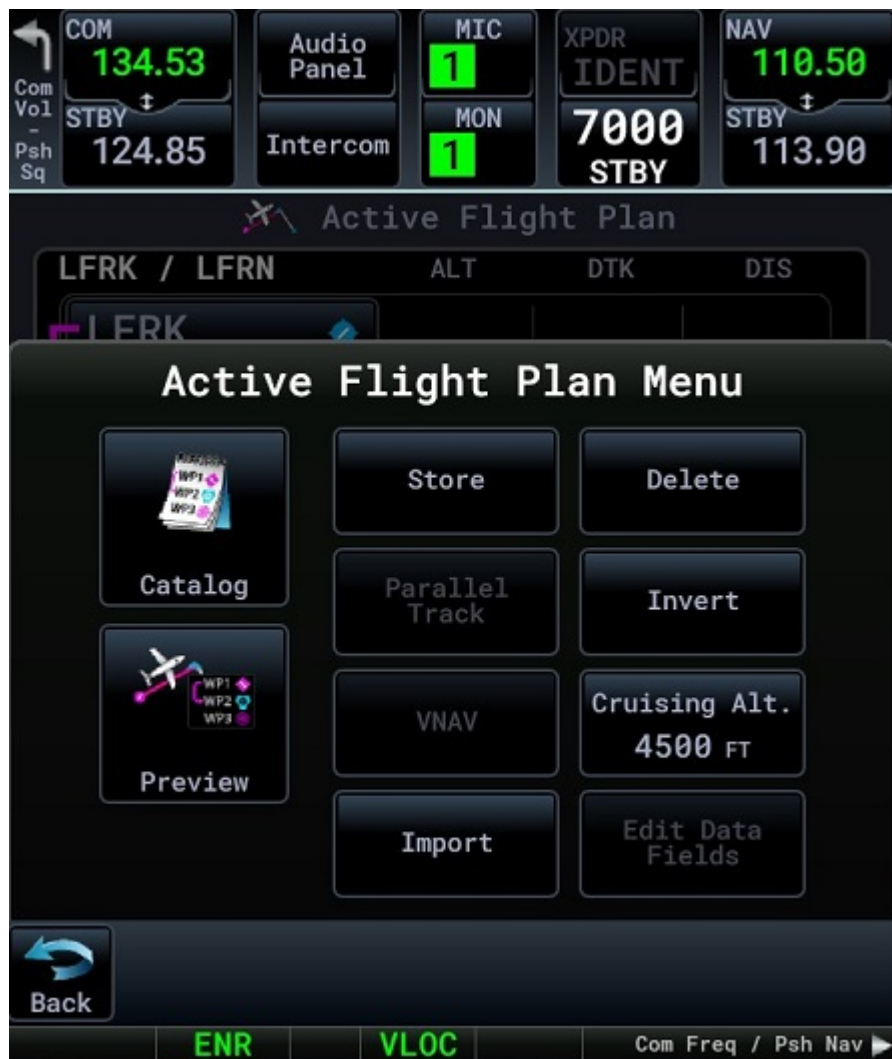
The premium extension manages a flight plan catalog. It is available from the flight plan page menu.



It can store up to 30 flight plans per aircraft.

Flight plans are saved internally (not in a file) at aircraft level. Aircraft catalogs are independent each other (A flight plan saved in an aircraft will not be visible from another aircraft).

In order to save your current flight plan in the catalog, press the store button from the flight plan page menu.



## Importing a flight plan

This is a premium feature.

The premium extension allows importing a flight plan as your current flight plan. This is completely independent from the catalog feature but once imported you can save the flight plan to the catalog.

There is no "export to file" function because this is not technically possible for now (javascript code cannot write a local file).

Use the import button from the flight plan page menu to import a flight plan into the GTN750.



This may give you a choice between several options depending if you are in WTT mode and if you own a premium license.





## Import from a file

Only the PLN format is accepted.

*This feature is not available to XBOX users.*

To import a flight plan, set its name to "fpl.pln" and drop the file into the "fpl/gtn750" subdirectory of the GTN750 package inside the community folder.



Only the file named fpl.pln is checked by the GTN750 import function. Any other files in the fpl/gtn750 subdirectory will be ignored so you can put here some of your pln files and rename (or copy) the one you want to import to "fpl.pln". Just think to save the content of this folder, if necessary, when updating the GTN750 package to a new version.

Some external applications may not deliver a correct information in the pln files especially for waypoints associated to airports. Because of a bug inside the sim's kernel, this may result to a CTD.

Little Navmap delivers well-formatted pln files. If you have a pln file coming from another external software, it is advised to first import it to Little Navmap and then re-export it for the GTN750.

## Import from SimBrief

Before being able to import a flight plan from SimBrief you must have at least one flight plan generated in SimBrief and you must have entered your SimBrief pilot ID in the GTN750 System/Setup/SimBrief page. This is a one shot operation for all your aircraft.

The SimBrief Pilot ID is a number that you can get from your SimBrief account settings.



The GTN750 imports the latest SimBrief generated flight plan for your account ID.

Note: if you want to share a flight plan with another user, you can ask him to enter your pilot ID into the GTN750 so he will be able to load your SimBrief flight plan, even if doesn't have himself a SimBrief account.



## Import from ATC

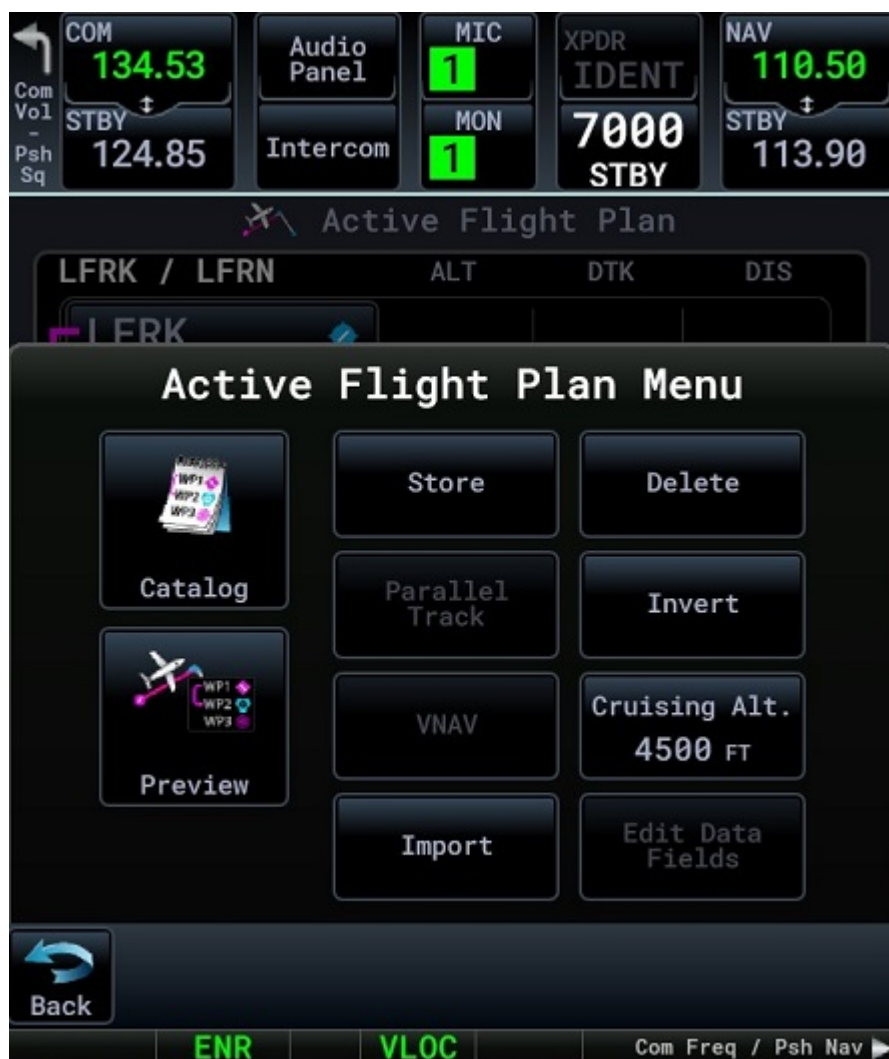
You can also import the current ATC flight plan with the import button. This features works also for the free version. You should import the ATC flight plan only in case of flight restart when you have lost your original world map flight plan. Importing from ATC works only if you are in WTT mode because the ATC flight plan may be different of the WT flight plan.

## Waypoint Altitude

From the flight plan page, you can set the altitude constraint for each waypoint except for approach waypoints (sim limitation). The altitude constraint is limited to 20000 feet (sim limitation).

For that, just click on the waypoint altitude field.

You can also set the cruising altitude from the flight plan menu:



Changing the cruising altitude will update the altitude of all the enroute waypoints. Any entered cruising altitude less than 1000ft will reset the cruising altitude. The cruising altitude is limited to 20000 feet (sim limitation).

If you plan to cruise at higher level than FL200, don't use the cruising altitude.

Cruising altitude is not a RW GTN750 feature.

You can display the waypoint altitudes in the map by enabling constraints from the map menu.

## Metar

---

This is a premium feature.

Textual Metar data is available on the premium extension.

It requires an API token (free) that you can get on the [avwx rest API](#).

- Register on [AVWX](#)
- Choose the free version
- Get an API token

Once you have your API token, you have to set it in the System/Setup/Setup Metar page of the GTN750:



The Metar token is quite long and it's easy to have a typo error. If you have an underscore character in your API token, switch the keyboard to lowercase to set it. Pay attention to uppercase/lowercase and some characters difficult to distinguish from each other. We suggest that you first copy the metar key to the notepad. This should help you to distinguish some characters (ex lowercase "L" and uppercase "i").

The Metar token length is not fixed so don't take care of the number of possible characters in the keyboard edit line. Just enter it as it is and press the "Enter" key.

The Metar token is to be entered just one time. Be patient, it will only take a few minutes of your life.

The test metar button allows testing the Metar token (LFRK airport metar). If the response is "No Data" this is a typo error on your side when entering the key (or you are not connected to the internet).

Metar is then available from the airport info page:



## IMPORTANT

Exit MSFS via the Welcome screen "quit to desktop" after setting your metar token. If you don't do that, you may have to enter your token again.

You must be connected to the internet for Metars to work.

Metars are significant only while playing with live weather.

Note: We are just displaying what AVWX reports including the decoding part. If you have any issue with the values you can check by yourself from your browser with this url:

[https://avwx.rest/api/metar/AIRPORT?](https://avwx.rest/api/metar/AIRPORT?token=MYTOKEN&options=translate&airport=true&reporting=true&format=json&onfail=cache)

[token=MYTOKEN&options=translate&airport=true&reporting=true&format=json&onfail=cache](https://avwx.rest/api/metar/AIRPORT?token=MYTOKEN&options=translate&airport=true&reporting=true&format=json&onfail=cache)

Where AIRPORT is the airport ident (ex LFRK) and MYTOKEN is your AVWX token.

If you don't enter an AVWX token, the GTN750 fallbacks to the sim Metar but it's less detailed and you will not get the TAF data.

# Charts

This is a premium feature.

Navigraph Charts is integrated in the GTN750.

To use it, you must have a valid Navigraph subscription for charts.

Before using Navigraph Charts, you must connect the GTN750 to your Navigraph account. This can be done in the Sytem/Setup/Charts page of the GPS:



You will need a mobile device with a QrCode reader and your Navigraph credentials. Just follow the procedure.

The Navigraph web page should give you an answer like "Code approved". Then the GTN750 displays a message "You are now connected to Navigraph".

If your device gives you a blank page after entering your credentials, try with another device and/or verify your javascript settings or if you have an add or popup blocker. You may also copy the link on a computer and try from it.

The chart page looks like in the native GTN750:

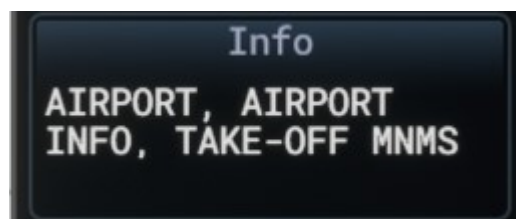




After choosing your airport, you can use one of the chart type buttons to switch between Info, Approach, Arrival, Departure.



Then select your chart from the chart select button.



If you have a message, "No chart available" and you know that charts exist for the selected airport, try to re-enter your airport.

You can adjust the brightness and day/night mode from the contextual menu.

Your airplane position is displayed on the map.

Navigraph connection uses a token that must be refreshed some time to time. The GTN750 code is doing that automatically. If you have any trouble to retrieve charts, go the the setup charts page to verify your connection. Each time you enter the setup charts page, this also refreshes your Navigraph token.

**Nota:** You will have to reconnect Navigraph in case of CTD or if you don't leave the sim via the Welcome screen "quit to desktop". There is no workaround to this issue at the moment.

## Vertical calculator (VCALC)

This is a premium feature.

The Vertical Calculator (VCALC) function allows you to create a three-dimensional profile which guides you from your present position and altitude to a final (target) altitude at a specified location. This is helpful when you would like to descend to a certain altitude near an airport. Once the profile is defined, additional data can be configured on the Map Page to keep you informed of your progress. You can also configure an alert displayed in the message page when it's time to descent or when you are reaching the target altitude.



VCALC is inhibited in the following conditions:

- Groundspeed is less than 35 knots.
- No active flight plan or direct-to destination.
- SUSP mode.
- VLOC mode.
- OBS mode.
- An approach is loaded but not activated and you are flying the destination airport leg.
- The direct To target is not part of the flight plan.

- The target altitude is above the current altitude (climb).

The VCALC result gives you two informations:

- the required vertical speed to reach the target
- the time to the top of descent.



When there is a valid calculation, the main map page displays a TOD (Top Of Descent) waypoint:





Notes:

- If the TOD waypoint falls into a hold, it will be displayed at 1nm of the hold end.
- If you are out of track, the TOD waypoint may be also out of track.
- If the TOD waypoint falls into an arc or turn leg, it may not be displayed exactly on the path because the TOD display algorithm considers a straight line between the waypoints.

## Fuel planning

This is a premium feature.

Fuel planning is implemented nearly as the original instrument.

It's currently not possible to use fuel planning for flight plan in the catalog. Only the current active flight plan can be used.



To refresh the leg list while in flight plan mode, press the Flight plan key.  
Press the menu button to set fuel type and unit.

## OBS

OBS mode does the following:

- Transform any waypoint to act like a VOR so you can set a radial to it.
- Suspend the flight plan to the current target waypoint.

To enter OBS mode, press the OBS button from the Map page. The OBS indicator then appears in the bottom of the screen.

While in OBS mode, you can set the OBS angle (radial) by the way of the right knob (10 degrees for large knob and 1 degree for small knob). You must be on the Map page.

You can also enter directly the OBS value by clicking the OBS indicator in the status bar.



Pushing the knob restores the OBS angle to the initial desired track.

After reaching your target waypoint, press the OBS mode again to disable it and continue flying your flight plan.

Disabling OBS Mode before reaching the target waypoint switches the GPS to the direct To mode.

## Status bar shortcuts

Some status bar areas are clickable:



Home

Map

Options page  
When the map  
page is active

OBS angle  
When OBS active

Direct To

## GS Indicator (GSI)

A GSI is displayed in the map page when you are flying an ILS or RNAV approach and there is available data.





With a WTT compatible airplane the GSI is also displayed for visual approaches.

This is not a standard feature so you can disable it from the options page.

## Map field pages

---

This is a premium feature.

This is a non standard feature. To activate it, you must go to the options pages and set the number of map field pages to something greater than 1.

