



CLASSIC GLJ MODEL 25 SPECIAL EDITION v2.1 FLIGHT MANUAL

ADD-ON AIRCRAFT for LOCKHEED MARTIN® PREPAR3D® and MICROSOFT® FLIGHT SIMULATOR X

xtremeprototypes.com

Xtreme Prototypes, Inc.
Montreal, Quebec
CANADA

Find us on 

facebook.com/XtremePrototypes

RELEASE NOTES

“OPTIMIZE_PARTS” Issue Now Resolved in Prepar3D® v4.1!

The “OPTIMIZE_PARTS” issue, that was causing geometry problems in the fully animated virtual cockpit of our GLJ Model 25 SE addon, no longer exists in the new Prepar3D® v4.1 that was released on October 10, 2017.

We've been exchanging for many months with Lockheed Martin® regarding this unfortunate issue. We were told very recently that the issue is now fixed. Please note that this was not an addon issue. It was an undocumented simulator issue and Lockheed Martin® thanked us for helping them tracking it down:

"We were able to revisit some of the logic of OPTIMIZE_PARTS combined with large counts of animations/visibility tags. We will have a change to support larger numbers in the next public release. Thanks for your assistance in tracking down this issue!" -Adam Breed, Prepar3D® Engineering Project Manager

No patch is required from our side. Prepar3D® users only need to upgrade their simulation platform to v4.1.

Unfortunately, there is no fix yet for Prepar3D® v4.0 and v3.x (see below).

VC Geometry Issue in Prepar3D® v4.0/v3.x

There is a known issue in Lockheed Martin® Prepar3D® v4.0 and v3.x that affects geometry when a certain number of animations is exceeded in a complex model with many moving parts, such as our GLJ Model 25 SE. This is an undocumented simulator issue, not an addon issue, that is now fixed in the new Prepar3D® v4.1. We don't know at this time if and when a fix will be available for Prepar3D® v3.x.

If you don't want to upgrade to Prepar3D® v4.1, you will need to modify one line in the

“Prepar3D.cfg” file (OPTIMIZE_PARTS=0 in the [SIM] section) in order for your GLJ Model 25 SE addon to display properly in the sim. For now, this is the only solution offered by Lockheed Martin® if you don't upgrade to v4.1. No modification is required if you are using Prepar3D® v4.1.

Please note that this change is only required if you install one of the native versions for P3Dv4 or P3Dv3 in either Prepar3D® v4.0 or v3.x. The change is not required if you install the FSX version in Prepar3D®, because it contains less animations. Aircraft systems and procedures are the same on all platforms and the simulation is not affected.

Please refer to section 2, page 7, for more details about this issue and how to fix it.

New Native Version for Prepar3D® v4.x

The GLJ Model 25 SE v2.1 addon now includes a native version for the new Prepar3D® v4.x simulation platform. A special installer for Prepar3D® v4.x is available from our "Downloads" section and the update is free for registered users.

Updating from v2.0 to v2.1

The installer will not erase nor replace version 2.0, if installed on your computer. Version 2.1 will be installed in different folders. Because version 2.1 is an updated version of version 2.0, we recommend removing version 2.0 from your computer before installing version 2.1. This is to avoid confusion between aircraft bearing the same name. The previous version can be removed from the Windows Control Panel (Program/Uninstall a Program), like any other program. Do not use the uninstallation program (uninstall.exe) directly.

Installing in FSX Steam®

The GLJ Model 25 SE addon is fully compati-

RELEASE NOTES *(cont'd)*

ble with Flight Simulator X: Steam® Edition. We recommend using the special installer for FSX: Steam® that is available from our "Downloads" section on our website. Please note that FSX: Steam® is installed in a different way to the boxed version and occupies a different location on your computer.

New Checklist and Reference Tabs

The kneeboard now includes new Checklist and Reference tabs for the GLJ Model 25 add-on aircraft (available in English or French).

New 3D Sound Set

This version includes new cockpit sounds and new engine sounds recorded from the real Learjet Model 25D aircraft.

Exterior sounds are now positioned in the 3D space, which means for example that you won't hear the same engine sounds if you are standing at the front of the aircraft rather than at the rear. Most interior sounds are recorded in stereo. More than 45 cockpit sound effects are included with this new package.

8-Track Tape Player Volume and Balance Controls

Sound volume and balance can now be adjusted by moving the cursors on the 8-track tape player (center pedestal). Balance control is available only in the Prepar3D® version.

Remove Before Flight Items

"Remove Before Flight" items (ribbons and pitot covers, wheel chocks, engine inlet covers, tail stand) are no longer installed by default when battery power is turned off. They need to be installed manually after the aircraft is parked. Click the center logo on the copilot's yoke to install/remove the "Remove Before Flight" items. Please note that these

items cannot be installed if the aircraft is not parked or if the starters/engines are running.

Crew (Exterior Model)

The captain and the copilot no longer appear by default on the exterior model when battery power is turned on. Click the center logo on the captain's yoke to bring the crew on board or to make it leave the cockpit after the aircraft is parked.

Guide des procédures en français

Les sections 7 et 8 de ce manuel sont maintenant disponibles en français. Nous avons également inclus les onglets "Liste de vérifications" et "Référence" de la tablette du pilote en français. Ces documents se trouvent dans le sous-dossier "français" contenu dans le dossier principal de l'addon.

Additional Modifications and Improvements (as of 2017/11/23)

- Engine oil pressure gauge needs AC power to function
- Minor cockpit sound effects volume adjustments
- Default autopilot vertical speed (when engaged) is now 1,000 ft./min.
- Red and white airspeed/Mach bugs on the ASI now allow for better "fine tuning" of the selected airspeed (useful when setting V_R , V_1 , V_2 and V_{REF})
- The tail stand is installed only when the aircraft is full of fuel (85% or more, CoG near aft limit).

See the complete list on page 1-4.

RELEASE NOTES (cont'd)

This page is intentionally left blank.



This classic Gates Learjet Model 25D add-on is dedicated to the memory of the passengers and crew of YV3191 on her last flight.

August 19, 2017

THANK YOU FOR PURCHASING YOUR LICENSE

We thank you for purchasing your software license for using this product. Xtreme Prototypes is a small add-on developer and we depend largely on your feedback and support to create better products. Contributions from our users, in the form of software license purchases, allow us to pursue our mission. By doing so, you are contributing to the making of unique high quality add-ons for advanced desktop pilots. In addition, your license gives you access to free personalized online technical support, product information, patches and updates.

This manual is to be used in conjunction with the Xtreme Prototypes GLJ Model 25 Special Edition add-on only. It is part of a software package and it is subject to the terms of use specified in the end-user software license agreement.

You are authorized to print copies of this manual for your own use, in conjunction with the Xtreme Prototypes GLJ Model 25 Special Edition simulation software.

**Xtreme Prototypes GLJ Model 25 Special Edition, Version 2.1
Copyright © 2017 by Xtreme Prototypes, Inc. All rights reserved.**

FBCS sound system and special sound effects used under license from their respective rightsholders.

The unauthorized reproduction, distribution, repackaging, sale, purchase, lease, loan, upload or download of this software and documentation, including this manual and the online help system, in whole or in part and by any mean, is prohibited.

The Xtreme Prototypes GLJ Model 25 Special Edition add-on is neither freeware nor shareware and is subject to the terms of use specified in the end-user software license agreement. The software and the manual are protected by international copyright laws. Please do not make illegal copies of the software and/or its related components and documentation.

Your activation key is unique, personal, non-transferable and traceable. Please keep it in a safe place.

The unauthorized reproduction and/or distribution of protected material constitutes an infringement to the exclusive right of its holder. This behavior could expose the offender to legal action and to a judgment to pay damages. Piracy kills quality add-ons. Posting or downloading illegal copies of this add-on over the Internet is a crime.

All images are unaltered, actual screenshots captured in Lockheed Martin® Prepar3D® or Microsoft® Flight Simulator X simulation platforms, except where otherwise noted.

Xtreme Prototypes virtual aircraft models are artistic interpretations inspired from real-world models and prototypes. They are in no way intended to represent real aircraft or to be used as training tools for real aircraft. There are significant differences between the models and the real aircraft. For historical accuracy and educational purposes, portions of this manual are inspired from the original "Gates Learjet Model 25D Airplane Flight Manual" published during the 1970s by Gates Learjet Corporation, and from other sources. Xtreme Prototypes is not affiliated with Bombardier Aerospace, Gates Corporation or any other company, entity or organization related to the development of the Gates Learjet 20 Series from 1960-1980.

Lockheed Martin and Prepar3D are either registered trademarks or trademarks of Lockheed Martin Corporation. Microsoft, Microsoft Flight Simulator, FSX, Windows, Windows Vista, Windows XP and DirectX are either registered trademarks or trademarks of Microsoft Corporation. Steam is either a registered trademark or a trademark of Valve Corporation. X-Plane is either a registered trademark or a trademark of Lamina Research. Other company or product names mentioned in the documentation may be trademarks or registered trademarks of their respective owners.

Xtreme Prototypes add-ons and manuals for the general public are considered edutainment software and shall not be used for real-world training.

Software features, online content, prices and release dates are subject to change without notice.

TABLE OF CONTENTS

WELCOME ON BOARD!	11
FOREWORD <i>By Captain Alan Velazquez, Learjet 25D Pilot</i>	12
INTRODUCTION AND PRODUCT DESCRIPTION	1
About the Real 20 Series	1-1
What's New in Version 2.1?	1-4
What's New in Version 2.0?	1-7
Addon Description	1-8
Software License Agreement	1-17
GETTING STARTED	2
Minimum System Requirements	2-1
Compatibility, Performance and Settings	2-2
Downloading your Addon	2-9
Package Description	2-10
Software Installation	2-10
AIRCRAFT DESCRIPTION AND SPECIFICATIONS	3
Aircraft Description	3-1
Aircraft Specifications	3-1
General Arrangement	3-3
INSTRUMENT PANELS (FULL 3D VIRTUAL COCKPIT)	4
VR-Ready 3D Virtual Cockpits	4-1
How to Actuate Switches, Buttons and Knobs	4-4
How to Move the Pilot's Viewpoint in the Virtual Cockpit	4-6
How to Configure the VC	4-7
Playing Music in the Cockpit	4-9
Retrofitting the Cockpit	4-10
Installing Third-Party 2D Gauges	4-11
Replacing the GPS and Radar Displays	4-14
Virtual Cockpit Configuration	4-15
Captain's Instrument Panel	4-16
Audio Panel	4-17

Ice Protection Panel	4-18
Marker Beacon / Gyro Panel	4-19
Flight Director Annunciators / Angle-of-Attack Indicator	4-20
Attitude Director Indicator (ADI)	4-21
Horizontal Situation Indicator (HSI)	4-22
Airspeed / Mach Indicator (ASI)	4-23
Radio Magnetic Indicator (RMI)	4-24
Altimeter, Vertical Speed Indicator (VSI), Radio Altimeter	4-25
Trim Indicators, Emergency Battery Switches (APU), Anti-Skid Lights	4-26
Standby Gyro, NAV1/GPS Switch, Flight Director Switch	4-27
Center Instrument Panel	4-28
ADF Radios, NAV Radios	4-29
COM2 Radio, Transponder	4-30
COM1 Radio	4-31
AFCS Mode Selector Panel (Captain's Side)	4-32
AFCS Mode Selector Panel (Copilot's Side)	4-33
GPS	4-34
Engine Gauge Cluster (EPR, EGT, RPM, Fuel Flow, Oil Press.)	4-35
Electrical Gauge Cluster (Oil Temp., AC Volts, DC Volts, Ammeters)	4-36
Electrical Switches	4-37
Flaps / Gear / Starter Panel	4-38
Glareshield	4-39
Main Annunciator Panel	4-40
Captain's Fire Panel, Exterior Extinguisher Discharge Indicators	4-42
Copilot's Fire Panel	4-43
Thrust Reversers Control Panel	4-44
Copilot's Instrument Panel	4-45
DME Head, Mini Gauge Cluster (O ₂ , Hydraulic and Emer. Air Press.)	4-46
Digital Clock	4-47
Pressurization Panel	4-48
Cabin Temperature Control Panel	4-49
Power Quadrant (Throttles, Flaps and Spoilers Switches, Test Panel)	4-50
Center Pedestal	4-52
Fuel Control Panel	4-53
Flight Controller (Autopilot)	4-54
Emergency Lights Panel, Yaw Damper Panel, Trim Indicators	4-55
Jetstar 8 Stereo 8-Track Tape Player	4-56
Side Wall Knobs, Lighting Switches, Oxygen Valves	4-57
Sun Visors, Flight Map	4-58
Control Yoke Buttons	4-59
Cabin Door and Lights	4-60

SYSTEMS DESCRIPTIONS

5

20 Series Aircraft Systems	5-1
Flight Controls, Electrical System	5-2

Hydraulic System, Landing Gear	5-3
Power Plant, Thrust Reversers	5-4
Fire Detection and Suppression System	5-5
Environmental Control System	5-5
20 Series Fuel System	5-6
Fuel Pumps, Refueling, Wingtip Tanks	5-6
Wing Tanks, Center Fuselage (Storage) Tank, Crossfeeding	5-7
Fuel Jettison	5-8
Fuel System Controls, Lights and Annunciators	5-8
Fuel System Procedures	5-12
Fuel System Limitations	5-15
Automatic Flight Control System (AFCS)	5-15
Autopilot	5-15
Flight Director	5-16
Attitude Direction Indicator (ADI)	5-17
Horizontal Situation Indicator (HSI)	5-18
Autopilot/Flight Director Buttons, Switches, Knobs and Lights	5-18
Mode Selector Panels	5-22
Flight Director Annunciators	5-24
Control Yoke Buttons	5-25
Stick Nudger/Puller	5-26
Autopilot Test Switches	5-26

FLIGHT PLANNING **6**

Fuel Required and Gross Weight	6-1
Takeoff Data	6-2
Climb and Cruise Data	6-4
Approach and Landing Data	6-7

NORMAL PROCEDURES AND CHECK LISTS **7**

Getting Started	7-1
Starting your Simulation Platform	7-1
Recommended Settings for Beginners	7-2
Adjusting the Sound Volume	7-2
Creating a Flight	7-3
Immediate Takeoff or “Cold and Dark” Startup	7-4
Exterior Inspection	7-4
Check Lists	7-5
Cockpit Preparation (Power OFF)	7-5
Cockpit Preparation (Power ON)	7-6
Warning Systems Tests	7-6
Before Starting Engines	7-7
Engine Start	7-9
Before Taxi	7-10

Taxi	7-11
Before Takeoff	7-11
Takeoff	7-13
Takeoff Sequence	7-13
Climb	7-14
Cruise	7-14
Descent	7-16
Approach	7-16
Before Landing	7-16
Landing (after Touchdown)	7-17
Before Clearing the Runway	7-18
After Clearing the Runway	7-18
Shutdown	7-19

ABNORMAL / EMERGENCY PROCEDURES 8

Engine Failure on Takeoff	8-1
Engine Failure in Cruise	8-1
Engine Failure on Approach	8-2
Engine Fire	8-2
Electrical and/or Hydraulic Systems Failure	8-3

QUICK START PROCEDURES (CHECK LISTS) 9

APPENDICES

Virtual Aircraft Reference Information	A1
Selected Bibliography	A2
Help and Support	A3
Frequently Asked Questions	A4
Known Issues	A5

SCREENSHOTS

WELCOME ON BOARD!



Welcome to version 2.1 of our GLJ Model 25 Special Edition addon for Lockheed Martin® Prepar3D® and Microsoft® Flight Simulator X.

This release contains many new features and improvements over the previous version, including a fully redesigned fuel system, an enhanced autopilot, a revised flight model (tested by a real Learjet 25D pilot), new 3D sounds from the real aircraft and an updated 225-page flight manual.

Nicknamed "fighters in civilian clothing" because of their sleek design and amazing performance, the classic Learjet 20 Series aircraft

were the first true executive jets and redefined business aviation during the 1960's and 70's, flying high above the weather at transonic speeds. Their capabilities earned them a place among the extreme aircraft, setting record after record. With the longer-range Gates Learjet Model 25D, from which this addon is inspired, came a longer cabin, increased seating capacity, more flexible loading options, greater fuel capacity and a rather sleek-looking stretched fuselage.

The Xtreme Prototypes GLJ Model 25 SE is a next generation addon optimized for the latest versions of our favorite simulation platforms and designed to take advantage of the new and more powerful personal computers and video cards that are available today. It is a complex aircraft simulator that features high resolution models and textures, hundreds of animations, over 50 sound effects, custom aircraft systems, and a fully analog, VR-ready virtual cockpit. Nothing was spared in our efforts to reproduce the original instrument panels, carefully modelling and animating each mechanical device with all the necessary moving parts. Except for the GPS/radar screens and the two optional panels, no flat 2D gauges are used in this model. Everything you see is in full 3D!

The result is a unique addon that strives to bring you the spirit and the actual feeling of flying such a high performance aircraft at a time when LCD screens, GPS and powerful computers didn't exist and pilots needed to know how to fly and navigate with minimal resources and to rely on their own experience, abilities and judgment. This is how real-world Learjet 25 pilots are still flying this amazing aircraft today (see next page)!

For the general aviation desktop pilot, being able to hop between small regional airports while passing airliners along the way is quite a thrill, but for the serious IFR enthusiast, we are confident this package will provide years of flying pleasure. Even if there are some differences between this addon and the real aircraft, mainly due to the current limitations in the available simulation platforms, nearly all systems, instruments, switches and knobs are fully functional in order to simulate complete procedures, from cold and dark to shutdown. We believe you will be thrilled by this new version as much as we are.

We wish to express our gratitude to all our users, followers, reviewers, test pilots, ex-Learjet employees and friends for their contribution to the making of this extreme aircraft model which we now consider to be our most advanced classic addon. Thank you for your constructive comments and suggestions!

The development team at Xtreme Prototypes

FOREWORD



Hello, my name is Alan Velazquez. I've been a Learjet 25 pilot over the past few years, operating a fleet from Caracas, Venezuela, and making daily private and commercial flights all over Central and South America, and sometimes, to North America.

Even if I fly other types of aircraft on a weekly basis, the Gates Learjet Model 25D is still my favorite to this day.

Compared to flying other business jets, being in command of a Learjet 25 gives you a thrill similar to racing your favorite sports car and leaving other fellow competitors way behind. It is fast, slim, sexy, comfortable and capable of maneuvers you would never attempt with another civilian aircraft. Not surprising they used to call it a fighter in civilian clothing. Its performance as a general aviation business jet is simply unequalled, even by today's standards.

When I first tested the GLJ Model 25 SE addon, I was impressed by the flight dynamics the team at Xtreme Prototypes had developed for their unique model. In simple words, it was almost like flying the real aircraft, a quality rarely found in other Flight Simulator addons. To the point that I've asked project manager Alain and engineer Miguel not to change a single parameter in the flight model. Of course, they didn't obey me, you know how developers are... They simply made the flight dynamics even better!

I was really proud to join Xtreme Prototypes' development team as a test pilot and special contributor to this project. Together, we've improved not only the flight model but also many aircraft systems and features unique to the 20 Series aircraft, within the limitations of the simulation platforms. The fuel system and the AFCS have been totally redesigned and other functionalities like the stick nudger/puller and the stick shaker were added. The new engine and cockpit sounds you will hear when flying this new addon are the sounds I hear almost every day in the cockpit of our own Learjets, including the "bird sounds" one can hear when pushing the brake pedals — make sure the house cat is not around when you try this for the first time!

This is an ongoing project and the team and I are looking forward to improving this great addon even further as simulation platforms evolve and as we get more feedback from real-world pilots and users like you. I hope you will enjoy flying this new updated version of my favorite add-on aircraft which I believe is the most advanced, detailed and faithful classic Learjet simulation you can find.

Happy flying!

Captain Alan Velazquez
JetQuest/JetGlobal
Caracas, Venezuela

FOREWORD *(cont'd)*



Alan in command, on final approach to Merida, Venezuela (SVMD), in a real Learjet 25D.



On final approach to Montreal-Trudeau, Canada (CYUL), in the simulator.

INTRODUCTION AND PRODUCT DESCRIPTION

SECTION 1



ABOUT THE REAL 20 SERIES

Up until the 1960's, executives flew around in piston-powered propeller aircraft. These machines were usually conversions from WWII light bombers and transporters. Although many of them were faster, hot-rodded versions of the originals, as airlines adopted turbine power many executives were now considering commercial travel to save time and gain the comfort of flying above the weather in a pressurized cabin.

Bill Lear recognized this as a market opportunity and became focused on providing the American businessman with personal jet-propelled transportation. As an inventive entrepreneur, Lear was already providing converted WWII machines to the market he coveted so he understood what his customers needed. Nothing other than a high performance jet would do.

Lear's son, Bill Jr., who was working in Switzer-

land at the time, came across a jet fighter aircraft design which he thought would serve as a base for the new jet's design. The Swiss P-16, as it was then known, had an aerodynamic configuration that served the purpose well and so the Swiss American Aircraft Corporation was founded. The new executive aircraft would be called the SAAC-23.

After the initial honeymoon, the working culture of the Americans and the Swiss seemed irreconcilable so Lear swiftly decided to move the entire operation to Wichita, Kansas. After months of 24/7 shifts, the small company saw its efforts rewarded on September 15th, 1963, when the first Learjet Model 23 was rolled out and on October 7th, 1963, when N801L, the world's first civilian private jet, took off for a successful first flight.

Although the new aircraft promised to take the executive market by storm, cash flow difficulties threatened the project. Lear's response was to sell Lear Jet Corporation stock to the

public. The company became public in November, 1964.

During the next couple of years, a few accidents earned the small jet the reputation of a difficult aircraft to fly. These accidents were later blamed on insufficient pilot training and insufficient systems redundancy. Lear Jet Corporation responded with the Model 24 which although similar to the 23 now had airline-style systems with the appropriate redundancy to remain safe in all weather conditions. Pilot training programs were also put in place to ease the transition for private pilots moving up from propeller airplanes.

Such aeronautical successes unfortunately were not enough to counter persistent financial problems within the corporation and in 1967, the Gates Rubber Company became the controlling shareholder of Lear Jet Corporation. With the backing of such solid ownership, Lear Jet could now concentrate of its development.

Under Gates ownership, the company changed its name to the Gates Learjet Corporation. The 20 Series continued to be developed into state

-of-the-art precision flying machines becoming better, more luxurious and easier to fly. Your new Xtreme Prototypes GLJ Model 25 SE add-on is inspired from the 20 Series aircraft of the Gates era.

In the late 1960's, as Learjet's customer's needs evolved and grew, so did the aircraft they came to love. With the Model 25, and later the longer-range model 25D with greater fuel capacity, came a longer cabin, increased seating capacity and more flexible loading options, not to mention a rather sleek-looking stretched fuselage.

The Model 25's shape became synonymous with flying coolness and would remain so to this day, were it not for the aging GE CJ-610 turbojet engines. Nonetheless, improved versions of the power plant gave the 20 Series yet another increase in performance.

Gates ownership saw the transition from straight-turbojet to more efficient turbofan power. Up to then, the 20 Series aircraft were all powered by the ubiquitous General Electric CJ-610 turbojet engine, a simple, lightweight and powerful single-spool turbojet derived





from the military General Electric J-85 engine. The CJ-610 engine gave the 20 Series an astonishing climb performance and high-altitude cruise. It was however very noisy and fuel-thirsty so it was no surprise that in the wake of the 1973 fuel crisis, a new engine, the Garrett TFE-731 turbofan, was chosen. Although slightly less spirited than the CJ-610 it replaced, the TFE-731 offered far better range, less noise and less air pollution.

The Garrett-powered Learjets became known as the 30 Series and warranted yet another fuselage stretch. Models 35 and 36 were presented to the public in mid-1973.

During the 1970s, the 20 Series continued to be developed and sold, as many operators preferred their simplicity and performance. In August 1977, a new aircraft was flown. It had a new wing that replaced the traditional tip tanks with upswept winglets which provided a dramatic reduction of induced drag, therefore stretching range and enhancing climb performance. It was known as the Model 28, and along with its longer-range sister ship the Model 29, represented the epitome of the straight-turbojet executive aircraft.

The end of the 1970's saw the turbofan take over the market and the 20 Series was gradually abandoned. At the end of the 1980's, many airports around the world had banned the 20 Series aircraft due to noise restrictions. Today, a few remain in marginal use, some as cargo aircraft and some in service in countries where altitude considerations predominate.

During the 1980's, development continued with, among others, the Model 55, essentially a Learjet with a larger fuselage with stand-up cabin and later transcontinental range.

By the end of the decade, ownership of the company had changed hands a few times only to be acquired by Montreal-based Bombardier Aerospace in 1990. Model 60, an improved version of the Model 55, was rolled out the same year.

By mid-1990's, Learjet was totally integrated into Bombardier's operations which made the Canadian company the world's third largest aircraft manufacturer. Under Bombardier ownership, the 40 Series came to life with the Model 45, a technologically advanced, roomy and efficient aircraft for the new millennium,

entirely designed with computers. Then came models 70, 75 and 85.

The development of the Model 85 was unfortunately cancelled in October 2015 for financial reasons, so the company could concentrate on its new C Series and Global 7000/8000 instead. At the time of this writing, nothing has yet been divulged by the company regarding the future of its Learjet subsidiary and the new Model 85. Nevertheless, the longevity of this aircraft family is a testimony to Bill Lear's original vision and the way it forever changed business travel.

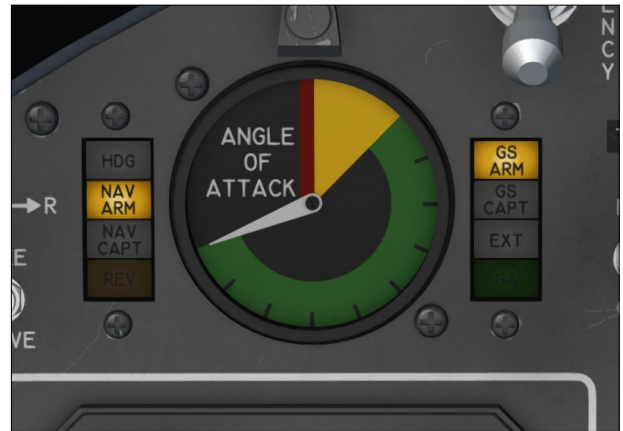


WHAT'S NEW IN VERSION 2.1?

Completely redesigned fuel system to imitate as closely as possible the fuel system of the real aircraft, within the current limitations of the simulator:

- New fuel balance (wingtip tanks with recognition light and fuel jettison system installed, wing tanks and fuselage tank)
- Fuselage tank used as "storage" like in the real aircraft
- Jet pumps functional
- Standby pumps functional
- Crossfeeding (one tank supplies fuel to both engines) available to balance wing tanks or for single engine operation
- Fuel jettison (wingtip tanks only, like on the real aircraft)
- All switches and lights on the fuel panel functional and conform to the real aircraft

- Fuel counter reset button functional



Enhanced autopilot/flight director:

- New AP/FD modes added: speed hold, Mach hold, wing leveler, attitude hold, localizer only hold, glideslope only hold
- AP logic between different modes improved, to conform to the AFCS and FD on the real aircraft
- New flight director annunciators (each side of the AoA indicators)
- Buttons on the flight controller panel are now illuminated when AP modes are engaged
- AP turn knob functional and controls bank, disables lateral-directional modes
- AP pitch wheel functional and controls pitch, disables pitch modes
- Autopilot test switches all functional
- Autopilot speed hold mode automatically switches to Mach hold mode above FL290 when engaged and vice versa, like on the real aircraft
- Steer lock and AP release buttons animated and functional on both yokes
- Primary and secondary yaw damper systems functional
- AP automatic stick pusher/puller animated and fully functional to prevent aerodynamic stall or overspeed (switchable)
- Stick shaker animation and sound when entering the yellow zone in the AoA indicator



Other new features:

- New native Prepar3D® v4 version, in addition to the native Prepar3D® v3, FSX and FSX Steam® versions
- New Checklist and Reference tabs for the pilot's kneeboard (in English or French)
- Low altitude overspeed horn - to prevent bird strikes (over 306 knots under FL140)
- Electric auxiliary hydraulic pump now functional (with sound)
- Crew and passenger oxygen system
- Emergency batteries ("APU") now simulated in case of a general power failure
- Emergency lighting system
- Generator reset switches now simulated
- Standby gyro caging button (animated and functional)
- More reflection in windshield glass, dirt in windows
- ASI bugs preset, Mach bug now linked to Mach card (no longer needs constant adjustment)
- Aircraft nose added to the virtual cockpit
- Fuel jettison tubes added to the rear of the wingtip tanks (exterior model)
- Fuel jettison visual effect

New sounds from the real aircraft:

- New 3D mix for the external aircraft sounds
- New engine sounds
- New starter sounds

- New autopilot/yaw damper disengage alert
- New altitude alert
- New overspeed horn alert
- Pitch trim clicker (stabilizer in motion)
- Stick shaker sound
- Brake sounds ("birds in the cockpit")

Modifications and improvements:

- Revised flight model for better performance during takeoff and climb, more stability in cruise at high altitude, and to eliminate unwanted roll/yaw oscillations at altitude
- New weight and balance to conform better to the real Model 25D
- New flight director annunciators, conform to the real aircraft
- Antiskid lights illuminate like on the real aircraft (only when antiskid inop or during test or malfunction)
- Steer lock switch is now spring loaded and conform to the real aircraft. Release button added on yoke. Green annunciator goes on when steering is engaged.
- Nose pitches down when spoilers are extended, like on the real aircraft
- New cabin altitude alert and horn (annunciator flashes above 9,000 ft., horn blows above 10,100 ft.)
- Low fuel annunciator modified to conform to the new fuel system
- Enhanced emergency gear extension system with air bottle
- Enhanced stall warning system with test switch
- CPCS rate knob now a rotary-type design, no longer spring loaded
- Engines up to 85% RPM in reverse (thrust reversers deployed), like on the real aircraft
- New calibrated cabin altitude controller (no more pressurization issues above FL400)
- Emergency battery switches no longer linked to the antiskid system (emergency batteries are now simulated)
- No more standby gyro power switch, instrument now powered by main bus or by

emergency batteries

- Wing and horizontal stabilizer anti-ice system fully simulated, new wing temperature gauge
- DME hold mode now temporarily holds the last reading on the DME head display
- Sim on ground condition added to the emergency stow function and other thrust reversers controls to prevent engine cutoff in mid air
- Minor modifications on both ADIs and HSI
- Several minor system improvements
- Several modifications on textures
- "Remove Before Flight" items are no longer installed by default when power is turned off (user controlled)
- Crew's presence in the cockpit is now user controlled
- Sound volume and balance can now be adjusted by moving cursors on the 8-track tape player (volume only on the FSX version)
- Engine oil pressure gauge now needs AC power to function
- Default autopilot vertical speed (when engaged) is now set to 1,000 ft./min.
- Red and white speed/Mach bugs on the ASI now allow for better fine tuning of the selected airspeed
- The tail stand is installed only when the aircraft is full of fuel (85% or more, CoG near aft limit).

Updated 225-page manual:

- New comprehensive 20 Series fuel system section
- New comprehensive AFCS (autopilot/flight director) section
- New climb and cruise tables in the planning section
- Images and text revised and updated, with new content
- Normal and emergency procedures sections are now available in French (28 pages)



Fixes:

- Fuel tank selector issue when add-on is loaded after a flight with a single engine aircraft with different tankage – fixed
- Unwanted roll and yaw oscillations at high altitude – fixed
- Rotating beacon lights flashing in cabin and cockpit – fixed
- Gyro free/slave selector switch inverted – fixed
- Copilot RMI card not rotating – fixed
- Copilot HSI glideslope needle not working – fixed
- Windshield glass filters out landing and taxi light beams on runway in FSX – fixed
- Cabin does not depressurize when door is opened at high altitude – fixed
- Aircraft has issues when used with third-party EZDOK/EZCA software – fixed
- Fuel quantities indicated on the fuel panel differ from the tanks installed – fixed
- Mouse wheel rotation reversed on the DME NAV1/NAV2 selector knob – fixed
- Landing gear struts not enough compressed on the ground when aircraft is fully loaded – fixed
- Main gear wheels sink below runway when landing under certain conditions – fixed
- Inverted rudder trim tab on exterior model – fixed
- Pitch trim switch on center pedestal inverted – fixed

- Manual cabin temperature switch not working - fixed
- Horn silence switch not always working - fixed



WHAT'S NEW IN VERSION 2.0?

New high resolution 3D exterior model — High-resolution 3D exterior model, optimized for the latest versions of Lockheed Martin® Prepar3D® and Microsoft® Flight Simulator X, with more than 800 parts and 80 animations.

New high resolution textures — Ten (10) new high-resolution (4096 x 4096) texture variations with unique liveries and paint schemes for each aircraft.

New high resolution, VR-ready, fully functional 3D virtual cockpit — Fully functional high resolution virtual cockpit with over 1,500 parts and 250 full-3D animated gauges, switches, levers, light indicators, flight instruments and systems with integrated tooltips.

New switches, knobs and levers — New switches, control sticks, handles and levers to conform better to the real Model 25 aircraft. Nearly all switches and knobs in the virtual cockpit are clickable and functional.

New thrust reversers — The new GLJ Model 25 addon is equipped with fully animated thrust reversers on both engines, including new subthrottles and a control panel in the virtual cockpit.

New sound effects — New 20 Series aircraft sounds and over 30 new additional cockpit sound effects. Contains Bill Leaming's FBGS sound system to play these sounds.



New optional panels for installing third-party gauges — The center panel that contains the GPS and the radar can be replaced by two optional panels for installing third-party gauges such as a new GPS, radar or glass cockpit. Instructions are provided for the user to modify the “panel.cfg” file to add those systems to the addon’s virtual cockpit. Users can cycle between two different optional panels and the default GPS/radar panel.

New cockpit lighting — The cockpit panel lights are now separate from the cabin and flood lights and can be controlled independently. New reading and exit lights were added in the cockpit and in the cabin.

Other new features:

- Fully redesigned landing gear and landing gear wells, complete with flexible hoses, landing and taxi lights, anti-skid system, animated snubbers, and more
- Fully redesigned main entry door
- Fully redesigned cabin and seats
- Fully redesigned windows
- New animated rotating beacon lights
- Animated stall vanes on the nose
- Animated engine inlet guide vanes
- Optional nose test probe with vanes
- Fully redesigned cockpit and instrument panels with new 3D animated gauges, switches and levers
- Modified radios for use in the simulator (VHF COM1/COM1 Standby, COM2, ADF1, ADF2, NAV1, NAV2, transponder, DME). Now fully compatible with ATC.
- Independent flight director
- NAV or GPS navigation modes. The autopilot is retrofitted to be fully functional in GPS mode.
- New DME head
- New digital clock and stopwatch
- Functional Lear Jet Stereo “Jetstar 8” 8-track tape player on the center pedestal that can play user’s music (a tribute to the inventive genius of Bill Lear)
- Rearranged side control knobs

- New pilot seats with adjustable armrests
- New animated and slidable sun visors
- Hideable control columns and yokes
- Hideable throttle quadrant
- Hideable iPad® tablet on the copilot side
- New camera views (5 exterior, 9 interior)
- An updated, 160-page flight manual (printable PDF version)
- A comprehensive paintkit (Adobe® Photoshop® CS5 file format) to allow users to create their own liveries



ADDON DESCRIPTION

The classic Learjet 20 Series aircraft, nicknamed “fighters in civilian clothing” because of their sleek design and amazing performance, were the first true executive jets. Their capabilities earned them a place among the extreme aircraft, setting record after record while allowing shirt-sleeve comfort in their plush cabins.

With the longer-range Gates Learjet Model 25D, from which this addon is inspired, came a longer cabin, increased seating capacity, more flexible loading options, greater fuel capacity and a rather sleek-looking stretched fuselage.

The Xtreme Prototypes GLJ Model 25 SE addon contains ten variations inspired from actual and fictitious paint schemes. Each variation is fully detailed and has been carefully modeled



based on a real-world aircraft and on available drawings, flight manuals, photographs, films and other archive material.

The high resolution 3D exterior model features over 800 parts and 80 animations. The fully functional, VR-ready virtual cockpit contains over 1,500 parts and more than 250 back and front-lit animated 3D gauges, lights, switches, knobs, levers and flight instruments.

A custom, pilot-tested flight model was conceived and optimized to simulate the performance of a high-powered civilian jet aircraft in the simulator. Nearly all systems are reproduced to simulate complete procedures, from cold and dark to shutdown.

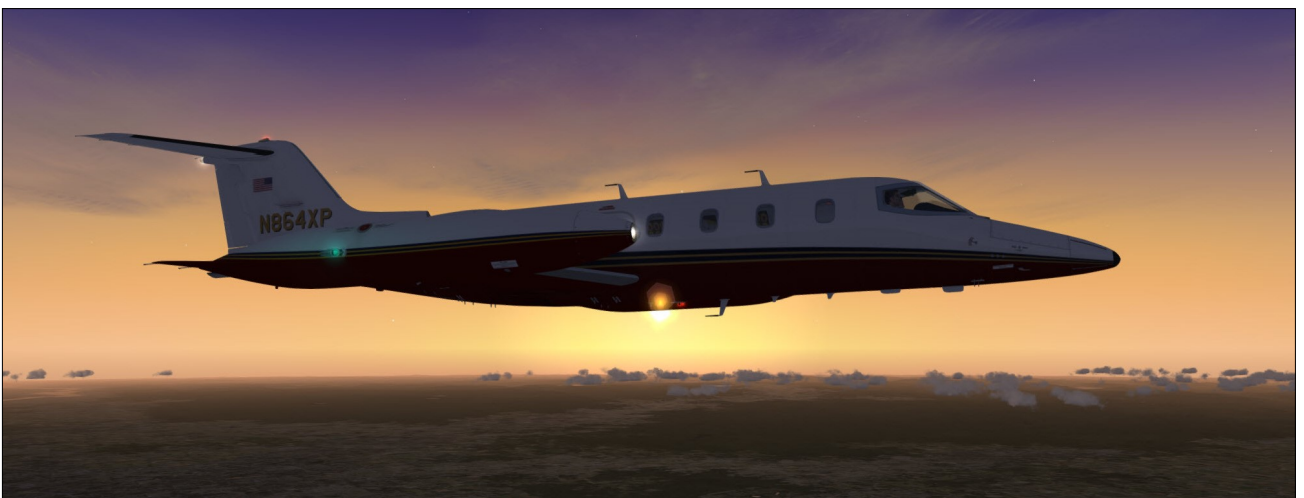
The package also includes custom visual effects, 3D sounds from the real aircraft, multiple camera views and an updated 225-page flight manual, among many other features.

The new analog virtual cockpit has been retrofitted to allow for both GPS and VOR navigation in autopilot mode and provides all the instruments and features necessary for complete IFR flight.

General Features

Ten (10) variations of the Gates Learjet Model 25D business jet, inspired from actual and fictitious models and liveries:

- U.S. Private “Red Belly” variation, inspired from actual liveries (fictitious tail number N864XP)
- U.K. Private “Blue Bird” variation, inspired from actual liveries (fictitious tail number G-KEXP)
- Mexican Private variation, inspired from actual liveries (fictitious tail number XA-XPS)
- French Private variation, inspired from actual liveries (fictitious tail number F-GLXP)
- German Private variation, inspired from actual liveries (fictitious tail number D-XPSE)
- U.S. Air Force V.I.P Transport variation, inspired from actual liveries (fictitious tail number 60214XP)
- U.S. Government Area 51 Special Ops variation, inspired from actual liveries (fictitious tail number N4251XP)



- Canadian Government Black V.I.P. Transport variation, inspired from actual liveries (fictitious tail number 150018XP)
- Canadian Private “Xtreme Red Bird” variation (fictitious tail number C-GAXP)
- Unpainted Test Aircraft, inspired from actual prototype (fictitious tail number N486XP)

Flight Model Features

Optimized, pilot-tested, 20 Series flight dynamics to simulate the performance of a high-powered civilian jet aircraft in the simulator:

- Two General Electric CJ-610, 2,950-pound static thrust, single-spool turbojet engines
- Service ceiling: 45,000 ft.
- Absolute ceiling: 51,000 ft.
- Maximum speed: 359 KIAS
- Maximum Mach: Mach 0.82 (at 24,000 ft.)

