Got Friends

LX Family Suite

Navigation & Variometer Systems

FLIGHT MANUAL

Microsoft Flight Simulator

FOR SIMULATION USE ONLY:

This avionics package is designed for single-pilot operation, tailored specifically to enhance the simulated environment. It was developed using a range of real-world data points and manuals from various systems and dates, with certain modifications made to optimize functionality within Microsoft Flight Simulator. The LX Family is not a direct replica of any real-life unit; instead, it integrates features from multiple sources. For your safety, please refrain from using the LX Navigation or LX Variometer units for real-world training. This avionics suite is intended for Simulation Use Only.

FLIGHT MANUAL INFORMATION:

This flight manual has been written to aid in both Microsoft Flight Simulator 2020 and Microsoft Flight Simulator 2024 gameplay. Although some images and information may be directed towards a specific simulator, most of the information is shared between both simulators. If you find discrepancies in this manual that differ between either, please contact the Got Friends team at gotfriends.marketing@gmail.com and we will do our best to address these issues and forward the changes to Microsoft for future manual releases. Thank you for your patience in advance and we look forward to receiving your feedback.

A SPECIAL THANK YOU TO IAN LEWIS

We extend our deepest gratitude to Ian Lewis (B21) for his incredible work and collaboration in developing this avionics suite. Ian's glider expertise and commitment to the community has made a profound difference, allowing users to experience a truly refined and immersive glider suite in Microsoft Flight Simulator. His attention to detail and in-depth understanding has enriched the simulation experience in ways that both novice and advanced users can appreciate.

In addition to this exceptional package, Ian has developed the B21 Task Planner, a highly recommended online tool for advanced glider pilots. This tool enables users to create common glider tasks with ease, enhancing the functionality of the LX Navigation system within Microsoft Flight Simulator. The Task Planner simplifies the creation of common glider tasks, making it a valuable resource for those who wish to explore and simulate realistic glider tasks with their friends.

Thank you, Ian, for your hard work on this project, we are immensely grateful and humbled by your ongoing support!

3rd PARTY DEVELOPER INTEGRATION:

If you would like to include this avionics suite in your own glider project, feel free to contact the Got Friends team at gotfriends.marketing@gmail.com and we will do our best to help answer any integration questions.

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INTRODUCTION

The LX Family Suite, comprising of the LX Navigation and LX Variometer Systems, is a fully customizable and advanced avionics suite crafted for glider pilots within Microsoft Flight Simulator 2020 and 2024. This powerful combination enhances flight efficiency and situational awareness, bringing the precision of real-world glider avionics directly into the virtual environment. Developed using real-world references and various data-points, the LX Navigation System provides essential guidance features such as positional tracking, altitude monitoring, and waypoint navigation, while the LX Variometer System accurately measures climb and sink rates to enable real-time adjustments to flight paths throughout the user's flight.

A standout aspect of the LX Navigation System is its extensive customizability, allowing pilots to display multiple data sources on-screen, including waypoint information, altitudes, estimated arrival times, and more. This flexibility enables pilots to arrange information according to their unique flight needs, making it ideal for advanced gliding tasks, especially when paired with tools like the B21 Task Planner for creating and executing realistic gliding missions.