Once done you will see a small indicator at the top of the map page. You can swap the pages by pressing the dedicated area in the instrument's bottom status bar:



Once a page is displayed, you can press the "Change Fields" button in the map menu to set the fields for the current page.

## Auto Zoom

This is a premium feature.

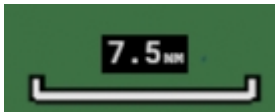
With a valid flight plan, the Auto Zoom feature will automatically change the Map page range depending on the distance to the next waypoint in the flight plan. If enabled, it will also automatically zoom to the minimum zoom range when the aircraft is on the ground (taxiing). The minimum Auto Zoom range is 4nm and the maximum is 100nm.

Auto Zoom can be overridden at any time by manually zooming with the In and Out buttons.

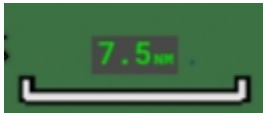
You can enable/disable the Auto Zoom feature by clicking on the zoom range indicator on the bottom part of the map page.

The indicator gives the Auto Zoom state:

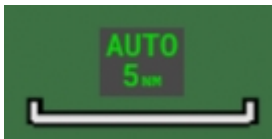
No Auto Zoom:



Auto Zoom on but not active:



Auto Zoom on and active:



Auto Zoom is re-activated once one of the following conditions is met:

- A waypoint is sequenced.
- The manual override range matches the Auto Zoom range.
- Auto Zoom is toggled off and back on in the Map page.

## Elevation data

---

The sim doesn't have any elevation API so we are using an external one to get the elevation data in the main map page.

This is a premium feature and requires a bingmap key.

Please see instructions in the file map\_key.txt located in the package Config/pms50-gtn750 subfolder for the way to set the Microsoft BingMap key.

## Direct-To Map Waypoint

---

A Direct-To course may be set to any waypoint selected on the Map page.

The waypoint is selected by touching an item such as an airport, VOR, or NDB or any other location.

Touching the map page at any place not having an existing location name will create a waypoint with the name "MAPWP".

Touching the Direct-To key will automatically insert the selected waypoint as the Direct-To waypoint.



## Map Visual button

Optionally, the map page may display a Visual button:



This is a premium feature available only in WTT mode.

Clicking the Visual button selects and activates a visual approach for the destination airport defined in the flight plan.



The visual button is displayed only following some conditions defined in the Options pages:



"Map Visual Button" option may have 3 values:

- "Disabled": the visual button is never displayed.
- "Always": the visual button is always displayed if the distance condition fits.
- "No Approach": the visual button is always displayed if the distance condition fits and there is no approach in the flight plan.

"Visual Distance" defines the distance to the destination airport within which the button is displayed.

In any case, if you are on the ground, the button is not displayed.

## Approach activation

---

*Stock mode only*

Approach is automatically activated when you have reached your last enroute waypoint (unless you have unset the option).

If you set a Direct To, this de-activates the approach. It will be re-activated automatically if your target waypoint is part of your approach, 2nm before reaching the target.

## Direct To an airport

---

*Stock mode only*

The sim currently removes the entire flight plan (except origin) if you issue a direct To an airport.

If you didn't set an origin to your flight plan you will not be able to set an approach to an airport while in direct to it.

Anyway, it is advise to always set an origin in your flight plan, so first to do that when starting the GPS if there is no origin.

## Traffic page - TCAS

---

This is a premium feature.

TCAS (anti collision system) information is available in the premium extension in the traffic page.



Aircraft near your position are represented by the usual TCAS symbols with the following range:

- Red square if relative distance < 2nm and relative altitude < 800ft.
- Orange circle if relative distance < 4nm and relative altitude < 1000ft.
- Filled blank diamond if relative distance < 6nm and relative altitude < 1200ft.
- Un-filled blank diamond if relative distance < 30nm and relative altitude < 4000ft.

Altitude deviation from your own aircraft altitude is displayed (in hundreds of feet) for each target symbol. An arrow near the symbol tells if the aircraft is climbing or descending (altitude trend).

TCAS data is disabled if your own aircraft is below 500ft AGL unless you have enabled the Traffic on ground option (see options page).

The aircraft that do not fit one of the TCAS conditions will not be displayed.

TCAS algorithms used in the mod are very simple and based only on the proximity. There is no calculation about any projected collision like in real instruments.

# User waypoints

This is a premium feature.

User waypoints are implemented nearly as the original instrument.



There are still a few differences:

- The waypoints are organized in 20 banks of 100 waypoints each for performance reasons (instead of a single 1000 waypoints bank). The banks can be named as you want (10 characters). You can copy/paste banks and import user waypoints from an external file.
- The ident is limited to 5 characters instead of 6. This is because there is currently a bug in the sim where activating a leg doesn't work if the ident length is greater than 5. Idents SAR01 to SAR99 are reserved for SAR patterns and cannot be entered.
- There is no radial/radial mode.
- The latitude is limited to 75deg. This is a sim limitation on the map so we can't change it.
- You can't edit a user waypoint that is part of the flight plan (you can still edit the original user waypoint that you have inserted in the flight plan).
- Airport option is not available.

To define the position of your waypoint you can use the map (drag and move), you can set directly the coordinates or you can define a reference waypoint with a radial and a distance.

To insert a user waypoint in your flight plan, just select its ID like any other waypoint from the waypoint input keyboard.

To manage the waypoint banks, you must press the Menu button of the user waypoints list (menu Waypoint Info / User Waypoint / View List). Then you can choose the current active bank, set its name and clear its content:



You can insert user waypoints from different banks to the flight plan.

## Import user waypoints

This is a premium feature.

*This feature is not available to XBOX users.*

The premium extension allows importing a set of user waypoints defined in a csv format file.

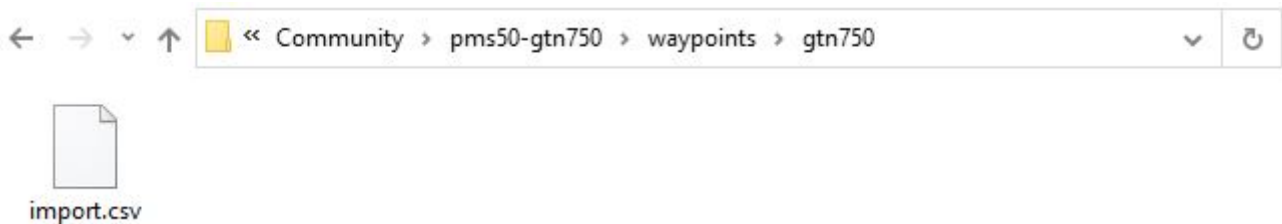
Import file content example:

```
UWI1,Import 1,49.09553,-0.354167
UWI2,Import 2,49.139167,-0.293333
UWI3,Import 2,49.189167,-0.293333
```

Each line of the import file corresponds to a single user waypoint with 4 fields separated by a comma character:

- Field1: Ident. 5 characters max. Contains uppercase letters or digits 0 to 9, no space.
- Field 2: Comment. 20 characters max. Contains uppercase or lowercase letters, spaces or the following special characters: ".", "-", "\_", "@".
- Field 3: latitude in decimal degrees. Must be between -75 and + 75 (sim limitation). Southern values are negative.
- Field 4: longitude. Must be between -180 and + 180. Western values are negative.

To be recognized by the GTN750, the file must be named "import.csv" and placed into the waypoints/gtn750 subdirectory of the GTN750 package inside the community folder.



Only the file named import.csv is checked by the GTN750 import function. Any other files in the waypoints/gtn750 subdirectory will be ignored.

To import or copy/paste user waypoints, press the "Import Waypoints" button in the "Waypoint Info" GTN menu:



The "Import" button reads the import file and imports the waypoints into the current bank. Any existing waypoint with the same ident will be replaced.

The "Copy" button copies the current bank waypoints to an internal buffer and to a sim level buffer.

The "Paste" button imports the waypoints of the internal buffer into the current bank. Any existing waypoints with the same ident will be replaced.

The "Load" button imports the waypoints of the sim buffer into the current bank. Any existing waypoints with the same ident will be replaced.

In order to copy/paste user waypoints across aircraft, use the "Copy" button in the first aircraft and the "Load" button in the second one.

The "Bank" button selects the current bank.

The "Bank Name" button sets the current bank name.

The "Delete All" button clears the current bank.

## SAR Patterns



---

This is a premium feature.

SAR Patterns are implemented in the premium version with a few limitations:

- Only one SAR pattern per flight plan. If you define a second pattern, this will erase the first one.
- The initial waypoint must be an enroute user waypoint.
- Orbit pattern is not available.
- The Load Pattern & Activate button is available only in WTT mode (you can't direct To a user waypoint with the stock Asobo flight planner).

To create a SAR pattern, add a user waypoint in your flight plan, select it in the flight plan page and press the Load SAR button.



## Target altitude distance

---

This is a premium feature.



If you have set a target altitude in the flight plan, the map will show an arc (banana) representing the distance where you will reach this altitude.



This may help to adjust the vertical speed.

The banana will be displayed only if the following conditions are met:

- Map is on track up mode.
- Map is not in pan mode.
- Ground speed is greater than 20 knots.
- Following the target altitude mode, you have set a positive target altitude in the autopilot, in VCALC or you have an altitude constraint. See the options pages to enable the altitude mode.
- The vertical speed is not between -100ft and +100ft.
- You are descending and the target altitude + 100 feet is below the current altitude.
- You are climbing and the target altitude - 100 feet is above the current altitude.

## Switching COM/NAV index

---

This is an extended feature not available in the real unit so it must be activated from the System/Setup/Options page.

The COM/NAV switching is not available in the toolbar panel version or if the aircraft does not accept COM2.

Use this option only if your aircraft provides a single GTN unit but you need to set both COM1/COM2 from this unit.

If you use it with several units, the channel spacing you have set may be not retrieved correctly when you restart your flight.

When the option is enabled, push the unit volume button to switch the index:



The COM/NAV buttons display the current index (here COM2/NAV2).

Note: this feature doesn't change the base COM/NAV index of the unit itself. It's just a way to set the values. For example if the unit is basically connected to COM1 and you choose a frequency from an airport frequency list, it will be set for COM1, even if you have displayed COM2 in the radio part.

The unit index is displayed in the System Status page.

If you change the channel spacing from a unit where you have enabled the COM/NAV switching, this will change it for both COM1 and COM2.

## Checklists

This is a premium feature.

Checklists are available from the Utilities page as well as in the real instrument:



The checklists are defined per aircraft.

## Importing checklists into the instrument

Before using the checklists, they must be imported into the GTN750.

You can import the checklists from a local file or from a central repository managed by PMS50.

After the import, the checklists are saved in the sim so it's not necessary to import them again.

Note: If you have several GPS in your cockpit, the newly imported checklists will be automatically updated in any other GPS when entering the Utilities/Checklists page.

### Import from a local file

*This feature is not available to XBOX users.*

The checklists are written in a json file format.

In order to import the checklists file, set its name to import.json and drop the file into the checklists/gtn750 subdirectory of the GTN750 package inside the community folder.



Only the file named import.json is checked by the GTN750 import function. Other files in the checklists/gtn750 subdirectory will be ignored so you can put here some of your checklists files and rename (or copy) the one you want to import to "import.json". Just think to save the content of this folder, if necessary, when updating the GTN750 package to a new version.

A good practice is to name the checklists file with the aircraft name (ex "c208\_checklists.json").

Use the "Import local file" button from the System/Setup/Checklists page menu to import the import.json file as the current checklists in the instrument.



Import from PMS50

If there is a valid checklist for your aircraft on the remote repository, press the "Import from PMS50" button to choose it:



If there is no available checklists for your aircraft, the "Import from PMS50" button is greyed. The checklists availability is based on the ATC name of the aircraft as defined by the aircraft builder.

Don't hesitate to submit your own checklists. See our [dedicated checklists page](#).

## Checklist organization

The checklists are organized in named groups. A group contains a collection of named checklists.

Group and checklist names are limited to 30 characters.

You can choose the group and the checklist from the contextual menu of the checklist page:



A checklist is a list of items of one of the following type:

- CHALLENGE - Defines an action that must be checked by the user. The first line is the title (max 40 characters) followed eventually by 2 lines of description (max 100 characters). The last line is the response, for example "As required" (max 40 characters). The left side of the item shows a button to toggle item check. Once checked, the item color turns to green.
- SUBTITLE - Displays a subtitle (max 35 characters).
- TEXT - Displays a simple text (max 150 characters).
- NOTE - Displays a text with the "NOTE" prefix (max 150 characters).
- WARNING - Displays a text with the "WARNING" prefix (max 150 characters).
- CAUTION - Displays a text with the "CAUTION" prefix (max 150 characters).

The colors are specific for each item type to easily distinguish them:





## Checklist file

The checklists are written in a json file format.

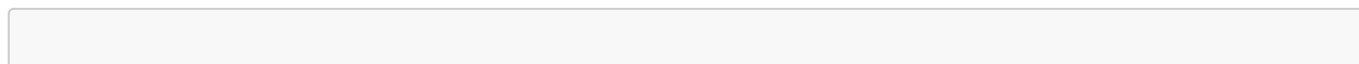
The GTN750 package is delivered with a default import.json file that you can use as a base for building your own checklists.

Be sure to respect the json syntax (especially the comma separators). If the syntax is not correct, the file may be not imported or may crash the sim.

The main structure of the file is the following:

```
[
  group_1,
  group_2,
  ...,
  group_n
]
```

Each group is structured in this way :





```
{
  "name": "group name",
  "checklists": [
    checklist_1,
    checklist_2,
    ...,
    checklist_n
  ]
}
```

Each checklist is structured in this way :

```
{
  "name": "checklist name",
  "items": [
    item_1,
    item_2,
    ...,
    item_n
  ]
}
```

Each item is structured in this way :

```
{
  "type": "TYPE (can be CHALLENGE, SUBTITLE, TEXT, NOTE, WARNING or CAUTION)",
  "text": "Item text (Title for CHALLENGE type)",
  "comment": "Comment (only for CHALLENGE type)",
  "response": "Response (only for CHALLENGE type)"
}
```

If you are not familiar with json, you can also use [the checklist maker](#) made by icebird4all. From the maker page, Press the help button to get the syntax.