20 Series Aircraft Systems

The following 20 Series systems are simulated to conform as closely as possible to the operation of the real aircraft, within the present limitations and capabilities of the simulator:

- Flight controls
- Stall/overspeed warning systems with stick nudger/puller and stick shaker
- Electrical system
- Emergency batteries (“APU”)
- Hydraulic system (including functional electric auxiliary hydraulic pump)
- Landing gear, anti-skid system, differential brakes
- Fuel system (including crossfeeding and wingtip tanks fuel jettison system)
- CJ-610 Power plant
- Fire detection and suppression system
- Pneumatic (high pressure), bleed air, pressurization and environmental control systems
- Air conditioning and cabin temperature (H-valve) system
- Anti-ice system
- Automatic flight control system (autopilot, flight director, yaw damper)
- Caution and warning system
- Avionics, radio and navigation systems (VHF COM1/COM1 Standby, COM2, ADF1, ADF2, NAV1, NAV2, transponder, DME), compatible with ATC



- GPS, compatible with the autopilot
- Emergency gear extension system
- Crew and passenger oxygen system
- Main entry door (fully animated)
- Cockpit lighting system, including emergency lighting

Aircraft Model Features

- High resolution 3D exterior model, optimized for the latest versions of Lockheed Martin Prepar3D® and Microsoft® Flight Simulator X
- Highly detailed model inspired from the real aircraft, with more than 800 parts and 80 animations
- 4096 x 4096 high resolution textures
- Unique markings and liveries for each aircraft variation
- Movable aerodynamic control surfaces:
 - Movable horizontal stabilizer
 - Elevator
 - Ailerons with trim and balance tabs
 - Flaps
 - Vertical stabilizer/rudder with trim

tab

- Spoilers

- Fully animated landing gear, complete with flexible hoses, landing and taxi lights, anti-skid system, snubbers, and more
- Fully animated main entry door (lower and upper sections)
- Detailed GE CJ-610 power plant with animated (compressor and turbine) blades and inlet guide vanes
- Fully animated thrust reverser on both engines
- Animated rotating beacon lights
- Animated stall vanes on the nose
- Optional nose test probe with vanes

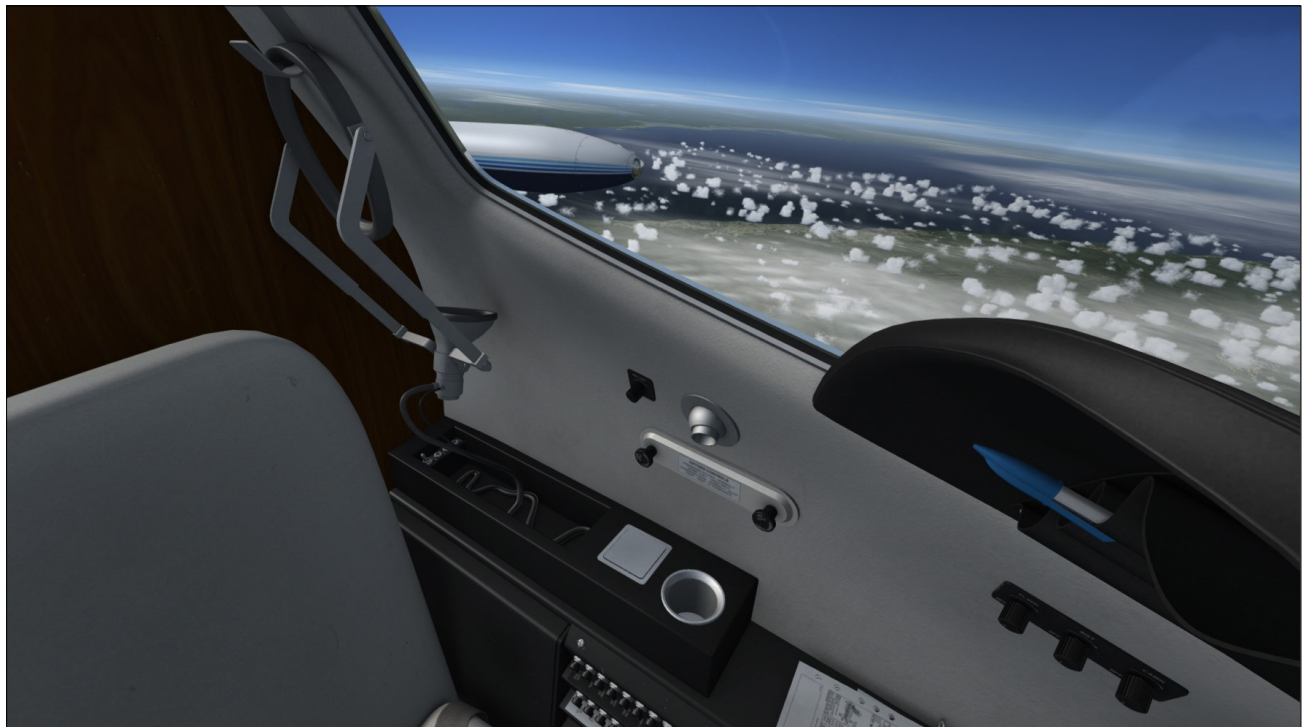
Virtual Cockpit Features

Note: Xtreme Prototypes next generation addons no longer include 2D panels found in older products. They are replaced by virtual cockpits with full-3D gauges. Except for the GPS/radar screens and the two optional panels, there are no flat 2D gauges in the VC.

- High resolution, VR-ready virtual cockpit with over 1,500 parts and 250 full-3D animated gauges, switches, knobs, levers,







- light indicators and flight instruments with tooltips
- Advanced instrument panels:
 - Captain's panel
 - Center panel
 - Electrical and radio panels
 - Copilot's panel
 - Annunciator panel
 - Thrust reverser control panel
 - Center pedestal
- Animated control columns and yokes (hideable, user-selectable), with stick nudger/puller and stick shaker animation, and functional autopilot buttons
- Animated rudder pedals with differential brakes
- Modified radios for use in the simulator (VHF COM1/COM1 Standby, COM2, ADF1, ADF2, NAV1, NAV2, transponder, DME). Fully compatible with ATC.
- Independent flight director
- NAV1 or GPS navigation modes. The autopilot is retrofitted to be fully functional in GPS mode.
- GPS and dummy radar panel (hideable, can be replaced by third-party gauges)
- Two optional user-configurable flat panels to install third-party 2D gauges such as GPS, GTNs, glass cockpits and radar systems (selectable)
- DME head
- Analog and digital clocks with stopwatch
- Functional Lear Jet Stereo "Jetstar 8" 8-track tape player on the center pedestal that can play user's music (a tribute to the inventive genius of Bill Lear)
- Side control knobs





- Pilot seats with adjustable armrests
- Animated and slidable sun visors
- Hideable throttle quadrant
- Thrust reverser subthrottles
- Hideable (dummy) iPad® tablet on the copilot side
- Cockpit lighting (instruments, cabin, flood)

Special Visual Effects

- Engine smoke and contrail effects
- Wing vortices and vapor trails
- Aircraft lights, some animated (landing, taxi, recognition, navigation, strobes, rotating beacon)
- Cockpit/cabin lights

Sound Effects

- New 20 Series 3D sound set, including new starter and engine sounds recorded from the real aircraft and positioned in the 3D space
- Over 45 additional cockpit stereo sound effects, many from the real aircraft: switch-

es, knobs and levers, pneumatic valves, blower fan, alerts and horns, brake (“birds in the cockpit”) sounds, etc.

Miscellaneous

- Contains Bill Leaming's FBGS sound system for playing cockpit sounds and music
- 5 external camera views
- 10 internal camera views
- A 225-page printable PDF manual
- A comprehensive paintkit (Adobe® Photoshop® CS5 file format) to allow users to create their own liveries

Note: Software features are subject to change without notice. Some functionalities may differ from those in the real aircraft due to limitations in the simulation platforms.

Some features available in the native Prepar3D® versions may not be available in the FSX version. The FSX version contains less animations and features than the native Prepar3D® versions. However, systems and procedures are the same on all platforms and this has no impact on the simulation.

Due to the high number of animations in the virtual cockpit, the native version for Prepar3D® v3.x requires the `OPTIMIZE_PARTS=0` entry in the "Prepar3D.cfg" configuration file. This is an undocumented simulator issue that is now fixed in Prepar3D® v4.1, not an addon issue. The change is not required for Prepar3D® v4.1 users.

Third-party radar and GTN/GPS units are not included and are sold separately.

SCOPE

The Xtreme Prototypes GLJ Model 25 SE addon is inspired from a series of real-world aircraft known in the 1970's as the Gates Learjet 20 Series (models 23 to 28). The package strives to recreate the general look and feel of the original aircraft for the virtual pilot's enjoyment.

While we regard this addon more as a mini aircraft simulator rather than a game, we do not pretend that it is one hundred percent historically or technically accurate or that it truly reproduces all the systems and flight characteristics of the real Learjet 25 aircraft.

There are significant differences between the models and the real aircraft. Xtreme Prototypes addons and manuals for the general public are considered edutainment software and shall not be used for real-world training.

This manual contains the necessary information for the installation and operation of the Xtreme Prototypes GLJ Model 25 SE addon on your simulation platform. Nearly all 20 Series systems that can be reproduced in Lockheed Martin® Prepar3D® or Microsoft® Flight Simulator X are simulated, unless otherwise noted (refer to sections 4 and 5 for details).

GIVE THE MANUAL A CHANCE...

The operation of the Xtreme Prototypes GLJ Model 25 SE addon is very similar to the operation of the real aircraft from which it is inspired. For proper operation and enhanced realism, it is suggested that users read the present flight manual and follow the procedures carefully.

This addon strives to bring you the spirit and the actual feeling of flying a high performance aircraft at a time when LCD screens, GPS and powerful computers didn't exist and pilots needed to know how to fly and navigate with minimal resources. While this addon allows comprehensive procedural IFR flight, anyone who masters the simulator's default jets can fly the GLJ Model 25 SE. It is up to you to decide which level of complexity you want to achieve.

If you're feeling overwhelmed by the cockpit of the GLJ Model 25, we suggest giving the manual a chance, as it was written with non-experienced pilots in mind. The aircraft is quite rewarding once mastered, but as most things in life, practice makes perfect!

A WORD ABOUT PIRACY

Piracy is not a victimless crime.

Developing high quality professional addons for the latest simulation platforms is becoming more and more complex and challenging. It requires the contribution of a dedicated and passionate team of artists, technicians, pilots and engineers. These products cost money to develop and take many months of research and hard work, and are aimed at a relatively limited market of serious flight simulation enthusiasts.

Xtreme Prototypes is a small addon developer and we depend largely on your feedback and support to create better products. Contributions from our users, in the form of software license purchases, allow us to pursue our mission.

This addon is neither freeware nor shareware and is subject to the terms of use specified in the enclosed end-user software license agreement (see next page). As a user, you are responsible for the protection and good use of this software for which you obtained a license. Please do not make illegal copies of the software and/or its related components and documentation, including the manual.

Piracy kills quality addons. Posting or downloading illegal copies of this addon over the Internet is a crime.

END-USER SOFTWARE LICENSE AGREEMENT FOR XTREME PROTOTYPES GLJ MODEL 25 SPECIAL EDITION ADDON

This End-User Software License Agreement ("EULA") is a legal agreement between you (either an individual or a single entity) and Xtreme Prototypes, Inc. ("Xtreme Prototypes") for the software product identified above, which includes computer software and may also include associated media and printed materials, and may include online or electronic documentation ("SOFTWARE PRODUCT"). The SOFTWARE PRODUCT also includes any updates and supplements to the original SOFTWARE PRODUCT provided to you by Xtreme Prototypes.

By installing, copying, downloading, using, accessing or otherwise using the SOFTWARE PRODUCT, you agree to be bound by the terms of this EULA. If you do not agree to the terms of this EULA, do not install or use the SOFTWARE PRODUCT.

SOFTWARE PRODUCT LICENSE

The SOFTWARE PRODUCT is protected by copyright laws and international copyright treaties, as well as other intellectual property laws and treaties.

The SOFTWARE PRODUCT is licensed, not sold.

The SOFTWARE PRODUCT is neither freeware nor shareware and is subject to the terms of use specified in this EULA.

PERSONAL ACTIVATION KEY

At the time of purchase of your license, you were issued a personal activation key to install the SOFTWARE PRODUCT on your computer. Your activation key is unique, personal, non-transferable and traceable.

GRANT OF LICENSE

This EULA grants you the following rights:

Software - You may install and use one copy of the SOFTWARE PRODUCT on a single computer at a time and only by one user at a time, for personal, noncommercial use. The primary user of the computer on which the SOFTWARE PRODUCT is installed may make a second copy for his or her exclusive and personal noncommercial use on a second computer.

Concurrent Use - A license for the SOFTWARE PRODUCT may not be used concurrently on different computers.

Storage/Network Use - If not prevented by copy protection technology, you may also store or install a copy of the SOFTWARE PRODUCT on a storage device, such as a network server, used only to run the SOFTWARE PRODUCT on your other COMPUTERS over an internal network; however, you must acquire and dedicate a license for each separate computer on which the SOFTWARE PRODUCT is RUN from the storage device. A license for the SOFTWARE PRODUCT may not be shared or used concurrently on different COMPUTERS.

ERS.

Reservation of Rights - All rights not expressly granted are reserved by Xtreme Prototypes. All other uses that fall outside the scope of the EULA must receive the prior written permission of Xtreme Prototypes.

DESCRIPTION OF OTHER RIGHTS AND LIMITATIONS

Entertainment or Educational Use Only - This SOFTWARE PRODUCT is for edutainment purposes only and shall not be used for formal training.

Limitations on Reverse Engineering, Decompilation and Disassembly - You may not reverse engineer, decompile, or disassemble the SOFTWARE PRODUCT.

Separation of Components - The SOFTWARE PRODUCT is licensed as a single product. Its component parts may not be separated for use on more than one computer or with other products or applications.

Rental and Lending - You may not lend, rent or lease the SOFTWARE PRODUCT.

Distribution and Sale - Unauthorized sale and/or distribution of the SOFTWARE PRODUCT by any mean, including but not limited to the Internet and/or physical media, is prohibited.

File Sharing - File sharing of the SOFTWARE PRODUCT by any mean is prohibited. You may not upload or download illegal copies of the SOFTWARE PRODUCT.

Software Transfer - You may not transfer your rights under this EULA to another user. Your activation key is unique, personal, non-transferable and traceable.

Modification of Configuration Files - You may modify the configuration files located in the SOFTWARE PRODUCT's "airplanes", "panel", "model" and "sound" folders for your own private experimentation and use as long as the modified files are kept on your computer. You may not sell or otherwise distribute or transfer the modified configuration files or make them part of another product or application.

Modification of Aircraft Textures (Repaints) - You may modify or repaint the aircraft textures included with the SOFTWARE PRODUCT with a paint program. You may not sell the modified textures or make them part of another product or application. However, you may post your own repaints on the Internet for the benefit of other registered users, provided that your name, the original SOFTWARE PRODUCT name and the nature of the modification (a short description) are mentioned.

Modifications to Gauges and Special Effects - You may modify the XML code and the bitmaps included with the SOFTWARE PRODUCT's gauges and special visual effects for your own private experimentation and use as long as the modified gauges and effects are kept on your computer. You

may not sell or otherwise distribute or transfer the modified gauges and/or effects or make them part of another product or application. However, you may post images of the aircraft with the modified gauges and/or special visual effects on the Internet or elsewhere, provided that the original SOFTWARE PRODUCT name and the nature and author of the modifications are mentioned.

Sound Module and Sound Effects - The SOFTWARE PRODUCT includes a sound module and a number of sound effects that are used under license from third parties. They are considered integral part of the SOFTWARE PRODUCT and may not be separated for use with other products or applications.

Dual Media Software - You may receive the SOFTWARE PRODUCT in more than one medium, including but not limited to files downloaded from the Internet. Regardless of the type or size of medium you receive, you may use only one medium that is appropriate for your single COMPUTER. You may not RUN the other medium on another COMPUTER. You may not sell, loan, rent, lease, or otherwise transfer the other medium to another user.

Digital Rights Management and Copy Protection - The SOFTWARE PRODUCT may employ digital rights management (DRM) and/or copy protection technology, including the use of unique and traceable activation keys, to prevent the unauthorized use and/or copying of the SOFTWARE PRODUCT. It is illegal to make unauthorized copies of the SOFTWARE PRODUCT, to make an activation key public or to circumvent any DRM and/or copy protection technology employed in the SOFTWARE PRODUCT.

Upgrades and Patches - If the SOFTWARE PRODUCT is an upgrade or patch, you must be properly licensed to use the original SOFTWARE PRODUCT in order to install and use the SOFTWARE PRODUCT upgrade or patch. A SOFTWARE PRODUCT labeled as an upgrade or patch replaces and/or supplements the product that formed the basis for your eligibility for the upgrade. You may use the resulting upgraded product only in accordance with the terms of this EULA. If the SOFTWARE PRODUCT is an upgrade or patch of a component of a software package sold as a single product, the SOFTWARE PRODUCT may be used and transferred only as part of that single product package and may not be separated for use on more than one computer or with other products or applications.

Electronic Documentation - The electronic documentation included with the SOFTWARE PRODUCT is to be used only in conjunction with the SOFTWARE PRODUCT. The SOFTWARE PRODUCT and the documentation are licensed as a single product and may not be separated. No part of the documentation may be reproduced or distributed in any form or by any means without the written permission of Xtreme Prototypes. However, as a registered user, you can print copies of the PDF manual for your own personal use, in conjunction with the SOFTWARE PRODUCT.

Online Help System (Online Manual) - The SOFTWARE PRODUCT may be provided with an online help system on Xtreme Prototypes' website ("online manual"). The online manual for the SOFTWARE PRODUCT is to be used in conjunction with the SOFTWARE PRODUCT only. The SOFTWARE PRODUCT and the online manual are licensed as a single product and may not be separated. The online manual is available to registered users only. You must be logged in to your personal account on Xtreme Prototypes' website to ac-

cess the online manual. No part of the online manual may be reproduced or distributed in any form or by any means without the written permission of Xtreme Prototypes. You cannot give access to your personal account to other users.

Software Protection, Good Use and Termination - As an end user, you are responsible for the protection and good use of the SOFTWARE PRODUCT for which you obtained a license under this EULA. Without prejudice to any other rights, Xtreme Prototypes may decide to withdraw your rights and privileges to use the SOFTWARE PRODUCT, close your user account and terminate this EULA if you fail to comply with the terms and conditions of this EULA, especially in the case of copyright infringement related to unauthorized reproduction and/or distribution of the SOFTWARE PRODUCT over the Internet and/or by any other means. In such event, you must destroy all copies of the SOFTWARE PRODUCT and all of its component parts.

Minimum System Requirements - You understand that the SOFTWARE PRODUCT is an add-on to a third-party simulation platform that is required for the SOFTWARE PRODUCT to be installed and used. The SOFTWARE PRODUCT is not a stand-alone product and cannot be used without the underlying simulation platform. Xtreme Prototypes is not responsible for changes in third-party simulation platforms that would prevent the SOFTWARE PRODUCT from performing or being used, including the discontinuation of such required third-party simulation platform. You acknowledge that your computer system has the minimum system requirements specified in the SOFTWARE PRODUCT's online documentation for installing and using the SOFTWARE PRODUCT. Xtreme Prototypes is not responsible for the lack of computer system requirements or features that would prevent you from using the SOFTWARE PRODUCT or causing the SOFTWARE PRODUCT to underperform.

Software Download Sales are Final - You understand that the SOFTWARE PRODUCT is available via download only and that for obvious reasons, software download sales are final and not refundable.

Software Replacement and Loss of Activation Key - The replacement of lost downloaded files is not guaranteed. You must make backup copies for your own personal use in the future. Xtreme Prototypes cannot be responsible for the loss of activation keys or downloaded files and does not guarantee that they will always be available for download.

COPYRIGHT

All title and copyrights in and to the SOFTWARE PRODUCT (including but not limited to any images, graphics, photographs, animations, video, audio, music, text, 3D models, computer programs, code, and other components incorporated into the SOFTWARE PRODUCT), the accompanying printed, electronic and/or online material, and any copies of the SOFTWARE PRODUCT, are owned by Xtreme Prototypes, except where otherwise noted in the SOFTWARE PRODUCT. All title and intellectual property rights in and to the content which may be accessed through use of the SOFTWARE PRODUCT is the property of the respective content owner and may be protected by applicable copyright or other intellectual property laws and treaties. This EULA grants you no rights to use such content.

The SOFTWARE PRODUCT is protected by copyright laws and international treaty provisions. Therefore, you must

treat the SOFTWARE PRODUCT like any other copyrighted material except that you may (a) make personal copies of the SOFTWARE PRODUCT solely for backup or archival purposes, and/or (b) install the SOFTWARE PRODUCT on a maximum of two computers, as mentioned above.

No part of the documentation may be reproduced or distributed in any form or by any means without the written permission of Xtreme Prototypes.

No part of the online manual may be reproduced or distributed in any form or by any means without the written permission of Xtreme Prototypes.

The unauthorized reproduction and/or distribution of protected material constitute an infringement to the exclusive right of its holder. This behavior could expose the offender to legal action and to a judgment to pay damages.

INJUNCTIVE RELIEF

The parties agree that if you download, install, distribute or utilize the SOFTWARE PRODUCT or any of its components, including the online manual, in an unauthorized manner, or breach the terms and conditions of this EULA, that such use or breach would have a devastating and serious impact on Xtreme Prototypes' continuing ability to compete profitably and would, therefore, result in immediate and irreparable injury, loss or damage to Xtreme Prototypes. The parties agree that in such event, in addition to Xtreme Prototypes' right to withdraw your rights and privileges to use the SOFTWARE PRODUCT, to terminate this EULA and to recover damages for a breach of this EULA, Xtreme Prototypes would be entitled to obtain a temporary restraining order or a preliminary injunction from a court of competent jurisdiction to prevent you from engaging in any further use of the SOFTWARE PRODUCT or the continued breach of the terms and conditions of this EULA.

JURISDICTION

This EULA is governed by the laws in force in the Province of Québec, Canada, and, in respect of any dispute which may arise hereunder, you consent to the jurisdiction of the federal and provincial courts sitting in Montreal, Québec, Canada.

Should you have questions concerning this EULA, or if you wish to contact Xtreme Prototypes for any other reason, please visit our website:

<https://xtremeprototypes.com/en/shopcustcontact.asp>

LIMITED WARRANTY

Xtreme Prototypes warrants that the SOFTWARE PRODUCT will perform substantially in accordance with the accompanying documentation for a period of ninety (90) days from the date of receipt. To the extent allowed by applicable law, implied warranties on the SOFTWARE PRODUCT, if any, are limited to ninety (90) days.

No other warranty - To the maximum extent permitted by applicable laws, Xtreme Prototypes provides the SOFTWARE PRODUCT as is and with all faults, and hereby disclaims all other warranties and conditions, either express, implied or statutory, including, but not limited to, any (if any) implied

warranties or conditions of merchantability, of fitness for a particular purpose, of lack of viruses, of accuracy or completeness of responses, of results, and of lack of negligence or lack of workmanlike effort, all with regard to the SOFTWARE PRODUCT, and the provision of or failure to provide support services. ALSO, THERE IS NO WARRANTY OR CONDITION OF TITLE, PEACEFUL ENJOYMENT, PEACEFUL POSSESSION, CORRESPONDENCE TO DESCRIPTION OR NON-INFRINGEMENT, WITH REGARD TO THE SOFTWARE PRODUCT. THE ENTIRE RISK AS TO THE QUALITY OF OR ARISING OUT OF USE OR PERFORMANCE OF THE SOFTWARE PRODUCT AND SUPPORT SERVICES, IF ANY, REMAINS EXCLUSIVELY WITH YOU.

This limited warranty gives you specific legal rights.

LIMITATION OF LIABILITY

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL XTREME PROTOTYPES BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFITS OR CONFIDENTIAL OR OTHER INFORMATION, FOR BUSINESS INTERRUPTION, FOR PERSONAL INJURY, FOR LOSS OF PRIVACY, FOR FAILURE TO MEET ANY DUTY INCLUDING OF GOOD FAITH OR OF REASONABLE CARE, FOR NEGLIGENCE, AND FOR ANY OTHER PECUNIARY OR OTHER LOSS WHATSOEVER) ARISING OUT OF OR IN ANY WAY RELATED TO THE USE OF OR INABILITY TO USE THE SOFTWARE PRODUCT, THE PROVISION OF OR FAILURE TO PROVIDE SUPPORT SERVICES, OR OTHERWISE UNDER OR IN CONNECTION WITH ANY PROVISION OF THIS EULA, EVEN IN THE EVENT OF THE FAULT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, BREACH OF CONTRACT OR BREACH OF WARRANTY OF XTREME PROTOTYPES, AND EVEN IF XTREME PROTOTYPES HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

CUSTOMER REMEDIES

Notwithstanding any damages that you might incur for any reason whatsoever (including, without limitation, all damages referenced above and all direct or general damages), the entire liability of Xtreme Prototypes under any provision of this EULA and your exclusive remedy for all of the foregoing shall be limited to the greater of the amount actually paid by you for the SOFTWARE PRODUCT or U.S. \$1.00. The foregoing limitations, exclusions and disclaimers shall apply to the maximum extent permitted by applicable law, even if any remedy fails its essential purpose.



The Xtreme Prototypes GLJ Model 25 Special Edition is an add-on software package that requires:

- Lockheed Martin® Prepar3D® (any version)

or

- Microsoft® Flight Simulator X SP2 with Acceleration Expansion Pack (or Flight Simulator Gold fully installed)

or

- Flight Simulator X: Steam® Edition

to be installed on your computer.

The software is not a stand-alone product and cannot be used without the underlying simulation platform. Make sure that your simulation platform has been properly installed according to the instructions provided by the developer before installing this addon.

Important

- Xtreme Prototypes next generation addons are designed to take advantage of the new and more powerful personal computer systems that are available today. They require better video cards and more processing power and RAM than other more conventional addons. Before installing this product, make sure you have the minimum system requirements or better. Increased per-

formance will be noticed on more powerful systems.

- Windows® 10/8.1/8/7 or later is required to install and fly this addon. We are sorry we cannot provide support for this addon if installed under Windows® Vista™ or Windows® XP®.

Note to FSX: Steam® Edition Users

- The GLJ Model 25 SE addon is fully compatible with Flight Simulator X: Steam® Edition. A special installer is available from our "Downloads" section on our website (free for registered users).

Note to Prepar3D® v2.x or v1.x users

- The GLJ Model 25 SE addon for FSX is compatible with Prepar3D® v2.x and v1.x. However, you will need to edit the path to your simulation platform when installing the software so the files are copied to the correct folders on your system. At this time we only supply installers for Prepar3D® v4.x and v3.x, and FSX/FSX Steam®. Please note that the Prepar3D® versions of this addon are native versions that are only compatible with Prepar3D® v4.x or v3.x. To install this addon in Prepar3D® v2.x or v1.x, please use the FSX installer and change the installation path.

MINIMUM SYSTEM REQUIREMENTS

Flight Simulation Platform (depending on the addon version installed): Lockheed Martin® Prepar3D® v4.x, v3.x, v2.x or v1.x, Microsoft® Flight Simulator X: Steam® Edition or Flight Simulator X SP2 with Acceleration Expansion Pack (or FSX Gold fully installed). This product is not compatible with earlier versions of Microsoft® Flight Simulator.

Operating System: Windows® 10/8.1/8/7 (or later) 32-bit (64-bit recommended)*.

Computer Memory (RAM): 16 GB or better recommended*

Processor: Quad Core 3.0 GHz or better recommended*

Hard Drive Space: Downloaded ZIP file size approx. 1.3 GB, each addon version size approx. 3 GB when installed*

Video Card: A high-end video card with at least 2 GB GDDR5 or better is highly recommended*. Installing this addon in Prepar3D® requires a DirectX® 11-compatible video card*. Make sure you have the latest video driver for your operating system.

Graphics: DirectX® 11, 10 or 9 (depending on your simulator's requirements)*

Other: Wheel mouse, controller (joystick or yoke), pedals (optional), sound card and speakers, Adobe® Acrobat Reader®, Adobe® Photoshop® CS5 or later (optional, required for using the paintkit)

*: Please refer to your simulator's documentation for more information (or special requirements).

COMPATIBILITY, PERFORMANCE AND SETTINGS

The GLJ Model 25 SE addon is optimized for the latest versions of Lockheed Martin® Prepar3D® version 4.x, 3.x, 2.x or v1.x., Microsoft® Flight Simulator X SP2 with Acceleration Expansion Pack (or Flight Simulator X Gold fully installed) and Flight Simulator X: Steam® Edition.

Make sure that you install the correct addon version for your simulation platform. The currently available versions are for Prepar3D® v4.x (P3Dv4), v3.x (P3Dv3), Flight Simulator X (FSX) and Flight Simulator X: Steam® Edition (FSX Steam).

Important

- This addon is not compatible with Flight Simulator X with Service Pack 2 alone. You will need to install the Acceleration Expansion Pack in addition to FSX SP2.
- This addon is not compatible with Microsoft® Flight Simulator 2004.



- This addon is not compatible with Laminar Research® X-Plane®.
- The addon version for Flight Simulator X is compatible with all versions of Prepar3D®. However, we recommend installing the correct addon version for your simulation platform to benefit from extra features in Prepar3D® v4.x and v3.x.
- The versions for Prepar3D® v4.x and v3.x are native versions that are not compatible with Prepar3D® v1.x, v2.x and Flight Simulator X. Make sure that you install the correct addon version for your simulation platform.
- The addon version for FSX is compatible with all versions of Prepar3D®. However, you will need to edit the path to your simulation platform when installing the software in order for the files to be copied to the correct folders on your system. At this time, we only supply installers for Prepar3D® v4.x and v3.x, and FSX/FSX Steam®. To install this addon in Prepar3D® v1.x or 2.x, please use the FSX installer and change the installation path.
- Some features available in the native Prepar3D® versions may not be available in the FSX version. The FSX version contains less animations and features than the native Prepar3D® versions. However, systems and procedures are the same on all platforms and this has no impact on the simulation.
- If you have installed the FSX version in Prepar3D® v4, you will need to copy the included 64-bit sound DLL to the addon's "panel" folder. The DLL is available in the "64-bit sound" subfolder located in the main addon folder. Follow the instructions carefully. Without the 64-bit sound DLL, you will not be able to hear the cockpit sound effects.
- Windows® 10/8.1/8/7 (or later) is required for using this addon. We are sorry we cannot provide support for this addon if installed under Windows® Vista™ or Windows® XP®.

Settings

Please remember that this addon is a complex simulation that requires a good computer and a high-end video card to run properly.

Because there are as many computer systems as there are users, it is impossible to recommend unique settings that would fit all systems. However, as a rule of thumb, if your simulation platform is running properly on your computer, and assuming that your computer meets the minimum system requirements or better, you should be able to install and fly the GLJ Model 25 SE addon without major issues.

Performance

The GLJ Model 25 SE addon was designed with its overall visual quality, complex systems and most accurate simulation features in mind. Increased performance will be noticed on more powerful computers.

The custom aircraft systems that were designed for this addon are responsible for thousands of calculations at each computer cycle. These systems, combined with the new high resolution models and textures, hundreds of cockpit animations and some of the special visual and sound effects, may affect your frame rate on slower processors and video cards, depending on your simulation platform's settings.

Adjust your simulation platform's display, weather and traffic settings to correct this problem if necessary or upgrade your computer system with more processing power, more memory and a better video card.

Under normal conditions, assuming that your computer meets or exceeds the minimum system requirements, you should expect acceptable frame rates of between 30 to 60 frames per second, depending on your hardware and settings. Average frame rate should be between 25 to 45 fps. Frame rates below 20 fps are not normal.

We recommend limiting your frame rate to 30 fps on all platforms. This will free computer resources for other tasks and will improve performance.

Most of our tests were performed under Windows 8.1 in a 1920 x 1200 simulation window, with a screen resolution of 5760 x 1200 on all simulation platforms:

- Dell XPS 8500
- Intel (Quad Core) i7-3770 CPU @ 3,40 GHz, 64 bit
- 16 GB RAM
- AMD Radeon HD 7700 Series video card (2 GB GDDR5)

Refer to the documentation included with your simulation platform for more information about minimum system requirements and how to optimize your settings for the best overall performance.

Important

- Make sure you have the latest video card driver for your operating system.
- Make sure your antivirus program is not scanning your system while you are flying in the simulator. This could greatly affect performance.

Known Issues in Flight Simulator X

- If you experience "blue texture" flashes in FSX when the addon textures are loading, especially when in the virtual cockpit, we recommend disabling the DirectX® 10 Preview option in your "Display" settings ("Graphics" tab). FSX seems to perform better under DirectX® 9.
- If the special visual effects (aircraft lights, contrails, wing vortices, etc.) don't look like the images in this manual or simply disappear when viewed at certain angles, uncheck the Preview DirectX® 10 option box. Third-party free DirectX® 10 shader fixers are also available in Flight Simulation forums.
- We have noticed that when the mouse cursor is moved inside the main window when in the virtual cockpit mode, the frame rate could drop significantly. When the mouse

is moved out of the window, the frame rate goes back to normal. We believe this is a simulator issue and not an addon issue. Of course, it will be more apparent with more complex addons such as the GLJ Model 25 SE, especially on slower systems and graphic cards. We recommend moving the mouse cursor out of the main simulation window when not needed.

- If some textures are missing either on the exterior model or in the virtual cockpit after switching aircraft several times, simply load a default (stock) aircraft that comes with your simulation platform and reload the GLJ Model 25 SE. If this doesn't solve the issue, exit and restart the simulator. At this time, we don't know what might be causing this issue which seems to be more frequent with models with high resolution textures such as the GLJ Model 25 SE.
- It has been reported during the beta phase that some third-party addons or FS utilities may interfere with the correct installation of the GLJ Model 25 SE addon. These programs may also alter the appearance of your add-on aircraft by modifying the textures and the materials in the model files. If the GLJ Model 25 SE aircraft variations are correctly displayed in the "Select Aircraft" page but you are unable to select any one of them, or worse if selecting them causes FSX to crash, suspect such third-party programs. For unknown reasons, these programs may prevent the addon's system DLLs from being "trusted" by FSX and the addon will not work properly. Remove these programs to solve the issue.

Optional Settings in Flight Simulator X

These settings require that you modify the "fsx.CFG" file located in "C:\Users*your name*\AppData\Roaming\Microsoft\FSX". It is not Xtreme Prototypes' policy to modify the user's "fsx.CFG" file during the installation process. So this needs to be done manually by the user.

Note (FSX: Steam® Edition): The "fsx.CFG" file (or "fsx_se.CFG") may be located in " C : \ U s e r s \ *y o u r name* \ AppData \ Roaming \ Microsoft \ FSX - SE ", depending on the version.

Should you decide to change these settings, please make sure that you've made a backup copy of your original "fsx.CFG" (or "fsx_se.CFG") file and saved it in a safe place before proceeding:

To prevent the dynamic head movement in the virtual cockpit under strong acceleration conditions, you can make the following changes:

```
[DynamicHeadMovement]
LonAccelOnHeadLon=0.000000
LonAccelOnHeadPitch=0.000000
RollAccelOnHeadLat=0.000000
YawAccelOnHeadLat=0.000000
RollAccelOnHeadRoll=0.000000
MaxHeadAngle=0.000000
MaxHeadOffset=0.000000
HeadMoveTimeConstant=0.000000
```

If you have a widescreen monitor and feel you are too close to the main panel in the virtual cockpit even after zooming out or moving the seat aft, you can make the following change:

```
[Display]
WideViewAspect=True
```

Note: Changing the aspect ratio may affect the way the special visual effects (aircraft lights, contrails, wing vortices, etc.) are displayed, depending on your hardware and simulation platform.

If you own a powerful computer equipped with a high-end video card, you can make the following changes to optimize the graphics (the GLJ Model 25 SE addon uses 4096 x 4096 high resolution textures):

```
[Display]
TEXTURE_BANDWIDTH_MULT=80
```

```
[Graphics]
TEXTURE_MAX_LOAD=4096
```

Note: If you still experience performance issues after optimizing your simulation platform, you may need to upgrade your computer system. Refer to "Minimum System Requirements".

Known Issues in Prepar3D® v1.x

- No issues were reported in Prepar3D® v1.x.

Optional Settings in Prepar3D® v1.x

These optional settings require that you modify the "Prepar3D.cfg" file located in "C:\Users*your name*\AppData\Roaming\Lockheed Martin\Prepar3D". It is not Xtreme Prototypes' policy to modify the user's "Prepar3D.cfg" file during the installation process. So this needs to be done manually by the user.

Should you decide to change these settings, please make sure that you've made a backup copy of your original "Prepar3D.cfg" file and saved it in a safe place before proceeding:

To prevent the dynamic head movement in the virtual cockpit under strong acceleration conditions, you can make the following changes:

```
[DynamicHeadMovement]
LonAccelOnHeadLon=0.000000
LonAccelOnHeadPitch=0.000000
RollAccelOnHeadLat=0.000000
YawAccelOnHeadLat=0.000000
RollAccelOnHeadRoll=0.000000
MaxHeadAngle=0.000000
MaxHeadOffset=0.000000
HeadMoveTimeConstant=0.000000
```

If you own a powerful computer equipped with a high-end video card, you can make the following changes to optimize the graphics (the GLJ Model 25 SE addon uses high resolution 4096 x 4096 textures):

```
[Display]
TEXTURE_BANDWIDTH_MULT=80
```

```
[Graphics]
TEXTURE_MAX_LOAD=4096
```

Note: If you experience performance issues after optimizing your simulation platform, you may need to upgrade your computer system. Refer to "Minimum System Requirements".

Known Issues in Prepar3D® v2.x

Lockheed Martin® Prepar3D® v2.x is a professional simulation platform that requires a powerful computer and video card to run. We do not recommend flying the GLJ Model 25 SE addon in Prepar3D® v2.x if you don't have the required computing power and high-end video hardware.

Note: Prepar3D® v2.x requires DirectX® 11 and a DirectX® 11-compatible video card. Refer to your simulator's documentation for more details.

Advanced lighting options in Prepar3D® v2.x, such as shadows and HDR lighting, may dramatically affect performance and reduce frame rate. We recommend moderation when setting these options, especially on slower systems.

Note that the GLJ Model 25 SE addon uses 4096 x 4096 high resolution textures.

- The special effect engine was changed from CPU to GPU with the release of Prepar3D® v2. This has the advantage of freeing computer resources and improving performance on high-end graphics hardware. The GLJ Model 25 SE special visual effects were updated to conform to the Prepar3D® v2 specifications. While the new P3Dv2 particle effects are visually identical to the FSX/P3Dv1 effects, there may still be a simulator issue affecting extrusion effects that still needs to be resolved, depending on your simulator version. Until then, extrusion effects such as engine contrails, wing vortices and vaportrails, may appear sawtoothed, wrongly oriented, faded, delayed, with repeating arrow patterns. This is normal until a fix is made available.
- No special effect issue related to the view aspect ratio was reported in Prepar3D® v2.x.

Optional Settings in Prepar3D® v2.x

For optimal graphics quality, make sure the texture resolution is set to "Ultra - 4096x4096" in your graphics settings (under "Image and Texture Quality").

Other optional settings require that you manually modify the "Prepar3D.cfg" file located in " C : \ U s e r s \ y o u r n a m e \ A p p D a t a \ R o a m i n g \ L o c k h e e d M a r t i n \ P r e p a r 3 D v 2 ". It is not Xtreme Prototypes' policy to modify the user's "Prepar3D.cfg" file during the installation process. So this needs to be done manually by the user.

Should you decide to change these settings, please make sure that you've made a backup

copy of your original "Prepar3D.cfg" file and saved it in a safe place before proceeding.

To prevent the dynamic head movement in the virtual cockpit under strong acceleration conditions, you can make the following changes:

```
[DynamicHeadMovement]
LonAccelOnHeadLon=0.000000
LonAccelOnHeadPitch=0.000000
RollAccelOnHeadLat=0.000000
YawAccelOnHeadLat=0.000000
RollAccelOnHeadRoll=0.000000
MaxHeadAngle=0.000000
MaxHeadOffset=0.000000
HeadMoveTimeConstant=0.000000
```

Note: If you experience performance issues after optimizing your simulation platform, you may need to upgrade your computer system. Refer to "Minimum System Requirements".

Known Issues in Prepar3D® v4.x/v3.x

Lockheed Martin® Prepar3D® v4.x and v3.x are professional simulation platforms that require a powerful computer and video card to run. We do not recommend flying the GLJ Model 25 SE addon in Prepar3D® v4.x or v3.x if you don't have the required computing power and high-end video hardware.

Note: Prepar3D® v4.x and v3.x require DirectX® 11 and a DirectX® 11-compatible video card. Refer to your simulator's documentation for more details.

Advanced lighting options in Prepar3D® v4.x and v3.x, such as Shadows and HDR Lighting, may dramatically affect performance and reduce frame rate. We recommend moderation when setting these options, especially on slower systems.

Dynamic Reflections should be turned **OFF (or unchecked)**. The GLJ Model 25 SE addon uses its own static cubic environment map. Turning on the Dynamic Reflections has no effect and might decrease performance on your system.

Dynamic Lighting (Prepar3D® v4.x) should be turned **OFF (or unchecked)**. The GLJ Model 25 SE addon is not compatible with this new feature at this time. Turning on Dynamic Lighting will cause the landing and taxi lights to illuminate the cockpit.

Note that the GLJ Model 25 SE addon uses high resolution 4096 x 4096 textures.

- No extrusion effect issues were reported in Prepar3D® v4.x/v3.x.
- No special effect issue related to the view aspect ratio was reported in Prepar3D® v4.x/v3.x.

Cockpit Sound Issue in Prepar3D® v4.x (FSX version only)

If you have installed the FSX version in Prepar3D® v4.x, you will need to copy the included 64-bit sound DLL to the addon's "panel" folder. The DLL is available in the "64-bit sound" subfolder located in the main addon folder. Follow the instructions carefully. Without the 64-bit sound DLL, you will not be able to hear the cockpit sound effects.

Geometry Issue in Prepar3D® v4.0/v3.x

The issue — There is a known issue in Lockheed Martin® Prepar3D® v4.0 and v3.x that affects geometry when a certain number of animations is exceeded in a complex model with many moving parts, such as our GLJ Model 25 SE.

Lockheed Martin® recently acknowledged that there was something wrong in their model optimization routine and that it would be fixed in the next release. This issue no longer exists in the new Prepar3D® v4.1 that was released on October 10, 2017. Unfortunately, there is no fix yet for Prepar3D® v4.0 and v3.x.

If you don't want to upgrade to Prepar3D® v4.1, you will need to modify one line in the "Prepar3D.cfg" file in order for your GLJ Model 25 SE addon to display properly in the sim (see below). No modification is required if you are using Prepar3D® v4.1 and we encourage users to upgrade to the latest version of Prepar3D®.

Please note that this change is only required if you install one of the native versions for P3Dv4 or P3Dv3 in either Prepar3D® v4.0 or v3.x. The change is not required if you install the FSX version in Prepar3D®, because it con-

tains fewer animations (see below).

Please note that the native versions for P3Dv4 and P3Dv3 are fully animated and have more features than the version for FSX. Because we obtained a temporary "solution" from Lockheed Martin® until a permanent fix would become available, we thought that our Prepar3D® users would like to benefit from a fully animated cockpit with many features and we've decided to release the addon fully animated with a note about how to temporarily solve the geometry issue.

In order to bring you this, we needed to exceed the number of animated objects that is currently supported by v4.0 and v3.x of Prepar3D® before the optimization routine starts creating problems. Under these conditions, it is normal for the interior model to display geometry issues such as missing parts, distorted objects, flying geometric figures, etc. This is an undocumented simulator issue, not an addon issue.



How to fix it — To solve this issue in Prepar3D® v4.0/v3.x, you will need to modify the "Prepar3D.cfg" file located in:

C:\Users\yourname\AppData\Roaming\Lock-

heed Martin\Prepar3D v4 or v3

This is the only solution offered by Lockheed Martin® to solve this issue at this time.