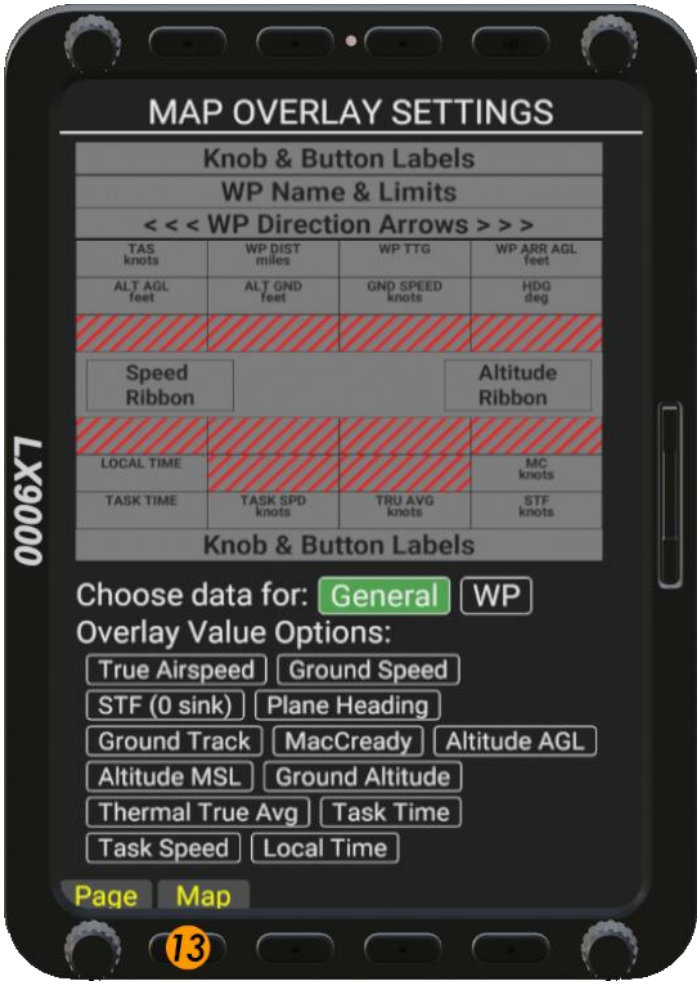
Exclusively designed for simulation, the LX Family Suite offers an immersive, data-rich experience that goes beyond basic instrumentation, allowing glider pilots to enjoy personalized control and enhanced situational awareness. Together, LX Navigation and Variometer Systems provide a powerful, unified suite that elevates the art of soaring in Microsoft Flight Simulator.

LX Navigation Features

- **Simple 4-Page Layout**: Organized with intuitive forward / backward navigation through four core pages — Map Page, Task Page, Settings Page, and Map Overlay Settings Page.
- **Customizable Information Overlay**: Map Page overlays offer complete customization of both layout and content, allowing pilots to adjust the balance between information density and map visibility. Pilots can select data points like waypoint distances, time-to-go, and predicted arrival heights for current and upcoming waypoints (WP+1, WP+2) up to including their finish gate and arrival.
- **Dark and Light Mode Themes**: Choose between dark and light themes for optimal visibility in various lighting conditions.
- **Enhanced Flight Plan Integration**: Full support for MSFS flight plans as gliding tasks, with real-time tracking and in-depth calculations of flight parameters, such as relative wind speed, distance-to-go, and predicted arrival height. Working Title compatibility is also available for cockpits with additional navigation support, like the Working Title G3X Touch and/or Working Title GNS-530.
- **Waypoint Features**: Includes gliding-specific waypoint annotations, supporting start / finish, waypoint radii, and maximum / minimum altitude requirements, with "North Up" and "Track Up" map orientations for enhanced forward visibility.
- **Advanced Task Guidance**: Improved calculations of distance and time for start / finish lines, with perpendicular visual nav line adjustments to optimize start / finish crossings.
- **Thermal Assistance**: Lift blob-trail thermal guidance overlays that aid in optimizing climb efficiency.
- **Seamless Integration**: Settings integrate smoothly with other cockpit instruments and gauges, allowing synchronization of units for speed, climb, and other parameters with metric and imperial values.

LX Variometer Features

- **5-Page Layout**: Simple, intuitive 5-page setup — Vario, Wind, Horizon, Settings #1, and Settings #2; designed for easy access and navigation including optional top and bottom knob support.
- **Multi-Function Scale and Needles**: Displays Total Energy, Netto, Speed to Fly, and MacCready values on every page, providing continuous access to essential variometric data.
- **Customizable Scale**: Option to switch between 0 - 10 knots (5 m/s) linear and 0 - 20 knots (10 m/s) non-linear scales for vario needle responsiveness.
- **Thermal Aid**: Optional toggle for thermal aid on the Vario page, displaying 360° lift/sink indicators based on recent completed circles to guide pilots in finding optimal lift.
- **Dark and Light Themes**: Adaptable to various lighting conditions with dark and light theme options.
- **Instrument Sync**: Synchronizes settings such as units with other cockpit instruments, ensuring consistent, integrated navigation throughout the panel.



The Map Page displays the main navigation screen as well as data points tailored by the user based on their selections in the Map Overlay Settings Page. In the Map Overlay Setttings Page, the user can "Double Click" an assigned block to remove that overlay from the Map Page. Additionally, the user can "Click" an unassigned block, then click a data point from the "General" or "WP (Waypoint)" Value Options to assign their desired value to that block for overlay assignment. The user can also hide additional overlays like Knob & Button Labels, Speed Ribbon, Altitude Ribbon and more as desired.