## Extended map features

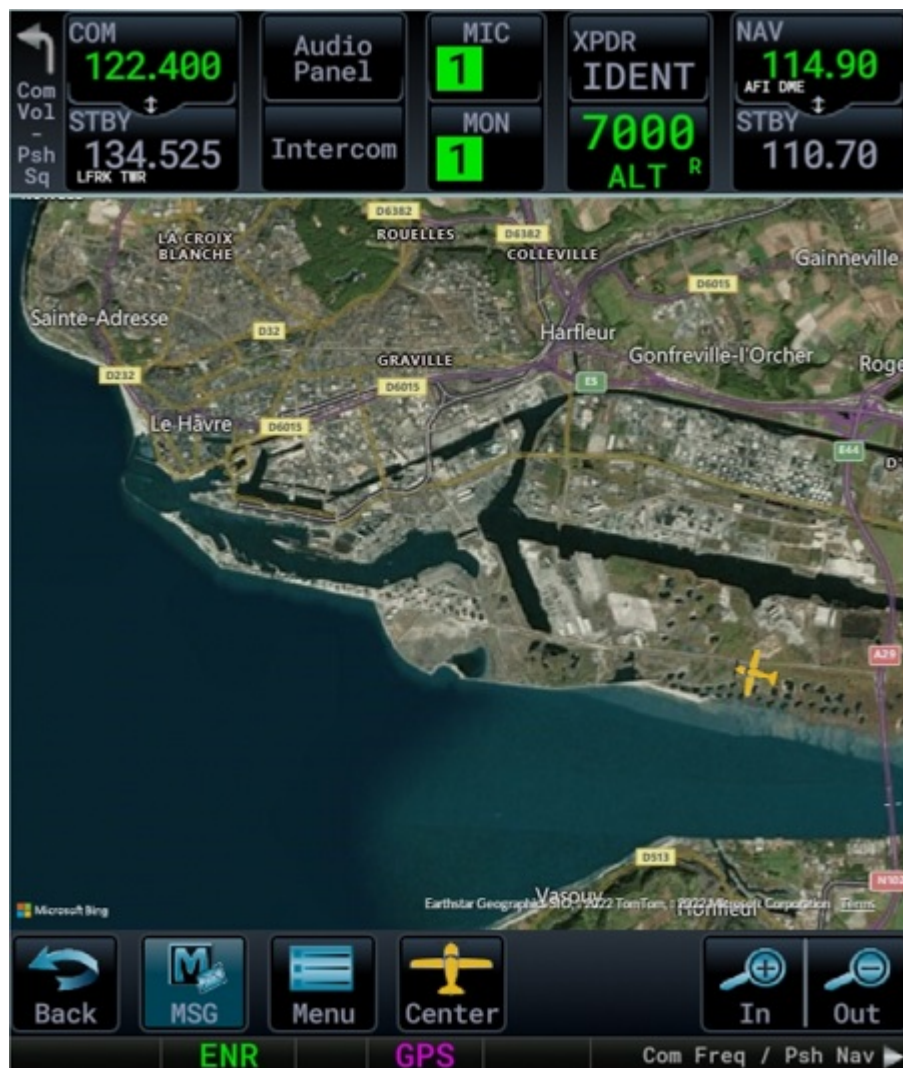
This is a premium feature.

If you own a development BingMap key (free) and/or a Navigraph subscription for charts or if you have defined some custom maps, this unblocks the map icon in the Utility menu page. See the Charts chapter in this documentation for information about connecting your Navigraph account.

See instructions in the file map\_key.txt located in the package Config/pms50-gtn750 subfolder for the way to set the Microsoft BingMap key.

See instructions in the file custom\_map\_layers\_example.txt located in the package Config/pms50-gtn750 subfolder for the way to add custom maps (not available to XBOX users).





In the Utilities pages, you have access to following map types:

- Road (BingMap key needed)
- Satellite (BingMap key needed)
- VFR - Day and Night versions (Navigraph account needed)
- IFR Low airways - Day and Night versions (Navigraph account needed)
- IFR High airways - Day and Night versions (Navigraph account needed)
- World - Day and Night versions (Navigraph account needed)

A double click allows adding a user waypoint at the selected position.

From the menu you can choose the map type, enable/disable auto center feature and set a scale factor for a better text visibility.

If auto center is set and you drag the map, the auto center mode is temporarily disabled. Re-center the airplane by the dedicated button to reactivate it.

When the auto center mode is set, changing the HDG bug displays a HDG direction line:







## Safe taxi

This is a premium feature.

The safe taxi feature delivers a detailed airport map to help you for taxiing. This requires a Navigraph subscription for charts.



When enabled, the main map page automatically switches to the utility map page after landing and shows you the detailed airport map with the airplane position. There is currently no traffic data displayed.

Note: there is no automatic safe taxi switching at departure time. It's up to you to go to the utility map and display the airport map (choose the "WORLD" map type).

You enable and set the safe taxi parameters from the System/Setup/Options page:



The "Max Speed" parameter indicates the maximum speed below which the system will be engaged after landing (default 50kts).

The "Zoom Level" parameter sets the initial zoom level of the airport map (default 2).

## Autopilot page

This is a premium feature.

This module is available in the Utilities page menu.

Warning. This is not a standard feature and it may not work with all the aircraft. This depends of the way the aircraft builder is managing its autopilot gauge. If the gauge is correctly made, that should work. The purpose was first to help aircraft builders to check the autopilot behavior with a known working module. The code is open source and can be reused without our authorization.





The buttons are self explained so we'll not detail them here with the exception of the GA and LVL modes.

The bottom two rows are displayed in the contextual menu for the GTN650.

GA Mode is a combined pitch and roll mode that maintains the wing levelers (0 bank angle) and a VS to a predefined value (700 feet/mn by default). The GA mode can be used for takeoff, for missed approaches or just for climbing. The armed altitude, if available, is working in GA mode.

LVL Mode is a combined pitch and roll mode that maintains the wing levelers (0 bank angle) and a VS to 0 feet/mn.

If you move your mouse over the ALT button and you are in ALT mode, this will display the locked altitude in the screen. Otherwise, the screen displays the selected target altitude.

In VS mode, pressing the UP/DN buttons displays the selected VS in the screen for a few seconds then the display comes back to the selected altitude. You can change the selected VS with the Up and DN buttons.

In FLC mode, pressing the UP/DN buttons displays the selected airspeed in the screen for a few seconds then the display comes back to the selected altitude. You can change the selected

airspeed with the Up and DN buttons.

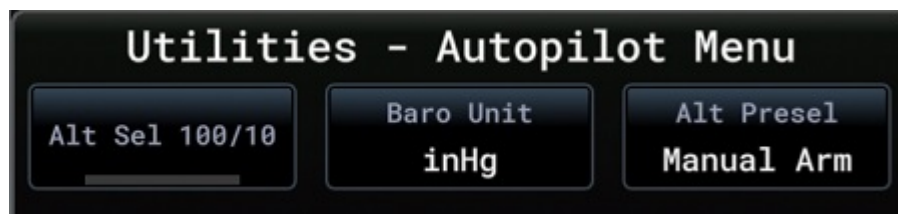
You can use the mouse wheel on the UP/DN buttons area to change the aircraft pitch, vs or flc references when available.

To preselect an altitude, press the center part of the Alt Sel button. The toolbar panel GTN750 allows using the mouse wheel to do that too. Use the outer virtual knob for high increments and the inner one for small increments.

The HDG SYNC button may not work in some aircraft. This is an aircraft issue then (ex JF Arrow).

In the toolbar panel version, you can change the HDG, CRS, OBS and Baro values by using the mouse wheel when the cursor is in the corresponding button.

The autopilot menu lets you modify some behavior:



You can change the altitude selection mode to increments by 100/10 feet instead of 1000/100 feet.

The module provides 3 modes for altitude selection:

- None. There is no altitude selector.
- Auto Arm. The autopilot automatically arms the selected altitude. First select your target altitude and then press the VS or FLC button.
- Manual Arm. You need to press the ARM button to arm the altitude selection. First select the target altitude, select VS or FLC and press the ARM button. In Manual Arm mode, if you don't arm, you can use the VS and FLC modes without targeting an altitude.

Select the mode that better suits the aircraft autopilot gauge. The current mode is saved with your aircraft data and restored when starting up the GTN750. Changing the mode may change some autopilot modes.

If the aircraft is designed to not use an autopilot module, the autopilot commands will have no effect. Thank you to not report an issue in this case. However, you can try to make the GTN750 autopilot panel working for some of these aircraft by modifying their systems.cfg file:

- Locate the file named systems.cfg in the aircraft package (usually in SimObjects/Airplanes/aircraftName)
- Edit the file and search for the [AUTOPILOT] section.
- Be sure to have the following lines in this section

```
[AUTOPILOT]
autopilot_available = 1
flight_director_available = 1
```

Tested with the DR400.

Maybe with some aircraft you should also need to check or add the autopilot electrical circuit in the [ELECTRICAL] section of systems.cfg

ex for the DR400:

```
circuit.1 = Type:CIRCUIT_AUTOPILOT#Connections:bus.1#Power:10, 15, 10.0#Name:Autopilot
```

Finally, check your engines.cfg, the "DisableAutopilotControls" flag should be set to 0.

## ATC page

---

This is a premium feature.

The ATC page is for VATSIM or IVAO users. It gives the list of online controllers with their frequency.



The list is sorted by distance.

Pressing the controller button gives specific information about this controller and/or ATIS data.

Pressing the frequency button sets the frequency for COM standby.

The "Filter" button allows displaying all controllers, ATIS only or anything but ATIS. The Filter button is not available for IVAO because there is not specific ATIS frequency.

The "In Range" button, when set, gives only the controllers that are in range following your aircraft position and the controller visual range. For IVAO, there is currently no visual range information so we have hard coded it to 100nm.

The "Update" button refreshes the list from the ATC source.

There is a contextual menu:



the "Source" button selects the ATC data source (VATSIM or IVAO).

You can auto update the data at a 2 minutes frequency.

"The Max Distance" is a supplementary filter that limits the displayed list to the defined range.

## Logs page

---

This is a premium feature.

This module is available in the Utilities page menu.

It is a sim variable viewer.



The free version displays only some GTN750 variables.

The premium version displays all the sim variables.

Variables are organized in Groups/Sections. You can select the group/section to display from the contextual menu.

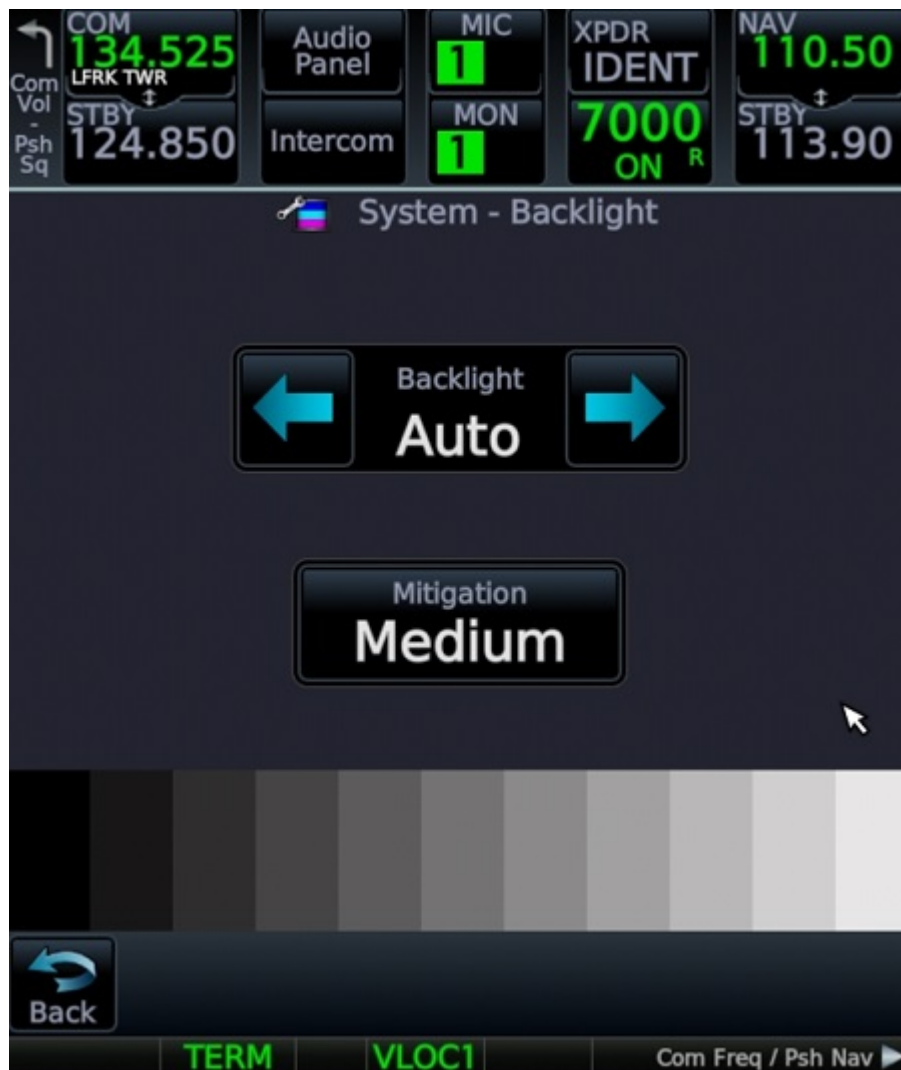
The premium version takes the group/section definitions from a file located in the variables/gtn750 package subfolder. You can edit this file to suit your needs.

Look at the file itself for further information.

## Backlight

You can adjust the instrument backlight from the System/Backlight page:





You can set a specific value from 1 to 12, the "Auto mode" or the "External" mode (premium)

## Manual mode

Select the value from 1 to 12.

You can change the slope of the curve by using the mitigation button.

## Auto mode

In auto mode, the backlight value is automatically calculated from some sim day night variables. You can reduce the result with the mitigation button.

## External mode

This is a premium feature. In external mode you can adjust the backlight by the way of the volume knob or by a sim variable.

Note: in external mode, changing the backlight value will have effect on all the GTN units having the external mode set so you don't have to adjust them individually.

## Using the volume knob

When the external mode is set, press the upper left corner of the GTN750/GTN650 screen. This changes the volume knob control from "Com Vol" to "Set Brt" mode with a time out of 5 seconds. Then use the volume knob to change the brightness.



## Using a sim variable

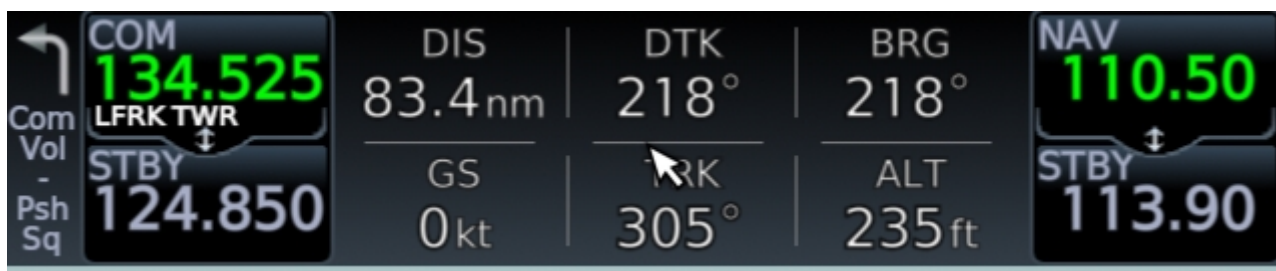
In external mode, backlight is controlled by a sim variable named "L:GTN750\_BRIGHTNESS". it takes numeric values from 30 to 100.

You can use this variable from any external hardware or application to change the brightness.

# User fields

Premium version and GTN750 only.

By enabled the dedicated option from the options page, the audio panel and XPDR parts of the display can be replaced by a set of user fields.



The default is to display the transponder and audio panel in the GTN750 first unit and to display the user fields in the second GTN750 unit if your aircraft have one.