Since it is not Xtreme Prototypes' policy to modify the user's "Prepar3D.cfg" file during the installation process, this needs to be done manually by the user. Should you decide to make this change, please make sure that you've made a backup copy of your original "Prepar3D.cfg" file before proceeding:

1. Please exit Prepar3D® v4.0/v3.x and open the "Prepar3D.cfg" file with your text editor (ex.: Notepad).
2. Make the following change:

```
[SIM]
SYSCLOCK=0
OPTIMIZE_PARTS=0 <--- enter 0 (zero) here
```

3. Save the file and close your text editor.
4. Restart Prepar3D®.

Note: If you have more than one version of Prepar3D® installed on your system, please make sure the change was made in the right Prepar3D.cfg (they all have the same name) and that the entry was made correctly.

Also, other applications might change your Prepar3D.cfg and reset `OPTIMIZE_PARTS=1` without telling you. This is usually the case if you re-install Prepar3D® or third-party addons. Please make sure that `OPTIMIZE_PARTS` is set to zero (0) after updating your simulation platform or third-party addons and before flying your new GLJ Model 25 SE addon.

If you have a good computer with a high-end video card, you shouldn't be too concerned with the `OPTIMIZE_PARTS=0` issue. Based on our tests, we didn't notice any significant performance deterioration with `OPTIMIZE_PARTS=0` when flying the GLJ Model 25 SE addon in Prepar3D® v4.0 or v3.x.

Remember that this change is not required if you are using Prepar3D® v4.1.

The FSX version option — If you don't want to make the above modification to the "Prepar3D.cfg" file, you can install the FSX ver-

sion in Prepar3D®. However, please note that the FSX version has less animated objects and features than the native Prepar3D® versions. Fortunately, version 2.1 for FSX has more animations and features than the previous v2.0. So if you don't want to edit your "Prepar3D.cfg", you can still install the FSX version that is fully compatible with all versions of Prepar3D® and you will miss almost nothing. The version for FSX does not require `OPTIMIZE_PARTS=0` because it has fewer animations in the virtual cockpit. Aircraft systems and procedures are the same on all platforms and the simulation is not affected.

What we are doing about it — We've been exchanging for many months with Lockheed Martin® regarding this unfortunate issue. We were told very recently that the issue is now fixed in Prepar3D® v4.1. As mentioned previously, this was not an addon issue. It was an undocumented simulator issue and Lockheed Martin® thanked us for helping them tracking it down:

"We were able to revisit some of the logic of OPTIMIZE_PARTS combined with large counts of animations/visibility tags. We will have a change to support larger numbers in the next public release. Thanks for your assistance in tracking down this issue!" -Adam Breed, Prepar3D® Engineering Project Manager

No patch is required from our side. Prepar3D® users only need to upgrade their simulation platform to v4.1.

Optional Settings in Prepar3D® v4.x/v3.x

For optimal graphics quality, make sure the texture resolution is set to "Ultra - 4096x4096" in your graphics settings (under "Image and Texture Quality").

Other optional settings require that you manually modify the "Prepar3D.cfg" (see previous topic). Should you decide to change these settings, please make sure that you've made a backup copy of your original "Prepar3D.cfg" file and saved it in a safe place before proceeding.

To prevent the dynamic head movement in the virtual cockpit under strong acceleration con-

ditions, you can make the following changes:

```
[DynamicHeadMovement]
LonAccelOnHeadLon=0.000000
LonAccelOnHeadPitch=0.000000
RollAccelOnHeadLat=0.000000
YawAccelOnHeadLat=0.000000
RollAccelOnHeadRoll=0.000000
MaxHeadAngle=0.000000
MaxHeadOffset=0.000000
HeadMoveTimeConstant=0.000000
```

Note: If you experience performance issues after optimizing your simulation platform, you may need to upgrade your computer system. Refer to "Minimum System Requirements".

DOWNLOADING YOUR ADDON



Our products are available for download only. At this time, you should have downloaded the ZIP file that contains two installation programs (one for Prepar3D® v3.x and the other for FSX) from our website and received your personal activation key by email.

The installers for the GLJ Model 25 SE addon are contained in ZIP files to prevent them from being blocked by antivirus programs while the addon is being downloaded from our website (some anti-virus software won't allow you to download ".exe" files).

Make sure you are authorized to download ZIP files (check your antivirus software) or you may not be able to download your addon.

Note: Please contact us if you did not receive your activation key or were unable to download your addon after your order was pro-

cessed.

The ZIP file ("XP_GLJL25_v2r1.zip") weights approximately 1.3 GB and normally takes about 5 to 15 minutes to download on a high speed Internet connection.

Note to FSX: Steam® Edition Users

- The GLJ Model 25 SE addon is fully compatible with Flight Simulator X: Steam® Edition. A special installer, contained in a ZIP file ("XP_GLJ25_v2r1_FSX_Steam.zip"), is available from our "Downloads" section on our website (free for registered users).

Note to Prepar3D v4.x® Users

- The GLJ Model 25 SE v2.1 addon now includes a native version for the new Prepar3D® v4 simulation platform. A special installer for Prepar3D® v4 is available in a ZIP file from our "Downloads" section and the update is free for registered users ("XP_GLJ25_v2r1_P3Dv4.zip").

Known Download Issues

- If you don't have a high speed Internet connection, or experience intermittent connection issues, you may be timed out or disconnected while transferring the file. If you are not able to download your addon after several attempts, we recommend using another and better connection either at work (if allowed) or at a parent's or friend's. If you don't have access to another connection, and still cannot solve the issue, please contact us for other options.
- We recommend using your Internet browser (Internet Explorer, Chrome, etc.) to download your addon. Do not use a third-party download manager or you may experience problems that were reported by a number of users.
- Some antivirus programs may also prevent you from downloading your addon. Make sure your antivirus does not interfere with your downloads. Also, some antivirus won't allow you to download "zip" (or ".exe") files. You can disable your antivirus

program temporarily (while downloading your addon) to solve this issue. Don't forget to reactivate your antivirus after the file is downloaded.

Once downloaded, temporarily save the ZIP file to your computer desktop.

You can download your addon again at any time by logging in to our website. Once you are logged in, select "Review or re-download previous order(s)", click on your order number, and click the link to download your addon. You may download the file a limited number of times. After that, you will need to contact us if you need the file again.

You can also download only the individual installer(s) needed for your simulation platform (s). When in your account page, select "Download available patches and updates for your addon(s)". Fill in the form with your order number and activation key and select the file (s) you want to download (one file at a time). Click the "Download File" button to download the file.

Please note that the replacement of lost downloaded files is not guaranteed. We recommend making an extra copy for your own use and to save it in a safe place along with your personal activation key. Refer to the end-user software license agreement for more details.

PACKAGE DESCRIPTION

Extracting the Installers from the ZIP Files

To extract the installers from the ZIP files, right click the ZIP files and select "EXTRACT ALL...". Follow the instructions to extract and save the installers to your desktop.

The available installers are:

- "XP_GLJ25_v2r1_P3Dv4_setup.exe", a native version for Prepar3D® v4.x
- "XP_GLJ25_v2r1_P3Dv3_setup.exe", a native version for Prepar3D® v3.x
- "XP_GLJ25_v2r1_FSX_setup.exe" for Flight Simulator X (can be used with all

versions of Prepar3D®)

- "XP_GLJ25_v2r1_FSX_Steam_setup.exe", for FSX Steam®

These installers contain the addon and all its components to be installed on your computer. Because of differences between the different simulation platforms, the installers are not interchangeable (except for the FSX version that can be installed in all versions of Prepar3D®).

You may install the four available versions of the GLJ Model 25 SE addon concurrently on your computer if the four simulation platforms are present. However, we recommend installing only the version(s) you intend to use. Each addon will occupy about 3 GB of disk space on your computer when installed.

Note to users of version 2.0: Because version 2.1 is an updated version of version 2.0, we recommend removing version 2.0 from your computer before installing version 2.1 (see instructions below). This is to avoid confusion between aircraft bearing the same name. The installer will not erase nor replace version 2.0, if installed on your computer. Version 2.1 will be installed in different folders.

Note to users of version 1.x: The installer will not erase nor replace the original 20 Series Business Jets addon (version 1.x), if installed on your computer. Version 2.1 will be installed in different folders. You may choose to delete or keep version 1.x before installing the new version. Please note that the original 20 Series Business Jets addon is now a legacy product for which we can no longer offer support.

You will need a valid activation key to install your addon. Please contact us if you did not receive your activation key by email moments after your order was processed.

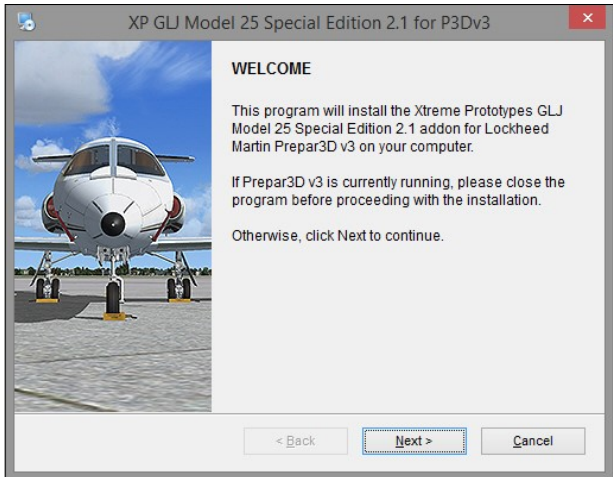
SOFTWARE INSTALLATION

Installation on one simulation platform at a time:

1. Make sure that the required simulation platform has been properly installed according to the instructions provided by the developer before you install your

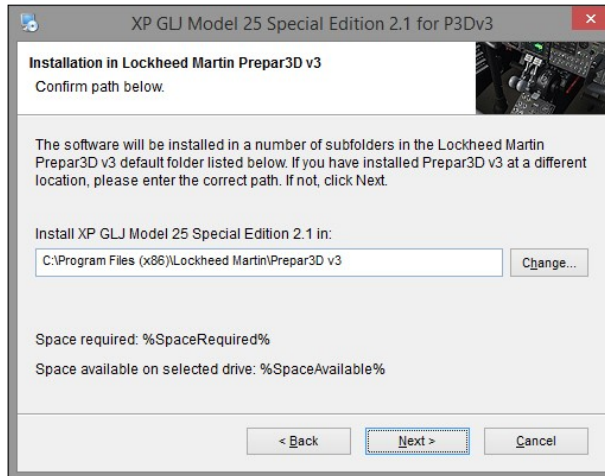
new GLJ Model 25 SE add-on. If your simulation platform is currently running, please close the program before proceeding with the installation. **Make sure you are using the proper installer for your simulation platform (refer to “Package Description”).**

2. **We recommend removing the previous version 2.0 from your computer before installing version 2.1.** This is to avoid confusion between aircraft bearing the same name. The previous version can be removed from the Windows Control Panel (Program/Uninstall a Program), like any other program. Do not use the uninstallation program (uninstall.exe) directly.
3. **Double-click the installer file and follow the instructions that appear on screen.** Enter your name and personal activation key when asked. You must accept the end-user license agreement and enter a valid activation key before you can install and use your add-on. The installer will copy the required files to their proper location on your computer.



Important

- The installer cannot detect the path to your simulation platform's root directory automatically. If you are installing the FSX version in Prepar3D® v1.x or v2.x, you will need to specify the path to your simulation platform during the installation process. You have nothing to do if you are in-



stalling for Prepar3D® v4.x/v3.x or FSX/FSX Steam®. Make sure you are using the proper installer for each simulation platform.

- If you have installed Flight Simulator X or Prepar3D® in a custom folder at a different location on your computer, you will need to specify the correct path/folder during the installation process.

If you have more than one simulation platform installed on your computer, **repeat the previous steps for each add-on version you want to install.**

Note to FSX: Steam® Edition Users

- We recommend using the special installer for FSX: Steam® Edition that is available from our "Downloads" section on our website.
- Please note that FSX: Steam® Edition is installed in a different way to the boxed version and occupies a different location on your computer. With the standard installer for FSX, you would need to specify a different path/root folder during the installation process to deploy the add-on into FSX: Steam® Edition (by default: "C:\Program Files (x86)\Steam\steamapps\common\FSX").
- The installer for FSX: Steam® Edition cannot detect the path to your simulation platform's root directory automatically. If you have installed Flight Simulator X:

Steam® Edition in a custom folder at a different location on your computer, you will need to specify the correct path/folder during the installation process.

Security Warnings (FSX/FSX Steam)

In addition to many other files, important software components need to be installed, trusted and run on your computer for the GLJ Model 25 SE addon to function properly. These are contained in separate DLLs (software libraries).

These DLLs are copied to the addon's panel folder during the installation process. In FSX, you must trust these modules and allow them to run on your computer or the addon will not work properly.

Standard Windows® security warning dialogs will pop up the first time the GLJ Model 25 SE addon is loaded in the simulator, asking if you allow the DLLs to run on your computer. Click

the "Run" button to accept. This needs to be done only once.

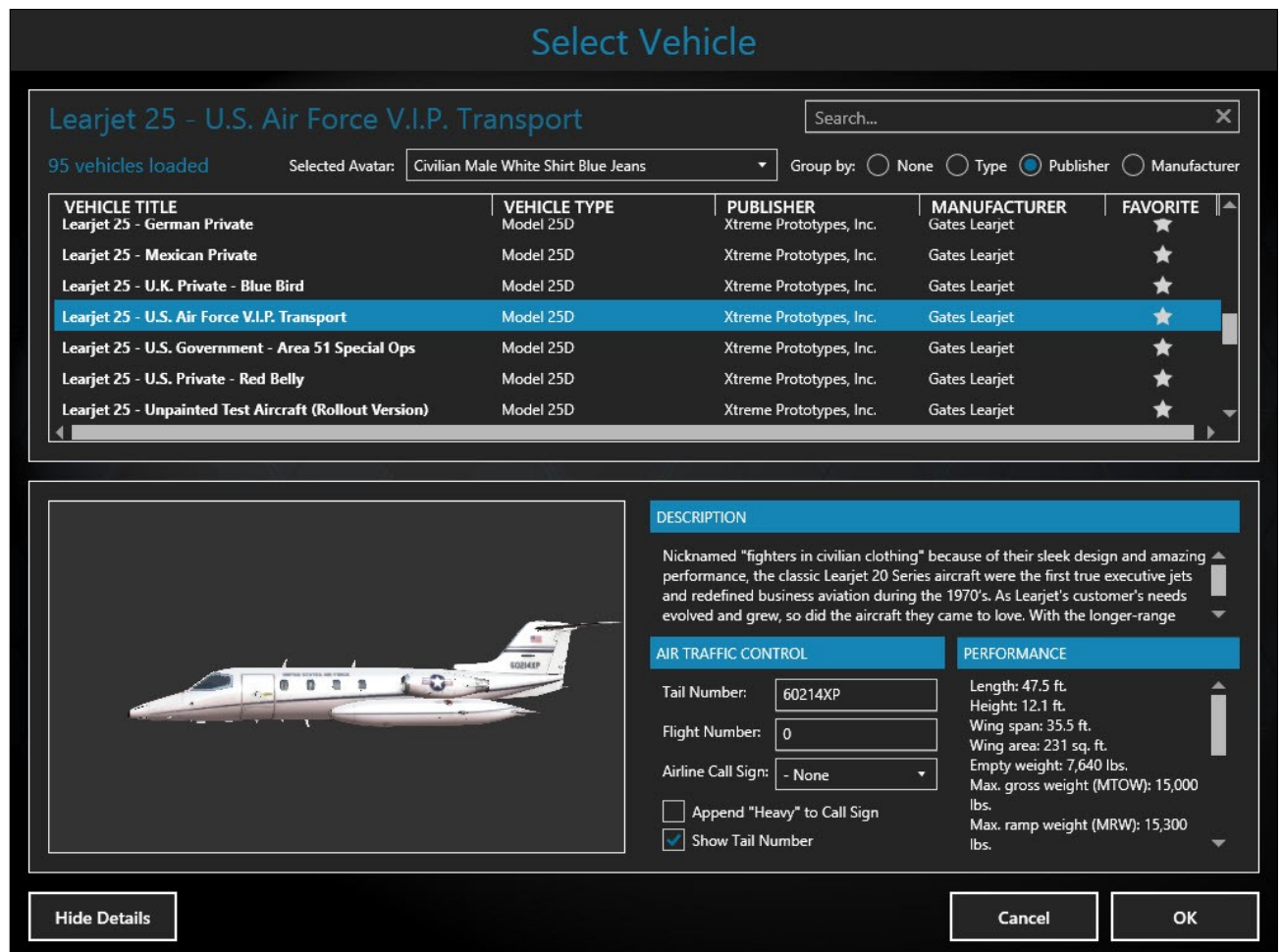
Another dialog will pop up in your simulator's main window the first time the Model 25 SE addon is loaded. This time it asks if you trust the DLLs. Click the "Yes" button to designate the DLL as "trusted" software. This needs to be done only once.

Checking the Installation

Once the addon is installed, the different aircraft variations will be available on the "Select Vehicle" (or "Select Aircraft") page in your simulation platform.

Note: The "Select Vehicle/Aircraft" page may look different from the one shown below, depending on your simulation platform.

The GLJ Model 25 SE addon consists of ten (10) variations of the Gates Learjet Model 25D



business jet. If some aircraft variations are not visible, make sure the **"Show all variations"** option is selected on the "Select Aircraft" page (FSX).

Known Issue (FSX)

- It has been reported during the beta phase that some third-party addons or FS utilities may interfere with the correct installation of the GLJ Model 25 SE addon. These programs may also alter the appearance of your add-on aircraft by modifying the textures and the materials in the model files. If the different GLJ Model 25 SE aircraft variations are correctly displayed in the "Select Aircraft" page but you are unable to select any one of them, or worse if selecting them causes FSX to crash, suspect such third-party programs. For unknown reasons, these programs may prevent the addon's system DLLs from being "trusted" by FSX and the addon will not work. Remove these programs to solve the issue.

Known Issues (All platforms)

- Some antivirus programs may interfere with or prevent the installation of certain software components, including important DLLs. The GLJ Model 25 SE addon will not work properly without these DLLs. If you experience this issue, disable your antivirus program temporarily while reinstalling your addon. Don't forget to reactivate your antivirus after the addon is installed and working properly.
- If there is no sound from the cockpit (for example, when clicking a switch) or some aircraft parts are missing on both the exterior model and the virtual cockpit, try resetting the flight. If this does not solve the issue, it may be because some important software components are missing or were not installed properly during the installation process. If so, you'll need to reinstall the addon to solve this issue. Make sure your antivirus program does not interfere with the installation.
- Some third-party addons/utilities aimed at enhancing the simulation experience in FSX or Prepar3D® may interfere with the

proper operation of the GLJ Model 25 SE addon. If you experience such an issue, simply disable the third-party addon/utility for this aircraft.

File Structure

The GLJ Model 25 SE aircraft models, textures, panels, sounds, systems and configuration files are installed under different names in different folders in your "... *simulator name*\SimObjects\Airplanes" folder.

The special visual effects are installed in your "... *simulator name*\Effects" folder.

Removing the GLJ Model 25 SE addon from your computer

The GLJ Model 25 SE addon can be removed from the Windows Control Panel (Program/Uninstall a Program), like any other program.

Do not use the uninstallation program (uninstall.exe) directly. The uninstallation program is located in the application folder that was created during the installation process and is used by the Windows Control Panel.

You are now ready to go!



AIRCRAFT DESCRIPTION AND SPECIFICATIONS

SECTION 3



The Gates Learjet Model 25 is a twin turbojet-powered light civilian aircraft. It was first tested in the summer of 1966 and introduced in the fall of 1967. An estimated 368 aircraft were built over a period of almost 15 years.

Its low wing has a very slight (15 degrees) sweep and the T-tail is also swept. The wing is equipped with hydraulically-powered, single-slotted Fowler flaps. The wing is also equipped with hydraulically-powered spoilers.

Roll control is achieved through cable-actuated ailerons. Both ailerons are equipped with a balance tab while the left aileron also has a trim tab.

The moveable stabilizer is the primary pitch trim. The cable-controlled elevator is the primary pitch control.

The rudder is also cable-actuated and has a trim tab.

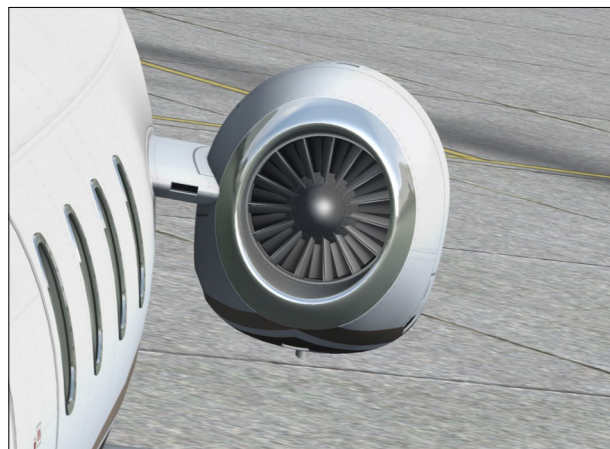
Your new addon consists of ten variations of the Gates Learjet Model 25D aircraft, a longer-range, improved version with greater fuel capacity, introduced in the mid 1970's. It has a short wing with tip tanks and a stretched fuselage compared to previous 20 Series models, allowing more passengers (7 seats +2) and loading options.

AIRCRAFT SPECIFICATIONS

Power Plant

Your GLJ Model 25 SE addon is equipped with the reliable General Electric CJ-610 single-spool turbojet engine. Rated at 2,950 lbs. static thrust per side at sea level, the CJ-610 provides the aircraft with fighter-like performance.

The single-spool turbojet engine will provide more thrust at altitude than a like-rated modern turbofan engine. This makes the 20 Series aircraft well-suited for high altitude flight. The downside is that fuel consumption and noise are far greater.



Your GLJ Model 25 SE addon is equipped with thrust reversers which may be used anytime the airplane is on the ground to produce shorter stopping distances. Each engine is equipped with a Dee Howard target thrust reverser system which consists of upper and lower clamshell doors, pivoted near the engine centerline. The reverser doors are hydraulically actuated and electrically controlled.

Airplane Dimensions

The overall dimensions of the Gates Learjet Model 25D aircraft are:

- **Length:** 47.5 feet
- **Wingspan:** 35.5 feet
- **Height (top of vertical fin to ground):** 12.1 feet
- **Wing area:** 231 sq. feet
- **Wheel base:** 19.2 feet
- **Tread:** 8.25 feet

Airplane Weight

The launch **gross weight** of the airplane (including fuel and internal load) is approximately 15,000 pounds.

Ramp weight is about 15,300 pounds.

The **empty weight** is about 7,640 pounds.

Limitations

- **Maximum Mach:** Mach 0.82 (at 24,000 feet)
- **Maximum speed:** 359 KIAS (306 KIAS under 14,000 feet for protection against bird strikes)
- **Service ceiling:** 45,000 feet
- **Absolute ceiling:** 51,000 feet

Refer to Appendix 1 at the end of this manual for more aircraft reference information.

Airplane Tail Numbers

The tail numbers used for the ten variations of your GLJ Model 25 SE addon are fictitious.

While the tail numbers are painted on the different texture sets and cannot be changed in the "aircraft.cfg" file, a comprehensive paintkit (Adobe® Photoshop® CS5 file format) is provided for users to create their own liveries with tail numbers of their choice. The paintkit is available to registered users from the "Downloads" section on our website.



The tail number on the white plaque located on the main panel in the virtual cockpit (captain's side) can be changed in the "aircraft.cfg" file, located in the main aircraft folder:

```
[fltsim.0]
atc_id=N864XP
```

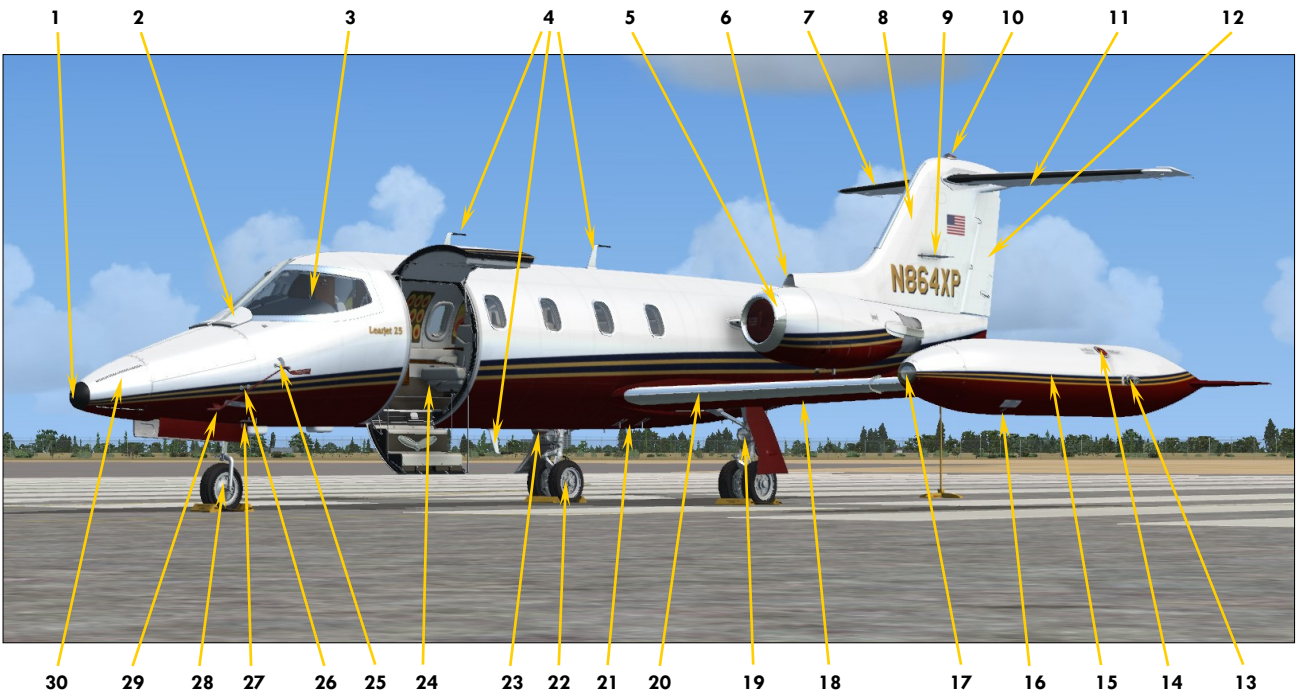


Figure 3-1

- | | |
|--|--|
| 1. Radome Alcohol Outlet | 16. Wingtip Tank Sump Drain Valve |
| 2. Windshield De-Icing Nozzles and Defog Outlets | 17. Recognition Light |
| 3. Windshield | 18. Wing |
| 4. Radio/NAV Antennas | 19. Landing/Taxi Light (2 intensities) |
| 5. Engine Nacelle De-Icing Lip | 20. Wing Heated Leading Edge |
| 6. Cabin Air Intake | 21. Drains and Valves |
| 7. Stabilizer Heated Edge | 22. Main Landing Gear |
| 8. Vertical Fin | 23. Rotating Beacon Light |
| 9. VOR/Localizer Antenna | 24. Main Entry Door |
| 10. Rotating Beacon Light | 25. Stall Warning Vane |
| 11. Movable Stabilizer | 26. Static Ports |
| 12. Rudder | 27. Drains and Valves |
| 13. Navigation and Strobe Lights | 28. Nose Gear |
| 14. Fuel Filler Cap | 29. Pitot Head |
| 15. Wingtip Tank | 30. Radome with Static Dischargers |

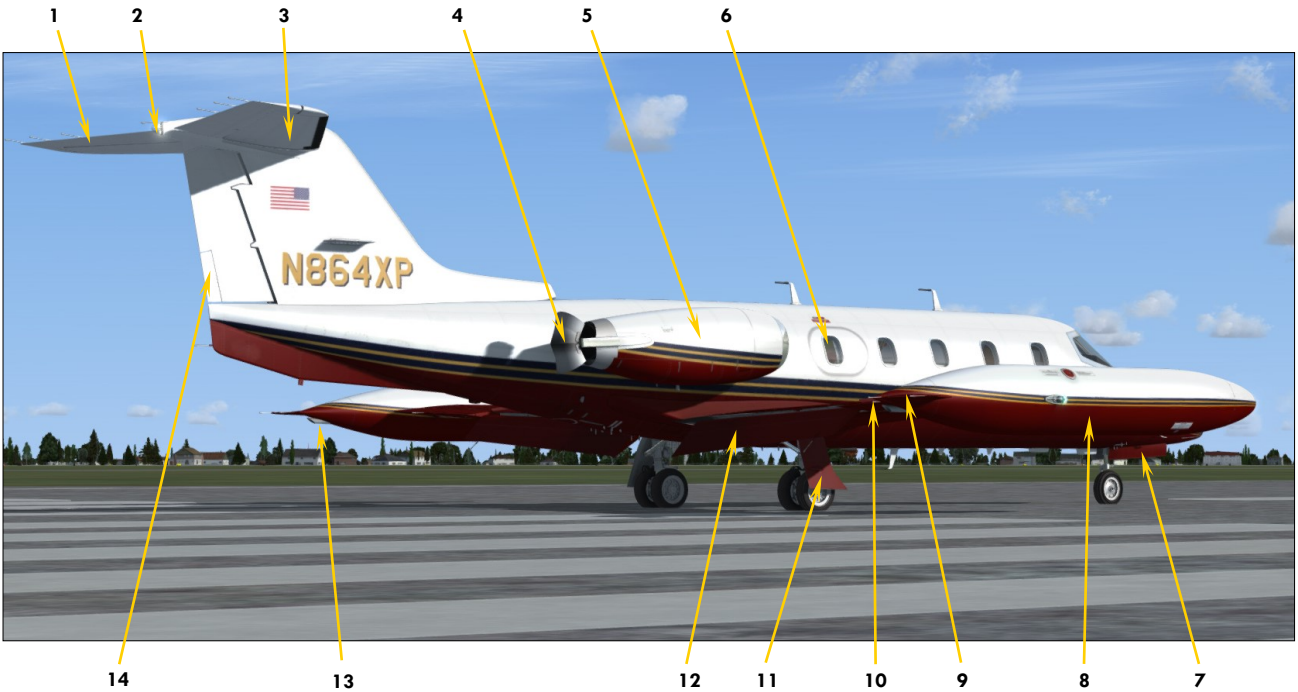
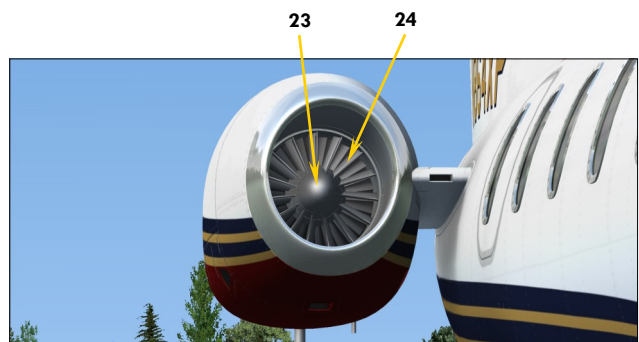
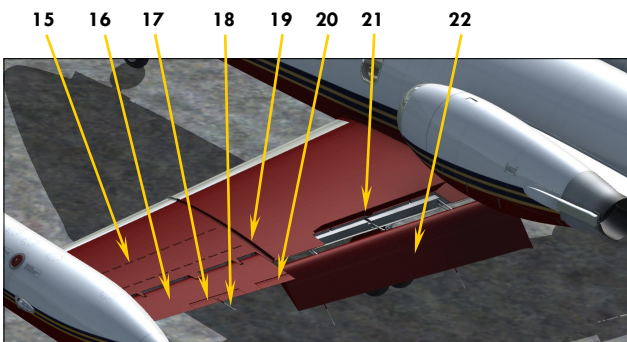


Figure 3-2

- | | |
|---------------------------------|-------------------------------------|
| 1. Elevator | 13. Wingtip Tank Fuel Jettison Tube |
| 2. Navigation and Strobe Lights | 14. Rudder Trim Tab |
| 3. Movable Stabilizer | 15. Boundary Layer Energizers |
| 4. Thrust Reverser | 16. Aileron |
| 5. Engine Nacelle | 17. Aileron Balance Tab |
| 6. Emergency Exit Door | 18. Static Discharger (Wick) |
| 7. Nose Gear Door | 19. Wing Fence |
| 8. Wingtip Tank | 20. Aileron Trim Tab |
| 9. Wingtip Tank Fin | 21. Spoiler |
| 10. Aileron | 22. Flap |
| 11. Main Gear Door | 23. GE CJ-610 Engine |
| 12. Flap | 24. Engine Inlet Guide Vanes |



INSTRUMENT PANELS (FULL 3D VIRTUAL COCKPIT)

SECTION 4



VR-READY 3D VIRTUAL COCKPITS

Most virtual cockpits found in other addons use standard FSX 2D gauges that are "projected" on the various instrument panels. When viewed from an angle, these gauges appear flat even though they might contain needles, buttons, knobs and other movable parts that should not be flat. 2D gauges are generally created with layers of drawings (bitmaps) that are animated, while some may also include vector text and graphics.

The stock FS9/FSX Garmin 500 GPS unit is a good example of a "flat" 2D gauge that contains both bitmaps and vector graphics. Viewed from the side, the knobs and buttons look flat. Also, many 2D gauges use low-resolution graphics and are limited in size.

Xtreme Prototypes' full-3D virtual cockpits don't use low resolution flat 2D gauges found in so many virtual cockpits, except for CRT/LCD screens which are flat by nature, such as in the GPS or radar. They contain fully modeled high resolution instruments and gauges with real moving parts.

This, along with the highly detailed aircraft interior, makes this addon an ideal candidate for new virtual reality applications such as FlyInside®. Equipped with the necessary software and 3D glasses/VR goggles, the desktop pilot really feels he's/she's inside the real aircraft, in front of the real instrument panel, not merely a 2D representation of a panel.

Please note that Xtreme Prototypes next generation addons no longer include 2D panels



found in older products. You must be in the virtual cockpit view to fly this addon. The virtual cockpit allows for a total 3D immersion into the GLJ Model 25 flying environment.

If your addon appears to have no virtual cockpit, make sure you have selected the **VIRTUAL COCKPIT** view in the simulator, not the (2D) main panel view. The virtual cockpit is available from the "Views" menu item on your simulation platform's top menu bar or by pressing the "F9" key. You can cycle forward or backward the different views with the "S" key. You can also select the virtual cockpit as the default cockpit view when configuring your simulation platform.

Multiple cameras are provided when in the virtual cockpit view for entering the passenger cabin and to help the pilot access switches and other items in areas of the cockpit that are difficult to reach. You can cycle through the different camera views when in the virtual cockpit by pressing the "A" key.

The virtual cockpit included with the GLJ Model 25 SE addon contains over 1,500 parts and 250 custom systems, animated gauges, switches, knobs, levers, light indicators and

flight instruments with integrated tooltips (small yellow rectangles with text that appear under the mouse pointer with useful information about the underlying device).

The virtual cockpit and passenger cabin were meticulously modeled to conform as closely as possible to the interior of a typical Gates Learjet Model 25D of the 1970's. Unless otherwise noted, nearly all levers, knobs and switches are clickable and can be used to simulate almost every step and procedure required before, during and after a flight. Features may vary between the Prepar3D® versions and the FSX/FSX Steam® versions. The Prepar3D® versions are fully animated and have more features than the FSX/FSX Steam® versions.

The virtual cockpit contains:

- The captain's panel
- The center panel
- The electrical and radio panels
- The copilot's panel
- The annunciator panel
- The thrust reverser control panel

- The center pedestal
- The pilot's seats with animated armrests, side consoles, circuit breakers, oxygen masks, and other items

Other virtual cockpit features include:

- Animated control columns and yokes that are user-selectable and hideable by clicking the boot. Both columns are equipped with a stick nudger/puller and a stick shaker.
- Configurable power quadrant (the throttles, subthrottles and parking brake lever are hideable)
- Thrust reverser subthrottles
- Animated rudder pedals with differential brakes
- Modified radios for use in the simulator (VHF COM1/COM1 Standby, COM2, ADF1, ADF2, NAV1, NAV2, transponder, DME). Fully compatible with ATC.
- Independent flight director
- DME head
- NAV or GPS navigation modes. The autopilot is retrofitted to be fully functional in GPS mode.
- Fully modeled Garmin 500 GPS and dummy radar — both displays can be replaced by third-party 2D gauges
- Two optional and user-configurable center panels to install third-party 2D gauges such as a new GPS/GTN, radar or glass cockpit. Users can cycle between the optional panels and the default GPS/dummy radar panel at the touch of an icon.
- Analog and digital clocks with stopwatch
- Functional Lear Jet Stereo "Jetstar 8" 8-track tape player on the center pedestal that can play user's music
- Side control knobs
- Animated and slidable sun visors
- Hideable tablet on the copilot side
- Cockpit lighting (instruments, cabin, flood)

Note: Some functionalities may differ from those in the real aircraft due to limitations in the simulation platforms. Some features avail-

able in the Prepar3D® versions may not be available in the FSX/FSX Steam® versions. Until further notice, the FSX/FSX Steam® versions contains less animations than the Prepar3D® versions. However, systems and procedures are the same on all platforms.

Geometry Issue in Prepar3D® v4.0/v3.x

There is a known issue in Lockheed Martin® Prepar3D® v4.0 and v3.x that affects geometry when a certain number of animations is exceeded in a complex model with many moving parts, such as our GLJ Model 25 SE.



This issue no longer exists in the new Prepar3D® v4.1 that was released on October 10, 2017. No patch is required from our side because this is a simulator issue, not an add-on issue. Prepar3D® users only need to upgrade their simulation platform to v4.1. Unfortunately, there is no fix yet for Prepar3D® v4.0 and v3.x.

If you don't want to upgrade to Prepar3D® v4.1, you will need to modify one line in the "Prepar3D.cfg" file in order for your GLJ Model 25 SE add-on to display properly in the sim.

Please note that this change is only required if you install one of the native versions for P3Dv4 or P3Dv3 in either Prepar3D® v4.0 or v3.x. The change is not required if you install the FSX version in Prepar3D®, because it contains fewer animations.

Please note that the native versions for P3Dv4 and P3Dv3 are fully animated and have more features than the version for FSX. Because we obtained a temporary "solution" from Lockheed Martin® until a permanent fix would be-

come available, we thought that our Prepar3D® users would like to benefit from a fully animated cockpit with many features and we've decided to release the addon fully animated with a note about how to temporarily solve the geometry issue.

For more information, please refer to section 2, pages 7-8.

HOW TO ACTUATE SWITCHES, BUTTONS AND KNOBS

- Most **2-position switches** can be turned **ON** or **OFF** with a simple left click with the mouse cursor positioned over the switch actuator. In addition, turning the mouse wheel up will turn the switch to **ON**, turning the mouse wheel down will turn the switch to **OFF**. *If a switch or button does not respond to clicks, it is probably a 3-position switch (see below). Try the mouse wheel instead!*
- Most **3-position switches** can be turned to their **UP** position from their **MIDDLE** (or center) position by turning the mouse



wheel up. Turning the mouse wheel down will move the switch actuator down one position at a time (**UP**, **MID**, **DOWN**). Turning the mouse wheel up will move the switch actuator up again one position at a time (**DOWN**, **MID**, **UP**). *Single-clicking with the left mouse button has no effect on most 3-position switches. Make sure you have a wheel mouse!*

- Some **3-position switches** use a combination of mouse clicks and wheel turns (for



example, the Gyro Drift Compensation Switch [8, fig. 4-5], the Manual Mode Cabin Temperature Control Switch [2, fig. 4-4-] or the Manual Cabin Rate Cherry Picker Switch [3, fig. 4-39]). Turning the mouse wheel will move the switch to either direction while left-clicking will return the switch to its middle (center) position. Other switches, such as the Flaps Switch [25, fig. 4-41] will respond to both the mouse wheel and mouse clicks.

- **Switch guards** can be opened or closed with a simple left click with the mouse cursor positioned over the guard. In addition, turning the mouse wheel up will open the guard, turning the mouse wheel down will close the guard.
- **Push-button switches (and momentary switches)** can be activated with a single left click on the center button/plunger/lever.
- Some **levers and handles** can be dragged with the mouse to the desired position. Simply click on the handle with the left mouse button, drag the handle to the desired position, and release the mouse button.
- **Control columns and yokes** cannot be dragged with the mouse because they are synchronized with the movements of your controller or with the keyboard arrow keys (pitch and roll).
- The **rudder pedals** are synchronized with the rotation movement of your joystick or your flight sim pedals. Note that the **toe brakes** are synchronized with your brake buttons on your joystick/yoke or the toe brakes on your flight sim pedals. *Your GLJ Model 25 SE addon uses differential brakes!*
- **Knobs** can be rotated with the mouse wheel. Turning the mouse wheel up will turn the knob to the right (or up), turning the mouse wheel down will turn the knob to the left (or down). Continuous rotation is possible on some knobs by left or right clicking with the mouse and leaving the mouse button depressed until the knob is set to the desired position. Some knobs have dual functions. Turning the mouse



wheel will actuate the first function while left and right clicking will actuate the second function. On some knobs, like the Autopilot Roll Turn Knob [2, fig. 4-44] or the Autopilot Pitch Command Wheel [10, fig. 4-44], left clicking the knob will return it to its center position.

- **Tooltips** are small yellow rectangles with text that appear under the mouse pointer with useful information about the underlying device. They are integrated to every clickable parts in the virtual cockpit. When the mouse cursor becomes a hand and the tooltip is displayed, the device can usually be actuated with the mouse. If the mouse cursor does not change but the tooltip appears, it means that the device cannot be clicked. However, the tooltip may still contain useful information.

The tooltip always displays the correct reading of the underlying instrument even if power is not supplied to the instrument and the pointers are indicating zero. This



is an indication of electrical power not being supplied to the instrument, or that the breaker affecting the instrument is pulled out, or that the instrument is defective or failed.

Note: If you can't see the tooltips in the virtual cockpit, make sure the "Show cockpit tooltips" option is selected in your simulator's display settings.