1. **Map Knob:** Currently Inoperable and Reserved for Future Use.
2. **N. Up Button:** Switch Map Orientation between "Track Up" to "North Up" Display.
3. **Thermal Button:** Toggle Visual "Thermal Assistance" Blob-Trail Overlays.
4. **Mc - Button:** Decrease MacCready Value (Also Decreases LX Variometer's MacCready Needle).
5. **Mc + Button:** Increase MacCready Value (Also Increases LX Variometer's MacCready Needle).
6. **Zoom Knob:** Zooms In / Out of the Map.
7. **Page Knob:** Cycles between Map Page, Task Page, Settings Page, and Map Overlay Settings Page.
8. **Task Button:** Quick Cycles to the Task Page for Viewing.
9. **Unassigned Button:** Currently Inoperable and Reserved for Future Use.
10. **Unassigned Button:** Currently Inoperable and Reserved for Future Use.
11. **Unassigned Button:** Currently Inoperable and Reserved for Future Use.
12. **Waypoint Knob:** Cycles Between Waypoints and Adjusts Navigation Aids for Selected Waypoint.
13. **Map Button:** Quick Cycles to the Map Page for Viewing.

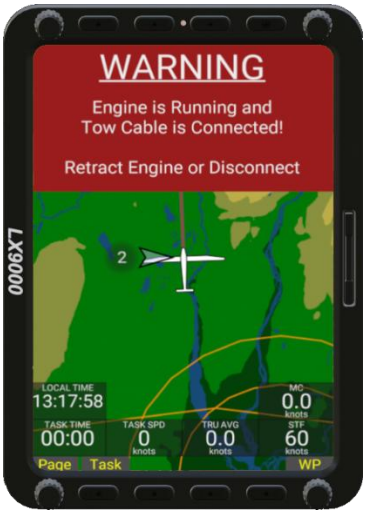
The Map Page also has some extra overlays that some users may find useful, these include:

- **Thermal Assistance:** Blob Trail Overlay with Green Dots indicating Lift and Red Dots indicating Sink. These Dots can vary in size depending on the average ammount of lift or sink at your previous location.
- **Task Notifications:** These notifications will periodically appear depending on your set glider task. They can indicate start times, waypoint information, captured altitudes, and time metrics for your glider task.
- **Overspeed Warning:** This notification will appear if you are exceeding your airspeed safety limits. If you see this warning, you should slowly extend your airbrakes and until you can maintain a safe airspeed.
- **Tow Cable Unsafe Warning:** This notification will appears if you are trying to initiate an Aerotow or Winch Tow while your engine is running and/or extended. This is considered an unsafe situation and you should retract your engine before commencing the towing operation.
- **North Up Orientation:** This will position your navigation screen into a "North Up" orientation that may help orient yourself in regard to the airspace.
- **Track Up Orientation:** This will position your navigation screen into a "Track Up" orientation, a common orient for most standard navigation systems.