You can configure the user fields from the System menu page:

Com  
Vol  
-  
Psh  
Sq

COM  
134.525  
LFRK TWR  
STBY  
124.850

DIS  
83.4nm

GS  
0kt

DTK  
218°

TRK  
305°

BRG  
218°

ALT  
235ft

NAV  
110.50  
STBY  
113.90

System

System Status

GPS Status

External LRUs

Setup

Alerts

Units

Audio

Backlight

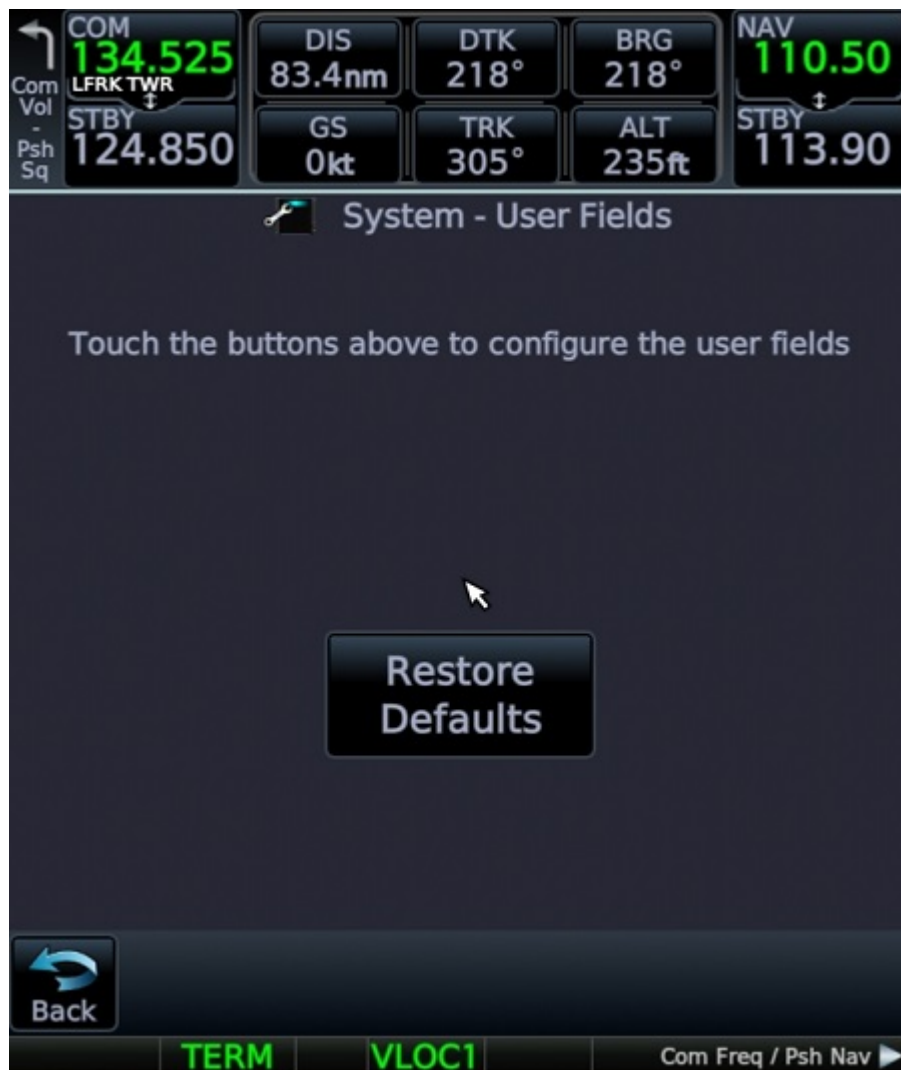
User Fields

Back

TERM

VLOC1

Com Freq / Psh Nav



## Extended volume knob

This is a premium feature.

By setting the corresponding option from the options page, you can set an extended volume knob management.

In this mode, you can use the volume knob to zoom in or out, scroll up or down.

Pressing the volume knob issues a "BACK" or "CANCEL" event following the context.

To set the volume in the extended mode, go to the home page first and use the volume knob as in the normal mode.

## Options pages

The options page is available from System/Setup/Options page.

It provides some general options to the GTN750. These options are specific to the game :



Traffic data should be set "on" for normal operation. You can disable it for debugging purpose if you think you have an issue with traffic data (ex CTD).

The Traffic refresh rate allows saving performance when searching for traffic data. You can set it to "Fast" or "Very Fast" and use a different value if you think you have performance issue around that.

Messaging system should be set "on" for normal operation. You can disable it for debugging purpose if you think you have an issue with the messaging system (ex CTD).

You can disable the specific airspace messages from the messaging system.

There is currently a bug in the sim's kernel with airspace management that triggers CTDs so it is strongly advised to disable the airspace messages for now.

By default the GTN750 automatically activates the approach after the last enroute waypoint. You can disable this feature if you prefer a manual control of approach activation.

The "Direct To button in map" option allows changing the default "Next" button of the Map pan view to "Direct To". In this way you can do a direct To directly from the popup screen.

The "Display GSI in Map" option allows to display a GS indicator in the map page for ILS and RNAV approaches.

"Target Altitude Source" option will set the target altitude source. Target altitude is used in the map page to display an arc (banana) representing the distance where you will reach this altitude. The GPS will take the target altitude following this option:

- If set to "Autopilot", the target altitude is the one entered in the autopilot (if you have one).
- If set to "Constraint", the GPS will use the target active waypoint constraint if there is one defined.
- If set to "VCALC", the GPS will use the value given in the VCALC calculator.
- If set to "None", the GPS will not use the target altitude and no arc will be displayed in the map.

"Map compass" allows displaying the compass in the map page (premium).

"Allow Com/Nav switch" allows switching the COM/NAV index so from the same unit you can set COM1, COM2, NAV1 and NAV2 frequencies. When the option is enabled, just push the volume button to switch the index.

"Wind on ground" allows disabling the wind data in the wind map field when the aircraft is on the ground.

"Traffic on ground" displays the traffic (TCAS) even if the aircraft is below 500ft AGL.

"Map HDG line" displays a dotted heading line in the map while you are changing the heading bug.

"Map Runway lines" defines the maximum map range below which the map displays a line in the alignment of the destination airport runways.

"Track Vector Length" sets the length in seconds for the map track vector. When turned on, the track vector is depicted as a cyan line extending from the nose of the aircraft in the direction of movement. The length of the track vector represents the path the aircraft will follow if the present speed and direction are maintained for the time configured.

"Map Traffic Range" gives the map maximum zoom range for displaying the traffic TCAS data.

"Map Fuel Ring", when enabled, displays 2 fuel range rings in the main map page. One for the total range and a second one considering a reserve. The map page also displays the remaining time for the 2 ranges.

"Fuel Reserve Time" sets the fuel reserve in minutes that is used to compute the map fuel range ring.



"Map Visual Button" and "Visual Distance" define the map visual button options. See the "Map Visual button" chapter for further information.

"Map icon" option sets the map icon. This can be Propeller (default), helicopter or jet. This is only for the maps, the chart and weather radar icons can't be changed.

"Map fields page" option sets the number of field pages you can display in the map (1 to 5). See chapter "Map field pages".

"Map VOR Rings", when set, allows displaying the VOR rings on the map page.

"Bush Trip Flight Plan" hides/shows the map flight plan when flying a bush trip. Default is to not show the bush trip flight plan.

"Optimize map FPS", when enabled, optimizes the refreshing of the map flight plan path. Useful in WTT mode because drawing the WT path may consume FPSs.

"XPDR VFR Default" sets the XPDR VFR default code used by the VFR button in the XPDR panel. This can be 1200 or 7000.

"XPDR + Audio Panels" enables/disables the transponder and/or audio panel in the upper part of the instrument. GTN750 only feature.

"DTK Auto Sync" enables the automatic update of the CRS value to the current GPS desired track when the navigation source is GPS. This option is saved at aircraft level. The unit connected to NAV1 sets the CRS1 and the one connected to NAV2 sets the CRS2.

"Safe Taxi" enables the safe taxi option.

# Events

---

You can control some GTN750 actions from an external software or hardware by the way of H events.

The events.pdf files in the package documentation folder provides the list of the main available H events.

# Toolbar panel

---

*This feature is not available to XBOX users.*

The GTN750 is available as an in-game panel (like weather or ATC panels).  
A big thank you to N666OB for this feature very useful for the VR users (but not only).  
This allows to get the GTN750 in nearly any aircraft.

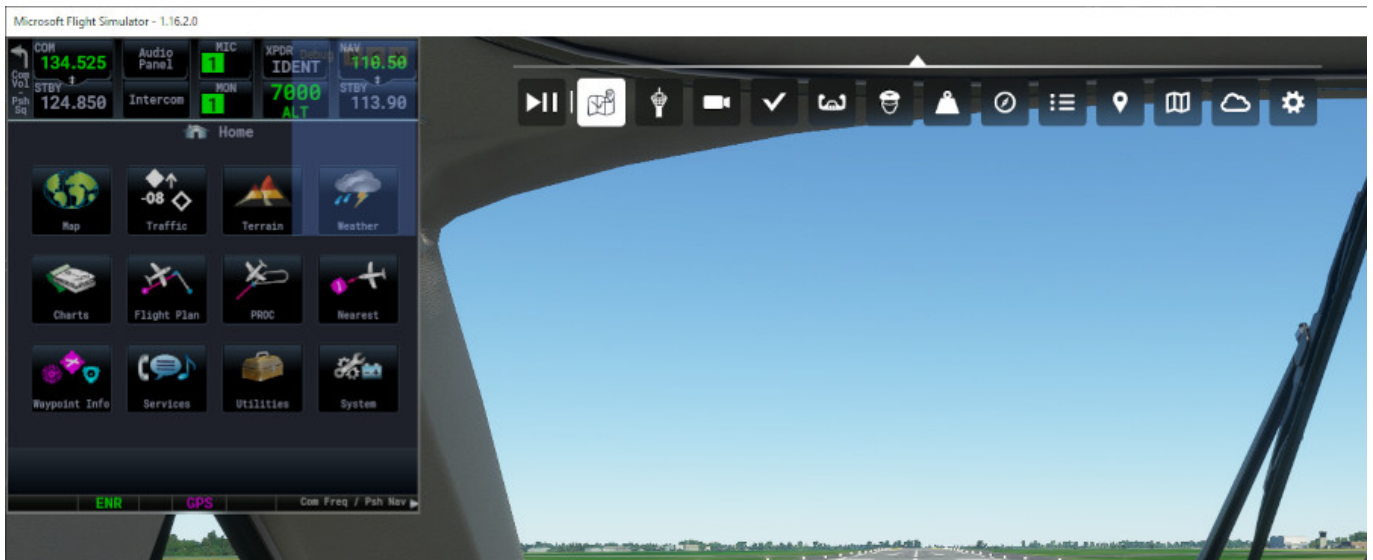
The panel automatically detects the avionics technology currently used in the aircraft (Working Title or stock Asobo) and synchronizes with it.

The panel version of the GTN750 is connected to the main bus for powering on (avionics bus for the in-cockpit bezel version).



## Displaying the panel

To toggle panel display, click on its icon on the panel toolbar:



The panel may take a few seconds to display. This is the time necessary to initialize the GTN750 instrument.

The panel window header is hidden because it creates display issues with the instrument.

You can popup the panel in a separate out of game window like any other panel.

You can toggle panel visibility with the Shift + Ctrl + S key.

The panel is hidden when switching from cockpit to external view. Anyway you can display it again while in the external view with the Shift + Ctrl + S key.

Note: the mouse wheel is working with the panel.

## Panel controls

Some panel areas are clickable and provide special functions



The OBS Angle is available only when the current page is the map. Use the mouse wheel to change the angle. You can also click the OBS indicator to enter the OBS value directly.

The Show width button will help you to resize the panel.

# Resizing the panel

---

To resize the in-game panel in in game mode, change its height by dragging the mouse on the top or bottom border. The width is usually automatically adjusted. If the width is not adjusted, this is because the panel window is not large enough to maintain the aspect ratio. At this time enlarge it manually until the instrument is fully displayed.

You may use the Show width button to display some hidden part of the panel. This will help you to see the exact dimensions of the panel for resizing.

# Moving the panel

---

Drag and drop the dedicated area (see above) to move the panel or minimize it and move the header.

In standby mode (see above), you can move the panel by drag and drop on its entire window.

# Minimizing the panel

---

Click the dedicated area (see above) to minimize the panel.

# Pop out the panel

---

To pop out the panel, first minimize it by clicking on the dedicated area (see above). While minimized, you can pop out the panel to an external window.

# Standby mode

---

You can turn the panel in a standby mode. In this mode, the panel is inactive, preserving your FPS and avoiding some conflicts with other GPSs. To turn the panel in standby mode, click on the dedicated area (see above).

# Events

---

The toolbar panel has no bezel. Anyway if you have an external hardware or application and want to send bezel events to the panel you can do it by the way of the following numeric variables (set it to 1 to enable the action):

- L:GTN750\_PANEL\_HomePush
- L:GTN750\_PANEL\_HomePushLong

- L:GTN750\_PANEL\_DirectToPush
- L:GTN750\_PANEL\_KnobSmallInc
- L:GTN750\_PANEL\_KnobSmallDec
- L:GTN750\_PANEL\_KnobLargeInc
- L:GTN750\_PANEL\_KnobLargeDec
- L:GTN750\_PANEL\_KnobPush
- L:GTN750\_PANEL\_KnobPushLong
- L:GTN750\_PANEL\_VolInc
- L:GTN750\_PANEL\_VolDec
- L:GTN750\_PANEL\_VolPush
- L:GTN750\_PANEL\_ToggleVisibility

If you own the premium version, you can also emulate the GTN750 H events.

For doing that, you must provide and edit a file named "toolbar\_panel\_events.txt" and put it in the Config/pms50-gtn750 package folder.

You will find further information in the file Config/pms50-gtn750/toolbar\_panel\_events\_example.txt file.

## Known panel issues

---

- When toggle display, the GTN750 may sometimes switch to the audio panel.
- The panel may not answer to click events. If this occurs, just leave the mouse outside of the panel and try again.
- Resizing the panel may provide some display issues (ex images lost), if this occurs try to resize it again and/or restart the GPS from the System/setup/Options menu.
- Some minor content display issues.
- Touch screen events are not transmitted by the sim to the instrument so using a pop-out GTN750 in a touchscreen will not work. This a sim issue so we can't do anything on our side.

## Virtual mouse

---

The virtual mouse allow controlling the instrument from external hardware.

This consists of a set of variables and H events.

## H Events

---

## Event names

The H event names are in the following format:

**H:prefix\_eventname**

where prefix can be:

- "GTN750" for the GTN750 instrument connected to COM1/NAV1
- "GTN750\_2" for the GTN750 instrument connected to COM2/NAV2
- "GTN650" for the GTN650 instrument connected to COM1/NAV1
- "GTN650\_2" for the GTN650 instrument connected to COM2/NAV2

example:

H:GTN750\_VMOUSE\_UP

H:GTN650\_2\_VMOUSE\_DOWN

## Toolbar panel events

As a toolbar panel, it can't directly process H events so there is a set of L variables that can be used to simulate the H events.

Set the variable value to 1 to enable the action.

The L variables names are in the following format:

**L:GTN750\_PANEL\_eventname**

example:

L:GTN750\_PANEL\_VMOUSE\_UP

L:GTN750\_PANEL\_VMOUSE\_DOWN

## Event names

- VMOUSE\_ON: Sets the virtual mouse on.
- VMOUSE\_OFF: Sets the virtual mouse off.
- VMOUSE\_UP: Sends a mouseup event for the element at the current coordinates.
- VMOUSE\_DOWN: Sends a mousedown event for the element at the current coordinates.
- VMOUSE\_CLICK: Sends a mousedown event and then a mouseup event for the element at the current coordinates.
- VMOUSE\_WHEEL\_UP: Sends a mousewheel up event for the element at current coordinates.
- VMOUSE\_WHEEL\_DOWN: Sends a mousewheel down event for the element at current coordinates.