Important

- A wheel mouse is required to actuate 3-position switches and some knobs. Refer to "Minimum System Requirements" in section 2.
- It sometimes occurs that the pilot's viewpoint is adjusted too far back and lays inside the pilot seat's backrest, rendering the switches unclickable. When this happens, simply move your viewpoint forward.

HOW TO MOVE THE PILOT'S VIEWPOINT IN THE VIRTUAL COCKPIT



While visibility is excellent looking forward in the GLJ Model 25 SE cockpit, it may be helpful from time to time, and especially during take-off and landing, to move the pilot's viewpoint in the virtual cockpit.

Use the keyboard to move the pilot's viewpoint in the virtual cockpit:

- "CTRL-Backspace" = Move Forward
- "CTRL-Enter" = Move Aft
- "SHIFT-Enter" = Move Up
- "SHIFT-Backspace" = Move Down
- "SHIFT-(left)CTRL-Backspace" = Move Left
- "SHIFT-(left)CTRL-Enter" = Move Right
- "+/-" = Zoom In and Zoom Out
- "SHIFT++ or SHIFT--" = Fine Zoom In or Zoom Out
- "CTRL++ or CTRL--" = Telephoto/Wide Angle Lens adjustment (field of view) — this works only in exterior camera views, but it's good to know
- "Backspace" = Reset Zoom

Caution

- Do not move the pilot's viewpoint too far aft because you may not be able to click some switches if the viewpoint is behind the seat or other obstacles. When this happens, move your viewpoint forward.

Tips

- We recommend using a wide screen aspect ratio in the virtual cockpit if you have a widescreen monitor. Refer to section 2 for more details on how to change the screen aspect ratio on your simulation platform.
- Adjusting both the zoom and the field of view when in external camera views (spot plane, locked spot plane, etc.) will help you make great screenshots.



HOW TO CONFIGURE THE VC

The virtual cockpit offers several options that can be set according to the user's preferences. These options include making the yokes or the throttles and other items visible or invisible, among other features.

Hiding the Control Columns and Yokes

The control columns can be made invisible by clicking the boot. This gives the pilot a better



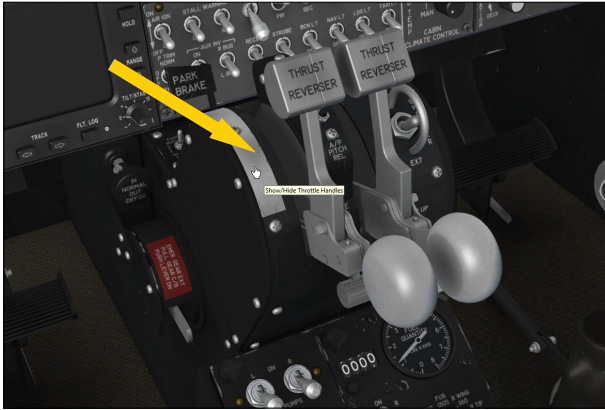
view of the main panel, making the switches and controls more accessible and the instruments more readable. Click the boot again to show the column. Each column/yoke is independent and user-selectable.



Hiding the Throttles

The throttles, subthrottles and parking brake lever can be made invisible by clicking the white strip on the throttle quadrant. This gives the pilot a better view of the switches on the electrical panel and center pedestal. Click the

white strip again to show the throttles and parking brake lever.



Cycling the Optional Instrument Panels

Two optional, user-selectable and configurable instrument panels can replace the default GPS/radar panel on the main instrument panel in the virtual cockpit.

Users can install their own 2D gauges, GPS, radar or glass cockpit systems acquired from third-party vendors in the virtual cockpit on these two optional panels. This is done by modifying a few lines in the addon's "panel.cfg" file (see instructions at the end of this section, pages 9-11).



Users can cycle between two different optional panels and the default GPS/radar panel by clicking the icon marked "OPT PANEL" above the upper right corner of the GPS.

Note: The stock FSX Learjet 45 PFD and EICAS gauges are provided as examples/placeholders only on the first and second optional panels and should be replaced by the user. They should not be used to fly the GLJ Model 25 SE addon. The Honeywell Primus 1000 system is not part of the Learjet 25.



Playing Music in the Cockpit



As a tribute to the inventive genius of Bill Lear, your GLJ Model 25 SE addon contains a functional “Jetstar 8” 8-track tape player installed on the center pedestal that can play up to four different tracks of stereo music, like the original player.

By default, we’ve programmed the FSX stock opening music but the tracks can be changed to any piece of music of your choice.

To play your own music, simply convert four of your favorite music pieces to **.wav** files and renamed them:

SND31.wav
SND32.wav
SND33.wav
SND34.wav

Copy these files to the “extra” folder that is contained in the “sound” folder of the addon’s main folder. The “extra” folder contains the cockpit sound effects, including the music from the 8-track tape player.

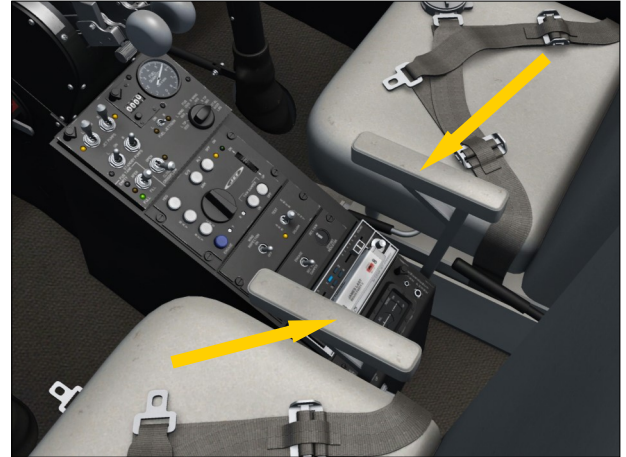
Left-clicking the 8-track tape cartridge [2, fig. 4-46] will play the music, starting with track number 1. Right-clicking will stop playing. Clicking the “Select” button [1, fig. 4-46] will switch between tracks.

Bill Lear introduced the world’s first Lear Jet Stereo 8-track player for automobiles back in the spring of 1965 through the Lear Jet Stereo division, an extension of Lear Jet Corporation.

The format will largely be adopted by the music industry and major electronics and car manufacturers from the mid-1960’s to the late 1970’s.

We thought it would be fun to add a Jetstar 8 player in the cockpit of our new GLJ Model 25 SE addon, along with a James Last 8-track cartridge, another adult icon of the 1970’s.

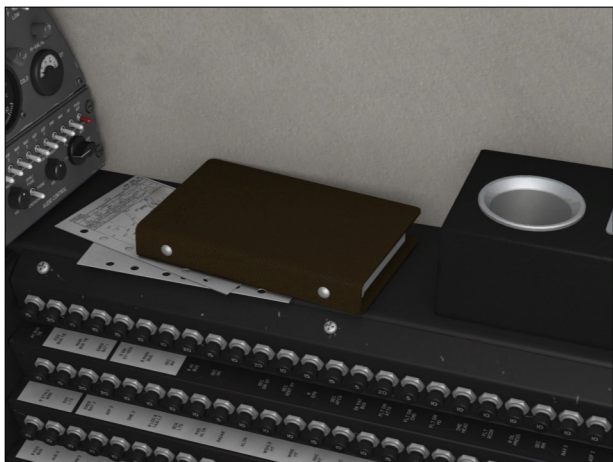
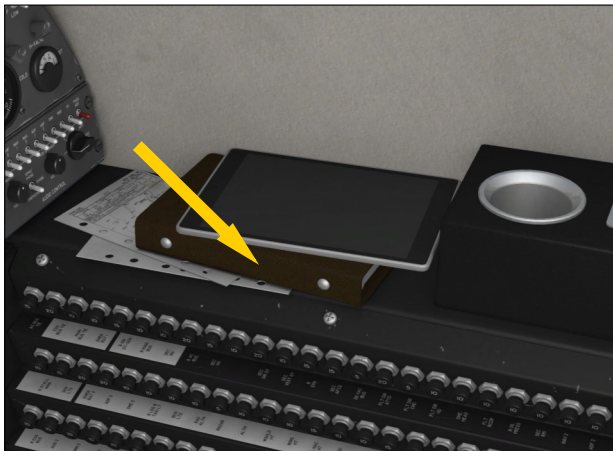
Releasing the Armrests



Simply click the armrests to release them. Click again to raise them.

Hiding the iPad® Tablet in the Cockpit

The iPad® tablet sitting on the right console can be made invisible (tablets didn’t exist in the 1970’s after all). To show or hide the iPad®, simply click the brown binder under it. Clicking the tablet will show/hide the map.



Using the Sun Visors



Click the green plastic section to lower or to raise the sun visor. Click and drag the hinge to slide the sun visor along the track.

RETROFITTING THE COCKPIT



Let's put the record straight. This addon strives to bring you the spirit and the actual feeling of flying a high performance business jet at a time when LCD screens, GPS and powerful computers didn't exist and pilots needed to know how to fly and navigate with minimal resources and to rely on their own experience, abilities and judgment. This is how real-world Learjet 25 pilots, like our special contributor Alan Velazquez, are still flying today (see "Foreword", page 12).

While retrofitting the main panel with modern instruments can be fun, it must be remembered that the Gates Learjet Model 25 is a 1970's aircraft equipped with the original analog instruments from that period. Nothing was spared in our efforts to reproduce the original panels, carefully modelling, animating and programming each mechanical device found in the real aircraft.

For classic aircraft enthusiasts, a carefully planned VFR or IFR flight is sure to be a rewarding, if not challenging experience. This addon provides all the instruments, controls and features necessary for complete IFR flight, in addition to a fully modeled Garmin 500 GPS receiver, a device widely installed in retrofitted Learjet 25 still in service today.

While we recognize the merit of some of our users' requests for more modern avionics, it was never part of this project to design a full glass cockpit for this legendary aircraft which would be unrealistic from a historical point of view and difficult to achieve in the real world.



due to the cost of implementing the technology to a legacy panel and getting the installation FAA approved. In our view, replacing the “steam gauges” with LCD screens would kill the spirit of what we wanted to achieve with this project.

This is why we absolutely wanted to keep the look and feel of the original instrument panel while at the same time giving users the possibility to add their own gauges acquired from third-party vendors, even though space was rather limited on the main panel.

Installing Third-Party 2D Gauges

We cannot guarantee support for third-party gauges and we didn't try them all. However, as a rule of thumb, as long as these systems are contained in standard 2D gauges (XML or DLL) that are compatible with Prepar3D® and/or FSX, you can add them to the optional panels in the VC.

The GLJ Model 25 SE addon is a standard P3D/FSX add-on aircraft. If you were able to add your own third-party gauges to the VCs of default (stock) aircraft or other add-ons on your simulation platform, you shouldn't normally have any problem adding them to the VC of the GLJ Model 25 SE addon.

For example, by default we've installed the stock FSX Learjet 45 PFD on the first optional panel and the FSX Learjet 45 EICAS on the second optional panel. These two gauges are standard XML gauges contained in a cabinet file included with FSX. By clicking the icon marked “OPT PANEL” located right above the default GPS unit, you can cycle between the default GPS/radar panel and the two other optional panels (PFD and EICAS).

You are only limited by the space available on these two panels. For example, you probably won't be able to have both your third-party GPS/GTN and radar units on the same panel, unless they fit perfectly or their size can be adjusted. Space is rather limited on the Model 25 main panel that was not originally designed for modern instruments with large LCD screens. In this case, you would probably install your GPS/GTN on one panel and your radar on the second panel.

Note: The stock FSX Learjet 45 PFD and EICAS gauges are provided as examples/placeholders only on the first and second optional panels and should be replaced by the user. They should not be used to fly the GLJ Model 25 SE addon. The Honeywell Primus 1000 system is not part of the Learjet 25.

Most third-party gauges are installed like standard P3D/FSX gauges by modifying a few



lines in the addon's "panel.cfg" file. However, some may be installed differently and may have their own installers, so please make sure that they are standard P3D/FSX gauges fully compatible with your simulation platform.

The image above shows the Reality XP® GTN 650/750 Touch units installed on the first optional panel in the VC (not included, third-party gauges sold separately).

Always backup the addon's "panel.cfg" file before attempting to install third-party gauges in your new GLJ Model 25 SE addon.

Third-party gauges can also be added as "popup" gauges available from the simulator's top menu. You can use them for a better view in detached windows or on a separate monitor as the display in the virtual cockpit will generally be too small. In all cases, you will need to modify the "panel.cfg" file accordingly.

Refer to the instructions provided with your third-party gauges for details about special installation and to your simulation platform's SDK for more information about how to modify the addon's "panel.cfg" file (like for adding

a popup gauge to the menu bar).

To install third-party 2D gauges on the provided optional panels, simply edit the addon's "panel.cfg" file (contained in the addon's "panel" folder) with your favorite text editor.

The two virtual cockpit optional panels are configured in the following sections of the "panel.cfg" file. The stock FSX Learjet 45 PFD and EICAS gauges are installed by default and can be replaced by the user:

```
// First optional panel -----
[Vcockpit03]
Background_color=36,36,36
size_mm=1024
visible=1
pixel_size=1024,1024
// no_luminous=1
texture=$GLJ25_02_G_C
gauge00=Lear_45_XML!PFD,248,119,536,800

// Second optional panel -----
[Vcockpit04]
Background_color=36,36,36
size_mm=1024
```

```

visible=1
pixel_size=1024,1024
// no_luminous=1
texture=$GLJ25_03_G_C
gauge00=Lear_45_XML!EICAS,248,119,536,800

```

Depending on their individual size, more than one gauge can be installed on a single optional panel and should be named accordingly:

```
// First optional panel -----
```

```

[Vcockpit03]
Background_color=36,36,36
size_mm=1024
visible=1
pixel_size=1024,1024
// no_luminous=1
texture=$GLJ25_02_G_C
gauge00=My_Gauge_Cab!My_Gauge_No1
250,120,50,50
gauge00=My_Gauge_Cab!My_Gauge_No2
300,120,50,50
gauge00=My_Gauge_Cab!My_Gauge_No3
350,120,50,50

```

The following example shows how to install the Flight1® GTN 650/750 units on the first optional panel (not included, third-party addons sold separately):

```
// First optional panel -----
```

```

[Vcockpit03]
Background_color=36,36,36
size_mm=1024
visible=1
pixel_size=1024,1024
// no_luminous=1
texture=$GLJ25_02_G_C
// gauge00=Lear_45_XML!PFD,248,119,536,800
gauge00=F1GTN!
GTN750,248,119,536,525,UNIT1.VC
gauge01=F1GTN!
GTN650,248,644,536,275,UNIT1.VC

```

Please note that this information is provided as an example only and that some tweaking might be necessary to fit the gauges perfectly inside the panel.

Refer to your simulation platform's SDK for more information about how to modify the addon's "panel.cfg" file. Again, make sure you have a backup copy of the addon's original "panel.cfg" file before you edit its content.

Important: You cannot remove [Vcockpit03] and [Vcockpit04]. You can only change the gauges in them.





Replacing the GPS and Radar Displays



It is possible to replace what appears on the screen of the default GPS and dummy radar with your own third-party gauges by editing the following sections in the addon's "panel.cfg" file:

```
// Default FSX Garmin 500 GPS display ----
[Vcockpit00]
Background_color=36,36,36
```

```
size_mm=1024
visible=1
pixel_size=1024,1024
no_luminous=1
texture=$GLJ25_01_G_C
gauge00=fs9gps!gps_500,211,248,670,586
```

```
// Dummy radar display -----
```

```
[Vcockpit01]
Background_color=36,36,36
size_mm=1024
visible=1
pixel_size=1024,1024
no_luminous=1
texture=$GLJ25_05_G_C
gauge00=XPGLJ25v2!
dummy_radar_screen,212,270,602,445
```

Important: You cannot remove [Vcockpit00] and [Vcockpit01]. You can only change the gauges in them.

Please note that replacing the display (what appears on the screen) will have no effect on the 3D buttons which are at this time hard-coded in the model. However, you will be able to control your new GPS or radar by using the buttons and knobs on their "popup" counterparts, if installed.

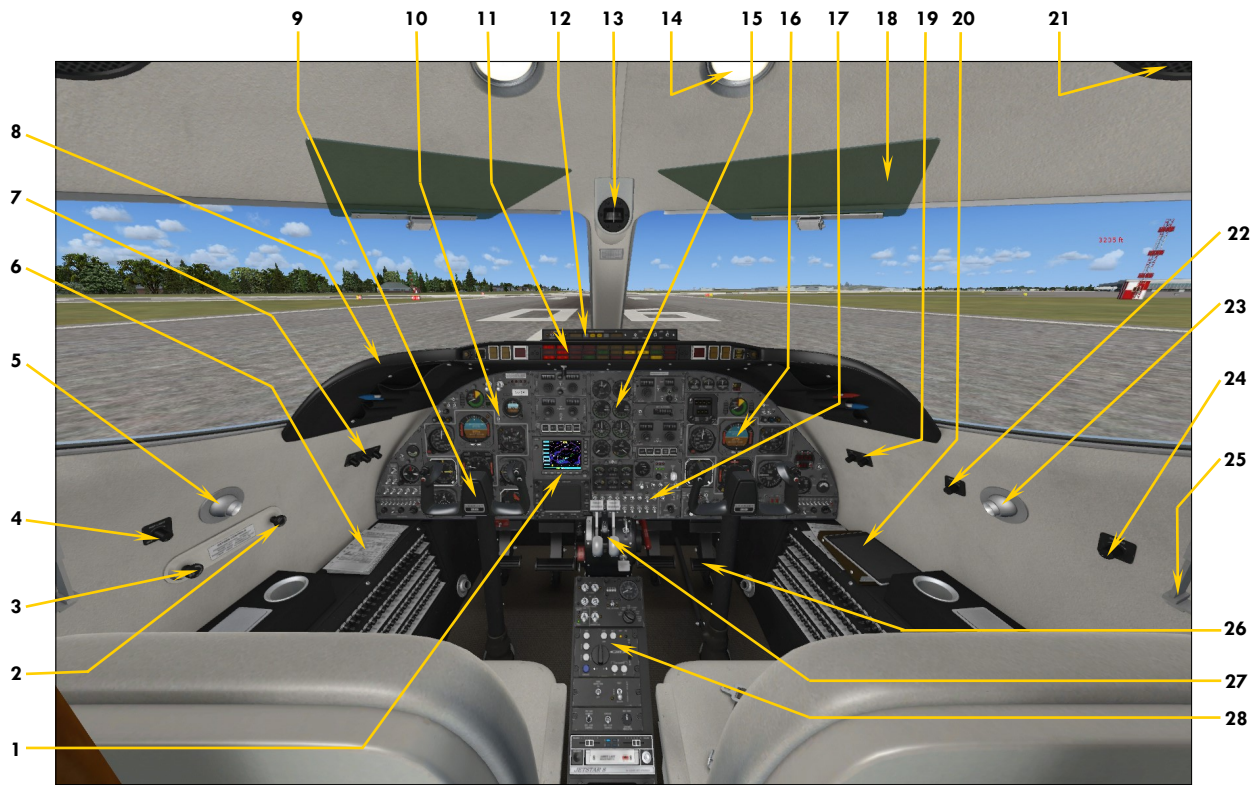


Figure 4-1

- | | |
|---|--|
| 1. Default GPS/Dummy Radar Panel
<i>Can be replaced by user-selectable optional panels to install third-party gauges. Refer to section 4, pages 8 and 10-13.</i> | 14. Cockpit Light |
| 2. Passenger Oxygen Valve | 15. Center Instrument Panel |
| 3. Passenger Mask Valve | 16. Copilot's Instrument Panel |
| 4. Captain's Map Light Control | 17. Electrical Panel |
| 5. Captain's Map Light | 18. Sun Visor |
| 6. Flight Maps
<i>Click to open the flight map.</i> | 19. Cockpit Lighting Controls |
| 7. Cockpit Lighting Controls | 20. Hideable iPad® Tablet (n/s)*
<i>Click to open the flight map.</i> |
| 8. Glareshield | 21. Ceiling Speaker |
| 9. Hideable Control Column and Yoke | 22. Copilot's Map Light Control |
| 10. Captain's Instrument Panel | 23. Copilot's Map Light |
| 11. Fire and Main Annunciator Panel | 24. Cockpit Cooling Fan Control |
| 12. Thrust Reversers Control Panel | 25. Oxygen Mask (n/s)* |
| 13. Magnetic ("Whiskey") Compass | 26. Rudder and Brake Pedals |
| | 27. Hideable Throttle Quadrant |
| | 28. Center Pedestal |

Note: (n/s) = not simulated. Device may be animated and may also have limited functionality and a tooltip. Refer to the following pages for details.

Some features may not be available in FSX.



Figure 4-2

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Audio Panel 2. Ice Protection Switches 3. Analog Clock 4. Wing Temperature Gauge 5. Directional Gyro 6. Radio Magnetic Indicator (RMI) 7. Airspeed/Mach Indicator (ASI) 8. Marker Beacon Lights 9. Gyro Switches 10. Flight Director Annunciators 11. Left Angle-of-Attack Indicator 12. Attitude Director Indicator (ADI) 13. Horizontal Situation Indicator (HSI) 14. Emergency Batteries Switches | <ol style="list-style-type: none"> 15. Optional Test Probe Icon
<i>Click to show/hide the (boom) nose test probe.</i> 16. Anti-Skid Generator Lights 17. Tail Number Plaque
<i>Click to show/hide the ATC window.</i> 18. Standby (Horizon) Gyro 19. Standby Gyro Caging/Adjustment Knob 20. Autopilot NAV1/GPS Switch 21. Flight Director Switch 22. Altimeter 23. Vertical Speed Indicator (VSI) 24. Trim Indicators 25. Radio Altimeter 26. Radio Altimeter Power Switch 27. Alternate Static Source Switch (n/s) |
|--|---|



Figure 4-3

- | | |
|--|--|
| <p>1. COM1 Monitor Switch
Set both COM1/COM2 Monitor Switches to ON to receive on both radios.</p> <p>2. COM2 Monitor Switch
Set both COM1/COM2 Monitor Switches to ON to receive on both radios.</p> <p>3. NAV1 Monitor Switch
Allows the pilot to listen to navigation code identifiers.</p> <p>4. NAV2 Monitor Switch
Allows the pilot to listen to navigation code identifiers.</p> <p>5. ADF1 Monitor Switch
Allows the pilot to listen to navigation code identifiers.</p> <p>6. ADF2 Monitor Switch
Allows the pilot to listen to navigation code identifiers.</p> <p>7. DME Monitor Switch
Allows the pilot to listen to navigation code identifiers.</p> | <p>8. Marker Beacon Monitor Switch
Allows the pilot to listen to navigation code identifiers.</p> <p>9. HF Monitor Switch (n/s)
This aircraft is not equipped with a short wave (HF) transceiver.</p> <p>10. ADF to Passengers Switch (n/s)
Allows selected ADF (radio) station to be broadcast in the cabin. Not simulated.</p> <p>11. Audio Transmit Selector Knob
Select COM1 or COM2 for radio transmit. Will turn COM1/COM2 Monitor Switches ON/OFF accordingly for radio reception on selected unit. HF radio, interphone and passenger speakers positions are not simulated.</p> <p>12. Passenger Speakers Volume Control Knob (n/s)</p> <p>13. Audio Output Selector Switch (n/s)</p> <p>14. Master Volume Control Knob (n/s)</p> |
|--|--|

Note: COM1 and COM2 refer to the VHF voice communication transceivers [Fig. 4-20 and 4-21]. NAV1 and NAV2 refer to the navigation receivers [Fig. 4-19]. ADF1 and ADF2 refer to the low-frequency NDB (ADF) receivers [Fig. 4-18]. DME refers to the distance measuring equipment installed in this aircraft (see "DME Head", fig. 4-36). Marker Beacon refers to the old VHF radio beacons used in conjunction with ILS (see fig. 4-5). Navigation code identifiers are broadcast in Morse in the simulator. The GLJ Model 25 SE add-on is not equipped with a short wave (HF) transceiver because it is not supported in the simulator. P.A. system and intercom are not simulated.

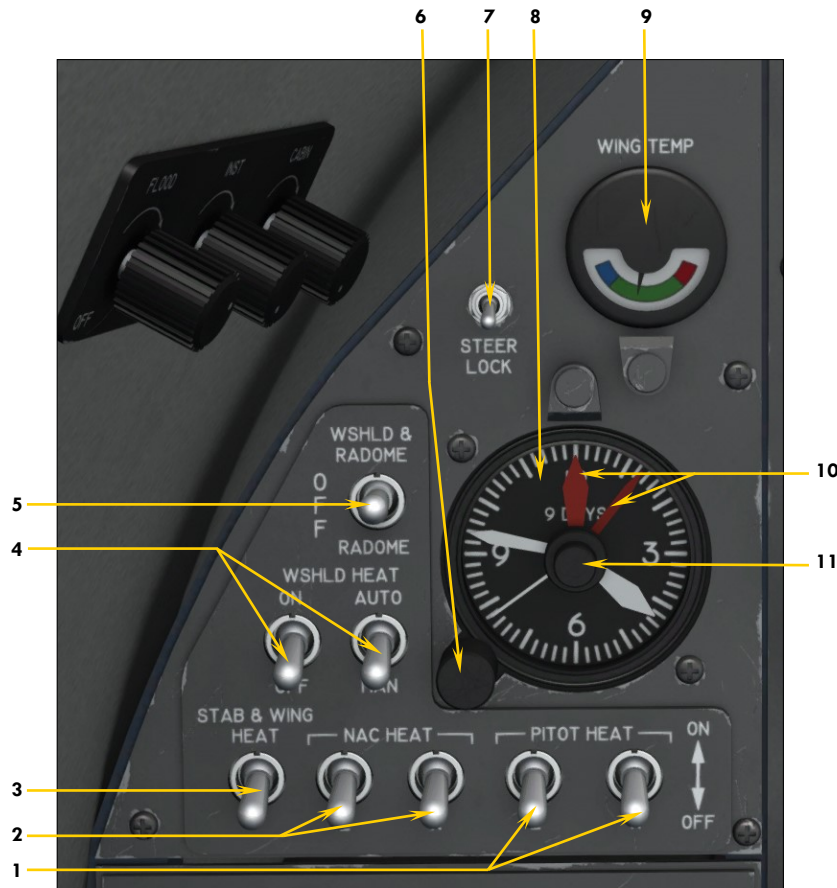


Figure 4-4

1. **Pitot Heat Switches**
These switches turn on heating elements in the pitot tubes and stall vanes. Due to limitations in the simulator, these two switches are linked.
2. **Engine Nacelle Heat Switches**
These switches turn on heating elements and energize control valves that allow bleed air from the engine to circulate and prevent ice formation on the engine inlet components.
3. **Wing and Stabilizer Heat Switch**
This switch energizes the control valve that allows bleed air to circulate and prevent ice formation on the wing leading edges. It also turns on heating elements on the stabilizer leading edges, if the aircraft is in flight. Requires the Bleed Air Switch [1, fig. 4-39] to be set to NORM or MAX.
4. **Windshield Heat Switches (n/s)**
These switches control the valve that allows bleed air from the engine to enter the footwarmer and defrost system and to heat the windshield if the Windshield Defog Knob [7, fig. 4-41] is pulled out. Requires the Bleed Air Switch [1, fig. 4-39] to be set to NORM or MAX.
5. **Anti-Ice Alcohol Switch (n/s)**
This switch activates the pump that supplies methyl alcohol to the windshield or radome to prevent ice formation.
6. **Time Setting Knob**
Use the mouse wheel to set minutes. Use the mouse buttons to set hours.
7. **Nose Gear Steer Lock Switch**
Click this momentary switch to engage electrical nose gear steering. A green annunciator [14, fig. 4-30] will illuminate on the main annunciator panel. Click the switch again to disengage electrical nose wheel steering (the annunciator will go off). This switch is spring loaded. Nose wheel steering is accomplished automatically in the simulator at certain speeds. See also "Wheel Master Button" [2, fig. 4-50].
8. **Analog Clock**
9. **Wing Temperature Gauge**
Blue arc: temperature below 35°F. Green arc: above 35°F and below 215°F. Red arc: above 215°F (reduce RPM). Make sure the needle is in the green.
10. **Clock Red Hands (Bugs)**
11. **Clock Red Hands Setting Knobs**
Outer (large) for hours, inner (small) for minutes. Red hands are used as markers (bugs) on this clock model. Stopwatch functions are available on the Copilot's Digital Clock. See fig. 4-38.

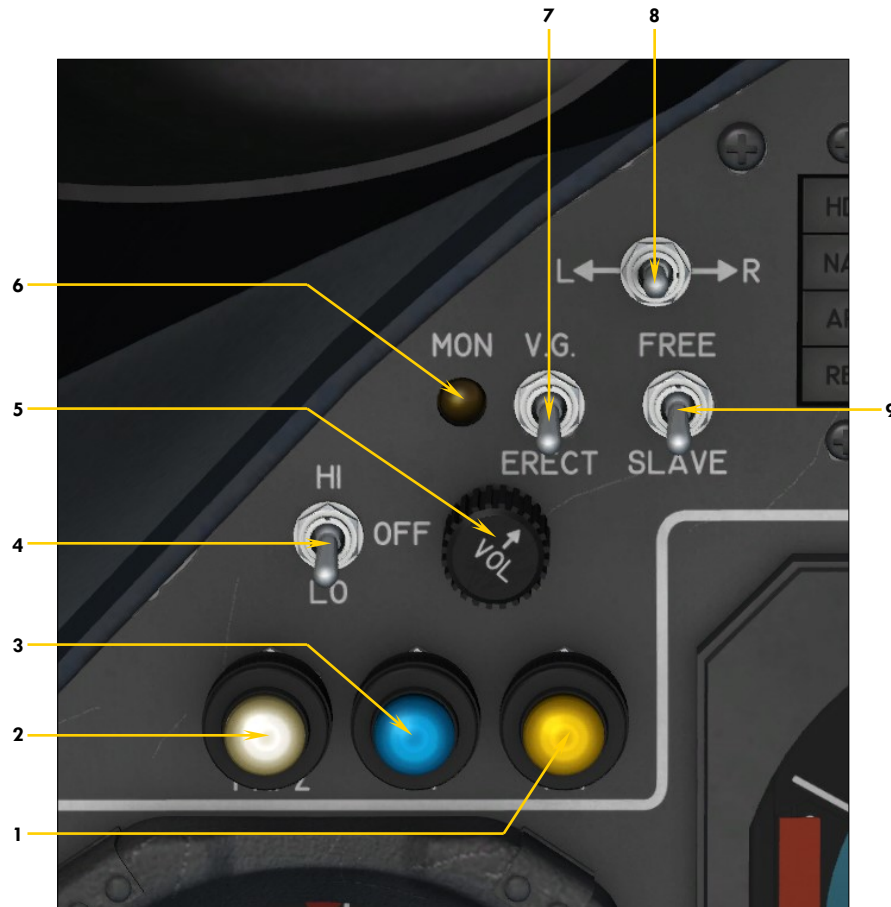


Figure 4-5

1. Middle Marker* Light (yellow)
2. Inner Marker* Light (white)
The old airway or fan/z marker light is replaced by the Inner Marker Light in the simulator.
3. Outer Marker* Light (blue)
4. Captain's Auxiliary Heat Switch (n/s)
5. Marker Beacon* Sound Volume Knob (n/s)
6. Marker Beacon* Monitor Light
Illuminated if Marker Beacon Monitor Switch [8, fig. 4-3] on the audio panel is ON.
7. Vertical Gyro Erect Switch
This switch is used to re-erect the gyroscope if the ADI tumbles and becomes temporarily unusable after experiencing strong unusual attitudes. Use this switch to cage (lock in place) the gimbals in the ADI to prevent damage to the gyroscope. Actuating this switch will disengage the autopilot.
8. Gyro Drift Compensation Switch
When the gyro operates in free mode (see below), use the mouse wheel to manually correct gyro drift. Click to reset the switch to its middle position. Refer to your simulation platform's documentation for a complete discussion about gyro drift.
9. Directional Gyro Free/Slave Switch
When the switch is set to SLAVE, the directional gyro is slaved to the magnetic flux valve for correcting the apparent gyro drift. When the switch is set to FREE, the pilot is free to make manual corrections with the Gyro Drift Compensation Switch (see above). The SLAVE position is the normal mode of operation in areas where magnetic references are reliable. Actuating this switch will disengage the autopilot.

*: Marker beacons are legacy VHF radio beacons normally used in conjunction with ILS to provide indications of an aircraft's position along a route. They are becoming more and more obsolete. There is an excellent article about marker beacons on [Wikipedia.org](https://en.wikipedia.org/wiki/Marker_beacon).



Figure 4-6

1. REV (Reverse Course Mode) Annunciator
2. NAV CAPT (Course Captured) Annunciator
3. NAV ARM (Navigation Hold Mode) Annunciator
4. HDG (Heading Hold Mode) Annunciator
5. Angle-of-Attack Indicator
 - Alive above 80 KIAS
 - **Green arc:** Safe maneuvering range
 - **Yellow arc:** Caution range, impending stick shaker condition
 - **Red line:** Stall, stick nudger condition (or system being tested)
6. GS ARM (Glideslope Mode) Annunciator
7. GS CAPT (Glideslope Captured) Annunciator
8. EXT (Course and Glideslope Captured) Annunciator
9. GA (Takeoff/Go-Around Mode) Annunciator

Note: Refer to section 5, page 24, for a complete discussion about the flight director annunciators. The angle-of-attack needle will move into the red zone when testing the stall warning system (see 13-14, fig. 4-41). The Left Angle-of-Attack Indicator is independent from the Right Angle-of-Attack Indicator.

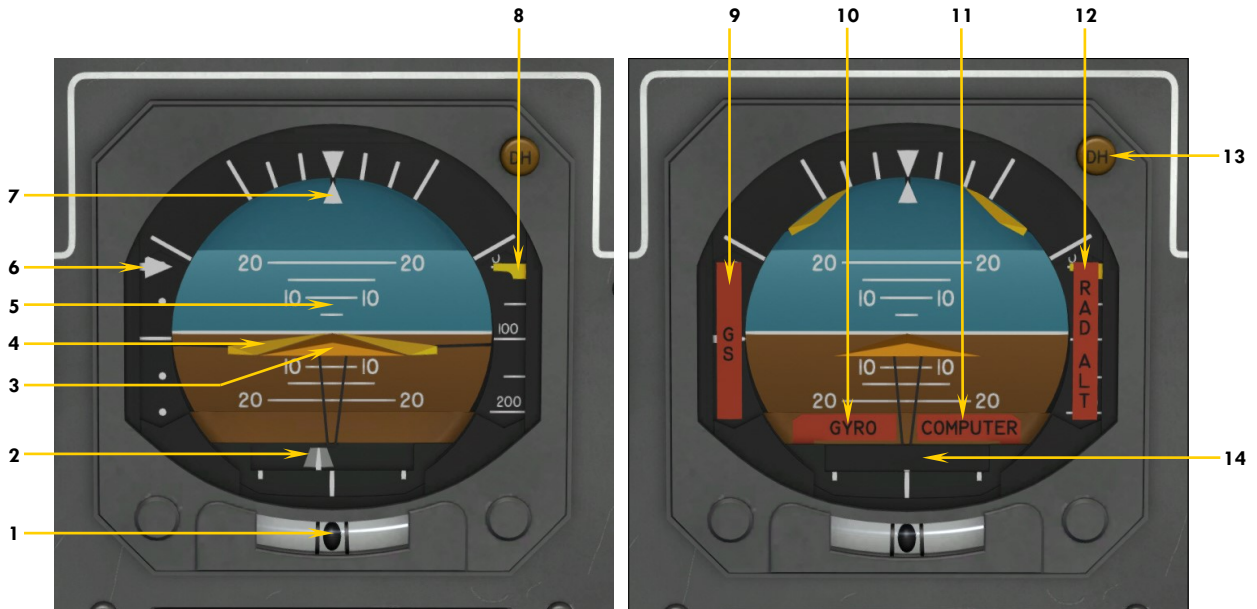


Figure 4-7

1. **Inclinometer Ball Indicator**
Indicates slip/skid condition (if the turn is coordinated, the ball is centered).
2. **Localizer Deviation Runway Symbol**
Repeats HSI CDI indication when a valid localizer signal is present. If the runway symbol is aligned with the middle reference bar, the aircraft is on course and aligned with the runway.
3. **Fixed Airplane Symbol**
A stationary reference symbol that represents the aircraft.
4. **Flight Director Command Bars**
Maneuvering guidance - Advisory. Turn ON the Flight Director Switch [1, fig. 4-16] to activate the command bars. The bars are parked and inactive when the Flight Director Switch is OFF. Refer to section 5, page 16, for a complete discussion about the flight director and the command bars.
5. **Attitude Tape**
Rotates for roll, moves up and down for pitch.
6. **Glideslope Deviation Indicator**
Repeats HSI glideslope deviation indication [6, fig. 4-8]. The arrow represents the glideslope. When the arrow is above the middle reference line, you are too low. When the arrow is below the middle reference line, you are too high. When the arrow is aligned with the middle reference line, you are on the glideslope.
7. **Bank Indicator**
Indicates present bank angle.
8. **Radio Altimeter Below 200 ft. Indicator**
Indicates the last 200 feet above ground. See "Radio Altimeter", fig. 4-13.
9. **Glideslope Warning Flag**
Indicates unreliable or non-existent glideslope signal.
10. **Gyro Warning Flag**
Indicates inoperative gyroscope.
11. **Computer Warning Flag**
Indicates inoperative AFCS computer.
12. **Radio Altimeter Warning Flag**
Indicates unreliable or non-existent radio altimeter signal.
13. **Decision Height Annunciator**
Indicates aircraft at or below selected decision height. See "Radio Altimeter", fig. 4-13.
14. **Runway Symbol Shutter**
Indicates unreliable or non-existent localizer signal.

Note: All NAV indications coupled to NAV1 radio [Fig. 4-19] or GPS [Fig. 4-24], depending on position of the NAV1/GPS Switch [5, fig. 5-16].

Main Panel (both sides)

HORIZONTAL SITUATION INDICATOR (HSI)

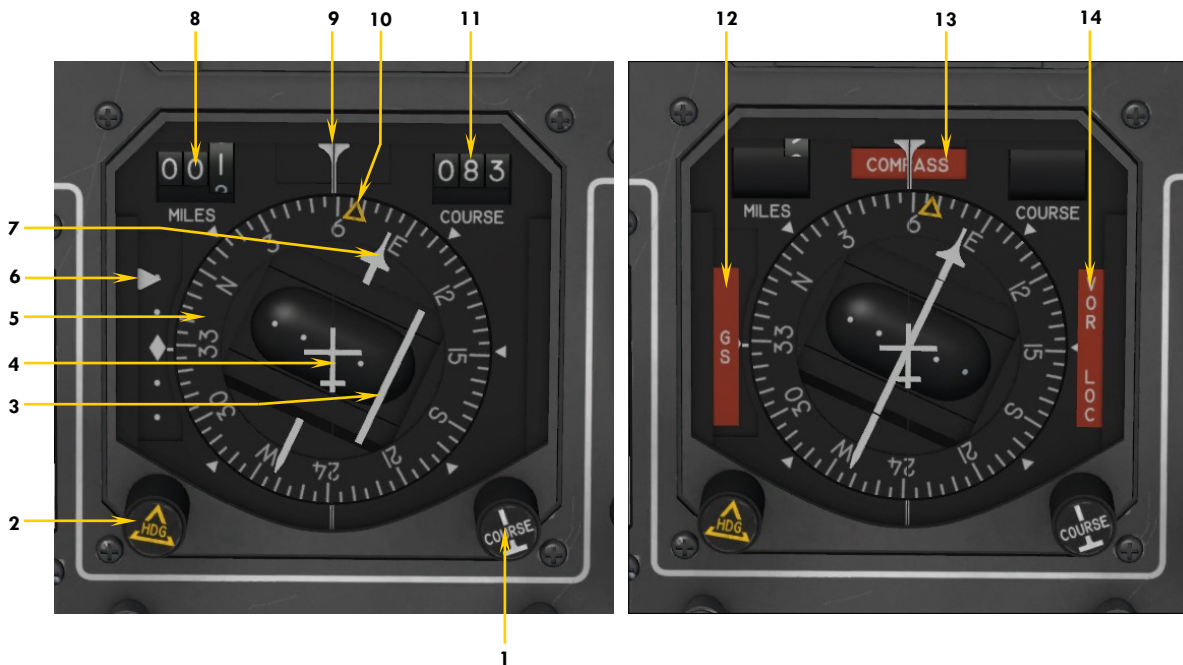


Figure 4-8

1. **NAV1 Course Selector Knob**
Rotating this knob rotates the NAV1 Course Needle to the desired course.
2. **Heading Selector Knob**
Rotating this knob rotates the yellow Heading Bug to the desired heading.
3. **Course Deviation Indicator (CDI)**
This line indicates the lateral deviation from a captured VOR/LOC course. When the bar is aligned with the NAV1 Course Needle, the aircraft is on course. If the line deflects to the left (one or two dots), you are too far right and must steer left to bring the aircraft back on course. If the line deflects to the right (one or two dots), you are too far left and must steer right to bring the aircraft back on course.
4. **Fixed Airplane Symbol**
A stationary reference symbol that represents the aircraft.
5. **Heading (Compass) Card**
Aircraft heading is indicated on this rotating card, under the Lubber Line. Gyro slaved or free, refer to Gyro Free/Slave Switch [9, fig. 4-5].
6. **Glideslope Deviation Indicator**
When the arrow is above the middle reference line, you are too low. When the arrow is below the middle reference line, you are too high. When the arrow is aligned with the middle reference line, you are on the glideslope.
7. **NAV1 Course Needle**
This needle points to the VOR/LOC selected course. It is good practice to align the NAV1 Course Needle with the actual heading at the beginning of a flight and before engaging the autopilot. The NAV1 Course Needle should be aligned with the Course Deviation Indicator when following a captured and valid VOR/LOC course. Used with all autopilot/FD NAV hold modes.
8. **NAV1 DME Readout**
Displays the distance to/from the selected DME station in nautical miles. Shuttered when distance information is unreliable or non-existent. Refer to "DME Head", fig. 4-36.
9. **Lubber Line**
10. **Heading Bug**
This yellow bug indicates the selected heading and can be rotated to any heading with the Heading Selector Knob. It is good practice to align the bug with the actual aircraft heading at the beginning of a flight and before engaging the autopilot. Used with the autopilot/FD HDG hold mode.
11. **Course Readout**
Displays the VOR/LOC selected course in degrees. Shuttered when the instrument is turned off.
12. **Glideslope Warning Flag**
Indicates unreliable or non-existent glideslope signal.
13. **Compass Warning Flag**
Indicates unreliable or non-existent magnetic heading signal.
14. **VOR/LOC Warning Flag**
Indicates unreliable or non-existent NAV1 signal.