Thermal Assistance

Task Notifications

Overspeed Warnings



Tow Cable Unsafe Warning

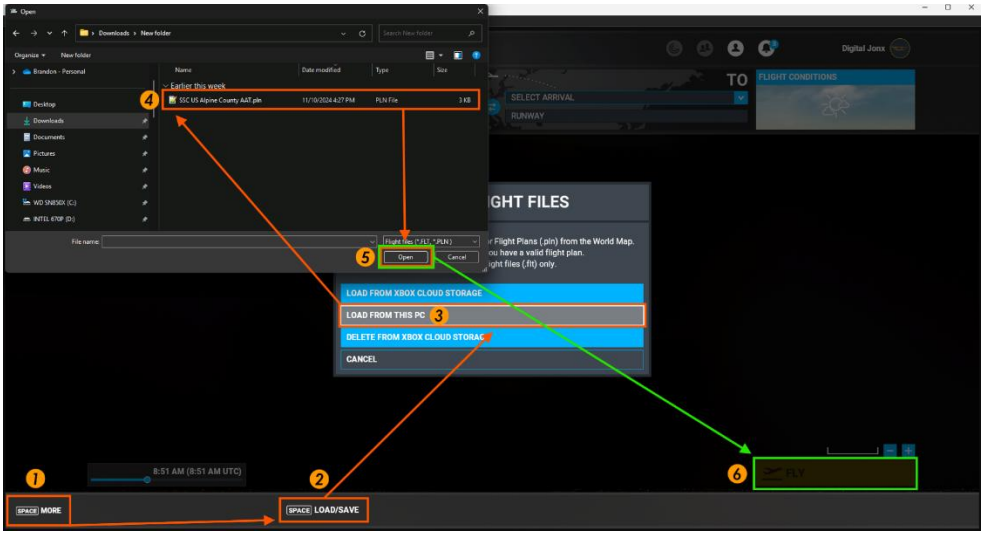
North Up Orientation

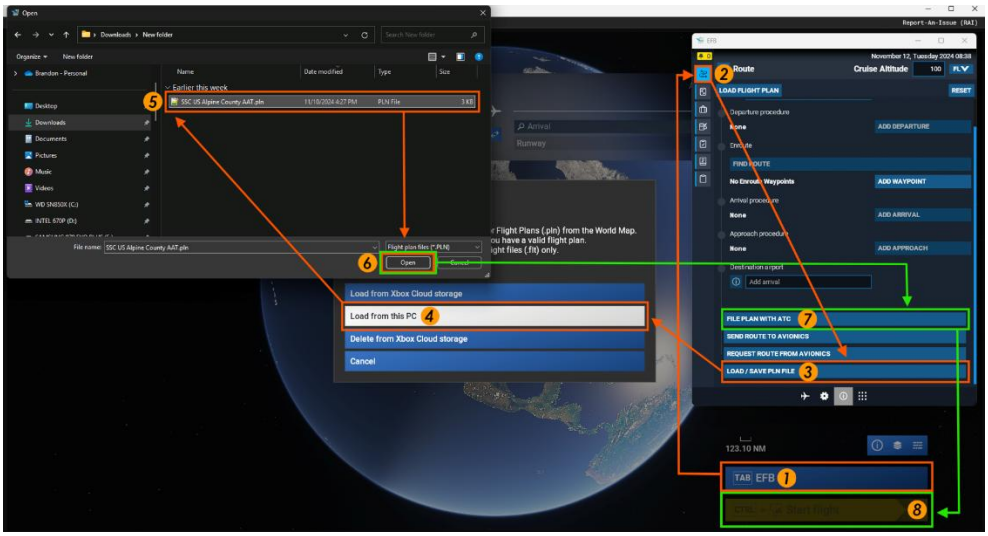
Track Up Orientation

The LX Navigation system is highly capable of loading external .PLN files, such as those created externally with various tools like the B21 Task Planner, making it easy for glider pilots to load common glider tasks directly into Microsoft Flight Simulator. This feature provides flexibility for pilots who wish to follow predefined routes or experiment with advanced tasks designed specifically for gliding. Additionally, the LX Navigation system also supports task creation and interpertation through the MSFS World Map, where users can set their own custom departures, waypoints, and arrivals. These routes are then automatically converted by the LX Navigation into glider-friendly tasks. Be mindful, creating these basic tasks on the World Map will set a baseline altitude and users should take extra precautions while flying the task. This functionality makes the LX Navigation system an invaluable tool for both structured training and exploratory glider flights.

NOTICE:

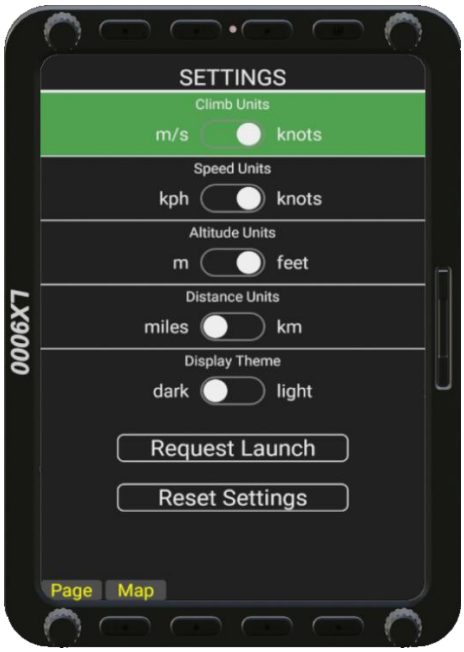
This loading sequence differs between MSFS 2020 and MSFS 2024. In the later, users will need to "Load .PLN File" through the Electronic Flight Bag (EFB) and then "File Plan with ATC" in order for the task to successfully load on the World Map prior to starting flight. If you choose to load a .PLN task, these steps must be taken to avoid automated flight plan modification by the Atlas App. Currently, this is the only way to load a glider task in MSFS 2024. As we continually update this navigation suite in the future, we will explore new ways to ensure easier task creation.