# L variables

---

## Variable names

The L variable names are in the following format:

**L:prefix\_variablename**

where prefix can be:

- "GTN750" for the GTN750 instrument connected to COM1/NAV1
- "GTN750\_2" for the GTN750 instrument connected to COM2/NAV2
- "GTN650" for the GTN650 instrument connected to COM1/NAV1
- "GTN650\_2" for the GTN650 instrument connected to COM2/NAV2
- "GTN750\_PANEL" for the toolbar panel

example:

L:GTN750\_VMOUSE\_STATE

L:GTN650\_2\_VMOUSE\_WIDTH

L:GTN750\_PANEL\_VMOUSE\_X

## Readable variable names

- VMOUSE\_STATE: reports the current active virtual mouse state (1=active, 0=inactive).
- VMOUSE\_WIDTH: reports the maximum value for the X coordinate.
- VMOUSE\_HEIGHT: reports the maximum value for the Y coordinate.

## Writable variable names

- VMOUSE\_X: X coordinate. Set it to move the cursor. The maximum value is the one given by the VMOUSE\_WIDTH variable.
- VMOUSE\_Y: Y coordinate. Set it to move the cursor. The maximum value is the one given by the VMOUSE\_HEIGHT variable.
- VMOUSE\_TIMEOUT: Time out value in milliseconds. Default is 0. When positive, the minimum value is 100ms. See below.

## Time Out

---

Optionally, you can set a time out value.

The virtual mouse will turn off after the inactivity delay given by the time out value.

This feature allows saving FPSs. When using it, you should post a VMOUSE\_ON event before any H event in order to wake up the virtual mouse.

## Testing

---

If you want to see the virtual mouse in action, you can test it.

- Choose an aircraft with a GTN750 or GTN650 bezel associated to Nav1.
- Open the GTN750 toolbar panel.
- Set the transponder code to 7777.
- From the toolbar panel, go to the Utilities/ Clean Screen page.
- Right click on this page to toggle the virtual mouse and play with the mouse in the clean screen page. You should see the cursor on the GTN750 bezel.
- You can now control the GTN750 bezel from the GTN750 toolbar panel.

You can notice that using the virtual mouse wheel events work on the bezel (test it in the map page).

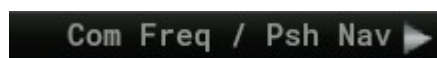
## GTN 650 specific

---

The GTN 650 has a hidden dedicated area for switching NAV/COM when it's displayed as a pop-out window.

The usual way is to push the bottom right knob.

You can also click on the following area:



## Touchscreen support

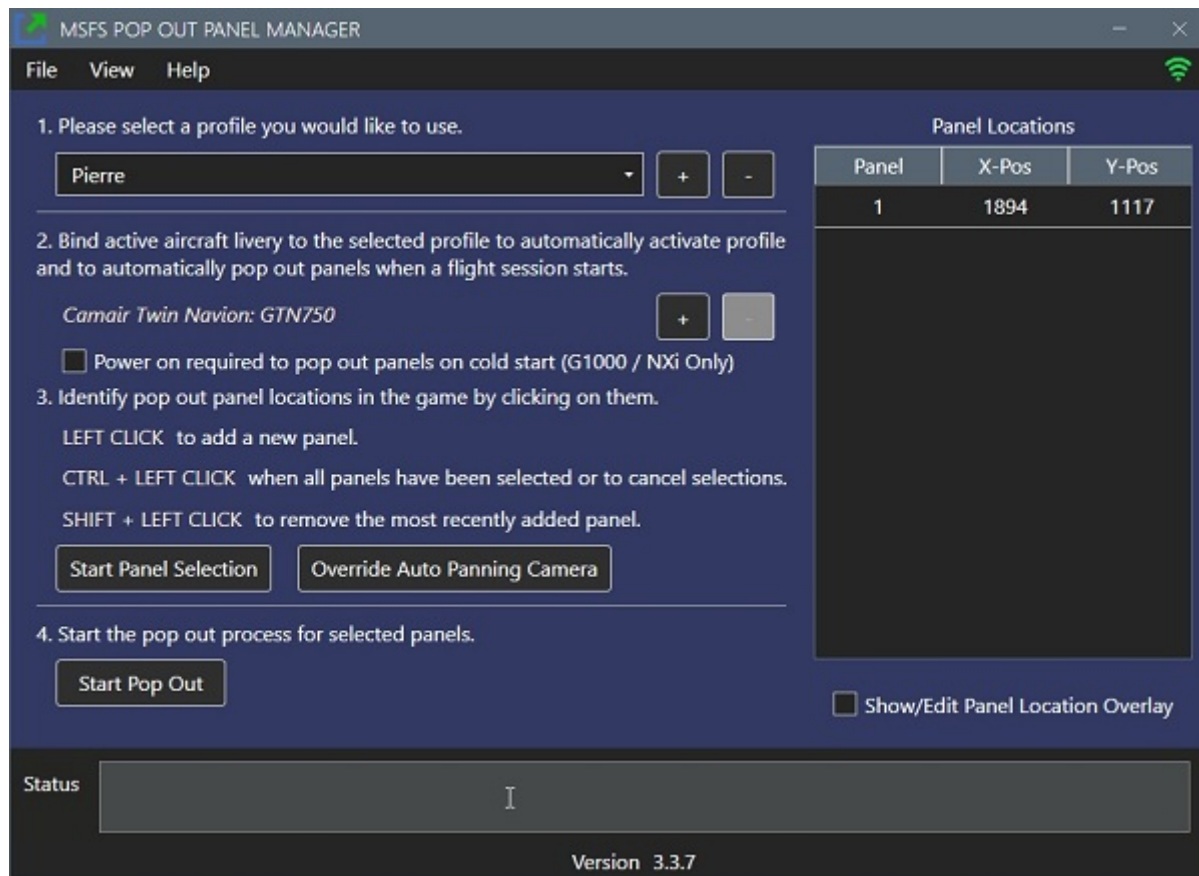
---

Currently, touch screen events are not transmitted by the sim to the instrument so using a pop-out GTN750 in a touchscreen will not work. This is a sim issue and we are waiting for Asobo to fix it.

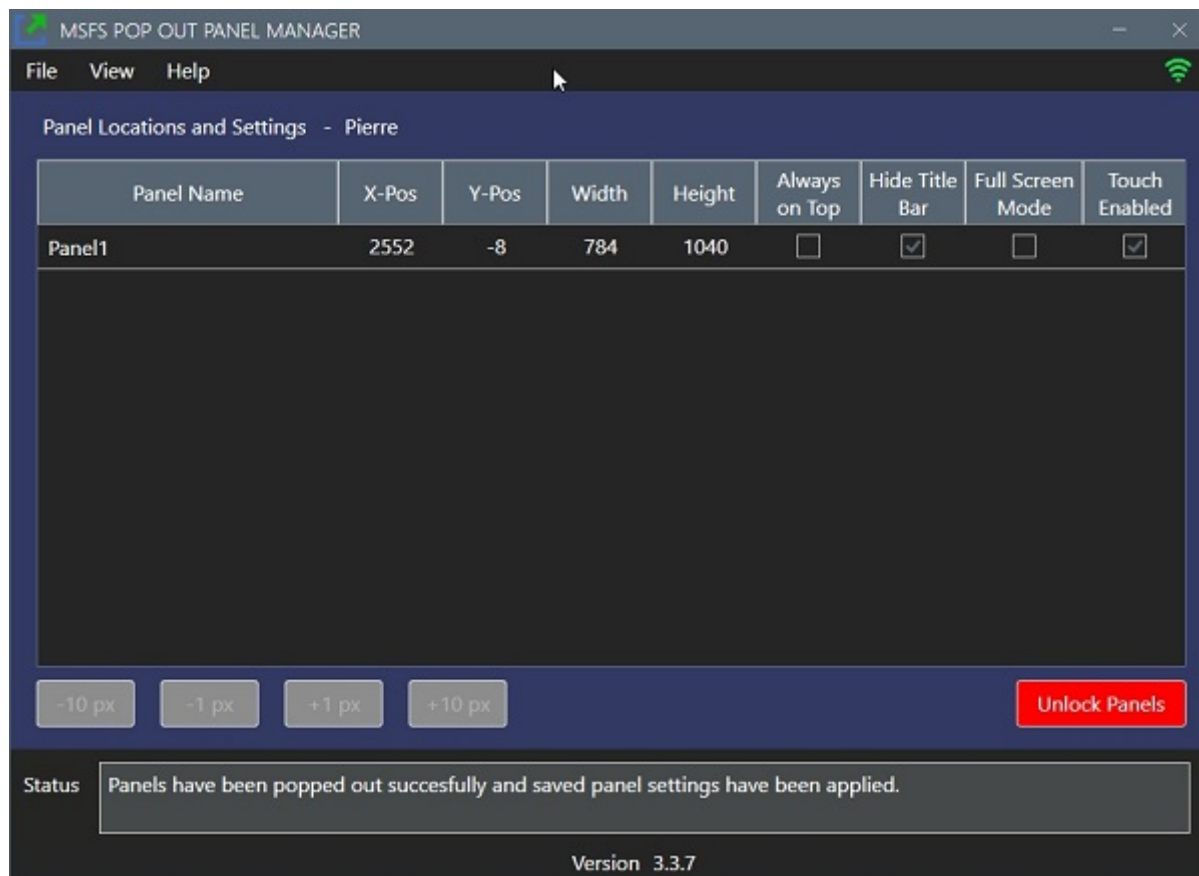
However, there is an alternative solution by using the MSFS Pop Out Panel Manager mod. You can find this mod [here](#):

<https://fr.flightsim.to/file/35759/msfs-pop-out-panel-manager>

This mod adds touch screen management to popped out cockpit instruments. This has been tested successfully with and Ipad + Duet application. However, it doesn't work with the GTN750 toolbar panel for now.



Be sure to check the "Touch Enabled" checkbox in the panel manager:



# GPS hot swapping

Some aircraft may provide a way to swap GPSs from the cockpit. As an example you could choose a GNS530 or the GTN750.

It is advised to choose your configuration when entering into the cockpit and to not change it after that.

Your GPS may have to restart when selecting it.

# Crash To Desktop (CTD)

Unfortunately, the sim's kernel is not very stable at the moment and you may experiment a CTD.

Most of the time, the GPS code is not directly responsible of that unless you can reproduce (at 100% of the time) a CTD sequence by only manipulating the buttons of the GPS. In this case you will get the CTD immediately after pressing a button.

A CTD is a combination of events that will overstress the kernel or making it to reach an unsafe part of the code. It is also linked to your hardware and software environment and settings.

## So what to do in case of a CTD?

- [First read that.](#)
- Disable the airspace messages from the System/Setup/Options page of the GTN750 (there is know issue at Asobo level with airspaces).
- Verify that your drivers are up to date and that your CPU/GPU is not overclocked.
- Update the GTN to the last version.
- Set the sim's weather to "clear sky".
- Remove temporarily all unusefull Mods.
- Try to reproduce a sequence that should help us to find a fix or a workaround.
- Exchange your experience on our [discord server](#).

Sending a support ticket for a CTD without a way to reproduce the sequence at 100% will not help. We really want to help you but we are completely helpless if we can not reproduce the issue.

So if you can't reproduce the CTD case 100% of the time (or nearly), just exchange your experience on the [discord server](#) by giving as much information as you can.

## Exiting MSFS

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### IMPORTANT

Always exit MSFS via the Welcome screen "quit to desktop". If you kill it hardly or by the windows top right cross or by alt f4, some GTN750 settings may not be saved.

Unfortunately, in case of CTD, the settings you have changed during your session will not be saved.

If you hardly leave MSFS or you have a CTD, you will have to reconnect Navigraph too.

## Integrators

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If you want to integrate the GTN750 in your aircraft or modify an existing aircraft, there is an integrator's guide available in the Integration subdirectory of the GTN750 package.

# Sim updates

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The game is constantly evolving. ASOBO regularly publishes updates.

Some of these updates can cause some problems on the GTN750 or even make it stop working.

We usually need a few hours to release an update that will be in line with new MSFS product developments. Thanks to wait a little before requesting support if you have some issues just after a sim update.

We apologize for this momentary inconvenience.

Everyone is doing their best to make this game as functional and realistic as possible.

## Bug reporting

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If you got a sim crash / CTD, please read the Crash To Desktop chapter above.

Before reporting a bug:

- Read the documentation (maybe not a real bug but a normal behavior)
- Install the latest release
- Check the installation (see chapter verifying the installation in this documentation).
- Remove any other MOD or livery
- Remove any external hardware or software involved with MSFS
- Take some time to search for the fastest sequence that reproduces the bug
- Re-install the product
- Restart the sim
- Reboot the computer
- Set the weather to clear sky at midday.
- Try with another aircraft and eventually with a different GPS (if this is a flight plan issue).
- If you get a CTD, especially without manipulating the GPS buttons, first try disabling the traffic data and messaging system from the GTN750 options page in System/Setup menu. If you still have some CTDs, try to set the GTN in safe mode.

When reporting please provide:

- All the information necessary to reproduce the bug. Be very precise



- The exact flight plan (textual)
- The version number
- The aircraft type
- The list of installed Mods and liveries.

If we are not able to reproduce the issue, it will be very difficult to fix it. Messages just like "I got a froze" or "I got a CTD" without further information will not help. We cannot support external hardware, software, other MODs nor liveries. Please try without them before requesting support. Thank you for your understanding.

## Known issues

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- Flight plan preview displays the theoretical sequence of waypoints. This may differ from the real waypoints that will be calculated by the sim's kernel in your flight plan. It may add/remove some waypoints around your first approach waypoint. This is not an issue at the GPS level and occurs with other GPSs. In WTT mode the GTN750 displays the correct sequence of waypoints.
- There is currently a bug in the sim's kernel with airspace management that triggers CTDs. It is strongly advised to disable the airspace messages for now. You can disable airspace messages from System/Setup/Options page.
- Displaying Nexrad in one GPS and in the same time a weather radar in another GPS may produce some bad data in the weather radar.
- Searching waypoints by name or city is not working well in the sim for now so the functionality has been disabled in the GPS.
- Touch screen events are not transmitted by the sim to the instrument so using a pop-out GTN750 in a touchscreen will not work. This a sim issue so we can't do anything on our side. However, there is an alternative solution by using the MSFS Pop Out Panel Manager mod (see the "Touchscreen support" chapter above).
- The airplane may be not centered correctly on the map at extreme latitudes and for maximum zoom out level (Asobo issue that limits the map to 75° lat).
- The Asobo flight planner removes your flight plan when you issue a direct To an airport. No such issue with the WT flight planner (WTT mode).

## Change log

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## v2.2.28

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- Bugfix: Arrival altitude constraint type not displayed correctly.
- WTT mode: Added the "Revert Constraint" button to revert an edited constraint to the original published data.

## v2.2.27

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- Bugfix: Autopilot re-engaging by itself after landing when there is no flight director in the aircraft.
- Aircraft developers can force the WTT mode.

## v2.2.26

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- Bugfix: the "activate vectors to final" button was not greyed for the Asobo flight planner on the procedure page.
- G3X compatibility bug fixes after the latest SU15 beta update.

## v2.2.25

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- Bugfix: the departure constraints are not displayed.
- Bugfix: the distance to destination field freezes the map page.

## v2.2.24

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- The WT layer has been upgraded to the latest version of the framework. This is a major change so you are encouraged to keep the previous version somewhere and revert to it if you encounter a problem.
- The GTN750 can be configured as an external navigator for the WT G3X.
- Aircraft developers can now embed a specific version of the GTN750 in their package.

## v2.2.23

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- Bugfix: WTT: importing a flight plan with user waypoints was not working in the previous versions (probably from 2.2.19).

## v2.2.22

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- WT G3X compatibility code step 3.
- Removing a file from the package that overrides an Asobo avionics file. This override had no consequences on the sim but it no longer seems necessary.
- Smoothing the fuel ring display to avoid small fluctuations.