Note: All NAV indications coupled to NAV1 radio [Fig. 4-191] or GPS [Fig. 4-24], depending on position of the NAV1/GPS Switch [5, fig. 5-16]. Heading Bug/Selector Knob can be used with autopilot GPS navigation when the NAV1/GPS Switch is set to GPS.

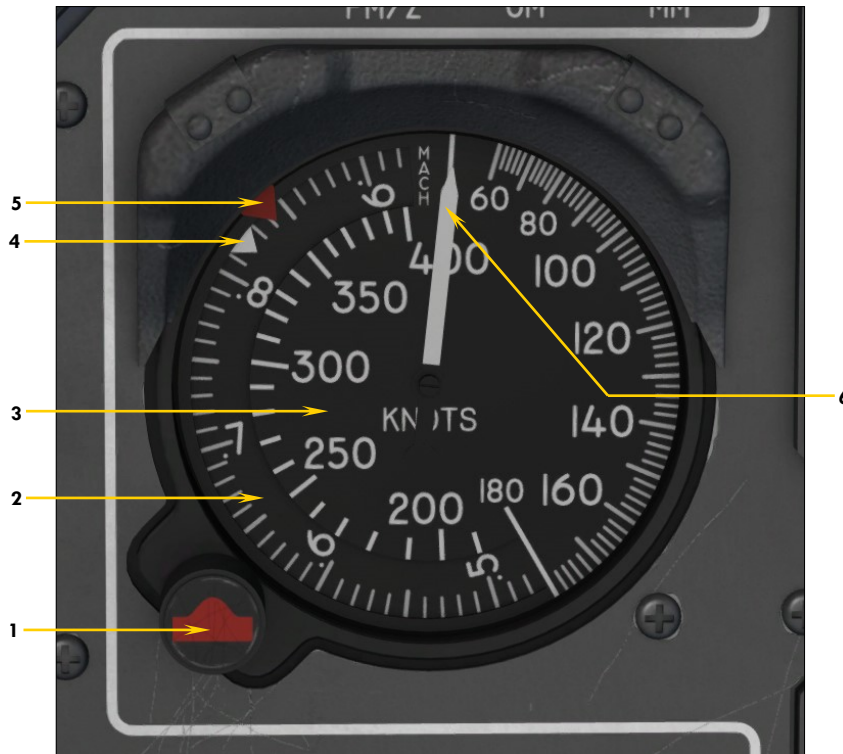


Figure 4-9

1. **Reference Bug Knob**
Use the mouse wheel to rotate the red airspeed bug (knots IAS). Use the left/right mouse buttons to rotate the white Mach bug.
2. **Mach Scale**
3. **Airspeed Scale (Knots IAS)**
4. **Mach Bug (white)**
This bug is linked to the Mach scale and can be rotated with the Reference Bug Knob. The bug is preset to Mach 0.82.
5. **Airspeed Bug (red)**
This bug can be rotated with the Reference Bug Knob. The bug is preset to 350 knots (IAS).
6. **Indicated Air Speed Needle**
Also indicates the Mach number on the Mach scale.

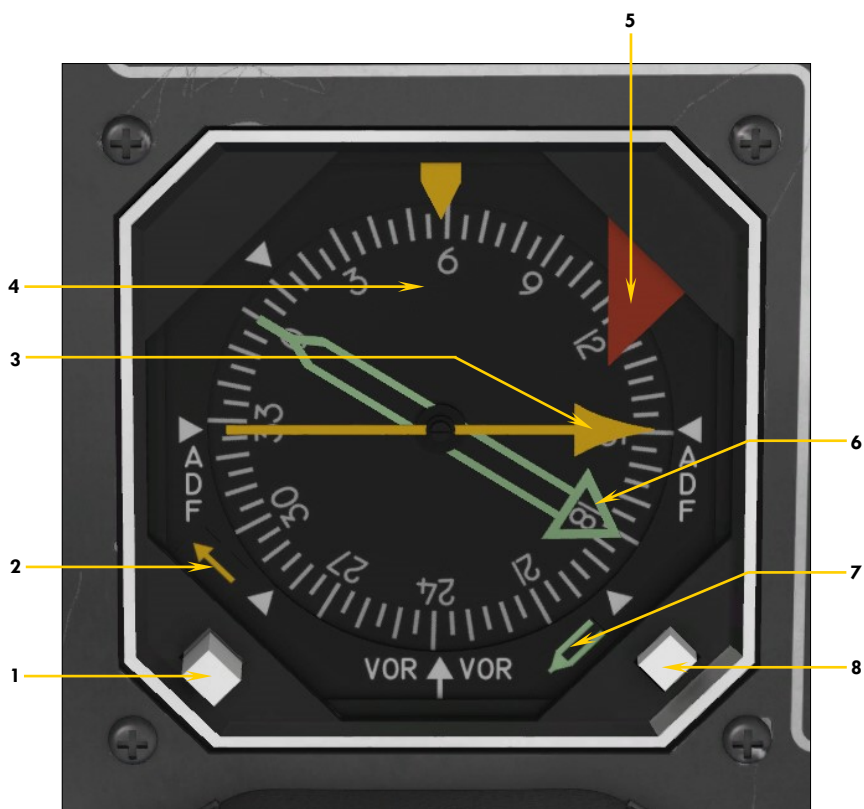
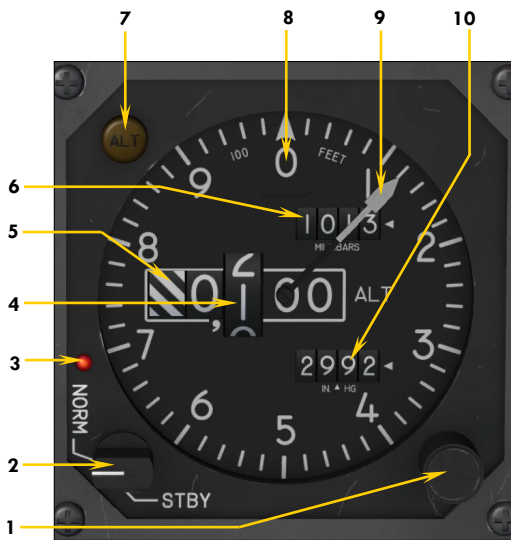


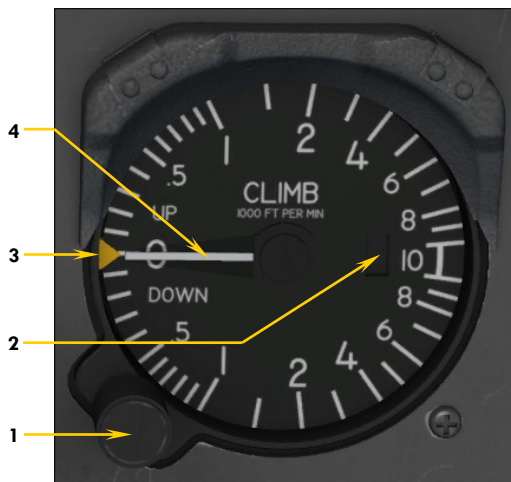
Figure 4-10

1. **Yellow Needle Signal Selector Button**
This button is used to select the navigation signal that is sent to the yellow needle, either ADF1 or NAV1.
2. **Yellow Needle Selection Flag**
Indicates which navigation signal is sent to the yellow needle, either ADF1 or NAV1.
3. **Yellow Needle (ADF1 or NAV1)**
This single needle points to the selected VOR1 or ADF1 (NDB) station. The VOR1 station is tuned on the NAV1 radio [fig. 4-19] and the ADF1 station is tuned on the ADF1 radio [fig. 4-18]. The pointer on the needle indicates the magnetic heading to the station and the tail indicates the magnetic heading away from the station.
4. **Compass Card**
Aircraft heading is indicated on this rotating card, below the yellow pointer. Gyro slaved or free, refer to Gyro Free/Slave Switch [9, fig. 4-5].
5. **Heading Warning Flag**
Indicates unreliable or non-existent magnetic heading signal.
6. **Green Needle (ADF2 or NAV2)**
This double needle points to the selected VOR2 or ADF2 (NDB) station. The VOR2 station is tuned on the NAV2 radio [fig. 4-19] and the ADF2 station is tuned on the ADF2 radio [fig. 4-18]. The pointer on the needle indicates the magnetic heading to the station and the tail indicates the magnetic heading away from the station.
7. **Green Needle Selection Flag**
Indicates which navigation signal is sent to the green needle, either ADF2 or NAV2.
8. **Green Needle Signal Selector Button**
This button is used to select the navigation signal that is sent to the green needle, either ADF2 or NAV2.



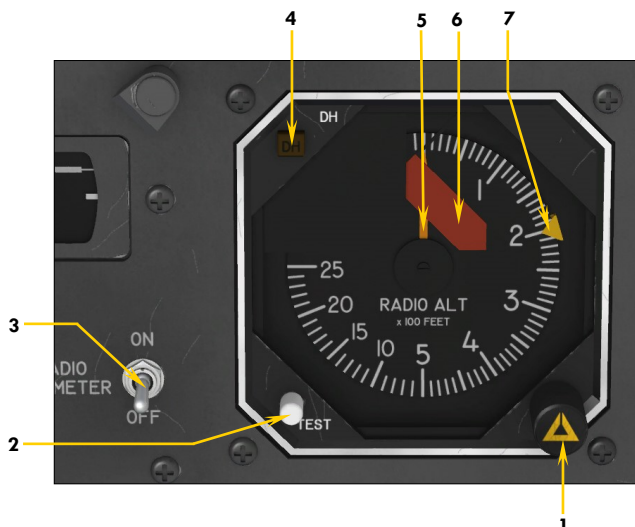
ALTIMETER (BOTH SIDES)
Figure 4-11

1. Barometric Setting Knob
2. Mode Selector Switch (n/s)
3. Normal Mode Indicator Light (n/s)
4. Altitude Readout
5. Warning Strips
Indicates altitude is below 10,000 feet.
6. Barometric Setting Readout (millibars)
7. Altitude Alerter Annunciator
Illuminated with aural warning if within 1000/300 feet of selected altitude. See "Altitude Preselector", fig. 4-23.
8. Failure Warning Flag (not shown)
9. Altitude Needle
10. Barometric Setting Readout (inHg)



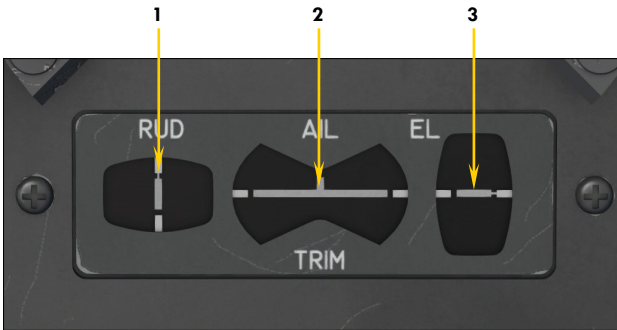
VERTICAL SPEED INDICATOR (VSI)
Figure 4-12

1. (Autopilot) Vertical Speed Selector Knob
This is the vertical speed setting knob for the autopilot and the flight director. Refer to section 5, page 21 for more details.
2. Failure Warning Flag (not shown)
3. (Autopilot) Vertical Speed Bug
This is the vertical speed command bug for the autopilot and the flight director. Refer to section 5, page 21 for more details.
4. Vertical Speed Needle



RADIO ALTIMETER
Figure 4-13

1. Radio Altimeter Decision Height Selector Knob
2. Radio Altimeter Test Button
3. Radio Altimeter Power Switch
4. Radio Altimeter Decision Height Annunciator
5. Radio Altimeter Needle
6. Failure Warning Flag
7. Radio Altimeter Decision Height Bug
Indicates the height above ground that triggers the decision height annunciators.

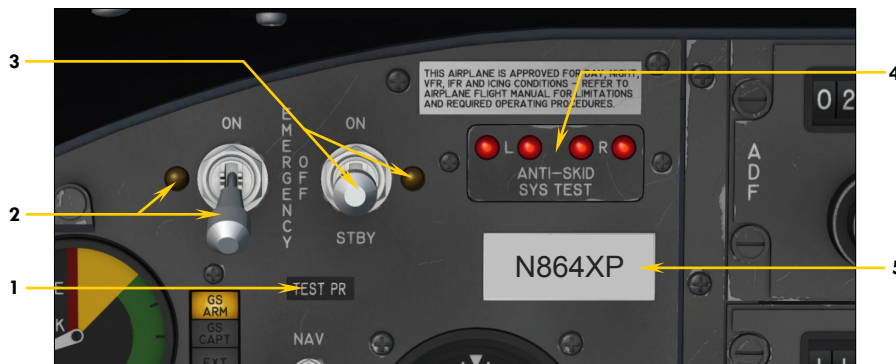


TRIM INDICATORS
Figure 4-14

1. Rudder Trim Indicator
2. Aileron Trim Indicator
3. Elevator Trim Indicator

Takeoff trim is typically one needle thickness below neutral.

Note: Autopilot effort indicators are not available in the simulator. In the sim, this panel is essentially a repeater of the Trim Indicator Panel installed on the center pedestal [7-9, fig. 4-45].

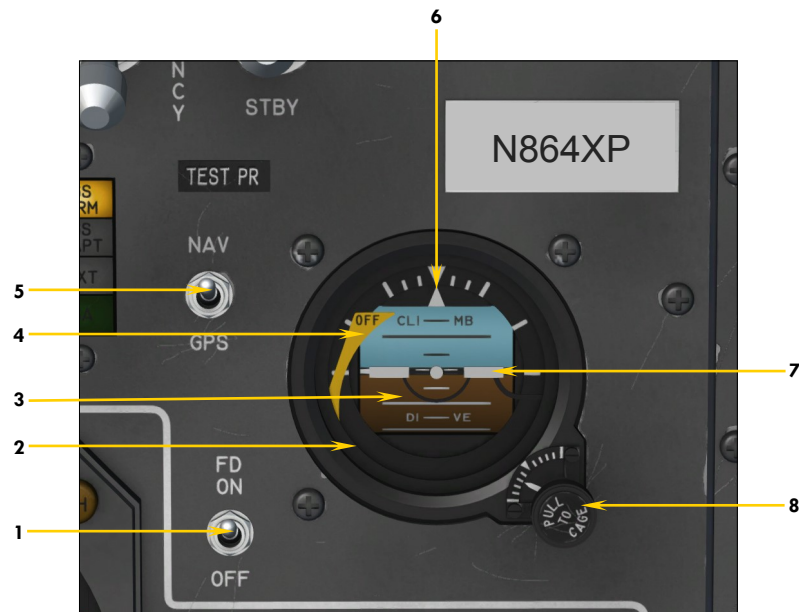


EMERGENCY BATTERY SWITCHES (APU) AND ANTI-SKID LIGHTS
Figure 4-15

1. **Optional Test Probe Icon**
Click this icon to show/hide the optional (boom) nose test probe on the exterior model. This probe is normally used on the "rollout" unpainted variation during flight tests.
2. **Emergency Battery Switch and Light**
Emergency batteries are not available in the simulator. However, this switch, when set to ON, will turn on the addon's APU to simulate emergency battery backup in case of a power failure. Like on the real aircraft, the switch indicator light illuminates only when the emergency battery is providing power to the aircraft. A 3-second delay is normal before the relays are energized and the aircraft is powered again. On the real aircraft, this switch provides power to the standby gyro [fig. 4-16], to its associated avionics and to its indicator light. An emergency power pack, consisting of two batteries, an inverter and associated circuitry, provides DC and AC power. There is no APU in the real aircraft.
3. **Standby Emergency Battery Switch and Light**

This switch, when set to ON or STBY, will turn on the addon's APU to simulate emergency battery backup in case of a power failure. On the real aircraft, this switch provides power to its indicator light and to its associated circuits, normally the gear, flaps and spoilers. The STBY position is used to conserve battery power by removing power to the gear, flaps, and spoilers.

4. **Anti-Skid Generator Lights**
These four red lights should go off when the Anti-Skid Power Switch [8, fig. 4-27] is set to ON and AC power is available. Illumination of these lights indicates anti-skid system malfunction or under test. The Anti-Skid Test Switch is located on the test switch panel [15, fig. 4-41]. Outboard lights represent outboard wheels and inboard lights represent inboard wheels (on the main landing gear). The Anti-Skid Test Switch is spring loaded to its middle position to allow for separate testing of outboard and inboard systems when moved forward or aft.
5. **Aircraft ATC Call (Tail) Number Plaque**
Click to show/hide ATC window. The tail number can be changed in the "aircraft.cfg" file (see section 3, page 2).



STANDBY GYRO & MISC. SWITCHES
Figure 4-16

1. **Flight Director Switch**
Toggles the flight director ON/OFF. Requires avionics power (Battery Switches [8-9, fig. 4-28] ON, Inverter Switches [10, 12, fig 4-27] ON). Refer to section 5, page 16, for a complete discussion about the flight director.
2. **Standby Gyro (Emergency Attitude Indicator)**
Powered by emergency batteries in case of a general power failure. The Emergency Battery Switch [2, fig. 4-15] or the Standby Emergency Battery Switch [3, fig. 4-15] must be set to ON or STBY in case of a power failure to provide AC power to the instrument. During normal operation, the Standby Gyro is powered by the main AC bus.
3. **Attitude Tape**
Rotates for roll, moves up and down for pitch.
4. **Failure Warning Flag**
Indicates instrument inoperative or gyro caged.
5. **Autopilot NAV1/GPS Switch**
Selects autopilot mode of navigation (NAV1 or GPS). Refer to section 5, page 18, for more details.
6. **Bank Indicator**
Indicates present bank angle.
7. **Fixed Airplane Symbol**
A stationary reference symbol that represents the aircraft.
8. **Standby Gyro Caging/Adjustment Knob**
Use the mouse wheel to rotate this knob and adjust the pitch scale depending on your viewing angle. If the indicator tumbles and becomes temporarily unusable after experiencing strong unusual attitudes, click this knob to cage (lock in place) the gimbals to prevent damage to the gyroscope. Click again to uncage.

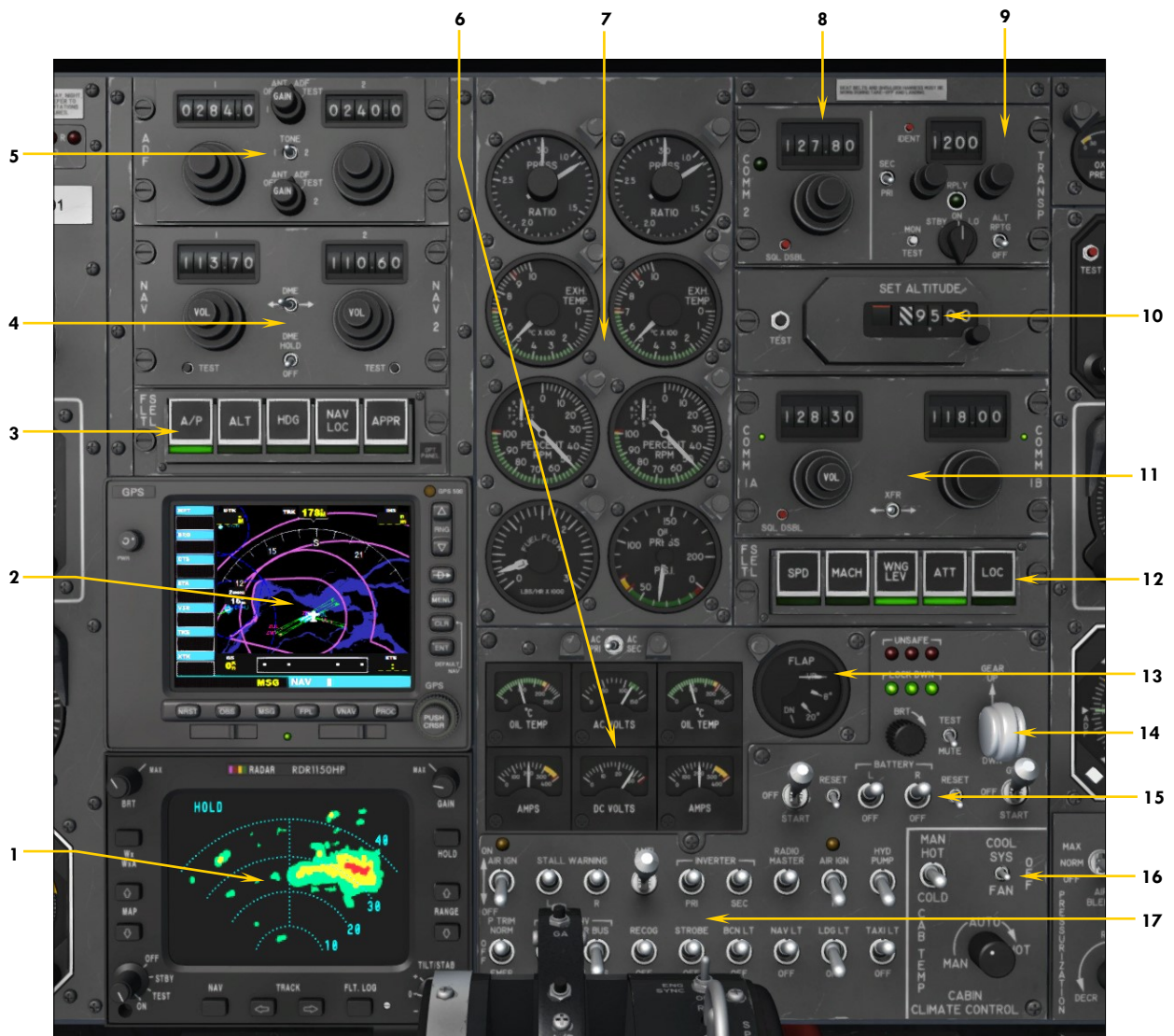
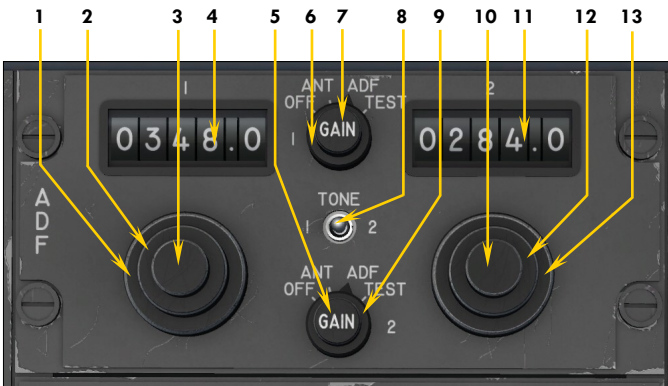


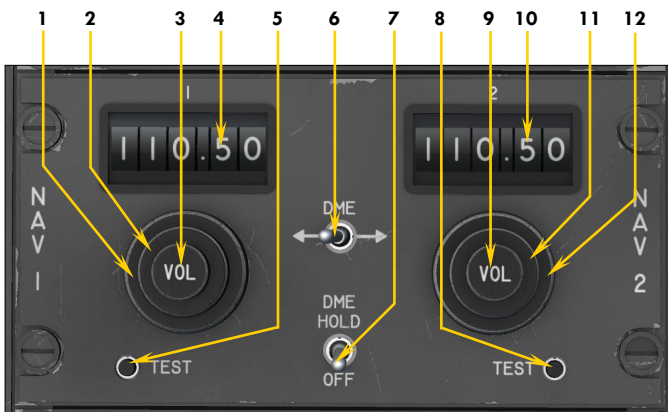
Figure 4-17

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Radar (mockup only, n/s)
<i>Rotate the Power Knob (bottom left) to the ON position to light up display. Requires avionics power. Display is a simple place holder that can be replaced by third-party gauges (see section 4, pages 12).</i> 2. GPS (default sim unit, fully functional)
<i>Display can be replaced by third-party gauges (see section 4, pages 12).</i> 3. Captain's Autopilot/Flight Director Mode Selector Panel 4. NAV1/NAV2 Radios 5. ADF1/ADF2 Radios 6. Electrical Gauge Cluster | <ol style="list-style-type: none"> 7. Engine Gauge Cluster 8. COM2 Radio 9. Transponder 10. Autopilot Altitude Preselector 11. COM1 Radio 12. Copilot's Autopilot/Flight Director Mode Selector Panel 13. Flaps Position Indicator 14. Gear Controls and Lights 15. Starting Panel 16. Cabin Temperature Control Panel 17. Electrical Panel |
|--|--|



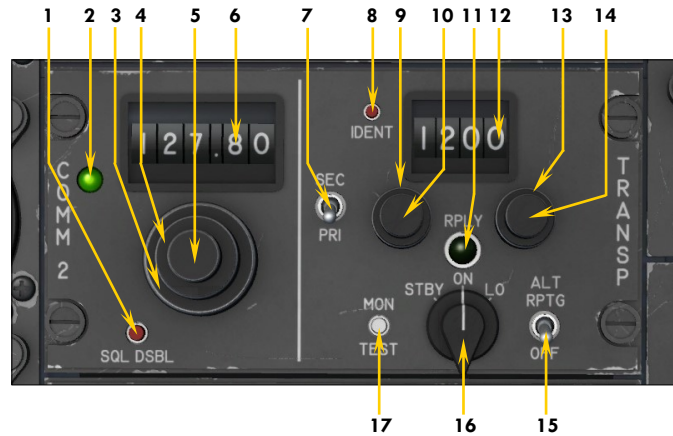
ADF RADIOS
Figure 4-18

1. ADF1 Frequency Selector Knob (Whole)
2. ADF1 Frequency Selector Knob (Fraction)
3. ADF1 Volume Control Knob (n/s)
4. ADF1 Frequency Readout
Use the mouse buttons to select whole. Use the mouse wheel to select fraction.
5. ADF2 Antenna Gain Control Knob (n/s)
6. ADF1 Function Selector Knob (n/s)
7. ADF1 Antenna Gain Control Knob (n/s)
8. Test Tone Switch
9. ADF2 Function Selector Knob (n/s)
10. ADF2 Volume Control Knob (n/s)
11. ADF2 Frequency Readout
Use the mouse buttons to select whole. Use the mouse wheel to select fraction.
12. ADF2 Frequency Selector Knob (Fraction)
13. ADF2 Frequency Selector Knob (Whole)



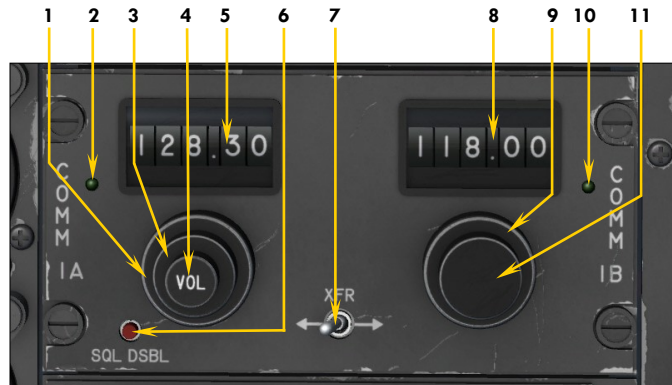
NAV RADIOS
Figure 4-19

1. NAV1 Frequency Selector Knob (Whole)
2. NAV1 Frequency Selector Knob (Fraction)
3. NAV1 Volume Control Knob (n/s)
4. NAV1 Frequency Readout
Use the mouse buttons to select whole. Use the mouse wheel to select fraction.
5. NAV1 Test Button
6. DME Selector Switch
7. DME Hold Switch
8. NAV2 Test Button
9. NAV2 Volume Control Knob (n/s)
10. NAV2 Frequency Readout
Use the mouse buttons to select whole. Use the mouse wheel to select fraction.
11. NAV2 Frequency Selector Knob (Fraction)
12. NAV2 Frequency Selector Knob (Whole)



COM2 RADIO / TRANSPONDER
Figure 4-20

1. COM2 Squelch Disabling Button
2. COM2 Transmit Select Light
Illuminated when VHF COM2 is selected for transmit on the audio panel [2, fig. 4-3].
3. COM2 Frequency Selector Knob (Whole)
4. COM2 Frequency Selector Knob (Fraction)
5. COM2 Volume Control Knob (n/s)
6. COM2 Frequency Readout
Use the mouse buttons to select whole. Use the mouse wheel to select fraction.
7. Transponder Radio Selector Switch (n/s)
8. Transponder ATC Ident Button (n/s)
Toggles ATC window.
9. Transponder First Digit Selector Knob
10. Transponder Second Digit Selector Knob
11. Transponder Activity Light
Simulates transponder activity.
12. Transponder Code Readout
13. Transponder Third Digit Selector Knob
14. Transponder Fourth Digit Selector Knob
15. Transponder A+C Mode Switch (n/s)
Enables transponder to respond to both Mode A and Mode C (altitude reporting) interrogations.
16. Transponder Function Selector Knob (n/s)
Transponder is always ON when avionics is ON.
17. Transponder Monitor Test Button



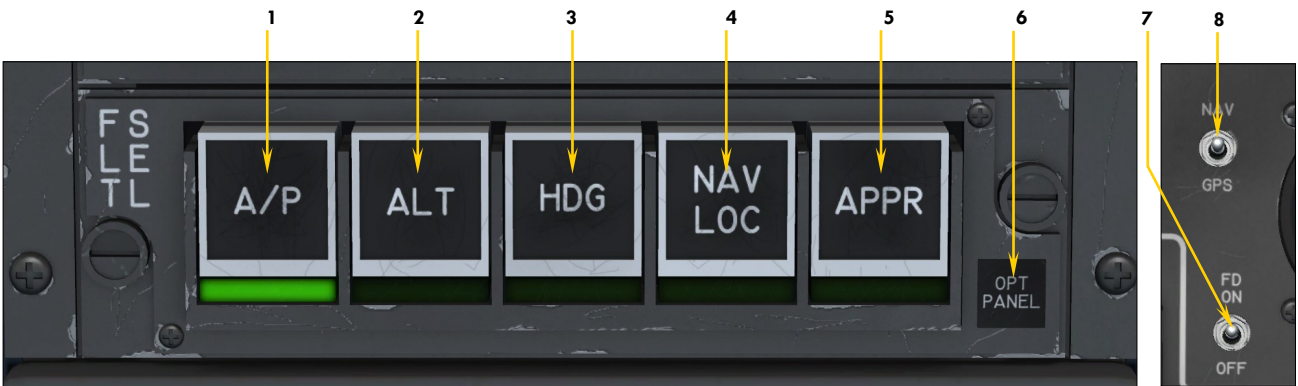
COM1 RADIO

Figure 4-21

1. COM1 Frequency Selector Knob (Whole)
2. COM1 Transmit Select Light
Illuminated when VHF COM1 is selected for transmit on the audio panel [1, fig. 4-3].
3. COM1 Frequency Selector Knob (Fraction)
4. COM1 Volume Control Knob (n/s)
5. COM1 Frequency Readout
Use the mouse buttons to select whole. Use the mouse wheel to select fraction.
6. COM1 Squelch Disabling Button
7. COM1 Frequency Swap Switch
Swaps COM1 active frequency with standby frequency and vice versa.
8. COM1 Standby Frequency Readout
Use the mouse buttons to select whole. Use the mouse wheel to select fraction.
9. COM1 Standby Frequency Selector Knob (Whole)
10. COM1 Transmit Select Light
Same as 2 above.
11. COM1 Standby Frequency Selector Knob (Fraction)

Captain's Instrument Panel

AFCS MODE SELECTOR PANEL

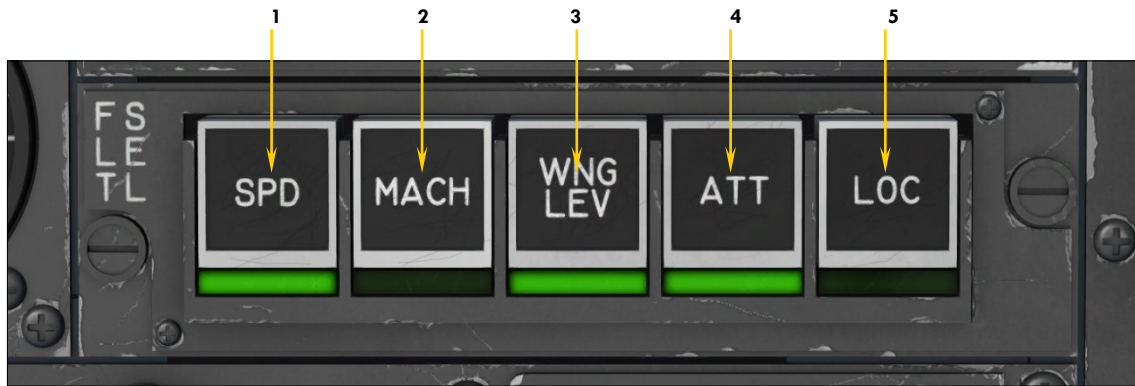


AUTOMATIC FLIGHT CONTROL SYSTEM / AUTOPILOT / FLIGHT DIRECTOR MODE SELECTOR PANEL — CAPTAIN'S SIDE

Figure 4-22a

- 1. A/P (Autopilot Engage) Switch and Light**
Engages the autopilot and the attitude hold mode (if the ALT mode is disengaged), and levels the wings. Autopilot assumes aircraft control. In the simulator, the flight director is independent from the autopilot and must be turned on separately (see 7, below). In the real aircraft, the flight director is engaged when the AFCS is engaged. Requires avionics power (Battery Switches [8-9, fig. 4-28] ON, Inverter Switches [10, 12, fig 4-27] ON).
- 2. ALT (Altitude Hold Mode) Switch and Light**
Engages the altitude hold mode. If the selected altitude differs from the current altitude, the AFCS will calculate a path to the selected altitude at the selected vertical speed. The pilot is responsible for managing airspeed (unless the SPD/MACH hold mode is engaged, see 1-2, fig 4-22b).
- 3. HDG (Heading Hold Mode) Switch and Light**
Engages the heading hold mode. The autopilot will turn the airplane as necessary and fly a heading selected by the position of the Heading Bug on the HSI [10, fig. 4-8].
- 4. NAV/LOC (Navigation/Localizer Hold Mode) Switch and Light**
Engages the navigation hold mode, the autopilot automatic tracking of a VOR course, GPS course, or localizer for navigation. The NAV1 radio signal will be tracked unless the NAV1/GPS Switch (see 8, below) is set to GPS.
- 5. APPR (Coupled Approach Hold Mode) Switch and Light**
Engages the approach mode (navigation plus glideslope) when a valid ILS signal is present on the NAV1 radio. It is recommended to engage the APPR mode only after initial localizer interception, with intercept angles shallower than 45 degrees. The coupled glideslope signal is best intercepted from below, once the localizer course is established and the recommended approach speed is stabilized.
- 6. Optional Panels Icon**
Toggles between the default GPS/radar panel and two optional, user-configurable panels. See section 4, pages 8, 10-12 for details.
- 7. Flight Director Switch**
Toggles the flight director on/off. In the sim, the switch will be turned ON automatically when certain modes are engaged and the autopilot is disengaged. Requires avionics power (Battery Switches [8-9, fig. 4-28] ON, Inverter Switches [10, 12, fig 4-27] ON). Refer to section 5, page 16, for a complete discussion about the flight director.
- 8. Autopilot NAV1/GPS Switch**
Toggles between NAV1 and GPS driving NAV1 and autopilot. Set to GPS for GPS navigation. Refer to section 5, page 18, for more details.

Note: Refer to section 5, page 15, for a complete discussion about the AFCS, the autopilot and the flight director.



**AUTOMATIC FLIGHT CONTROL SYSTEM / AUTOPILOT / FLIGHT DIRECTOR
MODE SELECTOR PANEL — COPILOT'S SIDE**
Figure 4-22b

1. **SPD (Airspeed Hold Mode) Switch and Light**
This switch engages the autopilot speed (SPD) hold mode. The SPD hold mode maintains the aircraft at the indicated airspeed that existed when the switch was depressed. The SPD Hold Switch must be used at altitudes below 29,000 feet. Like on the real aircraft, above 29,000 feet, the autopilot will automatically switch to the MACH hold mode. In the sim, speed hold is accomplished by the autothrottle.
2. **MACH (Mach Hold Mode) Switch and Light**
This switch engages the autopilot MACH hold mode. The MACH hold mode maintains the aircraft at the Mach number that existed when the switch was depressed. The MACH Hold Switch must be used at altitudes above 29,000 feet. Like on the real aircraft, below 29,000 feet, the autopilot will automatically switch to the SPD hold mode. In the sim, Mach hold is accomplished by the autothrottle.
3. **WING LEV (Wing Leveler) Switch and Light**
This switch engages the wing leveler that keeps the aircraft's wings level. The WING LEV mode is engaged by default when the autopilot is engaged and when the ATT hold mode is engaged.
4. **ATT (Attitude Hold Mode) Switch and Light**
This switch engages the attitude hold mode that keeps the aircraft's pitch and roll at the state that existed when the switch was depressed. The ATT hold mode is engaged by default when the autopilot is engaged, unless the ALT mode is engaged.
5. **LOC (Localizer Only Hold Mode) Switch and Light**
This switch engages the autopilot's "localizer only" hold mode, enabling automatic tracking of a localizer for instrument approaches. Localizer capture is identical with the NAV/LOC hold mode or the APPR mode.

Note: Refer to section 5, page 15, for a complete discussion about the AFCS, the autopilot and the flight director.



AUTOPILOT ALTITUDE PRESELECTOR
Figure 4-23

1. **Altitude Preselector Test Button**
2. **Failure Warning Flag (not shown)**
Indicates AC power is unavailable.
3. **Preselected Altitude Readout**
4. **Altitude Preselector Knob**
Selects desired altitude for the AFCS.

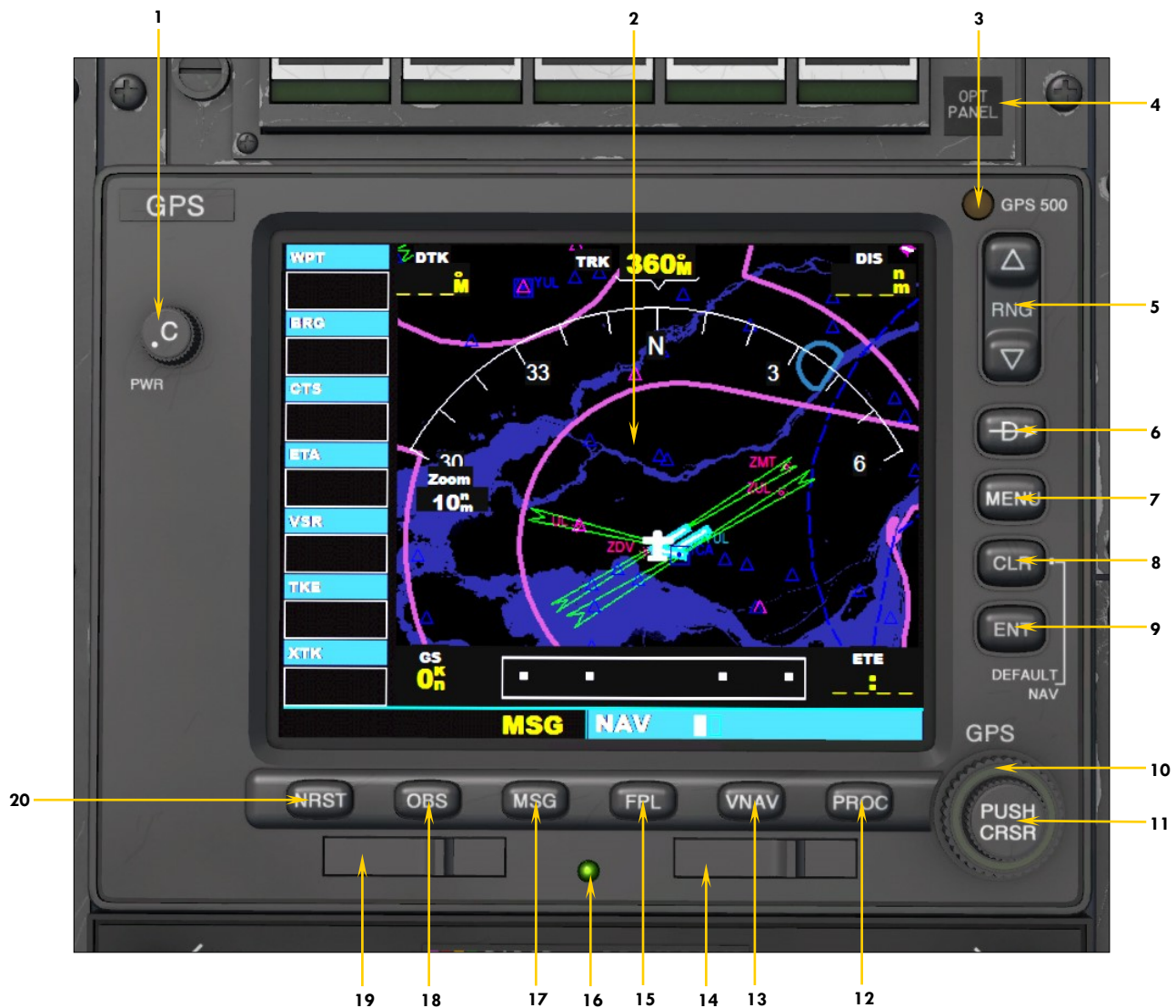


Figure 4-24

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. GPS Power Switch
<i>Requires avionics power.</i> 2. GPS Display 3. Photocell 4. Optional Panels Icon
<i>Toggles between the default GPS/radar panel and two optional, user-configurable, optional panels. See section 4, pages 7, 9-12 for details.</i> 5. Map Range Button (Zoom)
<i>Left click to zoom in, right click to zoom out, wheel up to zoom in, wheel down to zoom out.</i> 6. Direct-To Button 7. Menu Button 8. Clear Button | <ol style="list-style-type: none"> 9. Enter Button 10. Large Ring (Group Select) Knob 11. Small Ring (Page Select) Knob and Button 12. Procedure Button 13. Vertical Navigation (Terrain) Button 14. Terrain Data Card 15. Flight Plan Button 16. Power LED (cards inserted) 17. Message Button 18. OBS Mode Button 19. NavData® Card 20. Nearest Airports Button |
|---|---|

Note: Refer to "Using the GPS" in the Learning Center of your simulation platform for more details.