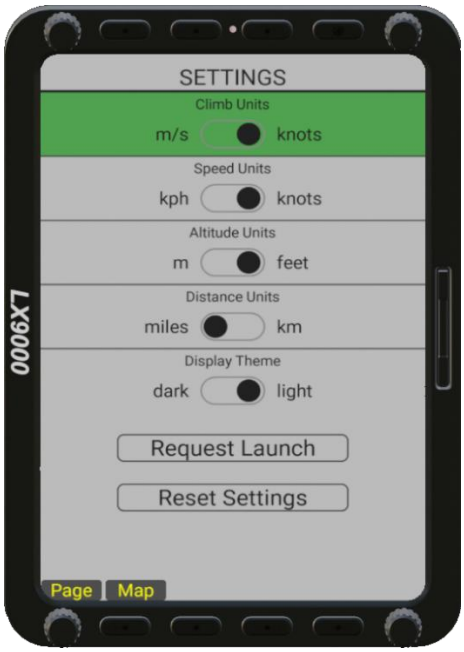




The Task Page on the LX Navigation System is pretty straight forward. On this page, you will be able to view your Starting Gate, Waypoints, Finishing Gate and Arrival as well as their associated altitudes, capture radius, bearing and distance. The user can use the "WP Knob" to cycle through the various waypoints and set them to the active target on the Map Page.

The Settings Page on the LX Navigation System controls various options that are shared between the LX Navigation and LX Variometer Systems. On this page, you will be able to change various Units of Measurment (UoM) as well as the Display Theme. Keep in mind that the Display Theme is not shared between the LX Navigation and LX Variometer System in order to give further customization to the user. Changing the UoM will automatically swap out the physical gauges in the glider's cockpit to the desired unit. The user can also Reset Settings to reset the entire LX Navigation System to its default settings. If available, the user can also "Request Launch" to spawn a towplane or winch. We are also working on integrating Multiplayer Towing Connection through this screen as well. However, that feature is still unavailable until further notice.





The LX Variometer offers real-time vertical speed and lift/sink rate data, enabling glider pilots to optimize flight efficiency and make precise adjustments in Microsoft Flight Simulator. The LX Variometer has six core pages – Vario, Wind, Vario + Thermal Aid, Horizon, Settings #1 and Settings #2. To cycle through the pages, the user can press the "Bottom Button" on the unit. To easily cycle through the Settings, the user can press the "Top Button on the Unit. To activate "Thermal Aid" while on the Vario Page, the user can press the "Center Button" to toggle the overlay. In addition to the three buttons, some variometer bezels may have two knobs. The Top knob controls the Variotone Volume and Variotone Sound Mode (Right-Click), while the Bottom Knob controls the MacCready Value and Variometer Scale (Right-Click).

Detailed Information:

- **Blue Diamond:** MacCready Needle.
- **Green Indicator:** Speed to Fly Needle.
- **Red Indicator:** Netto Needle.
- **Red Outter Circle:** Total Energy.
- **Blue Wind Arrow:** Wind Direction with Increased / Decreased Size based on Wind Speed.
- **Red / Green Blob Trail:** Thermal Aid Overlay with Green indicating Lift and Red indicating Sink.
- **Vario Sound Mode:** Toggle between Positive & Negative Variotone or Positive Only Variotone.
- **Vario Scale:** Toggle between 0 - 10 knots (5 m/s) linear scale and 0 - 20 knots (10 m/s) non-linear scale.
- **Display Theme:** Set display them to Light or Dark to aid in low lighting conditions.
- **Climb / Speed / Altitude Units:** Adjust various readouts to display in Imperial or Metric Measurements.
    - ❖ **Note:** Adjusting these settings will also adjust the LX Navigation Settings and Various Cockpit Gauges.
- **Top Button:** Cycles Various Variometer Settings.
- **Center Button:** Toggles Thermal Aid Overlay on Vario Page, alternatively toggles selected setting.
- **Bottom Button:** Cycles through Various Variometer Pages.
- **Top Knob (Optional):** Variotone Volume Adjustment and Variotone Sound Mode (Right-Click).
- **Bottom Knob (Optional):** MacCready Value Adjustment and Variometer Scale (Right-Click).