## v2.2.21

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- WT G3X compatibility code step 2.
- Bugfix: the active leg was not displayed correctly in the flight plan page when flying the leg to the destination airport.
- Bugfix: opening the Navigraph charts panel may change the NAV source from GPS to VLOC.

## v2.2.20

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- Bugfix: WT G3X compatibility code: approaches not working.

## v2.2.19

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- Bugfix: With the helicopter models, the CDI button may not switch from VLOC to GPS.
- Bugfix: The flight plan synchronization to ATC may fail.
- Preparing the code for an upcoming WT G3X compatibility.

## v2.2.18

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- WTT mode: Smoothing the transition from ALT to VS mode.
- APGA: bugfix: the WTT detection may fail in case of GPS hot swapping.
- APGA: workaround to an Asobo bug that may issue some unexpected H events after a flight restart. If you have installed one of the WTT additional package for the BrsDesign bonanza or debonair, the Erasam tecnam P92, the Milviz C310, you should upgrade it to the latest version.
- Increasing the nearest airspace refresh rate.
- WTT mode: added half/low bank management.
- WTT mode: added config parameters for bank angle values.
- WTT mode: added some code for checking the flight plan integrity.

## v2.2.17

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- WTT mode: Added the manual arming altitude management. See the integrator's guide.
- Safe taxi: the night view is now also set at sunset and sunrise times (only at night time in previous versions).
- Bugfix: the initial departure path may be wrong when starting from the parking.

## v2.2.16

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- Bugfix: WTT mode: Removing a waypoint may not update correctly the flight plan path.
- Bugfix: WTT mode: Some enroute waypoints may not be loaded from the ATC flight plan.
- Added a DTK Auto Sync option that automatically sets the CRS value to the current GPS desired track (premium).
- Added an option for an extended volume knob management. In this mode, you can use the volume knob to zoom in/out, scroll up/down and back to the previous page (premium).
- Fixed some issues when adding/removing origin/destination.
- WTT mode: a random direct To an airport sets the airport as the flight plan destination so it's possible to choose an approach.

## v2.2.15

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- Bugfix: The WTT mode may fail to start making the autopilot not working as expected.

## v2.2.14

---

- Bugfix: WTT mode: a direct TO may turn the aircraft in the wrong direction.
- Changed the OBS logic.
- Added the Direct TO course setting (WTT mode and premium).
- Smoothing of the Wind velocity value.
- Added the TO/GA management in WTT mode.
- Added a WTT config entry in the panel.xml file (see the integrator's guide).

## v2.2.13

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- Bugfix: WTT mode external: the instrument may be unresponsive when connected to the WT GNS530. This issue happens only in v2.2.12.

## v2.2.12

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- Bugfix: WTT mode: the displayed path for CF leg types was sometimes wrong.
- Bugfix: toolbar panel display issues in VR when the panel size is high.
- Bugfix: the bingmap roads map was not selectable in the previous version.
- Bugfix: a direct to the first waypoint of a VTF approach was making the approach not work correctly.
- Bugfix: with the Asobo flight planner, the direct To arrow was not displayed in the approach sequence.

## v2.2.11

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- Added a way for integrators to customize the CDI button behavior. See the integrator's guide.
- Added custom map layers in the utility map page. See the file `custom_map_layers_example.txt` located in the package Config folder.
- Added a map traffic range option for the main map page.
- Added a sort alpha button for airway exit waypoint selection.

## v2.2.10

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- BugFix: WTT mode: The flight director may not initialize correctly in some aircraft (ex TBM 850).
- Added the Navigraph US FAA Map on the utility page (premium).
- Changed the way to select the Utility maps.

## v2.2.9

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- Added the possibility to independently disable XPDR and Audio panel (premium). The freed space is then used for user fields.
- WTT mode: Added a visual button in the map page (see the manual chapter "Map Visual button"). Premium feature.
- Bugfix: the Bingmap key was saved at the instrument level instead of the global level.

## v2.2.8

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- Added an option for displaying user fields as a replacement for the audio panel and transponder (premium).
- Bugfix GTN650: The wind direction in the default navigation page was bad (Track up instead of North Up).
- Bugfix: WTT mode: bad target Direct To in the flight plan page when activating an approach and the last enroute waypoint is the same as the IAF.
- Bugfix: The map waypoint's constraint may blink if the waypoint appears 2 times in the flight plan.

## v2.2.7

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- Bugfix: The new toolbar panel events were not working in the previous release.
- Fallback to the sim Metar if AVWX call fails. The sim Metar is less detailed and there is no TAF data.

## v2.2.6

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- Bugfix: WTT external mode: Restarting the GTN750 toolbar panel while flying a hold may reset the active leg.
- Added the GTN750 toolbar panel events mapping (H events simulation). Premium only.
- Added a new set of GPS hot swapping variables for a deeper control (integrator's only). See the latest integrator's guide.
- We are now Using the BingMap APi for elevation data (requires the Bingmap key).
- Added a virtual mouse to control the instruments from external hardware. Premium only.

## v2.2.5

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- WTT mode: The VS autopilot director has been updated.
- Bugfix: The nearest airport list may fail to initialize.
- Added the Find button in the frequency selection page (premium).
- Bugfix: issues around the COM Channel spacing saving state.

## v2.2.4

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- Bugfix: WTT mode: ILS approach not working with the Black Square TBM 850.
- Added an option to disable the click sound.



## v2.2.3

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- Bugfix: WTT mode: Leaving OBS mode may corrupt the flight plan.
- The flight plan "insert before" button now works for the origin so it can be changed.
- The origin is pre-populated with the nearest airport if the Asobo flight plan is empty.
- Bugfix: the airport altitude may be bad after a hot GPS swapping.

## v2.2.2

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- WTT mode: Better management of adding waypoints on the flight plan page.
- Bugfix: Some frequencies were not settable from the frequency keyboard (ex 120.030).

## v2.2.1

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- Added an option to show/hide the bush trip flight plan (hidden by default).
- Bugfix: The trip timer was reset at touch down when the criteria is "In Air".
- Bugfix: More than one active waypoint displayed on the map page.
- Bugfix: the sim VFR map may not refresh the flight path.
- Bugfix: bad IAF detection for a few approaches.

## v2.2.0

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- Added an external brightness control mode.
- Bugfix: Heliport waypoint may not be selectable or is incorrectly displayed.
- Bugfix: The user waypoint icon is not displayed from v2.1.98.
- Bugfix: Some HOLD types were editable when they shouldn't (HA and HF leg types).
- Bugfix: Waypoint label size and position issues.

## v2.1.99

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- Import from Simbrief: importing the enroute altitude constraints.
- Bugfix: the "Load Approach & Activate" button in the approach selection page was issuing a vectors to final instead of a direct To the STRGHT waypoint.
- Bugfix: Weather radar displayed with a bad vertical offset.

## v2.1.98

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- Added the Fast find feature in the waypoint selection page. Premium only.
  - Added the TOD waypoint in the main map page when the vertical calculator (VCALC) is active. Experimental feature.
  - Bugfix: the WTT mode may fail to start in Cold and Dark mode for some aircraft.
  - Bugfix: WTT mode. When doing a new flight after landing without leaving the world map, the RNAV approach mode may not work on the next flight.

## v2.1.97

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- Added the map waypoint feature. This allows a direct To any clicked map point. When the clicked point is not a valid ICAO waypoint, this creates a map waypoint. Then, if you press the direct To, you will see this map waypoint directly selected so you can direct to it. This works also from the Utility map. Premium only.
- Added the flight plan path in the utility map.
- Bugfix: when removing an approach in WTT mode, the destination ident is the runway instead of the airport.
- Bugfix: the Fuel planning utility works now with the A2A Comanche.

## v2.1.96

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- Added the arc view on the terrain page.
- Added Knob events in the waypoint selection page (experimental).
- Fixed some fuel planning issues.
- Bugfix: The waypoint airport info page may not display correctly.
- Bugfix: some ILS frequencies were sometimes not displayed.

## v2.1.95

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- Autopilot utility: For the GTN650, the HDG, CRS, OBS and Baro buttons are now available from the contextual menu.
- Enroute constraint altitudes are now saved with the flight plan (as "At" type only).
- Added the Generic and trip timer values as a map field.
- Bugfix: some H events sent from external hardware/software may not be received by the first unit if the instrument is connected to COM1/NAV1 and is indexed in the panel.cfg file. This happens with the H145 helicopter.
- Bugfix: The waypoint airport info page may not display correctly.

- Bugfix: Fixed some direct To issues when using the stock Asobo flight planner.

## v2.1.94

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- Rebuilding the traffic code.
- Added a traffic refresh rate option.
- Added the autopilot panel in the GTN650.
- Added the time zone on the airport info page.
- Added Aera and G3X (not touch) versions compatible with the WTT mode.
- Bugfix: No map VOR ring for VORTAC.
- Bugfix: the visual approach was not working as expected for the G3X WTT aircraft. This requires updating your WTT mode for these aircraft.
- Bugfix: in WTT mode, the last enroute waypoint before the arrival segment may be displayed as part of the arrival when there is no approach in the flight plan.
- Bugfix: wrong range ring calculation when the fuel unit is not the gallon.

## v2.1.93

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- Added the fuel range rings in the main map page (premium).
- Bugfix: the user waypoint label may not display correctly.
- Added direct To a user waypoint for the stock Asobo flight planner (already working for WT flight planner).
- Smoothing transitions for the airplane icon and tiles on the utility map page.
- Fixed a few minor bugs.

## v2.1.92

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- Added the map fields DME distance and VOR Radial (To and From). Premium only.
- Added the map fields Altitude above ground (AGL) and True airspeed.
- Added a track vector to the map page (premium).
- Added the VOR rings on the map page (with option).
- Added the altitude constraint display in the VCALC waypoint selection list.
- Added a global option for fuel type and fuel unit.
- Added a shortcut to access the options page from the map page. See the "Status bar shortcuts" chapter in the manual.
- Separate options for NDB and VOR display in the map page.
- Bugfix: The airport info runway map got blinking labels.

## v2.1.91

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- Bugfix: some flight plan waypoint labels were not refreshed correctly.
- Added a G3X version compatible with the WTT mode (for integrators, see the integrator's guide).
- The map TRK field is now the plane heading if the ground speed is less than 2kts.

## v2.1.90

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- Import user waypoints from sim ATC: the 5 first characters of the waypoint label is now used for naming the waypoint instead of USRxx. Note: if a waypoint with the same label but different coordinates already exists, we still use USRxx as the name.
- Added an option to optimize FPS on the map page.
- The map waypoint loader has been rebuilt. More waypoints and faster display.
- Faster flight plan updates on the flight plan page.

## v2.1.89

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- Changed the runway lines options. Now you can set the maximum zoom level to display them.
- Flight plan import: user waypoints with an ICAO code are now accepted (a workaround to a Navigraph charts issue).
- Changed the map colors.

## v2.1.88

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- Changed the main font.
- Added a few animations.
- Better icon quality.
- Knob mode reset to COM action after 30s of inactivity if the previous action was NAV.
- Added a KnobPushLong event. The action is the standby/active frequency swapping. This requires some modifications by the aircraft developers.
- Added a DTK change alert message (premium and WTT mode only).
- Added a Traffic alert message (premium).
- Added the runway lines for the destination airport (premium).

## v2.1.87

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- Added a safe taxi feature (requires a Navigraph subscription for charts). Check the documentation for further information.
- Added IVAO as a data source on the ATC utility page.

## v2.1.86

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- Bugfix: WTT mode: The autopilot module may fail to initialize with the cold and dark mode.

## v2.1.85

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- Added the Navigraph VFR/IFR map in the utility map (requires a Navigraph subscription for charts).
- Added auto zoom on the main map page.
- Added UTC time and local time as map fields.
- Map field selection is sorted alphabetically.
- Best sorting of the airport chart list.
- Bugfix: in WTT mode the flight director may fail to initialize.

## v2.1.84

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- Added a scale factor in the utilities map page (Bing map).
- Added Bing map display customization files.
- Transponder OFF state management.

## v2.1.83

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- Bugfix: WTT mode: Import from ATC may duplicate the origin airport waypoint.
- Bugfix: WTT mode: In case of flight restart the flight plan was not synchronized back to the ATC.
- Bugfix: WTT mode. The active leg may be bad after importing a flight plan.
- Bugfix: Hot swapping. Some other html gauges may fail to start after a flight restart.
- Added SimBrief direct import (premium).
- WTT mode: Optimization of the flight path calculator.

## v2.1.82

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- Bugfix: on the DALT/TAS/Winds page, the displayed CAS was not correct when using sensor data.
- Added an ATC panel for VATSIM users (utilities menu).

## v2.1.81

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- Bugfix: the airspace stays displayed when returning from an external view, even if the option is not set in the map menu.
- Bugfix: the fuel planning menu is not displaying.
- DALT/TAS/Winds page: TRK set to HDG when GS is less than 2kts and using sensor data.
- Added the constraint altitude for the STRGHT visual approach waypoint.
- Added a Magnetic/True option on the DALT/TAS/Winds page.

## v2.1.80

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- Bugfix: the flight timers were not working in v 2.1.79

## v2.1.79

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- The VCALC Messages are now specific to each unit.
- Adding Logs utility. This is a sim variable viewer. The free version displays only some GTN750 variables. The premium version displays all the sim variables and allows editing of the file that defines the variables to display.

## v2.1.78

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- Bugfix: The visual approach selection for runway 36 hangs.
- Bugfix: Setting a map field on a page may change it on another page.

## v2.1.77

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- Bugfix: WTT mode: The message "Arrival at waypoint" may come too early in case of a direct To.



- Bugfix: The engine part was not displayed when using a G1000MFD replacement package for a stock aircraft.

## v2.1.76

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- Added the DALT/TAS/Winds utility page (premium).
- Added Waypoint info, Fuel, Timers and DALT/TAS as target pages for the map fields.
- Added an option (premium) to display more fields on the map. Check the documentation chapter "Map field pages".
- Integrators only: simplification of the integration steps. See our integrator's guide (guide version v1.25 minimum).

## v2.1.75

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- WTT mode: Allow a combination of a GTN750 as unit 1 and a WT GNS530/430 as unit 2. This is an experimental feature that could have side effects.

## v2.1.74

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- Bugfix: The distance to the STRGHT waypoint when activating a visual approach was bad. Side effect: the VCALC was stopping calculation in this case.
- Bugfix: The DTK in the flight plan page may be bad in case of direct To the IAF.
- Bugfix: Possible sim crash when activating an approach while there is a current direct To.
- Added an option to display TCAS traffic even below 500ft AGL.
- Added a traffic icon in the map page.

## v2.1.73

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- Bugfix: A direct to a random waypoint may hang the instrument in WTT mode (bug only in v2.1.72).
- Fixed SAR display issues in WTT external mode.
- Bugfix: The distance to the STRGHT waypoint when activating a visual approach was bad. Side effect: the VCALC was stopping calculation in this case.

## v2.1.72

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- WTT mode. Added all altitude constraint types (previously only AT type).

- Fixed some synchronization bugs in WTT external mode.

## v2.1.71

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- Bugfix: GNS530 interface: the approach data was not correctly synchronized with GNS530 making some approaches not work correctly.
- Bugfix: When switching from external WTT mode (ex GNS530) to the GTN750 internal WTT mode, the flight plan may be lost. We now reload it automatically from the ATC in this situation (you must be on the ground). We remind users that the host swapping should be done just after entering in the cockpit.