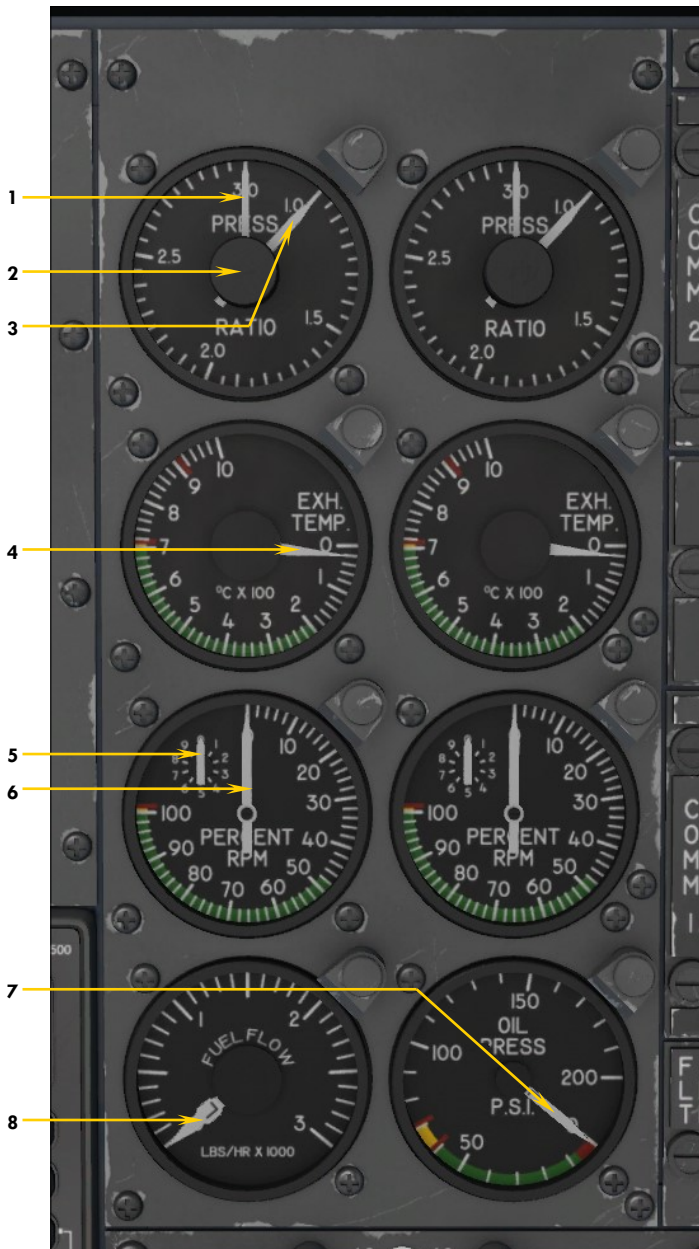


Figure 4-25

1. Left Engine Target EPR Bug
Same for right engine.
2. Left Engine Target EPR Selector Knob
Same for right engine.
3. Left Engine Pressure Ratio (EPR) Needle
Same for right engine.
4. Left Engine Exhaust Gas Temperature (EGT) Needle
Same for right engine.
5. Engine Revolutions per Minute (RPM) Vernier Needle
Used for fine power settings. Same for right engine.
6. Engine Revolutions per Minute (RPM) Needle
Used for coarse power settings. Same for right engine.
7. Left & Right Engine Oil Pressure Needles
Requires AC power from the inverters.
8. Left & Right Engine Fuel Flow Needles



Figure 4-26

1. Primary/Secondary AC Bus Selector Switch
This switch selects which AC bus voltage is sent to the AC voltmeter. To read the voltage from the primary AC bus, set the switch to AC PRI. To read the voltage from the secondary AC bus, set the switch to AC SEC.
2. Right Engine Oil Temperature Needle
3. AC Voltmeter Needle
Indicates available AC voltage from either the primary, secondary or auxiliary inverters.
4. Left Engine Oil Temperature Needle
5. Right DC Ammeter Needle
Indicates load on the right generator.
6. DC Voltmeter Needle
Indicates available voltage on the main DC bus.
7. Left DC Ammeter Needle
Indicates load on the left generator.

Note: Refer to section 5, page 2, for more information about the electrical system.

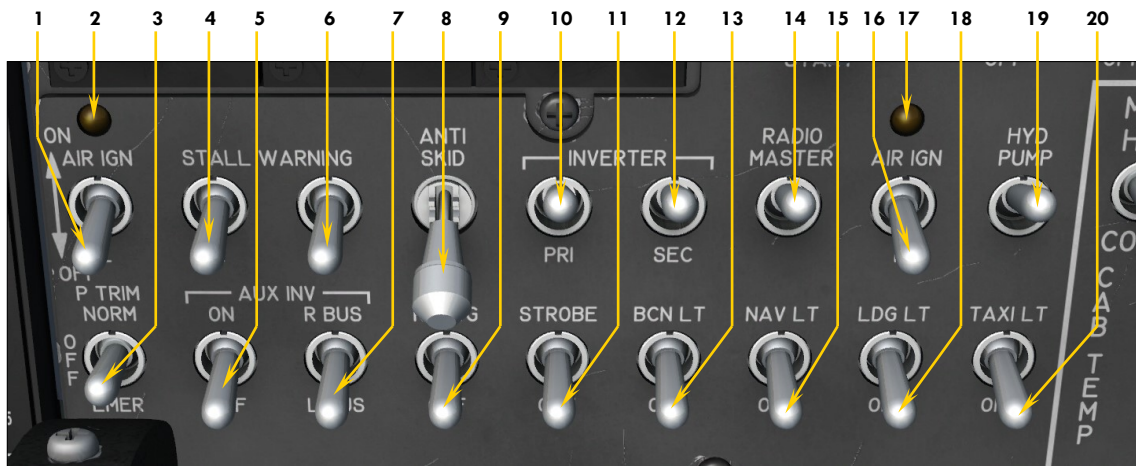


Figure 4-27

1. **Left Engine Air Ignition Switch**
This switch, when set to AIR IGN, provides for continuous operation of the ignition system for the left engine. The switch should be OFF unless ambient conditions require ignition to stay on.
2. **Left Engine Ignition Light**
This amber light illuminates when left air ignition is operating or system is in start cycle.
3. **Emergency Pitch Trim Switch**
This switch is normally set to NORM, unless emergency trim is required. The Emergency Trim Switch is on the center pedestal [10, fig. 4-45].
4. **Left Stall Warning Switch**
This switch is normally set to ON and the red L STALL annunciator [3, fig. 4-30] should go off. The switch energizes the left stall warning system and the stick shaker. On the real aircraft, this switch also energizes the stick nudger/puller. On the add-on, a separate switch is provided for the stick nudger/puller on the center pedestal [20, fig. 4-41].
5. **Auxiliary Inverter Switch**
The auxiliary inverter can be used in case of failure of the main inverters. Inverters provide AC power to the avionics and to other aircraft systems. Inverters require battery or generator power (including emergency power in case of a general power failure).
6. **Right Stall Warning Switch**
This switch is normally set to ON and the red R STALL annunciator [6, fig. 4-30] should go off. The switch energizes the right stall warning system.
7. **Auxiliary Inverter Bus Selector Switch**
This switch can be used to select which AC bus is powered by the auxiliary inverter in case of a malfunction of one of the main inverters.
8. **Anti-Skid Power Switch**
When AC power is available, set this switch to ON to energize the anti-skid system installed on the main landing gear. The four Anti-Skid Generator Lights [4, fig. 4-15] should go off when this switch is set to ON and AC power is available.
9. **Recognition Lights Switch**
10. **Primary Inverter Switch**
Inverters provide AC power to the avionics and to other aircraft systems. Inverters require battery or generator power (including emergency power in case of a general power failure). This switch energizes the primary inverter that provides power to the primary AC bus.
11. **Strobe Lights Switch**
12. **Secondary Inverter Switch**
This switch energizes the secondary inverter that provides power to the secondary AC bus.
13. **Rotating Beacon Lights Switch**
14. **Radio Master Switch (Avionics)**
The avionics bus provides AC power to the radios, the autopilot, the flight director and other instruments and systems. Make sure the inverters are turned on!
15. **Navigation Lights Switch**
16. **Right Engine Air Ignition Switch**
This switch, when set to AIR IGN, provides for continuous operation of the ignition system for the right engine. The switch should be OFF unless ambient conditions require ignition to stay on.
17. **Right Engine Ignition Light**
This amber light illuminates when right air ignition is operating or system is in start cycle.
18. **Landing Lights Switch**
19. **Electric Auxiliary Hydraulic Pump Switch**
This switch, when set to HYD PUMP, energizes the auxiliary hydraulic pump. This pump may be used in case of a main hydraulic system failure or for operating subsystems when the engines are not running.
20. **Taxi Lights Switch**

Note: Refer to section 5, page 2, for more information about the electrical system. Refer to section 5, page 25, for more information about the stick nudger/puller.



Figure 4-28

1. **Flaps Position Indicator**
Indicates the position of the flaps: Full up, 8 degrees, 20 degrees, 40 degrees full down. An audible alert will sound if the flaps are extended beyond 25 degrees and the landing gear is not down and locked. Requires DC power.
2. **Brightness Control Knob (n/s)**
3. **Landing Gear Position Lights (left, center, right)**
 - **Red:** The indicated gear is unsafe or in transit, and/or the gear door is not closed, and/or either engine RPM is below 70%, and/or the flaps are extended beyond 25 degrees, and the gear is not down and locked.
 - **Green:** The indicated gear is down and locked.
 - **No light:** The indicated gear is up and locked and the gear door is closed, or there is an electrical system failure.
 - **All lights on:** The system is being tested.
4. **Landing Gear Warning System Test Switch**
A warning horn will sound and the three red Position Lights (3, above) will illuminate if the flaps are extended beyond 25 degrees, and/or either engine RPM is below 70%, and the landing gear is not down and locked. Set this 3-position switch to TEST to test the gear warning system. The horn will sound and the six red and green Position Lights will illuminate. Reset the switch to OFF (middle position) when the test is finished. Setting the switch to MUTE will silence the warning horn in all conditions. Default position is OFF.
5. **Landing Gear Selector Switch**
Move this switch to the GEAR UP position to retract the landing gear. Move the switch to the DWN position to extend the landing gear. Requires DC power.
6. **Right Engine Starter/Generator Switch**
Move this switch down to START for engine start. After the engine is started, move the switch up to GEN to engage the generator. Refer to section 7 for complete starting procedures.
7. **Right Engine Generator Reset Switch**
This momentary switch will restart the generator.
8. **Right Battery Switch**
Due to limitations in the simulator, both battery switches are linked. Only one battery is provided in the sim.
9. **Left Battery Switch**
Same as 8, above.
10. **Left Engine Generator Reset Switch**
This momentary switch will restart the generator.
11. **Left Engine Starter/Generator Switch**
Move this switch down to START for engine start. After the engine is started, move the switch up to GEN to engage the generator. Refer to section 7 for complete starting procedures.

Note: Refer to section 5, page 2, for more information about the electrical system.

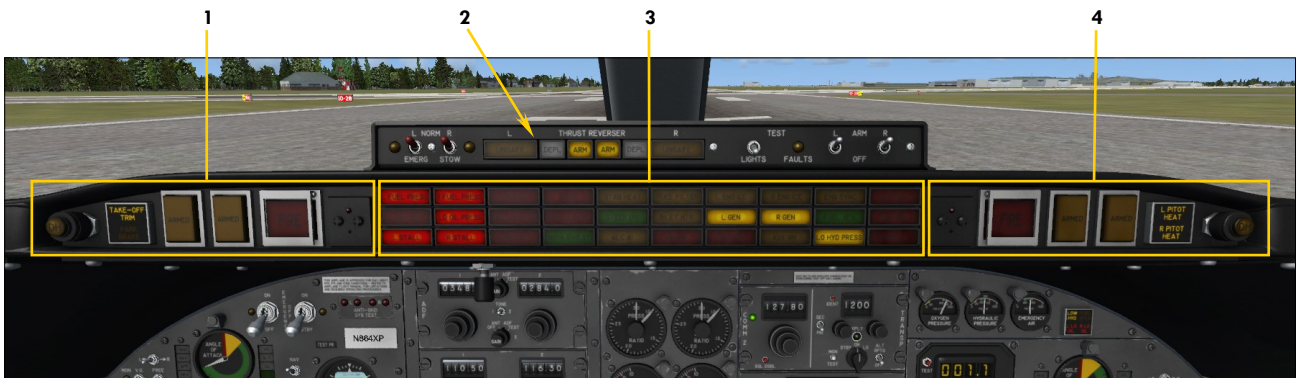


Figure 4-29

1. Captain's Fire Panel
2. Thrust Reversers Control Panel
3. Main Annunciator Panel
4. Copilot's Fire Panel

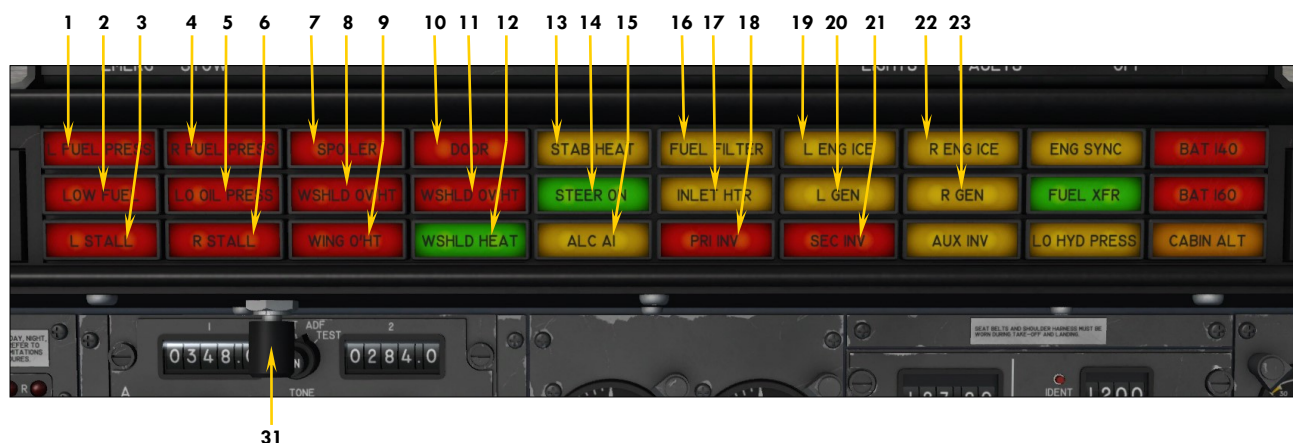


Figure 4-30

1. **Left Engine Low Fuel Pressure**
Indicates left engine fuel pressure below 10 psi. The light should come out when the left jet pump and/or the left standby pump are operating (refer to "20 Series Fuel System", section 5, page 6).
2. **Low Fuel Remaining**
This annunciator will illuminate when there is less than 50 gallons (approx. 335 pounds) of fuel in either wing tank or, if the Fuselage Tank Switch [6, fig. 4-43] is set to XFER, in the center fuselage tank (refer to "20 Series Fuel System", section 5, page 6).
3. **Left Stall**
Flashing with audible alert and stick shaker: Indicates left wing stall or left system is being tested. Steady: System has failed or Left Stall Warning Switch [4, fig. 4-27] is OFF.
4. **Right Engine Low Fuel Pressure**
Indicates right engine fuel pressure below 10 psi. The light should come out when the right jet pump and/or the right standby pump are operating (refer to "20 Series Fuel System", section 5, page 6).
5. **Low Oil Pressure**
Indicates oil pressure below 5 psi in one or both engines.
6. **Right Stall**
Flashing with audible alert and with or without stick shaker: Indicates right wing stall or right system is being tested. Steady: System has failed or Right Stall Warning Switch [6, fig. 4-27] is OFF.
7. **Spoilers Extended**
Indicates wing spoilers out of retracted position.
8. **Left Windshield Overheat**
Indicates left windshield overheat. Usually occurs if the Windshield Heat Switch [4, fig. 4-4] is ON when the aircraft is not moving and warm conditions exist.
9. **Wing Overheat**
Indicates wing anti-ice overheat (above 215°F). Usually occurs if the Wing and Stabilizer Heat Switch [3, fig. 4-4] is ON when the aircraft is not moving and warm conditions exist.
10. **Door Unsecured**
Indicates main entry door not closed and locked.
11. **Right Windshield Overheat**
Indicates right windshield overheat. Usually occurs if the Windshield Heat Switch [4, fig. 4-4] is ON when the aircraft is not moving and warm conditions exist.
12. **Windshield Heat Applied**
Indicates windshield heat on (see 4, fig. 4-4).
13. **Stabilizer Heat Applied**
Indicates stabilizer/wing heat on (see 3, fig. 4-4).
14. **Nose Wheel Steering Engaged**
When illuminated, indicates electrical nose wheel steering is engaged (used for taxiing). When off, indicates nose wheel steering is disengaged. Nose wheel steering is accomplished automatically in the simulator at certain speeds (see 7, fig. 4-4 and 2, fig. 4-50).
15. **Alcohol Anti-Ice On (n/s)**
Indicates windshield and radome alcohol pump energized (see 5, fig. 4-4).
16. **Fuel Filter Clogged (n/s)**
Indicates an abnormal pressure drop across either engine fuel filter.
17. **Engine Inlet Heat Applied**
Indicates engine nacelle heat on (see 2, fig. 4-4).
18. **Primary Inverter Inoperative**
Indicates low AC voltage from primary inverter.
19. **Left Engine Ice Detected**
Indicates ice presence in left engine intake.
20. **Left Generator Inoperative**
Indicates low DC voltage from left engine generator.
21. **Secondary Inverter Inoperative**
Indicates low AC voltage from secondary inverter.
22. **Right Engine Ice Detected**
Indicates ice presence in right engine intake.
23. **Right Generator Inoperative**
Indicates low DC voltage from right engine generator.

Continued on next page...



Figure 4-30

24. **Auxiliary Inverter On**
Indicates auxiliary inverter has been switched on (see 5, fig. 4-27). On the real aircraft, this annunciator indicates failure or low AC voltage from the auxiliary inverter if turned ON.
25. **Engine Sync On (n/s)**
Indicates Engine Sync Switch [22, fig. 4-41] is ON. Engine synchronization for jet engines is not available in the simulator.
26. **Fuel Transfer Pump On**
Indicates that the fuselage tank transfer pump is operating. In the sim, this indicates that the Fuselage Tank Switch [6, fig. 4-43] is set to XFER and that engines are fed from the center fuselage tank (refer to "20 Series Fuel System", section 5, page 6).
27. **Low Hydraulic Pressure**
Indicates hydraulic pressure below 1,200 psi.
28. **Battery Overheat (n/s)**
Indicates overheating battery, over 140° C.
29. **Battery Overheat (n/s)**
Indicates overheating battery, over 160° C.
30. **Cabin Altitude Annunciator**
Flashing: indicates cabin altitude is above 9,000 feet. Flashing, with audible alert: indicates cabin altitude is above 10,100 feet. Audible alert can be muted with the Horn Silence Switch [10, fig. 4-41] on the test switch panel.
31. **Annunciator Test Button**
Press to test the bulbs in all annunciators and lights, except for the autopilot and the flight director that have a separate test switch [10, fig. 4-41] on the test switch panel.

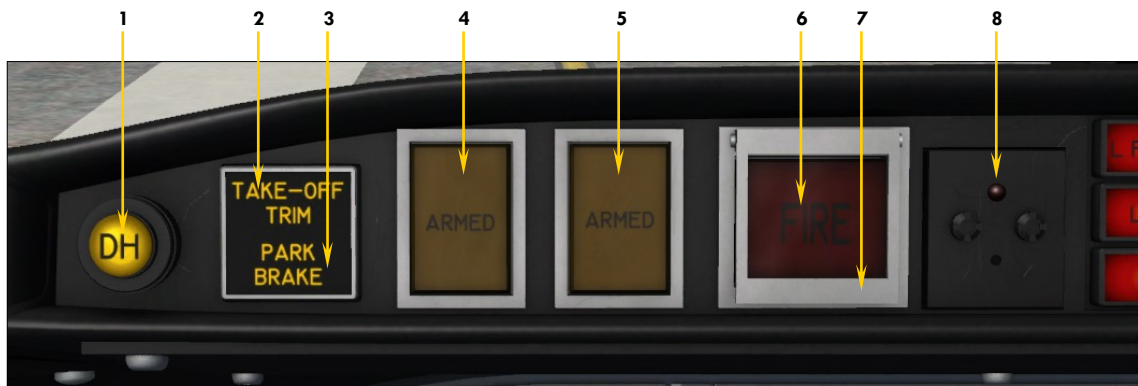
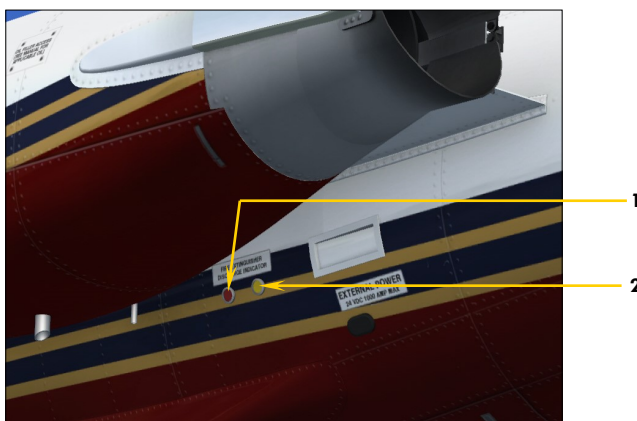


Figure 4-31

1. **Decision Height Light**
Illuminates when the aircraft is at or below the selected decision height. Refer to "Radio Altimeter", fig. 4-13.
 2. **Takeoff Trim Alert Annunciator**
Illuminates when pitch trim is out of takeoff range. Takeoff trim is typically one needle thickness below neutral. The annunciator is disabled in flight. Refer to "Trim Indicators", fig. 4-14, or fig. 4-45.
 3. **Parking Brake Annunciator**
Indicates parking brakes set. Parking brakes can be set by pulling a handle located on the left side of the throttle quadrant [8, fig. 4-41].
 4. **First Fire Extinguisher Armed Annunciator and Discharge Button**
Illuminates when the Left Engine Extinguisher Arming/Firewall Shutoff Button [6, below] has been pressed. Indicates that the first fire extinguisher bottle is ready for use. Press to discharge the first fire extinguisher bottle into the left engine nacelle.
 5. **Second Fire Extinguisher Armed Annunciator and Discharge Button**
Illuminates when the Left Engine Extinguisher Arming/Firewall Shutoff Button [6, below] has been pressed. Indicates that the second fire extinguisher bottle is ready for use. Press to discharge the second fire extinguisher bottle into the left engine nacelle.
 6. **Left Engine Fire Alarm Annunciator and Extinguisher Arming/Firewall Shutoff Button**
Indicates a fire in the left engine nacelle. Press to close left engine nacelle firewall shutoff valves and arm both fire extinguisher bottles. Discharged bottles cannot be armed and the Fire Extinguisher Armed Annunciator [4-5, above] for the discharged bottle(s) will remain off.
 7. **Left Engine Extinguisher Arming/Firewall Shutoff Button Guard**
Click to open guard.
 8. **Left Engine Firewall Shutoff Valve Pinlight**
Indicates that left engine nacelle firewall shutoff valves are closed if DC power is available.
- Note:** The two-bottle fire-extinguishing system is common to both engines. Either of two bottles of extinguishing agent can be discharged to either engine, or both bottles can be discharged to the same engine. Refer to section 8 for more details about emergency procedures in case of an engine fire.



EXTERIOR EXTINGUISHER DISCHARGE INDICATORS
Figure 4-32

1. **Thermal Discharge Indicator (Red Disc) (n/s)**
Disc is ruptured if one or both thermal relief valves have released extinguisher bottle pressure.
2. **Extinguisher Bottle Discharge Indicator (Yellow Disc)**
Disc is ruptured if either extinguisher bottle is discharged.

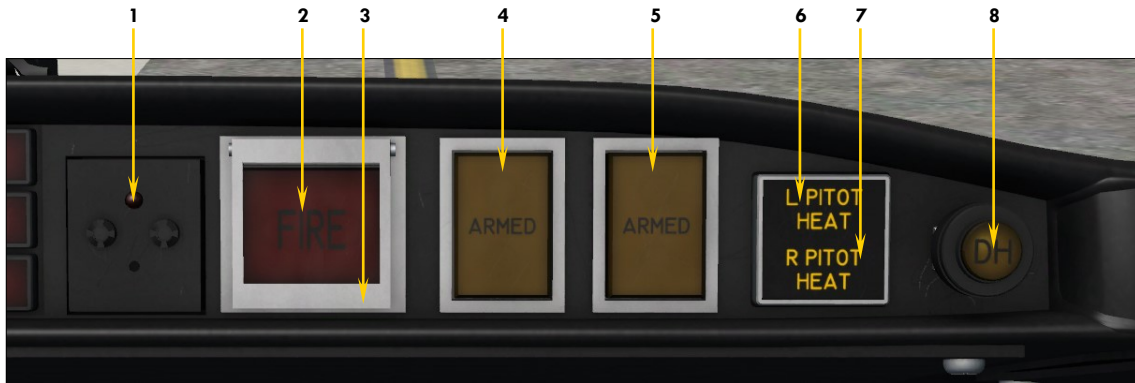


Figure 4-33

1. **Right Engine Firewall Shutoff Valve Pin-light**
Indicates that right engine nacelle firewall shutoff valves are closed if DC power is available.
2. **Right Engine Fire Alarm Annunciator and Extinguisher Arming/Firewall Shutoff Button**
Indicates a fire in the right engine nacelle. Press to close right engine nacelle firewall shutoff valves and arm both fire extinguisher bottles. Discharged bottles cannot be armed and the Fire Extinguisher Armed Annunciator [4-5, below] for the discharged bottle(s) will remain off.
3. **Right Engine Extinguisher Arming/Firewall Shutoff Button Guard**
Click to open guard.
4. **First Fire Extinguisher Armed Annunciator and Discharge Button**
Illuminates when the Right Engine Extinguisher Arming/Firewall Shutoff Button [2, above] has been pressed. Indicates that the first fire extinguisher bottle is ready for use. Press to discharge the first fire extinguisher bottle into the right engine nacelle.
5. **Second Fire Extinguisher Armed Annunciator and Discharge Button**
Illuminates when the Right Engine Extinguisher Arming/Firewall Shutoff Button [2, above] has been pressed. Indicates that the second fire extinguisher bottle is ready for use. Press to discharge the second fire extinguisher bottle into the right engine nacelle.
6. **Right Pitot Heat Inop Annunciator**
Indicates pitot probe heaters are off. Refer to 1, fig. 4-4.
7. **Right Pitot Heat Inop Annunciator**
Indicates pitot probe heaters are off. Refer to 1, fig. 4-4.
8. **Decision Height Light**
Illuminates when the aircraft is at or below the selected decision height. Refer to "Radio Altimeter", fig. 4-13.

Note: The two-bottle fire-extinguishing system is common to both engines. Either of two bottles of extinguishing agent can be discharged to either engine, or both bottles can be discharged to the same engine. Refer to section 8 for more details about emergency procedures in case of an engine fire.



Figure 4-34

1. **Left Thrust Reverser Emergency Stow Light**
Illuminates during emergency stowing of the left thrust reverser, under certain conditions.
2. **Left Thrust Reverser Emergency Stow Switch**
By default, this switch is set to the NORMAL position. Setting the switch to EMER STOW will electrically stow the left thrust reverser if the aircraft is on the ground, if the left throttle is at IDLE and if the Left Thrust Reverser Arm Switch (see 13, below) is set to OFF. This is used in case of a hydraulic system failure. Return the switch to NORMAL after the thrust reverser is stowed.
3. **Right Thrust Reverser Emergency Stow Switch**
Same as 2, but for the right engine.
4. **Right Thrust Reverser Emergency Stow Light**
Illuminates during emergency stowing of the right thrust reverser, under certain conditions.
5. **Left Thrust Reverser Unsafe Annunciator**
Indicates that the left thrust reverser is in transit (not fully deployed or stowed).
6. **Left Thrust Reverser Deployed Annunciator**
Indicates that the left thrust reverser is fully deployed.
7. **Left Thrust Reverser Armed Annunciator**
Indicates that the left thrust reverser is armed. The left thrust reverser can be armed
only if the aircraft is on the ground, if the left throttle is at IDLE and if the Left Thrust Reverser Emergency Stow Switch (see 2, above) is set to NORMAL.
8. **Right Thrust Reverser Armed Annunciator**
Same as 7, but for the right engine.
9. **Right Thrust Reverser Deployed Annunciator**
Indicates that the right thrust reverser is fully deployed.
10. **Right Thrust Reverser Unsafe Annunciator**
Indicates that the right thrust reverser is in transit (not fully deployed or stowed).
11. **Thrust Reversers Control Panel Lights Test Switch**
Set this switch to TEST to test the bulbs in the thrust reversers control panel lights and annunciators.
12. **Annunciator System Fault Light (n/s)**
Indicates a fault in the thrust reversers system.
13. **Left Thrust Reverser Arm Switch**
This switch arms the left thrust reverser if the aircraft is on the ground, if the left throttle is at IDLE and if the Left Thrust Reverser Emergency Stow Switch (see 2, above) is set to NORMAL. In the simulator, thrust reversers are armed by default. Setting this switch to OFF has no effect in the simulator.
14. **Right Thrust Reverser Arm Switch**
Same as 13, but for the right engine.

Note: Because of limitations in the simulator, thrust reverser controls have limited functionalities. Thrust reversers can be deployed by pressing the F2 key when the throttles are set to IDLE and the aircraft is on the ground. When deployed, thrust can be reduced by pressing the F3 key. Pressing the F1 key will return both throttles and thrust reverser subthrottles to idle, under certain conditions. In the simulator, thrust reversers are armed at all time when the aircraft is on the ground. Reverse thrust is limited to 85% RPM, like on the real aircraft.



Figure 4-35

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Pressurization Panel 2. Radio Magnetic Indicator (RMI) 3. Airspeed/Mach Indicator (ASI) 4. DME Head 5. Mini Gauge Cluster & Miscellaneous Annunciators 6. Flight Director Annunciators 7. Right Angle-of-Attack Indicator 8. Attitude Director Indicator (ADI) 9. Horizontal Situation Indicator (HSI) 10. Gyro Switches 11. Marker Beacon Lights | <ol style="list-style-type: none"> 12. Altimeter 13. Vertical Speed Indicator (VSI) 14. Battery Temperature Indicators 15. Digital Clock 16. Auxiliary Heat Switch (n/s) 17. Ram Air Temperature Warning Annunciator
<i>Illuminates if total air temperature is below -20° C or above 20° C.</i> 18. Ram Air Temperature Gauge 19. H-Valve Position Indicator 20. Audio Panel |
|--|--|



DME HEAD
Figure 4-36

1. DME Head Test Button
2. NAV1/NAV2 Selector Knob
Use this knob to select which DME signal to track. The HOLD position will keep the last readouts as reference only, even if other stations are tuned on the navigation radios. This is a convenience feature only and it differs from the real instrument that has extra circuitry for holding the last frequency. Only two NAV radios are provided in the simulator.
3. Distance Readout
Indicates the distance to/from the selected DME station in nautical miles. NAV1 readout is repeated on the HSI (see 8, fig. 4-8).
4. Ground Speed or Estimated Time to Arrival Readout
Ground speed (in knots) is the closing speed to station, not the actual aircraft ground speed. ETA is valid only when flying to the station.
5. Ground Speed/Estimated Time to Arrival Selector Knob
Rotate this knob to KTS to select ground speed (in knots) or to MIN to select the estimated time of arrival (in minutes). The OFF position turns off the DME head.



MINI GAUGE CLUSTER
Figure 4-37

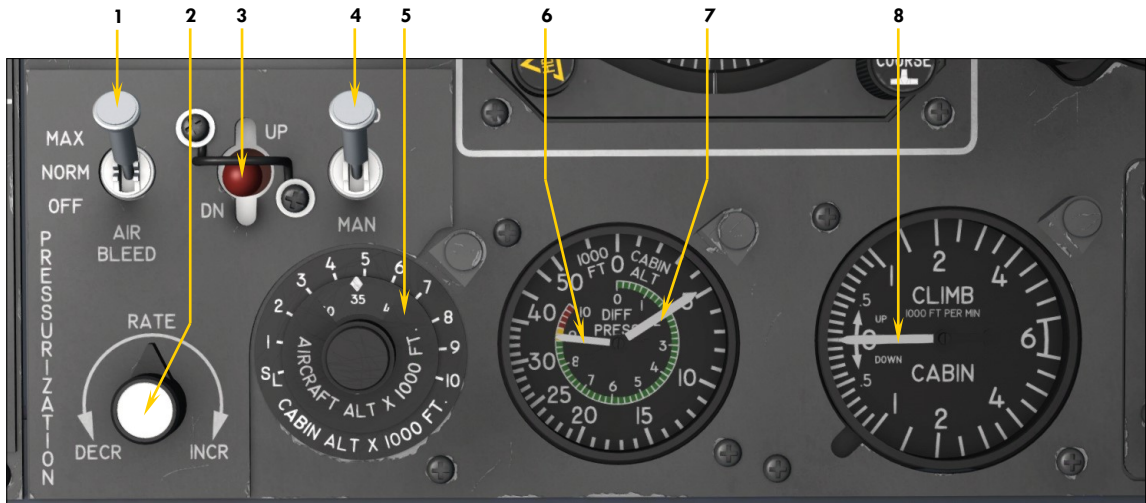
1. Oxygen Pressure Gauge
Provides a direct reading of the pressure in the green oxygen cylinder located in the right nose section of the aircraft (in the dorsal fin on later models). This cylinder provides oxygen to the passengers and crew through a network of valves and regulators. Click the gauge to refill. See also "Oxygen Valves" [5,7, fig 4-47].
2. Hydraulic Pressure Gauge
Provides a direct reading of the pressure in the hydraulic system. Refer to "Hydraulic System", section 5, page 3.
3. Emergency Air Pressure Gauge
Provides a direct reading of the pressure in the emergency air bottle. The bottle is located in the nose compartment and supplies compressed air to the emergency gear extension system. Click the gauge to refill. See also "Emergency Gear Extension Lever" [5, fig. 4-41].
4. Left Engine Low Oil Pressure Annunciator
Indicates oil pressure below 5 psi in the left engine.
5. Low Hydraulic Pressure Annunciator
Indicates hydraulic pressure below 1,200 psi.
6. Crossflow (Crossfeed) Valve Open Annunciator
In the sim, this light indicates that the crossfeed valves are positioned for crossfeeding fuel from one wing tank to one or both engines (refer to "Crossfeeding", section 5, page 7).
7. Right Engine Low Oil Pressure Annunciator
Indicates oil pressure below 5 psi in the right engine.



Figure 4-38

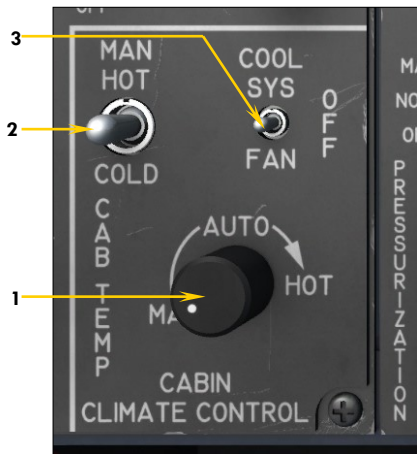
1. Tens of Seconds Readout
2. Time Switch
 - Position 1 (TIME) selects real time in hours, minutes and seconds.
 - Position 2 (F.T.) selects flight time, in hours, minutes and seconds of actual flight time. The flight time recorder will start as soon as the aircraft leaves the ground. It will stop when the aircraft lands and touches the ground. The flight time can be zeroed only by having aircraft power off and moving the stopwatch switch to the zero position. The pilot can have total flight time on a trip with a number of stops if he avoids returning the flight time recorder to zero.
 - Position 3 (E.T.) selects elapsed time in hours, minutes and seconds. This is the stopwatch mode of operation. The recorder can be started, stopped and reset to zero with the stopwatch switch. It will continue to operate even if the aircraft power is off.
3. Hours Readout
4. Tens of Hours Readout
5. Set Switch
 - Position 1 (UP) is a momentary position to increment the clock one minute forward.
 - Position 2 (SET) is the normal position.
 - Position 3 (D) is a momentary position to reset seconds to zero.
6. Dim Switch
 - Position 1 (B) is the bright position of the display for daytime use (not simulated).
 - Position 2 (DIM) is the dim position of the display for night time use (not simulated).
 - Position 3 (1hr up) is a momentary position to increment the clock one hour ahead.
7. Tens of Minutes Readout
8. Minutes Readout
9. Stopwatch Switch
 - Position 1 (ZERO) is a momentary position to set the elapsed time recorder to zero. Use this position to reset the flight time recorder to zero when aircraft power is off.
 - Position 2 (STOP) will stop the elapsed time recorder.
 - Position 3 (RUN) will start the elapsed time recorder.
10. Seconds Readout

Note: No aircraft voltage is necessary for the clock to operate. The clock has its own internal battery. Aircraft power is required to light the LED display only.



PRESSURIZATION PANEL
Figure 4-39

1. **Bleed Air Switch**
Bleed air from the engine compressor section is necessary for cabin pressurization, wing/stabilizer heat, windshield heat, cabin temperature control and hydraulic reservoir pressurization. This switch should be set to NORM or MAX for the duration of the flight, but to OFF during ground operations.
2. **Auto Rate Control Knob**
Use this knob to control the rate at which the cabin climbs or descends when in auto mode. In auto mode, the cabin controller maintains the desired rate of climb or descent until the selected cabin altitude is attained. Use the mouse wheel to decrease or increase rate. Click to reset knob to center position.
3. **Manual Rate “Cherry Picker” Control Switch**
Use this switch to control the rate at which the cabin climbs or descends when in manual mode. Manual mode can be used in case of a cabin controller malfunction. The switch can be used to increase or decrease cabin altitude in either the automatic or manual mode. Please note that the manual mode is not available in the simulator. The cabin controller always maintains the desired rate of climb or descent until the selected cabin altitude is attained. Use the mouse wheel to decrease or increase rate. Click to reset switch to center position.
4. **Pressurization Mode Switch**
Use this switch to select auto or manual mode of pressurization. The switch is normally set to AUTO (manual mode is not available in the simulator). In auto mode, the cabin controller automatically regulates cabin pressure and maintains the desired rate of climb or descent until the selected cabin altitude is attained.
5. **Target Altitude Selector Knob (Cabin Altitude Controller)**
Rotating this knob aligns an index between two scales. The outer scale represents cabin altitude and the inner scale (seen through a window) represents the target aircraft altitude. Simply set the knob for flight plan altitudes on the inner scale before takeoff and during flight, and for the destination field elevation before descent. When in auto mode, the cabin controller regulates cabin pressure in relation to the altitude that is set on the altitude selector knob. Please note that the manual mode of operation is not available in the simulator. The cabin controller always maintains the desired rate of climb or descent until the selected cabin altitude is attained.
6. **Cabin Differential Pressure Needle**
Indicates cabin differential pressure (between the cabin and outside air) in PSI. Design cabin pressure: 10 psi. Max. differential pressure: 8.9 psi.
7. **Cabin Altitude Needle**
Pressure inside the cabin is normally referred to as “cabin pressure altitude”.
8. **Cabin Rate Needle (VSI)**
Indicates cabin climb or descent rates, between 0 and 6,000 feet per minute.



CABIN TEMPERATURE CONTROL PANEL

Figure 4-40

1. **Automatic Mode Cabin Temperature Control Knob**
Turning the knob fully counter-clockwise will result in manual temperature control. Use this knob to adjust temperature when in auto mode. Make sure to keep the H-Valve position between 1/2 and 3/4. H-Valve movement is observed on the H-Valve position indicator [19, fig. 4-35].
2. **Manual Mode Cabin Temperature Control Switch**
Use the mouse wheel to increase or decrease the cabin temperature if the Automatic Mode Cabin Temperature Control Knob [1, above] is set to MAN (leftmost position). Click to reset switch to center position. Make sure to keep the H-Valve position between 1/2 and 3/4. H-Valve movement is observed on the H-Valve position indicator [19, fig. 4-35].
3. **Cooling System Selector Switch (n/s)**
Selects either the fan or the Freon-type air conditioner for the cooling system.

Note: Cabin temperature selection will affect the H-Valve [19, fig. 4-35] position. In the real aircraft, cabin temperature control is accomplished by conditioning the engine bleed air used for pressurization. The H-Valve controls the amount of engine bleed air that passes through the heat exchanger. The cabin heating system can be controlled manually or automatically. Cabin heating systems are not supported in the simulator. However all the controls and indicators are provided to simulate normal procedures.