## v2.1.70

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- Bugfix: WTT mode. Not possible to direct To the STRGHT or FINAL waypoints of a visual approach.
- Bugfix: WTT mode. The NAV source may not initialize correctly.
- Bugfix: WTT mode. The target altitude may not be correctly captured.
- Bugfix: WTT mode (for aircraft developers). When integrating the WTT mode in the cockpit and the GTN750 package is not installed, some aircraft gauges may not work correctly.

## v2.1.69

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- Bugfix: WTT mode. Default vertical mode was always PITCH. Now it's taken from the aircraft config file.

## v2.1.68

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- Bugfix: when switching from WT GNS550 to GTN750 in WTT mode, the autopilot management may be lost.

## v2.1.67

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- The GTN750 may fail to start.

## v2.1.66

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- Added an option for default VFR code (1200/7000).

- Bugfix: some aircraft with the new GPS hot switching may not work with the stock GNS530 (ex Carenado PC12 and Ovation).

## v2.1.65

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- Bugfix: The altitude selection in WTT mode for some Carenado aircraft may be wrong.

## v2.1.64

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- Bugfix: Map HSi is always displayed even if the option is not set.
- Bugfix: Corrupted map with some pln files imported from the world map (a workaround to an Asobo bug).
- Bugfix: New GPS hot swapping: the GTN750 may fail or take a long time to restart.

## v2.1.63

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- Bugfix: wrong detection of the WTT mode if there is no autopilot in the aircraft.
- Bugfix: the flight plan import may fail to load the approach.
- Added a map icon option on the options page. The icon can be "Propeller", "Helicopter" or "Jet".
- Baro range on the autopilot page is now 28-32 inHg (948-1084 mb).

## v2.1.62

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- GPS hot swapping: compatibility with WT GNS530 1.0.4.

## v2.1.61

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- Better WTT mode detection.
- Removed the "Import from ATC" button because it doesn't work well with the WT GNS530 for now.
- Few bug fixes with GPS switching.

## v2.1.60

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- bugfix: GPS switching: the GTN750 may fail to power on in case of flight restart.

- bugfix: when used with the WT GNS530 as an external WT engine, the flight plan may be corrupted if no destination is entered in the world map.
- bugfix: wrong VCALC time to descent value.
- VCALC: if the target waypoint is part of the approach and the approach is not activated and you are flying the leg to the airport, VCALC is calculating as if you did a direct TO the target waypoint (the one defined in VCALC).

## v2.1.59

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- New GPS switching mechanism (same as Working Title). The old one keeps working for compatibility issue but will be deprecated in the future.
- Adding ATC flight plan import feature.
- The system status page displays 3 values for WTT mode: "None", "External" and "Internal". External means connected to an external WT instrument (ex GNS530 or G1000Nxi). The internal mode uses our internal WT engine.
- bugfix: WTT mode: importing a flight plan with many waypoints could freeze the sim for a few seconds.
- bugfix: WTT mode: VCALC calculation may be wrong when the target waypoint is part of the approach and the approach is not activated.
- WTT mode: v2 is now released. This requires updating the WTT additional packages for your aircraft.
- WTT mode: automatic ATC synchronization (no manual button needed anymore). Only with WTT v2.
- integration: the embedded integration is not available anymore.

## v2.1.58

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- bugfix: FPS drop in v2.1.57.

## v2.1.57

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- Still some false positive virus detection in v2.1.56.

## v2.1.56

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- Preparing the code for the future WT switching GPS feature.
- Some false positive virus detection in v2.1.55.

## v2.1.55

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- Bugfix: distance calculations in flight plan page and map fields.
- Bugfix: ETE field may disappear sometimes in WTT mode.
- Bugfix WTT mode: a direct To action may not work if there is a previous one.

## v2.1.54

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- Bugfix: WTT mode V2. The AP may re-engage automatically in some cases.
- Bugfix: activating a leg may target the next one in rare cases.
- Bugfix: WTT mode V2. The approach arm state may be bad for RNAV.

## v2.1.53

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- Bugfix: Flight plan issues when it comes from the world map and contains more than a user waypoint. Occurs only with the stock sim flight planner.
- Bugfix in WTT mode (V1): Starting from SU11 the enroute waypoints were not loaded from the world map flight plan.

## v2.1.52

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- Bugfix: Create user waypoint not working in V2.1.51.

## v2.1.51

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- Bugfix: WTT V2 mode: In some aircraft (ex analog King Air) the setting of the minimums was not working.
- Bugfix: METAR not displayed if there is no TAF data at the target airport.
- Adding SAR Patterns (premium).

## v2.1.50

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- Bugfix: WTT mode: No map GSI for visual approaches.

## v2.1.49

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- Bugfix: possible stutters in the flight plan page for flight plans with many waypoints.
- WTT mode: possible side effects when restarting the GPS unit.
- Experimental new WTT mode (v2) based on the latest WT code. Requires a specific test package (see our discord).

## v2.1.48

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- Bugfix: possible stutters in the flight plan page for flight plans with many waypoints.
- Changed the way to calculate flight plan distances.
- WTT mode: Reducing flight path refresh rate in the map page if there are too many waypoints in the flight plan. This is to optimize FPS.
- Bugfix: WTT: can't load some STAR procedures if there is no specific runway.
- Bugfix: leaving OBS mode may sometimes not switch to Direct To.
- Removed the use of the Laurin server for traffic data because it may drop FPS when entering the map page.

## v2.1.47

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- Adding L variables for Knob state and current COM/NAV index.
- Entering OBS mode now displays a page to set the OBS angle.
- Adding TAF weather data to the airport info page.
- WTT mode: allow removing an approach waypoint while the approach is active.

## v2.1.46

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- SU11 compatibility (still compatible with SU10).
- Bugfix: can't add an enroute waypoint when a STAR is loaded.
- Altitude constraints can now be set to max 49900ft instead of 19900ft.
- Bugfix: the VCALC utility was giving bad information for approach waypoints.
- Bugfix: the map field DIS (distance) was changing too early.
- City information is not displayed anymore for waypoint info (except for airports) because there is currently an Asobo issue with city data.
- Fixed some bugs for departure and arrival selections.
- WTT mode: possibility to select an arrival or departure procedure without transition when available.
- Adding a way to share a bank of user waypoints across aircraft.



## v2.1.45

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- Bugfix: disable traffic and terrain buttons in the map menu when the license is not active.
- WTT mode: reducing some small flight plan waypoints overshoot.
- The ADF standby frequency can now be set directly from the Nearest NDB and NDB info pages (premium).

## v2.1.44

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- SU10 compatibility.
- Bugfix: the map CDI cursor was hidden by the From/TO arrow.
- Bugfix: APGA KAP140: the vertical mode may sometimes not turn to VS when engaging AP.
- Workaround to a Simbrief pln file issue (simbrief pln files are missing information for waypoints attached to an airport).
- G1000 MFD replacement mods are now working with the G1000Nxi (be sure to update the G1000 replacement package for your aircraft).
- Audio panel MON button: possibility to change monitoring when the aircraft has COM3 MIC enabled. Pressing the MON button then toggles COM1, COM2, COM1+COM2, NONE.
- Bugfix: some map airport symbol orientations are bad (Workaround to a sim issue).

## v2.1.43

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- SU10 compatibility step 2.
- Bugfix: removing city information in the waypoint map because this may create stutters (sim issue).
- Added clickable areas in the status bar as shortcuts to home, map, and direct To pages.
- Added a way to enter the OBS value directly by clicking the OBS status in the status bar.
- Tested an Ipad touchscreen working solution using the MSFS Pop Out Panel Manager mod and Duet application.
- KAP140 APGA: The ROLL mode now always operates as a wing leveler mode with a 0 bank angle.
- Bugfix: the region name for some small airport codes terminating with 2 numbers (ex WA96) may be wrong. Since we cannot be sure about the region name, in this case, it will be left blank.
- Bugfix: Map traffic icons may not be refreshed correctly.
- Bugfix: WTT mode: bad flight plan display when direct To a departure or arrival procedure waypoint.

- Bugfix: WTT mode: Workaround to a Sim bug that may display Arrival waypoints as enroute waypoints.
- Bugfix G1000Nxi compatibility: The toolbar panel init time has been increased to be sure the Nxi is ready before starting the GTN750. This prevents some cases where the world map flight plan is not correctly loaded.

## v2.1.42

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- SU10 compatibility step 1.
- Bugfix: Selection of a user waypoint from the direct To page was not working as expected (WTT mode).

## v2.1.41

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- Bugfix: The load approach button may flash on the approach procedure selection page.
- Bugfix WTT mode: missed approach active flag was not cleared after deleting a flight plan.
- The flight plan delete button is now always enabled.
- Bugfix: some H events for the direct To page were not triggered correctly.
- Bugfix: WTT mode: some fields (ex DIS) or leg distance are not correct when there is no origin and destination in the stock sim flight plan.

## v2.1.40

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- Bugfix: HDG line angle was not correct in the map north up mode.

## v2.1.39

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- Bugfix: right-click in map view engages the pan mode.
- Bugfix: right-click in chart view engages the pan mode.
- APGA: fixed an issue where the armed selected altitude may be bad. This bug occurred only in WTT mode if you try to set by yourself the "AUTOPILOT ALTITUDE LOCK VAR" instead of using the dedicated APGA events to change the selected altitude.
- Improved stability in WTT mode for VOR and LOC navigation.
- Bugfix: Autopilot page: the altitude selector in the GTN750 toolbar panel was not working correctly.
- Added an HDG line on the map page when turning the HDG knob (premium).

## v2.1.38

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- Bugfix in GTN650 VCALC target waypoint selection.
- Added an option to disable win data when on the ground.
- WTT mode: added code for disabling auto arming.
- GSI display on map: works now when not in autopilot approach mode.
- APGA: workaround to the 99000 altitude display (WTT mode only, the issue still exists with the Asobo AP manager).

## v2.1.37

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- Bugfix on the distance to destination map field (DTD).
- Fixed a few bugs for the G1000Nxi v12.2 compatibility (flying phase and GSI display).
- APGA: we can now adjust the altitude while in ALT mode by the way of the UP/DN buttons.
- APGA: code reorganization. This allows modifying the code for your own needs without changing the original code.

## v2.1.36

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- Bugfix: The VNAV options waypoint name was not set correctly (always GILRA).
- Bugfix: WTT mode: the missed approach waypoints were not displayed correctly.
- The autopilot page is available as a map field.
- The Sat/Road map page is available as a map field.

## v2.1.35

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- The backspace event was not working on the transponder keyboard.
- Lowercase letter events were not working in the general text keyboard.
- Digit 0 event was not working on some keyboards.
- Optimizing GPS switching code (disabling GTN750 interaction when hidden).
- Added NextGen Bandeirante and Milviz 310R as WTT compatible aircraft.

## v2.1.34

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- Autopilot page and APGA: Fixed some bugs with FLC and ALT modes with the sim stock autopilot manager.

## v2.1.33

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- G1000Nxi v0.12 compatibility. Requires a G1000Nxi patch (check the documentation).
- bugfix: nearest airspace list empty.

## v2.1.32

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- SU9 compatibility.
- Bugfix: Nxi compatibility: The first display of a waypoint map or procedure preview was resetting the Nxi selected altitude.
- Added events to the transponder keyboard.

## v2.1.31

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- Bugfix: Airway loading gets stuck on the exit point selection.

## v2.1.30

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- WTT Mode: Bugfix: NAV source not correctly initialized when the aircraft is started in VLOC mode.
- Displaying the current VLOC source: VLOC1 or VLOC2.

## v2.1.29

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- APGA: captured altitude was not correct.
- APGA: option for working with a mechanical altitude selector.
- Autopilot page and APGA: fixed some bugs in approach mode detection.
- Better GSI detection in WTT mode.

## v2.1.28

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- Autopilot page and APGA: Added combined modes Go Around and Level.
- Autopilot page and APGA: Added altitude selection phases.
- Autopilot page and APGA: Few bug corrections.
- Autopilot page: the mouse wheel can be used on the UP/DN buttons (toolbar panel only).
- WTT mode: workaround to a WT bug that may not update a sim GPS variable correctly.

## v2.1.27

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- Autopilot page: Up and Down buttons available in pitch mode.
- Added a new autopilot module (named APGA) to simplify the building of autopilot panels.

## v2.1.26

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- Autopilot page: Added an optional manual arm mode for targeting a selected altitude.
- Autopilot gauge made open source to help aircraft builders create their own autopilot gauge.
- SU9 Compatibility step 3 (fixed black screen in G1000 MFD replacement).

## v2.1.25

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- bugfix: Wind direction was taken as magnetic north instead of true north.
- Autopilot page: Added FLC mode.
- Autopilot page: Added mouse wheel events for HDG, CRS and Baro settings (panel only).
- Autopilot page: Added baro std button.
- Integrator's guide: adding a chapter about the autopilot gauges.
- bugfix: delete flight plan may not remove completely the destination.

## v2.1.24

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- SU9 Compatibility step 2.
- bugfix: Nexrad setting was not kept when leaving the map page.

## v2.1.23

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- SU9 Compatibility step 1.

## v2.1.22

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- Bugfix: No return to map after activating a direct To.
- The map page can now display, North Up, HDG Up and TRK Up.
- Removed the city display option because of an MSFS issue (stutters).

- Added an autopilot panel (premium). Not compatible with all aircraft (check documentation).

## v2.1.21

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- Bugfix: WTT Mode: CDI was flashing in OBS mode.
- Bugfix: WTT Mode: bad management of the OBS/SUSP button.
- Reset OBS when canceling a direct TO.
- Added a hover color for buttons.
- A double click on the utilities map allows adding a user waypoint at selected coordinates.

## v2.1.20

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- Bugfix: giving more time for the storage system to initialize.
- WTT mode: User waypoints can be direct To target.
- Nxi 0.11.0 compatibility (requires a Nxi patch, check the documentation).

## v2.1.19

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- Added H events to access the GTN750 pages.
- Bugfix: WTT mode: The departure active leg was not correct.

## v2.1.18

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- Bugfix: WTT mode: the KAP140 VS mode was not working as expected when engaging the autopilot.
- Bugfix: fuel planning: unselecting sensor data was giving a bad fuel flow value for a multi engine aircraft.
- Bugfix: The flight plan path was not displayed in case of direct To and an empty flight plan.
- Added the Got Friends Optica WTT compatibility.
- Disabling COM1/COM2 switch if the aircraft doesn't accept COM2.
- WTT mode: adding a way to reload the stock sim flight plan (import button in flight plan page menu). Premium only.

## v2.1.17

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- Bugfix: WTT mode: the GPS WP NEXT ID simvar was not set correctly.

- Bugfix: WTT mode: the GTN750 could freeze if the world map FP is empty.
- Added an auto-center button in the utilities map.

## v2.1.16

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- Map key saved in the game to avoid losing it after a Mod update.
- Radio part frequency names enlarged.
- Option to set COM1/NAV1 and COM2/NAV2 frequencies.
- Added display of WTT mode and COM/NAV index in the system status page.
- Added 3 WTT compatible aircraft: Carenado Seneca and Arrow, HPG Airbus H145.

## v2.1.15

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- SU8 compatibility
- Bugfix: Fuel planning, only the first engine was taken into account when using sensor data.
- Added extended map features in utilities and airport info pages (premium + specific key).  
See the documentation.

## v2.1.14

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- Bugfix: WTT mode: Distance to destination map field not correct.
- Bugfix: WTT mode: VTF approach duplicate FAF.
- Bugfix: WTT mode: VTF approach activate leg action sets a bad leg.

## v2.1.13

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- WTT Mode: adding the correct flying phase annunciations.
- Bugfix: the GS indicator was displayed only in the premium version.