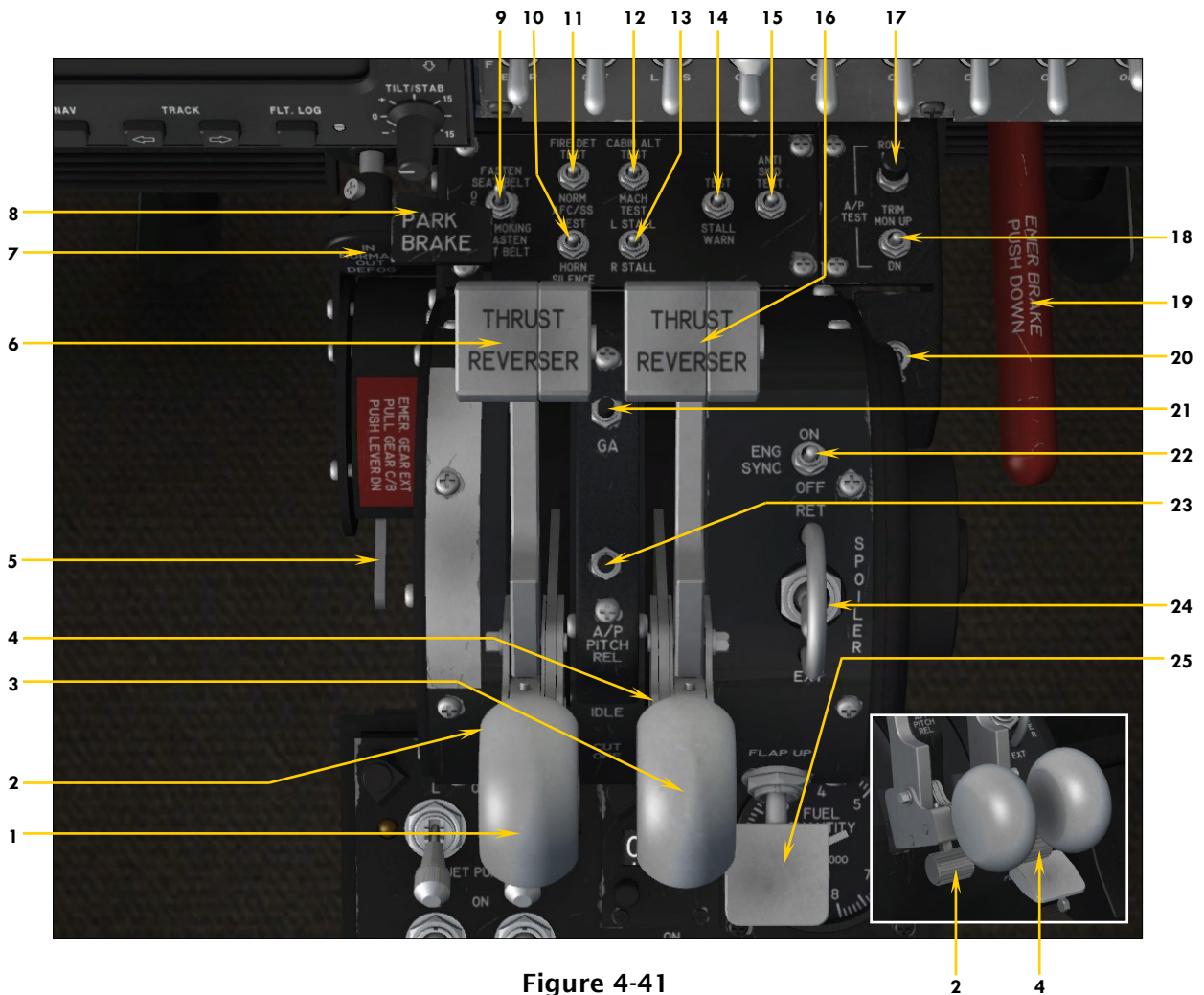


Figure 4-41

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Left Throttle (Control) Lever
<i>Actuate this lever beyond the IDLE (F1) mark to control thrust (left engine RPM). The Left Throttle Lever will not move if the Left Throttle Release Lever (2, below) is not raised, like on the real aircraft. Once released, the throttle can be dragged or moved with F2/F3.</i> 2. Left Throttle Release Lever
<i>This lever must be raised (clicked in the simulator) to open the fuel valve and move the Left Throttle Lever from the CUT OFF position to the IDLE position and vice versa. During the starting sequence, this is normally done at 10% RPM for the selected engine. Clicking this lever when the engine is started will move the Left Throttle Lever back to CUT OFF and will shut down the engine (fuel valve closed).</i> 3. Right Throttle (Control) Lever
<i>Same as 1, but for the right engine.</i> 4. Right Throttle Release Lever
<i>Same as 2, but for the right engine.</i> | <ol style="list-style-type: none"> 5. Emergency Gear Extension Lever
<i>This lever is used to extend the landing gear in case of a hydraulic system failure. The Landing Gear Selector Switch [5, fig. 4-28] should be placed in the DWN position prior to using the lever. The emergency air tank supplies compressed air or nitrogen to operate the emergency gear extension system. Tank pressure is shown on the direct-reading Emergency Air Indicator [3, fig. 4-37]. Refer to "Abnormal/Emergency Procedures" in section 8 for details.</i> 6. Left Thrust Reverser Subthrottle
<i>Use this lever to deploy or stow the thrust reversers and to control engine RPM in reverse. The aircraft must be on the ground, the thrust reversers armed [see 7-8, 13-14, fig. 4-34] and the throttle must be at IDLE (F1) before the Thrust Reverser Subthrottle can be moved (F2/F3).</i> 7. Windshield Defog Knob (n/s)
<i>External windshield defogging is accomplished by pulling out the Windshield Defog Knob. This will allow hot bleed air from the engine to enter the external defog outlets and to heat the windshield if</i> |
|--|---|

- the Windshield Heat Switches [4, fig. 4-4] are properly set. When the knob is pushed in, hot bleed air will be directed to the crew footwarmers (normal position). Requires the Bleed Air Switch [1, fig. 4-39] to be set to NORM or MAX.
8. **Parking Brake Lever**
Parking brakes are set by pulling this lever that traps hydraulic pressure in the brake assemblies.
 9. **No Smoking/Seat Belt Switch**
 10. **AFCSS/Horn Silence Test Switch**
In the simulator, setting this 3-position switch to AFC/SS will test all the bulbs in the autopilot and flight director lights and annunciators. On the real aircraft, this position is used to test the autopilot stability system (not available in the simulator). Setting this switch to HORN SILENCE will silence most audible alerts. Default position is OFF (middle position).
 11. **Fire Detection Test Switch**
Set this switch to FIRE DET TEST to test the continuity of the sensing elements and control units of the fire detection system. This will cause the fire panel lights to illuminate or to flash. Return the switch to NORM to end the test.
 12. **Cabin Alt Warning/Mach Test Switch**
When set to CABIN ALT, this 3-position switch is used to test the cabin altitude alert. When set to MACH TEST, this switch is used to test the overspeed warning system and alert, and the stick puller. The Stick Nudger/Puller Switch [20, below] must be set to ON prior to testing the stick puller. Default position is OFF (middle position).
 13. **Stall Warning Test Vane Selector Switch**
This switch is used for selecting which stall warning system to test with the Stall Warning System Test Switch (below).
 14. **Stall Warning System Test Switch**
This switch is used in conjunction with the Vane Selector Switch [13, above] to test the stall warning system, the stick shaker and the stick nudger. The Stall Warning Switches [4, 6, fig. 4-27] must be set to ON and AC power must be available. The Stick Nudger/Puller Switch [20, below] must be set to ON prior to testing the stick pusher.
 15. **Anti-Skid Test Switch**
With the Anti-Skid Power Switch [8, fig. 4-27] set to ON, this 3-position switch is used to test the anti-skid system installed on each inboard or outboard wheel of the main landing gear, depending on the switch position. Under normal conditions, the four Anti-Skid Generator Lights [4, fig. 4-15] should be off. Testing the anti-skid systems will cause some of the lights to illuminate, each light representing one wheel. Reset the switch to its middle (OFF) position after performing the tests.
 16. **Right Thrust Reverser Subthrottle**
Same as 6, but for the right engine.
 17. **Autopilot Roll Monitor Test Button**
This button is used to test the autopilot disengage function when an improper signal is introduced to the roll function. The button has two position: hold to TEST and a spring-loaded OFF position. Pushing this button to TEST will disengage the autopilot.
 18. **Autopilot Pitch Trim Monitor Switch**
This 3-position switch is used to test the autopilot disengage function when an improper signal is introduced to the pitch function. The switch is spring-loaded to the middle, OFF position. Setting this switch to UP or DN will disengage the autopilot.
 19. **Emergency Brake Lever (n/s)**
This lever will set the parking brakes (no emergency brake is provided in the simulator).
 20. **Stick Nudger/Puller Switch**
In the simulator, this switch is used to activate or deactivate the stick nudger (stick pusher) and the stick puller. When the switch is set to ON and the autopilot is engaged, the stick nudger will be activated if a stall condition is detected, and the stick puller will be activated if an overspeed condition is detected. The switch is set to ON by default.
 21. **Autopilot Go-Around Button**
Depressing this button disengages the autopilot pitch and roll hold modes (if the autopilot is engaged) and engages the takeoff/go-around mode. Throttles automatically advance to takeoff power, wings level, vertical speed is set to 4,500 fpm, and the flight director indicates takeoff pitch. TO/GA mode can be used for takeoff, or for a go-around on landing. Releasing the button disengages the TO/GA mode and engages the ATT hold mode if the autopilot is engaged.
 22. **Engine Sync Switch (n/s)**
On the real aircraft, this switch is used to synchronize the left engine RPM with the right engine RPM. This switch must be set to OFF for takeoff, landing, descent, single engine operation, and below 70% RPM. Engine synchronization for jet engines is not available in the simulator.
 23. **Autopilot Pitch Release Button**
When depressed, this button disengages the autopilot pitch hold modes and the SPD or MACH hold mode. Releasing the switch engages the ATT hold mode, maintaining the airplane pitch attitude.
 24. **Spoilers Switch**
When this switch is set to EXT, the spoilers extend and the SPOILER annunciator [7, fig. 4-30] illuminates on the main annunciator panel. Full extension is about 40°. Returning the switch to RET causes the spoilers to fully retract and the annunciator to go off. Like on the real aircraft, spoiler deployment is programmed to cause nose down pitching which should be anticipated. Spoilers are electrically controlled and hydraulically actuated.
 25. **Flap Selector Switch**
Click or use the mouse wheel to extend or retract the flaps. In the simulator, four flap positions are provided: Full Up, 8° down, 20° down and full down (40°). An audible alert will sound if the flaps are extended beyond 25° and the landing gear is not down and locked. Flaps are electrically controlled and hydraulically actuated.

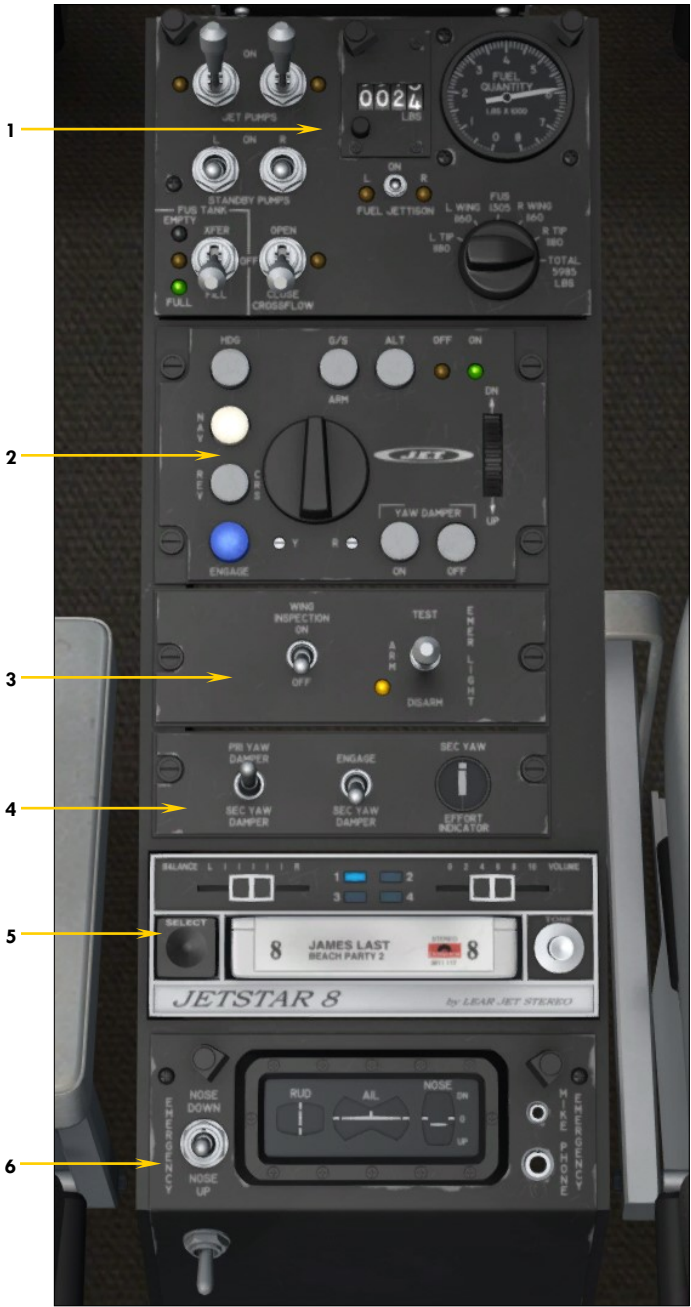


Figure 4-42

- 1. Fuel Control Panel
- 2. Flight Controller (Autopilot)
- 3. Emergency Lights Panel
- 4. Yaw Damper System Panel
- 5. 8-Track Tape Player
- 6. Trim Indicators Panel

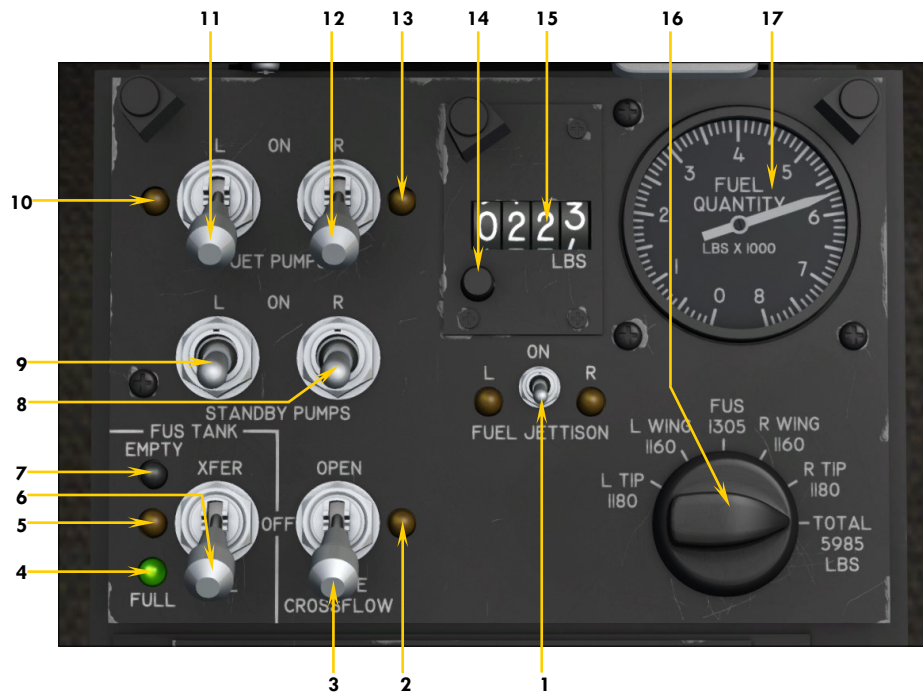


Figure 4-43

1. **Fuel Jettison Switch and Lights**
This switch is used to jettison fuel from the wing tip tanks. The lights are illuminated when the fuel jettison valves are open.
2. **Crossflow (Crossfeed) Valve Light**
In the simulator, this light indicates that the cross-feed valves are in transit.
3. **Crossflow (Crossfeed) Switch**
In the simulator, this switch controls the crossfeed valves which allow fuel from one wing tank to feed the opposite or both engines by "isolating" the other wing tank. Used in conjunction with the Standby Pump Switches [8-9, below].
4. **Fuselage Tank Full Light**
When the Fuselage Tank Switch [6, below] is set to FILL, this green light will come on if the fuselage tank is full.
5. **Fuselage Tank Valves Light**
This light indicates that the fuselage tank valves are in transit.
6. **Fuselage Tank Switch**
In the simulator, this switch, when set to XFER, is used to feed the engines from the fuselage tank when fuel in the main wing tanks is critically low. Normally set to OFF.
7. **Fuselage Tank Empty Light**
When the fuselage tank switch is set to XFER, this white light will come on if the fuselage tank is empty.
8. **Right Standby Pump Switch**
Controls the right boost pump. Used for crossfeeding or in case of a jet pump failure. Normally OFF.
9. **Left Standby Pump Switch**
Controls the left boost pump. Used for crossfeeding or in case of a jet pump failure. Normally OFF.
10. **Left Motive Flow Valve Light**
If the position of the valve does not correspond to the position of the switch, the light will come on.
11. **Left Jet Pump Switch (Fuel Pump)**
Should be ON for the duration of the flight. Allows motive flow to the wingtip/wing tank jet pumps.
12. **Right Jet Pump Switch (Fuel Pump)**
Should be ON for the duration of the flight. Allows motive flow to the wingtip/wing tank jet pumps.
13. **Right Motive Flow Valve Light**
If the position of the valve does not correspond to the position of the switch, the light will come on.
14. **Fuel Counter Reset Button**
This button, when depressed, resets the Fuel Counter [15, below] to zero.
15. **Fuel Counter**
This counter indicates the total amount of fuel burned (in pounds) since the last engine start or reset. Often called a "fuel totalizer".
16. **Fuel Tank Selector Knob**
This selector knob enables the pilot to read the remaining fuel quantity in each of the five tanks as well as the total system quantity, on the Fuel Quantity Gauge [17, below].
17. **Fuel Quantity Gauge**
This gauge indicates the remaining fuel quantity (as weight) for the selected tank or for the total system.

Note: Refer to "20 Series Fuel System", section 5, page 6, for a complete discussion about the fuel system.

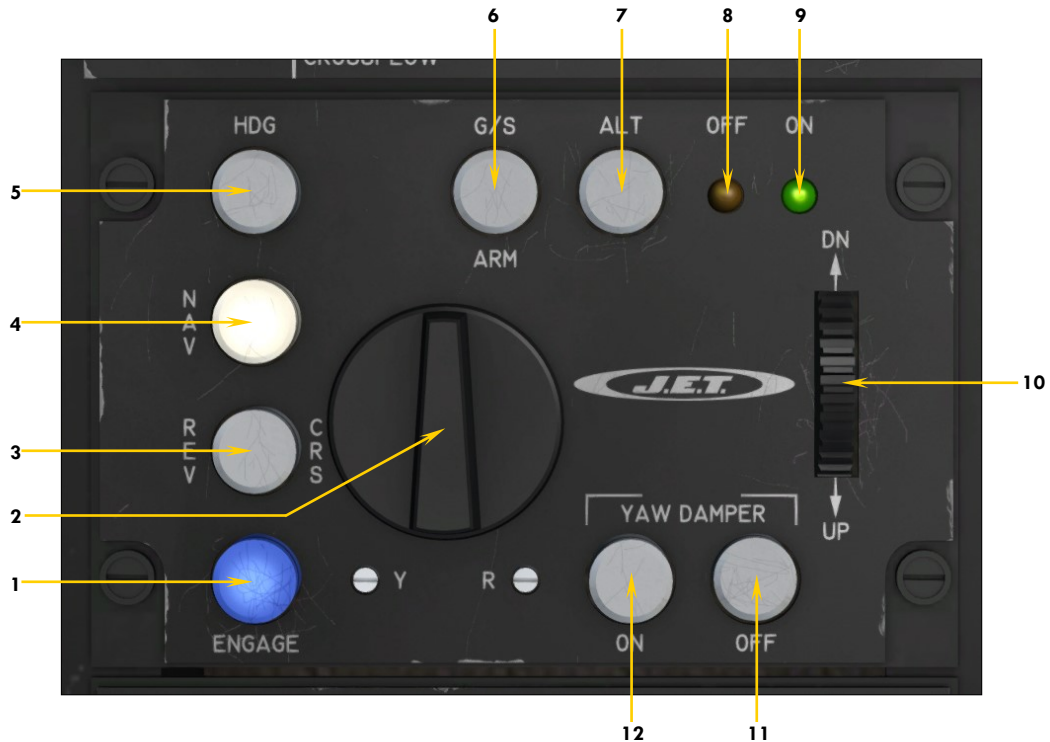


Figure 4-44

1. **A/P (Autopilot Engage) Button and Light**
Engages the autopilot and the attitude hold mode, and levels the wings. Autopilot assumes aircraft control. In the simulator, the flight director is independent from the autopilot and must be turned on separately [1, fig. 4-16]. Requires avionics power.
2. **Turn Command Knob**
This knob will command bank angles up to 30°, but it will disengage any horizontal modes. Use the mouse wheel to control the bank. Click the knob to center both the knob and the ailerons.
3. **REV CRS (Reverse Course Approach Mode) Button and Light**
The REV CRS button engages the autopilot's back course approach mode, enabling automatic tracking of a localizer (or GPS) back course for instrument approaches. When engaged, the function is similar to an approach mode, except the glide slope is disabled and the autopilot's response to a localizer signal is reversed.
4. **NAV (Navigation Hold Mode) Button and Light**
Engages the navigation hold mode, the autopilot automatic tracking of a VOR course, GPS course, or localizer for navigation.
5. **HDG (Heading Hold Mode) Button and Light**
Engages the heading hold mode. The autopilot will turn the airplane as necessary and fly a heading selected by the position of the Heading Bug on the HSI [10, fig. 4-8].
6. **G/S ARM (Glideslope Only Hold Mode) Button and Light**
When the G/S ARM button is depressed, the autopilot will capture and track the ILS glideslope signal.
7. **ALT (Altitude Hold Mode) Button and Light**
Engages the altitude hold mode. The aircraft climbs/descends to the altitude set on the Altitude Preselector [figure 4-23] at the rate set on the Vertical Speed Selector [1, fig. 4-12].
8. **Autopilot OFF Light**
The amber Autopilot OFF Light is illuminated any-time the AFCS has power available but the autopilot is not engaged.
9. **Autopilot ON Light**
In the sim, the green Autopilot ON Light is illuminated when the autopilot is engaged.
10. **Pitch Command Wheel**
When the Pitch Command Wheel is rotated, the autopilot will change airplane pitch attitude in response to the pitch command rotation. Use the mouse wheel to control the pitch. Click the knob to reset.
11. **Primary Yaw Damper OFF Button**
Depressing the YAW DAMPER OFF Button will disengage the primary yaw damper system.
12. **Primary Yaw Damper ON Button**
The YAW DAMPER ON Button engages the primary yaw damper system which helps eliminate unwanted aircraft yaw and keeps turns coordinated.

Note: Refer to section 5, page 15, for a complete discussion about the autopilot and the flight director.

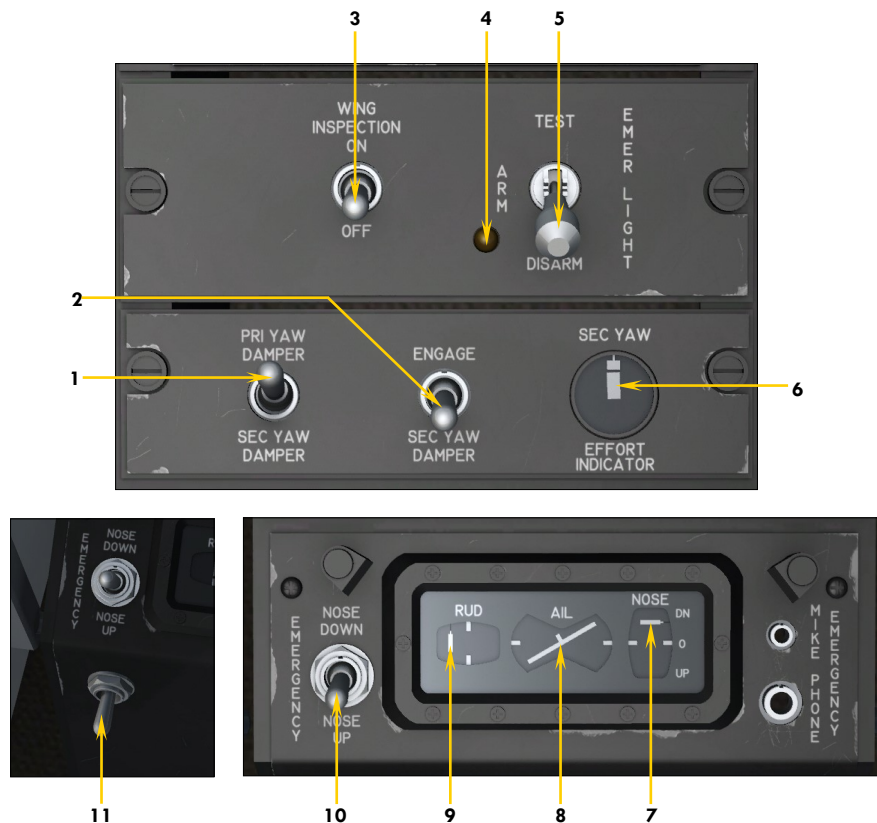
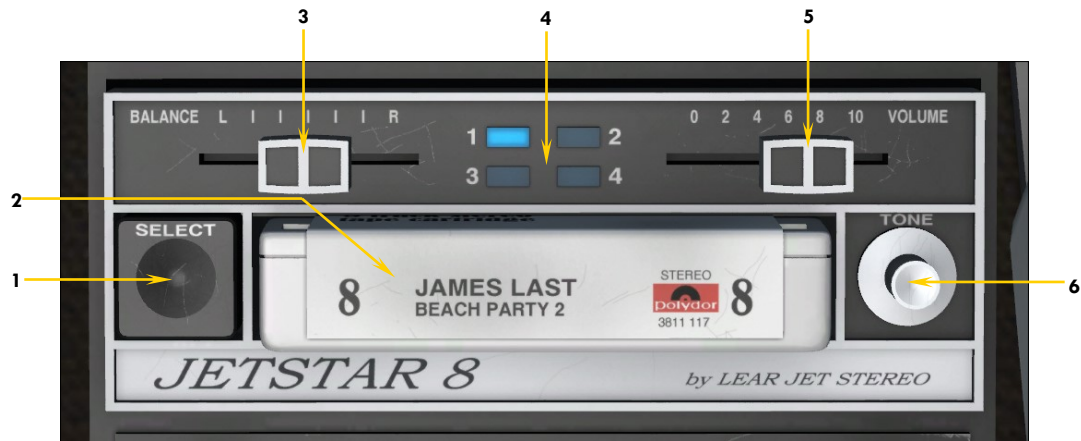


Figure 4-45

1. **Yaw Damper Selector Switch**
This switch selects the primary yaw damper system when set to PRI YAW DAMPER and the secondary yaw damper system when set to SEC YAW DAMPER. The GLJ Model 25 SE addon is equipped with dual (primary and secondary) yaw damper systems, like the real aircraft. Each system is completely independent and only one yaw damper system can be engaged at a time.
2. **Secondary (Emergency) Yaw Damper Switch**
This switch engages or disengages the secondary yaw damper system in case of an emergency. To engage the secondary yaw damper system, the Selector Switch [1, above] must be set to SEC YAW DAMPER. Selecting the primary yaw damper system will disengage the secondary yaw damper system.
3. **Wing Inspection Light Switch (n/s)**
This aircraft has no wing inspection light. In the simulator, this switch toggles the external belly lighting effect (from landing and taxi lights).
4. **Emergency Lighting System OFF Warning Light**
This amber light indicates that the emergency lighting system is not armed. The Emergency Lights Switch [5, below] should be set to ARM prior to takeoff.
5. **Emergency Lights Switch**
This switch, when set to ARM, arms the self-powered emergency cabin lighting system that illuminates the cockpit and the cabin in case of a DC power failure. In the sim, the system will turn on the cabin lights in case of a power failure. The panel lights and exit lights can also be turned on. On the real aircraft, only the top panel flood lights, the exit light and the wing inspection light are illuminated. Set the switch to TEST to test the system.
6. **Rudder Activity Indicator**
In the sim, this indicator shows rudder activity. A yaw damper effort indicator is not available in the simulator.
7. **Elevator Trim Indicator**
Takeoff trim is typically one needle thickness below neutral.
8. **Aileron Trim Indicator**
9. **Rudder Trim Indicator**
10. **Emergency Pitch Trim Control Switch**
This switch is used in case of failure of the primary trim system. The Emergency Pitch Trim Switch [3, fig. 4-27] should be set to EMER for the emergency pitch trim system to energize.
11. **Rudder Trim Control Switch**
This switch is used for trimming the rudder.



**LEAR JET STEREO
JETSTAR 8 STEREO 8-TRACK TAPE PLAYER**

A tribute to the inventive genius of Bill Lear.

Figure 4-46

1. **Track Selector Button**
Click to switch tracks. A Lear Jet Stereo 8-track cartridge (a format largely adopted by the music industry and major electronics and car manufacturers from the mid-1960's to the late 1970's) has four stereo tracks. On some real players, tracks can be played continuously — in a loop — or they can switch automatically to the next track. When the last track is finished playing, the music can stop or the player can switch to and start playing the first track again, depending on user's preferences. One of the main purposes of the 8-track player is to play music in a loop, continuously, without the need to rewind the tape or switch side. In the simulator, each track plays in a loop and the pilot needs to switch tracks manually by clicking this button.
2. **Stereo 8-Track Tape Cartridge**
Left-click to play music. Right-click to stop music. On a real player, the music normally starts playing as soon as the cartridge is inserted.
3. **Balance Control Cursor**
Move this cursor to balance the sound volume between the left and right audio channels (Prepar3D® only).
4. **Track LED Indicators**
Indicates which stereo track is playing (1-4).
5. **Volume Control Cursor**
Move this cursor to adjust the sound volume.
6. **Tone Control Knob (n/s)**
On a real player, this cursor will adjust the "tonal quality" (bass and treble combined) of the audio output. This is not available in the simulator at this time. Use your sound system or computer audio controls instead.

Note: The 8-track player requires DC power. Refer to section 4, page 9, for instructions about how to play your own music in the simulator.

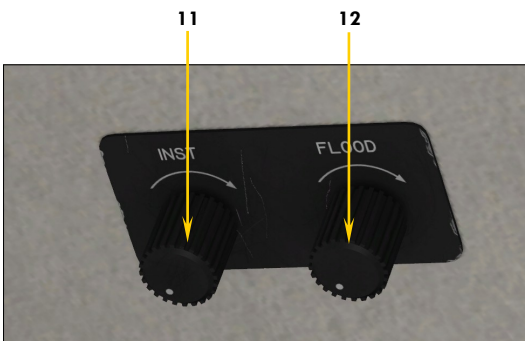
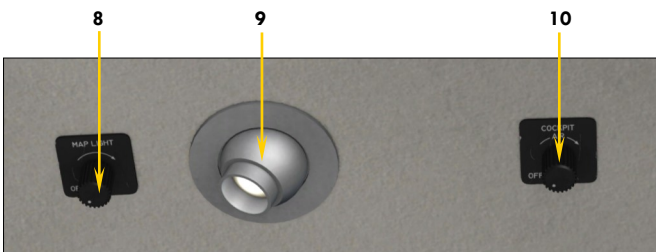
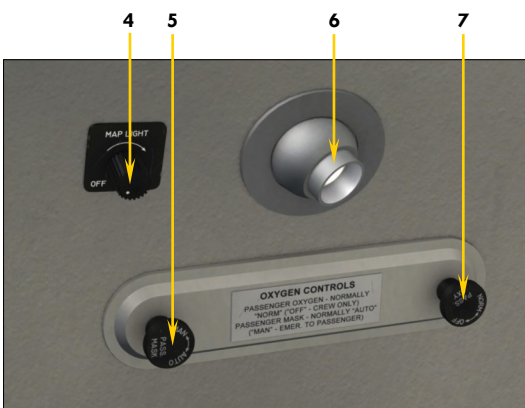
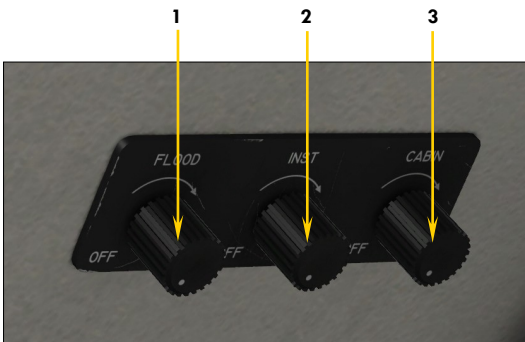


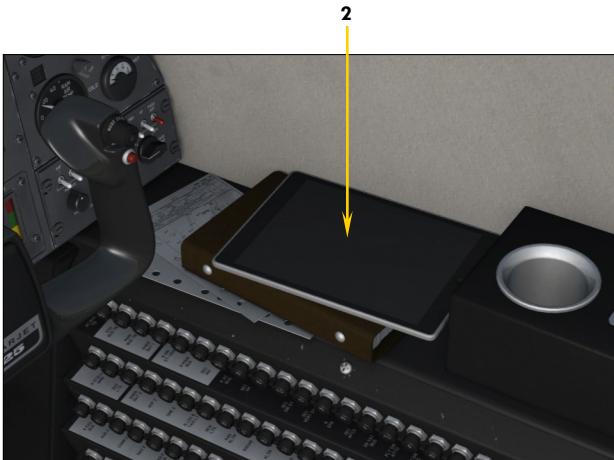
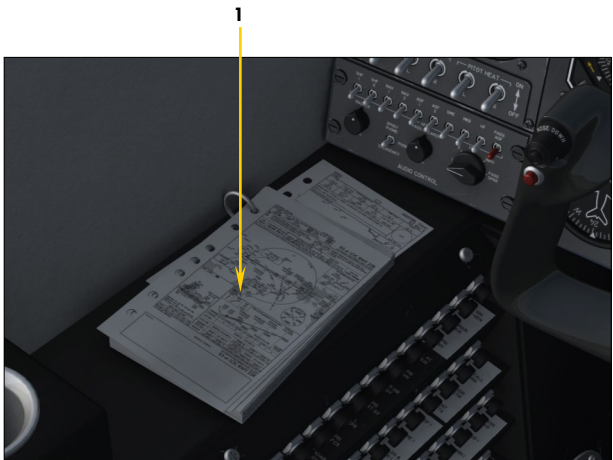
Figure 4-47

1. **Captain's Panel Flood Lights Control**
These lights are located under the glareshield.
2. **Captain's Instrument Lights Control**
In the simulator, this control knob toggles the instrument backlights, the panel lights and eyelids, the main door entry lights and the passenger's reading lights in the cabin.
3. **Captain's Cabin Lights Control**
In the simulator, this control knob toggles the cockpit ceiling lights and the cabin ceiling lights.
4. **Captain's Map Light Control**
Toggles the captain's map light.
5. **Passenger Oxygen Mask Valve**
This valve is normally set to AUTO. Rotating this valve to MAN with the Passenger Oxygen Flow Valve [7, below] set to NORM, oxygen will be provided to the passenger masks at any altitude, if required.
6. **Captain's Map Light**
7. **Passenger Oxygen Flow Valve**
This valve, when normally set to NORM (open), will automatically admit oxygen to the passengers through an aneroid-controlled solenoid valve if the cabin altitude reaches 14,000 feet and DC power is available. On the real aircraft, the passenger masks will be deployed and the cabin light will illuminate. If the valve is set to OFF (closed), oxygen will not be available to the passengers in any case. Oxygen is provided to the crew at all time. The crew distribution system consists of the pilot's and copilot's oxygen masks stowed on the pilot's and copilot's sidewalls. In the simulator, with only the crew being provided with oxygen, and the oxygen tank [1, fig. 4-37] filled to 1,500 psi, oxygen will last for about 120 minutes. With the crew and seven passengers being provided with oxygen, oxygen will last for about 30 minutes. Click the Oxygen Pressure Gauge [1, fig. 4-37] to fill the oxygen tank to 1,500 psi, if needed.
8. **Copilot's Map Light Control**
Toggles the copilot's map light.
9. **Copilot's Map Light**
10. **Cockpit Fan Control Knob**
11. **Copilot's Instrument Lights Control**
Same as the one on the captain's side.
12. **Copilot's Panel Flood Lights Control**
Same as the one on the captain's side.



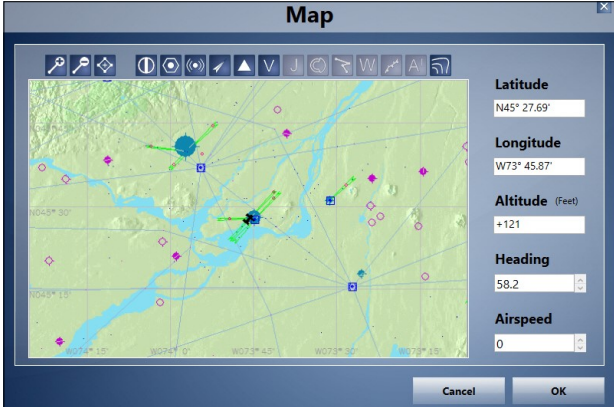
SUN VISORS
Figure 4-48

1. Sun Visor
Click the green plastic section to lower or to raise the sun visor.
2. Sun Visor Hinge
Click and drag the hinge to slide the sun visor along the track.



FLIGHT MAP
Figure 4-49

1. Flight Maps
Click the flight maps on the captain's side to open the simulator's flight map.
2. Copilot's (Hideable) iPad® Tablet
Click the tablet to open the simulator's flight map. Click the brown binder under the tablet to show/hide the tablet.



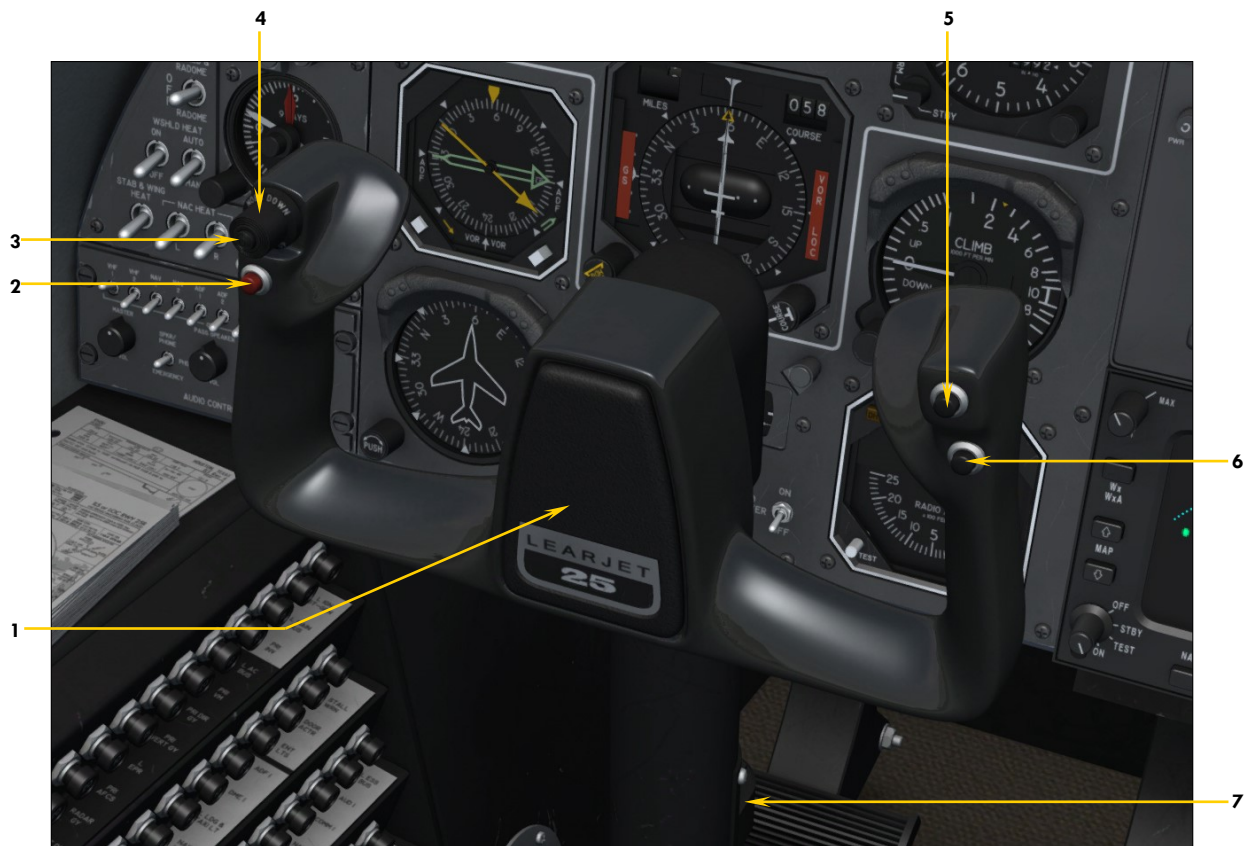


Figure 4-50

1. **Control Yoke**
Click the center logo on the captain's side to show/hide the crew (on the exterior model). Click the center logo on the copilot's side to install/remove the "Remove Before Flight" items. "Remove Before Flight" items cannot be installed if the aircraft is not parked or if the starters/engines are running.
2. **Wheel Master Button**
Click this momentary push button to engage electrical nose gear steering (up to 10° in either direction below 45 knots). A green annunciator [14, fig. 4-30] will illuminate on the main annunciator panel. Click the switch again to disengage electrical nose wheel steering (the green annunciator will go off). On the real aircraft, this switch, when held depressed, will engage the wheel master mode (steering of 40° to 50° in either direction, for taxi up to 10 knots). Nose wheel steering is accomplished automatically in the simulator at certain speeds. See also "Nose Gear Steer Lock Switch" [7, fig. 4-4].
3. **Trim Switch Arming Button**
In the simulator, when the center button on the four-way trim switch is momentarily depressed, the autopilot ALT and ATT hold modes are disengaged.
4. **Four-Way Trim Switch (n/s)**
On the real aircraft, when the autopilot is engaged and without the center arming button depressed, this four position switch is used to change the attitude of the aircraft. This switch is not simulated in the simulator. However, buttons can be programmed on your controller/yoke for pitch and roll trim.
5. **Maneuver Control Button**
Depressing this button momentarily disconnects the autopilot pitch and roll modes (ALT, ATT). When the switch is released, the ATT hold mode is re-engaged.
6. **Pitch Sync Button**
When depressed, this button disengages the autopilot pitch hold modes and the SPD or MACH hold mode. Releasing the switch engages the ATT hold mode, maintaining the airplane pitch attitude.
7. **Stick Shaker Motor-Vibrator**
Actuation of the stick shaker causes low-frequency, high-amplitude vibration in the control column. This is used in conjunction with the stall warning system and the stick nudger.