## v2.1.12

---

- Adding an optional GS indicator in the map page that works for ILS and RNAV approaches.
- Bugfix: WTT mode: Visual approach legs were bad.
- User waypoints added by the stock sim in approach procedures are not displayed any more as a red square.



## v2.1.11

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- Bugfix: WTT mode: Visual approach selection not working for runways with a designator (ex 03L).

## v2.1.10

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- Bugfix: WTT mode: Cannot add a procedure if origin and destination are the same and no other waypoint in the FP.
- Bugfix: WTT mode: The ILS VLOC mode was not set automatically.
- Bugfix: WTT mode: Setting autopilot modes may fail for some aircraft.
- Bugfix: WTT mode: In approach the flight state may stay to "ENR" instead of "APPR".
- Added WTT package for Carenado Ovation (requires Ovation package 1.5.1 minimum).

## v2.1.9

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- Bugfix: WTT mode: the GTN750 is working bad if no destination defined in the world map.
- Bugfix: Seminole WTT: Selecting negative VS values was impossible.
- Seminole WTT package updated to v 1.0.1
- Skymaster WTT package updated to v 1.0.1

## v2.1.8

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- Bugfix: the GTN650 default NAV page was not working from v 2.1.5.

## v2.1.7

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- Bugfix: Nxi compatibility: the autopilot state sometimes resets.

## v2.1.6

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- SU8 beta compatibility (the package should work also without SU8 beta).
- Bugfix: Nxi compatibility: the create user waypoint page back button was not working.
- Bugfix: Nxi compatibility: the airway preview was not working.
- Bugfix: Nxi compatibility: the PFD CDI was flickering.

## v2.1.5

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- WT G1000 Nxi compatibility step 5 (experimental see the documentation).
- Bugfix: the GTN650 map page was not working in v 2.1.4.
- BugFix: the map compass was true north oriented instead of magnetic.
- Adding a L variable to toggle the panel display from external applications.

## v2.1.4

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- WT G1000 Nxi compatibility step 4 (experimental see the documentation).

## v2.1.3

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- Bugfix: Procedure selection may not display the current loaded procedure when entering the page.
- Bugfix: Too many flight plan updates may cause stutters

## v2.1.2

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- WT G1000 Nxi compatibility step 3 (experimental see the documentation).

## v2.1.1

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- WT G1000 Nxi compatibility step 2 (experimental see the documentation).

## v2.1.0

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- Reporting the transponder ident to the sim.
- WT G1000 Nxi compatibility step 1 (experimental see the documentation).

## v2.0.31

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- Bugfix: World map flight plan cleaning issue at startup that may result in a bad flight plan.

## v2.0.30

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- Bugfix: Checklist remote import not working for some aircraft.

## v2.0.29

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- Group and checklist names are now limited to 30 characters.
- Added the checklists page in the map fields options.
- Added a checklist remote repository (import from PMS50).
- Importing a checklist now updates it in all the cockpit's GPS (650, 750 or Panel).

## v2.0.28

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- bugfix: Few checklists display.
- bugfix: Checklist or group selection UP and DOWN buttons not working.

## v2.0.27

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- Bugfix in import checklists.

## v2.0.26

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- Added checklists (premium).
- Added clean screen utility (not very useful in a sim).

## v2.0.25

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- Added fuel planning units and fuel type parameters.
- Added airspace altitudes when clicking on a nearest airspace list item.

## v2.0.24

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- SU7 compatibility.
- Added fuel planning page (premium).
- Added user waypoint creation from map page (premium).
- The map page zoom now centers on clicked map point like in the original instrument.
- Added a cursor in the map page when in pan mode.

## v2.0.23

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- Enhanced world map flight plan cleaning (removing TIMEVERT waypoints).
- Added bezel events for the toolbar panel (L variables).
- Bugfix: Flight plan not completely deleted after a delete order if an approach is loaded. Entering a new origin was then impossible.
- Bugfix: The approach autoactivation may not work if the last enroute waypoint is the same as the first approach waypoint.

## v2.0.22

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- Added a mitigation button to help adjust brightness control with very bright bezels.

## v2.0.21

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- Bugfix: Still stuttering issue definitively fixed.

## v2.0.20

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- Bugfix: stuttering issue if used with a low specs PC.

## v2.0.19

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- Bugfix: The sim may change the current leg while loading or removing an approach.
- Bugfix: The sim may change the autopilot NAV mode after canceling a direct TO.

## v2.0.18

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- Bugfix: the reload GPS option was not working.
- Bugfix: some waypoint display issues.
- Bugfix: FP is sometimes deleted when it has less than 3 waypoints.
- Bugfix: The approach frequency was not set when activating the approach.

## v2.0.17

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- SU6 compatibility (final step).

- Leaving OBS mode now switches to directTo (except for a user waypoint).
- The panel version power on is now linked to the main bus voltage instead of the avionics circuit. This prevents the GTN to stay off if there is no avionics bus in the airplane.
- Added auto brightness in the backlight page (value after 12).
- The default value for the U-turn bug workaround is now unset since the bug has been fixed in SU6.
- Removing the workarounds about adding and removing waypoints since the bugs have been fixed in SU6.
- Activating the approach sets a direct To the IAF as in the original instrument.

## v2.0.16

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- SU6 compatibility (third step).
- Added COM frequency ident and type in radio part.
- Increased max intersection display range.
- The fast find button of the waypoint keyboard selection displays the last map selected waypoint if there is one. This gives an easy way to add a waypoint to the Flight plan by selecting it from the map (premium).
- Added flight plan button in the map page pan mode (doesn't exist in the real unit, premium).
- Added a charts button in the procedure selection pages.
- The Frequency keyboard's first digit is now always 1 as in the real unit.
- Added a compass on the map page (premium).

## v2.0.15

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- SU6 compatibility (second step).
- Autocleaning flight plan at startup.
- Changed flight plan map display.
- Bugfix: the ETED field was displaying bad information in the case of directTO.
- Bugfix: The find recent waypoints page was lowering FPS.

## v2.0.14

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- SU6 compatibility (first step).

## v2.0.13

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- Bugfix: Text keyboard option Qwerty / ABC works now also in the waypoint selection.
  - Bugfix: Enhancement of the u-turn bug workaround that was not working in some situations.

## v2.0.12

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- Bugfix: Bad display of the terrain page when switching from the main map.
- Bugfix: The VS map field is not displayed if there is no flight plan.
- Bugfix: The GTN750 buttons can stay active even if the GPS is hidden (ex in Carenado aircraft when using the GNS530).

## v2.0.11

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- Added text keyboard option Qwerty / ABC.
- Added user waypoint banks (20 banks of 100 waypoints).
- Added user waypoint import from file.
- Removed the perf option.
- bugfix: Home push long on GTN650 was sometimes not going to the default nav page.

## v2.0.10

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- Keep direct To target when changing flight plan.
- Cruising altitude can be set from flight plan menu.
- Added flight timers in the Utility menu (premium).
- bugfix: cleaning FP sometimes not working.
- bugfix: it was not possible to enter an airway for the last SID waypoint.

## v2.0.9

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- Bugfix: display issue in catalog item if origin or destination is a user waypoint.
- Bugfix: display issue in flight plan preview if origin or destination is not an airport.
- Banana now works in North Up.
- Banana smoothing.
- Workaround to the MSFS airways issue (missing or bad exit waypoints).
- Bugfix: Could not select arrival transition.
- Bugfix: storing into FP catalog may require 2 attempts.

- Bugfix: discard any user WP in procedure when importing FP
- Airways saved in FPL catalog.
- FPL Import accepts airways.

## v2.0.8

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- Display IAF/FAF in flight plan page.
- Added along track waypoint creation (premium).
- bugfix: VS map field was not displayed correctly.
- Added banana for target altitude in Map page (premium).
- Safe mode option removed.
- Added a target altitude source option in options page.
- Added a target altitude Map field.

## v2.0.7

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- Duplicate waypoints sorted by distance.
- Added the Find button in waypoint keyboard (premium).
- Added beacon marker visual alert (premium).
- Waypoint altitude constraint can be set in flight plan (except for approach waypoints).
- Import flight plan sets the given cruising altitude for all enroute waypoints.

## v2.0.6

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- User waypoints (in beta for now).
- speed up the display of nearest pages.
- DA62 package updated for SU5 compatibility.
- the OBS angle initial value is now taken from the HSI/CDI (depends on the aircraft).
- Adding the map field ETA (estimated time of arrival at waypoint).
- The old map ETA field is now ETA Dest (estimated time of arrival at destination).
- Added the map field ETE Dest (estimated time left to destination).

## v2.0.5

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- pressing and holding the home button of the GTN650 brings you to the default nav page instead of the map page.



- bugfix: the OBS path was not displayed in directTo if there was an empty flight plan.
- bugfix: the directTo was not working correctly.
- bugfix: the clean flight plan was available only on premium version.
- C172 G1000 float and ski version integrated (same package as C172 G1000)

## v2.0.4

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- bugfix: the messages were not refreshed correctly
- bugfix: activate leg on approach waypoint was no working
- bugfix: the correct leg was not reactivated after a direct to an approach WP
- bugfix: the COM XFER was not working in the GTN650
- adding a clean flight plan option that removes the TIMECLI and TIMEAPPR waypoints introduced in SU5.

## v2.0.3

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- bugfix: direcTo an approach waypoint removes the flight plan when reaching the target
- panel: added a standby mode (see doc)

## v2.0.2

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- ident length of the imported user waypoints are now limited to 5 characters (issue in activate leg otherwise)
- vcalc now accepts user waypoints
- bugfix: cold and dark fps and memory issue

## v2.0.1

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- bugfix: airport elevation was displayed in meter instead of feet
- added: FPL import accept user waypoints
- bugfix: bad distance to destination if target directTo is final WP
- bugfix: panel was not resizing or minimize correctly
- workaround to MSFS resize panel issue (some images not showing after panel resize)
- Display OBS angle in CDI if OBS active
- panel: added a way to move it without displaying the header
- panel: control areas have changed (see doc)

- added Baron G58, cirrus SR22 and Carenado C182T as a compatible aircraft

## v2.0.0

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- compatibility with sim update 5
- single package instead of separate basic and premium
- Added GTN650
- The panel is now compatible with a cockpit GTN750.
- Added cities and constraints in the map menu.
- Panel is now directly integrated into the GTN750 package
- Panel: added a way to call home, map and directTo pages
- Panel: added a shortcut to toggle visibility (SHIFT + CTRL +S)
- Panel: hide it when switching to external view
- Panel: bugfix. Button events were triggered when clicking outside the panel.
- bugfix: the airplane icon was not displayed in the panel after a restart
- bugfix: traffic data was not displayed correctly in the panel

# Older Change log

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## BASIC

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### v1.0.21 Basic

- Airport info button is now active in FPL procedure lines
- Added System Status page with version + database info
- Prevent adding enroute WP while an approach is active
- Workaround to add/remove WP bug in MSFS when an approach is loaded
- Adding a popup independent panel (experimental feature)
- Some minor bug fixes

### v1.0.20 Basic

- Bugfix: Map Distance to destination was not correct
- Larger scrollbars

## **v1.0.19 Basic**

- Changed description of ETA field
- Added checking of new version
- Added display of NAV frequency ident/name

## **v1.0.18 Basic BETA**

- Compatibility with sim update 4
- Added an option for the U-Turn bug workaround
- Airspace message option disabled by default

## **v1.0.17 Basic BETA**

- bugfix: disable msg button when messaging is disabled.
- changed airspace messaging management
- added an option to disable airspace messages

## **v1.0.16 Basic BETA**

- HUD was displayed as glass cockpit when embedded in a bezel

## **v1.0.15 Basic BETA**

- Reducing map refresh frequency to prevent CTDs
- Changed the WT engine page detection
- Load procedure from waypoint page is possible now according to waypoint (destination or origin)
- bugfix: map cropped if nexrad option is active while starting flight

## **v1.0.14 Basic BETA**

- bugfix: DA62X Aux fuel not displayed
- bugfix: Airport symbol orientation to the main runway
- Added a speed option in setup
- Added a safe mode option in setup

## **v1.0.13 Basic BETA**

- Added option for a directTo button in map pan view
- Added volume control

- Changed airplane icon
- bugfix: bad VOR name in VOR info page
- bugfix: Map display error on airspaces and roads

## **v1.0.12 Basic BETA**

- Aircraft position displayed in Charts (requires premium > 1.0.8)

## **v1.0.11 Basic BETA**

- Added audio panel
- Added an options page

## **v1.0.10 Basic BETA**

- bugfix: button Navigraph connection not displayed
- bugfix: global brightness control makes some menu transparent

## **v1.0.9 Basic BETA**

- added map home button (home push long)
- Added global brightness control (system/backlight page)
- bugfix: map home button was resetting context buttons

## **v1.0.8 Basic BETA**

- bugfix: frequency display in airport info
- bugfix: frequency display in NDB info
- bugfix: Bad vertical distances in traffic
- bugfix: Wind arrow not displayed

## **v1.0.7 Basic BETA**

- Wind field was displaying always 88

## **v1.0.6 Basic BETA**

- Manage index for dual GTN750 installation
- Integrator's guide updated

## **v1.0.5 Basic BETA**

- bugfix: Engine page not displayed

## **v1.0.4 Basic BETA**

- bugfix: VSR field was VS instead of VSR
- Added VS Map field
- Prohibit duplicates in map fields
- Added detection of WT and multiple engine pages (G1000 replacement)

## **v1.0.3 Basic BETA**

- bugfix: procedure map legs not well displayed when OBS is active

## **v1.0.2 Basic BETA**

- Added distance to destination field
- display bug Sirius weather title (XW instead of XM)
- Fuel flow map field was not displaying correct information

# **PREMIUM**

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## **v1.0.18 Premium**

- minor bugfix in Navigraph connection
- Airways management in flight plan page

## **v1.0.17 Premium**

- bugfix: Navigraph connection may be lost after 30 minutes

## **v1.0.16 Premium**

- Navigraph connection issue
- Added FPL invert
- Larger scrollbars

## **v1.0.15 Premium**

- Changed description of ETA field
- Added checking of new version

- Added checking of license expiration

## **v1.0.14 Premium BETA**

- Compatibility with sim update 4
- bugfix: Traffic bad display of negative relative altitude
- traffic: added a range level 1nm
- Weather radar calibration
- Added Url for Navigraph setup

## **v1.0.13 Premium BETA**

- added an option GSL/AGL Altitude in Terrain page

## **v1.0.12 Premium BETA**

- bugfix: HUD was displayed as a glass cockpit when embedded in a bezel

## **v1.0.11 Premium BETA**

- Reducing map refresh frequency to prevent CTDs

## **v1.0.10 Premium BETA**

- bugfix: Navigraph connection lost (will still occur in case of CTD)

## **v1.0.9 Premium BETA**

- Increased charts zoom level
- Added a message if we can't get the Navigraph QRCode
- Added TOD Map field
- bugfix: VSR Map field was empty

## **v1.0.8 Premium BETA**

- Aircraft position displayed in Charts (requires basic > 1.0.12)

## **v1.0.7 Premium BETA**

- Added audio panel

## **v1.0.6 Premium BETA**

- Added charts as a page map field

## **v1.0.5 Premium BETA**

- Added global brightness control (system/backlight page)

## **v1.0.4 Premium BETA**

- Added brightness control for chart images (Charts menu)

## **v1.0.3 Premium BETA**

- Navigraph charts integration
- Laurin Traffic Service integration (requires <https://github.com/laurinius/MSFSTrafficService>)

## **v1.0.2 Premium BETA**

- Bugfix in get Metar info