Note: Refer to section 5, page 25, for more information about the (autopilot) control yoke buttons.

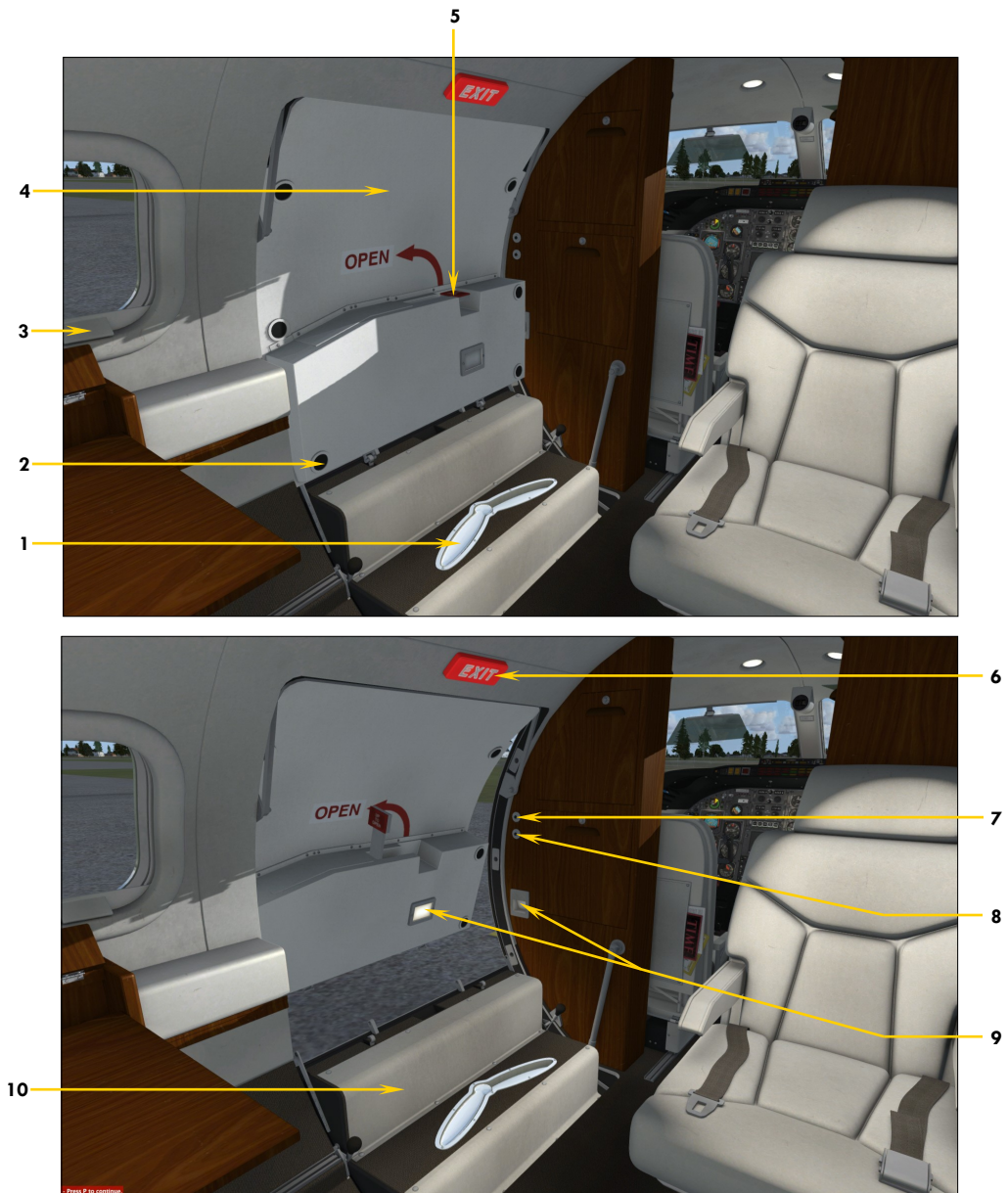


Figure 4-51

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Lower Door Locking Handle 2. Latch Pin Inspection Window 3. Window Shade 4. Upper Door 5. Upper Door Handle
<i>Click to open door (or press Shift-E).</i> 6. Exit Sign | <ol style="list-style-type: none"> 7. Entry Lights Switch
<i>Toggles entry, reading and instrument lights.</i> 8. Cabin (Ceiling) Lights Switch
<i>Toggles cabin lights.</i> 9. Entry Lights 10. Lower Door (Step Half) |
|--|---|

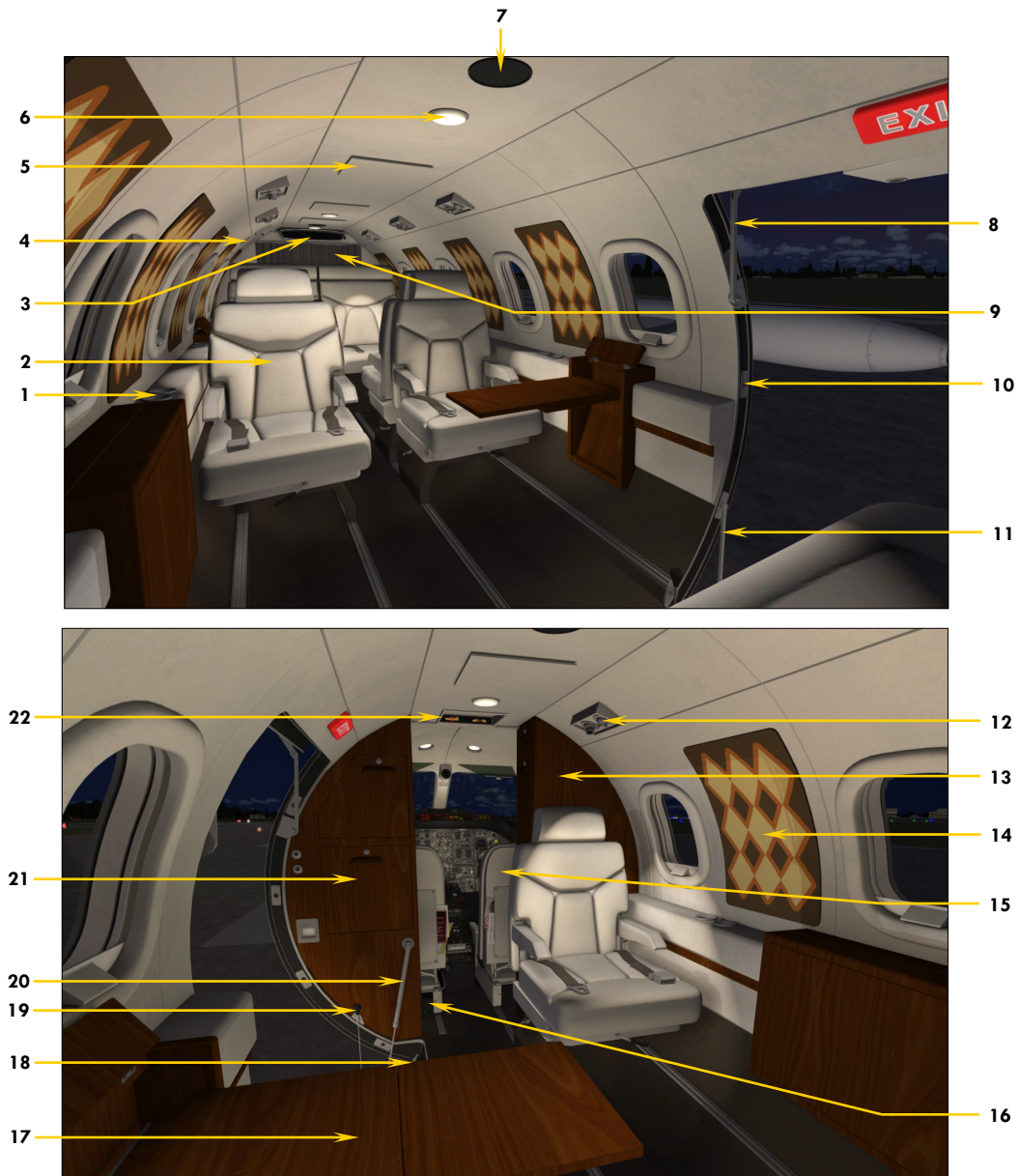


Figure 4-52

- | | |
|-------------------------------------|-------------------------------------|
| 1. Cup Holder/Ashtray | 12. Reading Light & Air Vent |
| 2. Passenger Seat | 13. Right Service Cabinet |
| 3. A/C Blower Duct (with diverters) | 14. Wall Decor (1970's) |
| 4. Emergency Door Handle | 15. Pilot and Copilot Seats |
| 5. Oxygen Mask Compartment | 16. Emergency Lighting Power Supply |
| 6. Cabin Light | 17. Table |
| 7. Speaker | 18. Lower Door Torsion Bar |
| 8. Upper Door Torsion Bar | 19. Support Cable Handle |
| 9. Baggage Compartment | 20. Damper Cylinder |
| 10. Latch Pin Hole | 21. Left Service Cabinet |
| 11. Metal Rod Support | 22. No Smoking/Seatbelts Sign |



20 SERIES AIRCRAFT SYSTEMS

The following section contains important information about the aircraft systems included with your new Xtreme Prototypes GLJ Model 25 SE add-on.

Although the GLJ Model 25 SE add-on is inspired from the classic Gates Learjet 20 Series aircraft family, there are a few differences in systems when compared to the real Learjet 25D. These differences are due mainly to limitations in the simulation platforms and to our desire to keep aircraft operations simple and enjoyable for an average-skilled virtual pilot.

Unless otherwise noted, the following systems are simulated to conform as closely as possible to the operation of the real aircraft, within the present limitations and capabilities of the available simulation platforms:

- Flight controls

- Electrical system
- Hydraulic system
- Landing gear
- CJ-610 Power plant
- Fuel system
- Fire detection and suppression system
- Environmental control system (pneumatics, bleed air, air conditioning, cabin temperature, and pressurization)
- Automatic flight control system
- Caution and warning system
- Avionics, autopilot, radio and navigation systems, fully compatible with ATC (VHF COM1/COM1 Standby, COM2, ADF1, ADF2,

NAV1, NAV2, transponder, DME)

- GPS (compatible with the autopilot)
- Main entry door (fully animated)
- Cockpit lighting system, including emergency lighting

Most systems, gauges, switches, light indicators and instruments are fully functional and behave like their original counterparts found in the real aircraft, unless otherwise noted.

Tooltips are provided in the sim and are very useful for cockpit familiarization (identifying the numerous instruments, gauges and switches and memorizing their location).

Below is a summary description of the most important systems followed by complete discussions about the new fuel system and automatic flight control system (autopilot/flight director) installed in this new software version.

Additional information about controls, gauges, lights and annunciators can be found in section 4, "Instrument Panels".

Flight Controls



Your GLJ Model 25 SE addon is equipped with manually-powered primary flight control systems. These consist of the elevator, ailerons and rudder. Secondary systems are either electric (stabilizer and other trims) or hydraulic (flaps and spoilers). The controls are balanced

to provide reasonable effort and feel for the pilot.

Your addon should be controlled with only constant and light movements of the joystick/yoke. The controls should never be pushed hard and should be properly trimmed at all times.



Remember: Trims are there to help you but they are not primary flight controls. As a qualified pilot, you should hold the desired attitude with the controls and trim until the effort is gone. Do not let go of the controls and use trim to get the required attitude. This is sloppy flying and can lead to loss of control.

Refer to fig. 3-1 and 3-2 in section 3 for the location of the different flight control surfaces on the GLJ Model 25 aircraft.

Electrical System

Your addon's electrical system consists mainly of a single 24-volt battery (instead of dual batteries like in the real aircraft), a main battery bus, a battery charging bus, two 28-volt DC/400-amperes engine-driven starter-generators, two main DC busses, two essential DC busses, two 115-volt AC/1,000 VA inverters, one auxiliary inverter, two AC busses and associated transformers, switches and gauges.

During normal operation, the generators supply DC power to the left and right DC busses where most components are connected. This also charges the battery. Two inverters (devices that convert DC current to AC current)



provide 115 VAC (or 26 VAC through transformers) to different aircraft systems and to the avionics bus, which powers most flight instruments, including the GPS and the communication and navigation radios. These are called the primary and secondary inverters. An auxiliary inverter is also installed for safety purposes, since critical instruments depend on AC power to tell up from down.

Important: The avionics, GPS and radios will not work if at least one Inverter Switch [5, 10, 12, fig. 4-27] and the Radio Master Switch [14, fig. 4-27] are not turned **ON**.

Electrical control switches and meters are located on the center section of the main instrument panels [Fig. 4-26, 4-27 and 4-28].

The instrument panel is also equipped with a standby gyro horizon [Fig. 4-16], powered by two emergency batteries when DC power is not available from the main DC busses. This means that in case of a loss of battery and



generators, the pilot will have attitude indication for as long as the emergency batteries last (typically enough for a precautionary landing).

The dual emergency battery system is controlled with two power switches on the main instrument panel [14, fig. 4-2].

Note: Emergency batteries are not available in the simulator and have been replaced by the APU. The APU, when engaged, will supply power to all aircraft systems.

Refer to section 7 for detailed operating procedures.

Hydraulic System

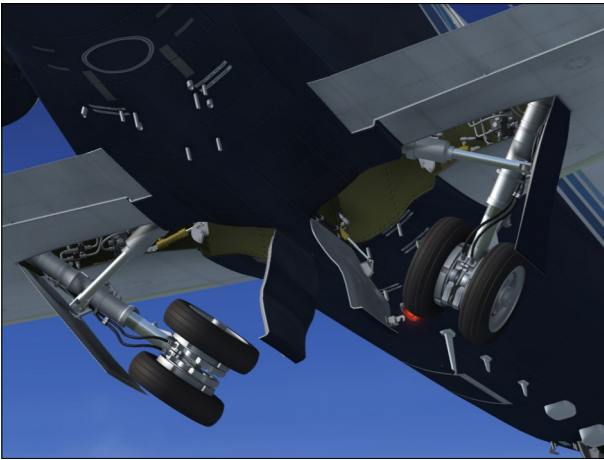
Your add-on's hydraulic system consists of two engine-driven hydraulic pumps and a backup fluid reservoir. The hydraulic system powers the landing gear and brakes, the flaps and the spoilers. Like the real aircraft, the add-on is also equipped with an electric auxiliary hydraulic pump for operations on the ground or in case of emergency.

Refer to section 7 for detailed operating procedures.

Landing Gear



Your add-on's landing gear is of the tricycle, retractable type. The main gear has dual-wheels while the nose gear has a single,



steerable wheel. The main gear is equipped with multi-disc hydraulic brakes controlled by an anti-skid computer, sensors and modulator valves.

Refer to section 7 for detailed operating procedures.

Power Plant, Thrust Reversers

Your add-on is equipped with the reliable General Electric CJ-610 single-spool turbojet engine. Rated at 2,950 lbs. static thrust per side at sea level, the CJ-610 provides the aircraft (especially at low weights) with fighter-like performance. It was said that a lightly-loaded Model 25 could outperform the legendary Lockheed T-33!

The single-spool turbojet engine will make higher thrust at altitude than a modern turbofan engine with similar ratings. This makes the 20 Series aircraft well-suited for high alti-



tude flight. The downside is that fuel consumption and noise are far greater. Your GLJ Model 25 SE add-on is no exception, so plan adequate fuel for your trip (see “Flight Planning”, in section 6)!

This new edition of our classic GLJ Model 25 add-on is equipped with fully modeled Dee Howard target thrust reversers consisting of upper and lower clamshell doors, pivoted near the engine centerline. The reverser doors are hydraulically actuated and electrically controlled.



The thrust reversers are an additional deceleration system which may be used anytime the airplane is on the ground to produce shorter stopping distances.

Refer to section 7 for detailed operating procedures.

Fire Detection and Suppression System



Each engine nacelle is equipped with a fire detection system. Two fire extinguisher bottles in the fuselage may discharge to either engine as needed. Each engine has its own fire control panel on the glareshield [Fig. 4-31 to 4-33].

Refer to “Abnormal/Emergency Procedures”, in section 8, for more details.

Environmental Control System



The GLJ Model 25 is meant to operate at high altitudes, where the air is thin and very cold. Your add-on is therefore equipped with a high performance pressurization system.

The pressurization system bleeds high-pressure air from the engine compressors and directs it into the cabin to maintain pres-

surization. The pressure is regulated through an outflow valve slaved to the pressurization controller [5, fig. 4-39].

Before takeoff and during flight, the pilot sets the target altitude of the flight and the pressurization controller will take care of the rest. Manual adjustment of the automatic cabin climb/descent rate is available via a control knob [2, fig. 4-39] on the pressurization panel. The “cherry picker” switch [3, fig. 4-39] controls the cabin rate when in manual mode.



Bleed air is quite hot as it leaves the engine. This heat is used to control cabin temperature as well. By mixing hot bleed air with bleed air cooled in a heat exchanger, a comfortable cabin temperature can be obtained.



The mixing of these two airflows takes place in the so-called “H-valve” [19, fig. 4-35]. As the cabin temperature is set on the temperature control panel [Fig. 4-40], make sure to monitor the H-valve position indicator accordingly.

Refer to section 7 for detailed operating procedures.



20 SERIES FUEL SYSTEM



Because of the current limitations in Prepar3D® and FSX, the fuel system in the GLJ Model 25 SE add-on is very similar but not identical to the one installed in the real aircraft. However, all the switches and annunciators are provided to simulate the real procedures and to enhance realism. Some of the switch functions on the add-on's fuel panel are different from those in the real aircraft. The differences between the add-on and the real aircraft are fully explained below.

Like in the real Learjet 25D, your add-on's fuel system is divided into left and right tankage, each feeding the corresponding engine. It consists of two wingtip tanks, two main wing tanks and a center (storage) fuselage tank.

Fuel Pumps

While the real aircraft uses pumps to assist in emptying the wingtip tanks and the center tank into the main wing tanks, the add-on uses gravity. However, the add-on is equipped with two fuel pumps to assist transferring fuel from the tanks to the power plants. Two switches [11-12, fig. 4-43] are provided on the add-on's fuel panel to energize the fuel pumps, one for each engine.

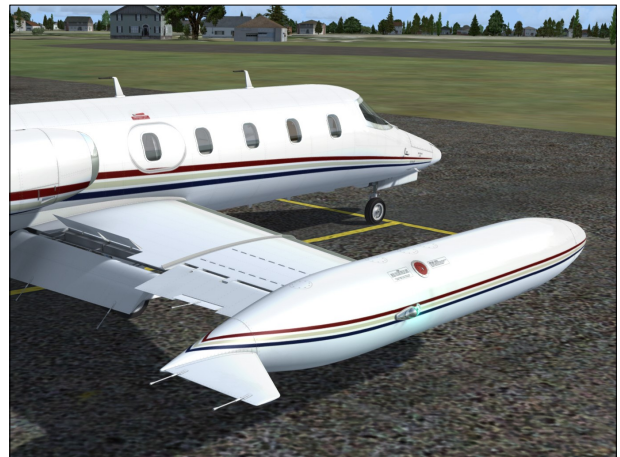
In the real aircraft: The top half-part of each wingtip tank will gravity flow into the wing tank automatically. An ejector-type jet pump in each wingtip tank is used to transfer

the remaining wingtip tank fuel into the respective wing tank. A ventury-type jet pump and an electrically operated centrifugal-type multi-function low pressure standby (boost) pump are installed at the most inboard and lower portion of each wing tank. This assures that the pumps are submerged in fuel until the tanks are almost empty.

Refueling

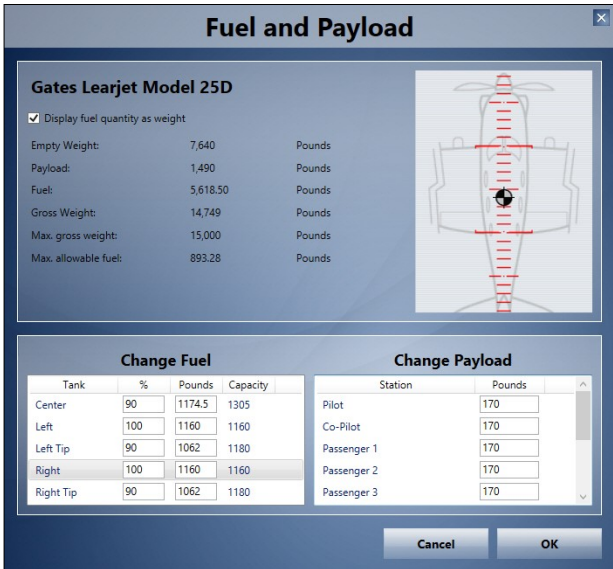
On both the add-on and the real aircraft, refueling is accomplished through a filler cap on top of each wingtip tank. In the sim, refueling is achieved through the "Fuel and Payload" settings or by requesting a fuel truck (SHIFT+F) in certain parking areas. Refer to your simulation platform's documentation for more details.

Wingtip Tanks



Like the real aircraft, the add-on is equipped with two wingtip tanks. Each wingtip tank has a recognition light installed at the front and a fuel jettison system at the rear. Because of this configuration, each tank has a capacity of 1,180 pounds of fuel.

Fuel is automatically transferred from each wingtip tank to its respective wing tank. All wingtip tank fuel can be jettisoned through a valve in the tank tailcone (see "Fuel Jettison" below).

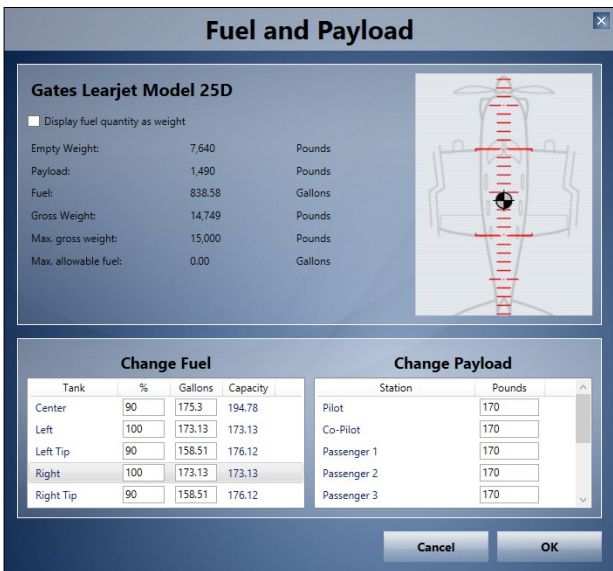


The fuselage tank has a capacity of 1,305 pounds of fuel.

A Fuselage Tank Switch [6, fig. 4-43] is provided on the add-on's fuel panel to feed both engines with fuel contained in the fuselage tank when fuel in the wing tanks is critically low.

The add-on's Fuselage Tank Switch cannot be used to pump fuel from the center fuselage tank into the wing tanks, like on the real aircraft. The Fuselage Tank Switch is used to directly connect both engines to the center fuselage tank instead.

Important: Like a real Learjet pilot, the desktop pilot must constantly monitor fuel in the wing tanks to prevent engine starvation.



The Fuselage Tank Switch must be set to **XFER** when the fuel in the main wing tanks is critically low. Switching from the main wing tanks to the center fuselage tank is not done automatically and must be performed manually, which is similar to the fuel transfer procedure on the real aircraft. The "Low Fuel Remaining" annunciator [2, fig. 4-30] will illuminate when there is less than 50 gallons (approx. 335 pounds) of fuel in either wing tank or, if the Fuselage Tank Switch is set to **XFER**, in the center fuselage tank.

In the real aircraft: The fuselage tank consists of four bladder-type cells. The fuselage tank is only a storage tank and fuel must be pumped into the wing tanks for use by the engines. This is done by setting the Fuselage Tank Switch to XFER.

Wing Tanks

The wing is divided by a center bulkhead into two separate compartments which serve as sealed, full span, integral fuel tanks. Fuel is not stored in the landing gear wheel well and in the wing leading edge area. By default, the left engine uses fuel from the left wing tank and the right engine uses fuel from the right wing tank. Each wing tank has a capacity of 1,160 pounds of fuel.

Center Fuselage (Storage) Tank

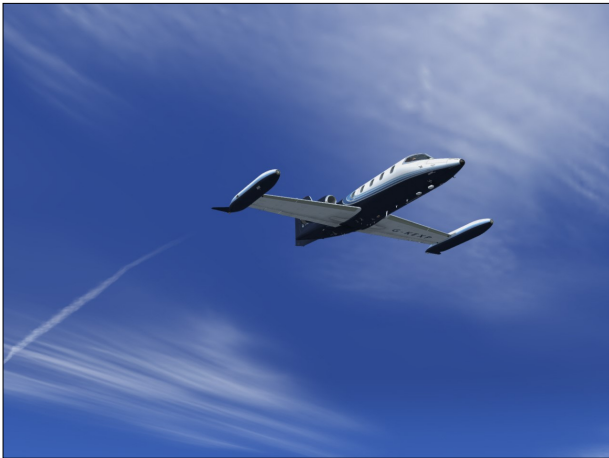
The center fuselage tank is used as a storage tank in both the add-on and the real aircraft.

Crossfeeding

A Crossfeed Valve Switch (labeled "Crossflow") [3, fig. 4-43] and two Standby Pump Switches [8-9, fig. 4-43] are provided on the add-on's fuel panel to crossfeed fuel from one wing tank to the opposite or both engines. In this case, the unused tank is "isolated" from its power plant. This may be used to balance fuel between the two wing tanks and during single engine operation. The Crossfeed Valve Switch cannot be used to transfer fuel from one wing tank to the other, like on the real aircraft.

In the real aircraft: A crossflow valve is provided to balance fuel between the two wing tanks, especially in case of single engine operation. The crossflow valve is used in conjunction with the two standby (boost) pumps. During cross-flowing, the Crossflow Switch is set to OPEN while the Standby Pump Switch for the heavy wing is turned ON and the standby pump switch for the light wing is turned OFF.

Fuel Jettison



The GLJ Model 25 SE addon is now equipped with a fuel jettison system. The fuel jettison system will jettison fuel from the wingtip tanks only, like in the real aircraft. It takes a few minutes to empty both wingtip tanks, depending on the remaining fuel. Fuel jettisoning can be interrupted at any time and will stop automatically when both wingtip tanks are empty. Fuel cannot be jettisoned from the wing tanks or from the center fuselage tank.

Note: Due to some limitations in the simulation platforms, fuel will first be jettisoned from the left wingtip tank, then from the right wingtip tank. The pilot will need to compensate for the fuel imbalance during jettisoning, until both tanks are emptied.

In the real aircraft: The fuel jettison system is applicable to the wingtip tanks only. Both wingtip tanks are emptied simultaneously. It takes about five minutes to empty both wingtip tanks. Very few Learjet 25D are equipped

with a fuel jettison system because fuel is burned so quickly on this type of aircraft that fuel jettisoning is almost never required.

Fuel System Controls, Lights and Annunciators



Left and Right Jet Pump Switches (Electric Fuel Pump Switches in the simulator) [11-12, fig. 4-43]

The two Jet Pump Switches control the motive flow valves and allow motive flow to their respective wingtip tank and wing tank jet pumps. They should always be in the **ON** position. These two switches control the electric fuel pumps in the simulator. There is one fuel pump for each engine. The fuel pressure annunciators [1, 4, fig. 4-30] should go out when the fuel pumps are operating.

Left and Right Motive Flow Valve Lights [10, 13, fig. 4-43]

These two amber lights next to the Jet Pump Switches monitor the position of their respective motive flow valve. If the position of the valve does not correspond to the position of the switch, the light will come on. It is normal for the light to come on for about one second when the Jet Pump Switch is set, indicating that the motion flow valve is in transit.

Left and Right Standby (Boost) Pump Switches [8-9, fig. 4-43]

The two Standby Pump Switches control the boost pumps. They are normally set to **OFF** except during cross-feeding or in the case of a jet pump failure. Regardless of the position of the switches, the boost pumps will be automatically energized when the fuselage tank switch is set to **FILL** or the starter engaged (the boost pumps supply fuel during engine starts) and de-energized when the fuselage tank switch is set to **XFER**.

To feed both engines with fuel from the left wing tank only, set the Crossflow Switch [3, fig. 4-43] to **OPEN** (see below). Then set the Left Standby Pump Switch to **ON** and the Right Standby Pump Switch to **OFF**. This will isolate the right wing tank and both engines will be fed by the left wing tank.

To feed both engines with fuel from the right wing tank only, set the Crossflow Switch [3, fig. 4-43] to **OPEN** (see below). Then set the Left Standby Pump Switch to **OFF** and the Right Standby Pump switch to **ON**. This will isolate the left wing tank and both engines will be fed by the right wing tank.

Low Fuel Pressure Annunciators [1, 4, fig. 4-30]

These two red annunciators, marked L FUEL PRESS and R FUEL PRESS indicate low engine fuel pressure below 10 psi. (one for each engine). They should come out when the jet pumps or the standby (boost) pumps are operating.



Low Fuel Remaining Annunciator [2, fig. 4-30]

This red annunciator, marked LOW FUEL will illuminate when there is less than 50 gallons (approx. 335 pounds) of fuel in either wing tank or, if the Fuselage Tank Switch [6, fig. 4-43] is set to **XFER**, in the center fuselage tank. When there is less than 300 pounds of fuel in either wing tank and the annunciator is illuminated, it is time to switch to the center fuselage tank by turning the Fuselage Tank Switch to **XFER**.

Crossflow Switch (Crossfeed Switch in the simulator) [3, fig. 4-43]

On the real aircraft, this switch marked CROSSFLOW controls the crossflow valve allowing fuel to flow between the wing tanks. On the add-on, this switch controls the cross-feed valves which allow fuel from one wing tank to feed the opposite or both engines by "isolating" the other wing tank. In the sim, the Crossflow (crossfeed) Switch cannot be used to transfer fuel from one wing tank to the other like on the real aircraft.



The Crossflow Switch must be used in conjunction with the two Standby Pump Switches [8-9, fig. 4-43] (see above).

To crossfeed fuel from the left wing tank to both engines, the Crossflow Switch must be set to **OPEN** and the Left Standby Pump Switch must be set to **ON** while the Right Standby Pump Switch is set to **OFF** (this will

isolate the right tank and feed both engines from the left wing tank).

To crossfeed fuel from the right wing tank to both engines, the Crossflow Switch must be set to **OPEN** and the Left Standby Pump Switch must be set to **OFF** while the Right Standby Pump Switch is set to **ON** (this will isolate the left tank and feed both engines from the right wing tank).

This technique can be used to balance fuel between the two wingtip/wing tanks by feeding both engines from the heavy side until balance is achieved. It can also be used for single-engine operation (crossfeeding one engine only). See page 15, in this section.

To stop crossfeeding, the Crossflow Switch and the two Standby Pump Switches must be returned to **OFF**.

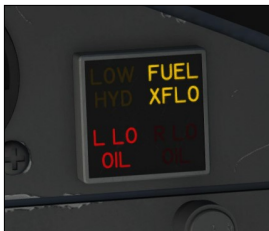
Crossfeeding will not occur if both Standby Pump Switches are set to **ON** to prevent isolating both wing tanks which would cause engine starvation. Do not crossfeed fuel if the Jet Pumps are inoperative as engine starvation may also occur.

Crossfeeding will not occur if the Fuselage Tank Switch [6, fig. 4-43] (see below) is not in the **OFF** (middle) position.

Crossflow Valve Light (Crossfeed Valves Light in the simulator) [2, fig. 4-43]

In the sim, this amber light indicates that the crossfeed valves are in transit. It is normal for this light to come on for about one second when the Crossflow (crossfeed) Switch is moved.

Crossflow Valve OPEN Annunciator (Crossfeed Annunciator in the simulator) [6, fig. 4-37]



In the sim, this annunciator, located on the copilot's instrument panel and marked FUEL XFLO, indicates that the crossfeed valves are positioned for crossfeeding fuel

from one wing tank to one or both engines.

Fuselage Tank Switch [6, fig. 4-43]

In both the add-on and the real aircraft, the fuselage tank is only a storage tank. In the real aircraft, fuel from the center fuselage tank must be pumped into the wing tanks to be used by the engines. In the add-on, due to software limitations, fuel must be *transferred* from the fuselage tank to the engines directly, without passing through the wing tanks.

By default, the left engine uses fuel from the left wing tank and the right engine uses fuel from the right wing tank (fuel is automatically transferred from each wingtip tank to its respective wing tank). On the add-on, the Fuselage Tank Switch is used to feed the engines from the center fuselage tank when fuel in the main wing tanks is critically low.



When the Fuselage Tank Switch is set to **XFER**, both engines are fed from the center fuselage tank. The add-on's Fuselage Tank Switch cannot be used to transfer fuel from the center fuselage tank to the wing tanks, like on the real aircraft. The Fuselage Tank Switch is used to connect both engines to the center fuselage tank directly.

On the real aircraft, the switch is also used during filling of the center fuselage tank. The standby (boost) pumps automatically fill the fuselage tank when the Fuselage Tank Switch is set to **FILL**. When the tank is full, the pump stops automatically and fuel is no longer

transferred. On the add-on, setting this switch to **FILL** has no special function except for monitoring if the center fuselage tank is full. Both engines will still be connected to the center fuselage tank when the Fuselage Tank Switch is set to **FILL**.

On both the add-on and the real aircraft, refueling is accomplished through a filler cap on top of each wingtip tank. In the sim, refueling is achieved through the “Fuel and Payload” settings or by requesting a fuel truck (**SHIFT+F**) in certain parking areas. Refer to your simulation platform’s documentation for more details.

In the add-on, engines are fed from their respective wing tank when the Fuselage Tank Switch is set to **OFF**, that is the left engine is fed from the left wing tank and the right engine is fed from the right wing tank. The Fuselage Tank Switch is set to **OFF** by default at the beginning of each flight and should remain in the **OFF** position until the fuel level in the wing tanks is critically low (below 300 pounds typically). Then the Fuselage Tank Switch must be set to **XFER** so the engines can be fed from the center fuselage tank. Switching from the main wing tanks to the center fuselage tank is not done automatically and must be performed manually by the desktop pilot, a procedure similar to transferring fuel from the fuselage tank to the wing tanks in the real aircraft.

Important: The add-on’s fuel panel uses its own custom variables which to this date are not kept by the simulator when a flight is saved due to software limitations (see Appendix 4, “Frequently Asked Questions”, for more details). For example, if the engines were both fed by the center fuselage tank when the flight was saved, settings will return to their default state when the flight is reloaded, that is the Fuselage Tank Switch will return to its **OFF** position and the engines will be fed by their respective wing tank until the fuselage switch is returned to **XFER**. Therefore, it is important to leave some fuel in the wing tanks before switching to the center fuselage tank to avoid engine starvation. This should be done as a standard procedure.

Note: By default, the Fuselage Tank Switch is

set to **OFF** at the beginning of each flight, allowing both wing tanks to be selected and to feed their respective engine. This solves the old simulator issue where settings from a previous flight with another aircraft with a different tankage or engine configuration are retained at the beginning of a new flight and prevent the engines from starting or to be fed properly during flight.

Fuselage Tank Full Light [4, fig. 4-43]

When the Fuselage Tank Switch is set to **FILL**, this green light will come on if the center fuselage tank is full. This light is off when the Fuselage Tank Switch is set to **OFF** or to **XFER**.

Fuselage Tank Empty Light [7, fig. 4-43]

When the Fuselage Tank Switch is set to **XFER**, this white light will come on if the center fuselage tank is empty. This light is off when the Fuselage Tank Switch is set to **OFF** or to **FILL**.

Fuselage Tank Valves (unmarked) Light [5, fig. 4-43]

This amber light indicates that the fuselage tank valves are in transit. It is normal for this light to come on for about one second when the Fuselage Tank Switch is moved.

Fuselage Tank Transfer Pump ON Annunciator [26, fig. 4-30]

This annunciator, located on the main annunciator panel and marked **FUEL XFR**, indicates that the fuselage tank transfer pump is operating. In the sim, this indicates that the engines are fed from the center fuselage tank.



Fuel Counter and Reset Button [14-15, fig. 4-43]

This counter, often called “fuel totalizer”, indicates the total amount of fuel burned (in pounds) since the last engine start or reset. The reset button, when depressed, resets the counter to zero. The counter should be reset to zero before starting the first engine. The counter is powered by the main DC bus.

Fuel Tank Selector Knob [16, fig. 4-43]

This selector knob enables the pilot to read the remaining fuel quantity in each of the five tanks as well as the total system quantity, on the Fuel Quantity Gauge [17, fig. 4-43] (see below).

Note: This knob is not a fuel tank selector switch to assign fuel tanks to engines. It is used only in conjunction with the Fuel Quantity Gauge to select the tank for which the remaining fuel quantity can be read on the gauge.



Fuel Quantity Gauge [17, fig. 4-43]

This gauge indicates the remaining fuel quantity (as weight) for the selected tank or for the total system in increments of 100 pounds and should be constantly monitored. Tank selection is made by rotating the Fuel Tank Selector Knob [16, fig. 4-43] (see above). The gauge is powered by the main DC bus.

Fuel Jettison Switch [1, fig. 4-43]

When set to **ON**, this switch is used to jettison fuel from the wingtip tanks only. It takes a few minutes to empty both wingtip tanks, depending on the remaining fuel. Fuel jettisoning can be interrupted at any time and will stop automatically when both wingtip tanks are empty. Fuel cannot be jettisoned from the wing tanks or from the center fuselage tank.



Note: Due to some limitations in the simulator, fuel will first be jettisoned from the left wingtip tank, then from the right wing tip tank. The pilot will need to compensate for the fuel imbalance during jettisoning, until both tanks are emptied.

Fuel Jettison Lights [both sides of the Fuel Jettison Switch]

These amber lights adjacent to the Fuel Jettison Switch indicates that the fuel jettison valves are energized.

Fuel System Procedures

Refueling

1. Battery switches [8-9, fig. 4-28] – **ON**.
2. All circuit breakers – Check **DE-PRESSED**.
3. Fuselage Tank Switch [6, fig. 4-43] – **FILL**.

Note: On both the add-on and the real aircraft, refueling is accomplished through a filler cap on top of each wingtip tank. In the sim, refueling is achieved through the “Fuel and Payload” settings or by requesting a fuel truck (**SHIFT+F**) in certain parking areas. Refer to your simulation platform’s documentation for more details.

4. After fuselage tank is full as desired – the green Fuselage Tank Full Light [4, fig. 4-43] will come on when the fuselage tank is full –, set the Fuselage Tank Switch [6, fig. 4-43] to **OFF**. The green Fuselage Tank Full Light will come off.

In the real aircraft: During fuselage fill, the crossflow valve will open, both standby (boost) pumps will turn on and the fuselage transfer valve will open. When the fuselage tank is full, the crossflow valve will close, both standby pumps will turn off and the fuselage transfer valve will be closed automatically. The green Fuselage Tank Full Light will come on until the Fuselage Tank Switch is set to OFF.

Preflight



1. Left Jet Pump Switch [11, fig. 4-43] – **ON** and watch for the amber Motive Flow Valve Light [10, fig. 4-43] beside the left Jet Pump Switch to come on and then off while the motive flow control valve is in transit. Check that the left Low Fuel Pressure Annunciator [1, fig. 4-30] goes out.
2. Left Jet Pump Switch [11, fig. 4-43] – **OFF** and watch for the amber Motive Flow Valve Light [10, fig. 4-43] beside the left Jet Pump switch to come on and then off while the motive flow control valve is in transit.
3. Right Jet Pump Switch [12, fig. 4-43] – **ON** and watch for the amber Motive Flow Valve Light beside the right Jet Pump Switch to come on and then off while the motive flow control valve is in transit. Check that the right Low Fuel Pressure Annunciator [2, fig. 4-30] goes out.
4. Right Jet Pump Switch [12, fig. 4-43] – **OFF** and watch for the amber Motive Flow Valve Light beside the right Jet Pump Switch to come on and then off while the motive flow control valve is in transit.
5. Left Standby Pump Switch [9, fig. 4-43] – **ON**, check that the left Low Fuel Pressure Annunciator [1, fig. 4-30] goes out.
6. Left Standby Pump Switch [9, fig. 4-43] – **OFF**.
7. Right Standby Pump Switch [8, fig. 4-43] – **ON**, check that the right Low Fuel Pressure Annunciator [2, fig. 4-30] goes out.
8. Right Standby Pump Switch [8, fig. 4-43] – **OFF**.
9. Left Jet Pump Switch [11, fig. 4-43] – **ON**.
10. Right Jet Pump Switch [12, fig. 4-43] – **ON**.
11. Crossflow (crossfeed) Valve Switch [3, fig. 4-43] – **OPEN** and check for the amber in-transit light beside the crossflow valve switch [2, fig. 4-43] to come on and then off while the crossflow valve is in transit.
12. Crossflow Valve Switch (crossfeed in the sim) [3, fig. 4-43] – **CLOSE**.
13. If the fuselage tank is full, set the Fuselage Tank Switch [6, fig. 4-43] to **FILL** and check for the green Fuselage Full Light [4, fig. 4-43] to come on. Then

turn the switch to **OFF** and the green light will come off.

Engine Start (same for both engines)

When the Starter Generator Switch [6, 11, fig. 4.28] is set to **START**, the motive flow control valve closes, the standby pump is energized and the ignition is armed. When the throttle [1, 3, fig. 4-41] is released and set to **IDLE**, ignition comes on and fuel flow is obtained. When the Starter Generator Switch is set to **GEN**, the motive flow control valve opens, the standby pump is de-energized, ignition goes off, the generator comes on and the Low Fuel Pressure Annunciator [1,2, fig. 4-30] remains out.

Takeoff



1. Both Jet Pump Switches [11-12, fig. 4-43] - Check **ON**.
2. Both Standby Pump Switches [8-9, fig. 4-43] - Check **OFF**.
3. Crossflow (crossfeed) Valve Switch [3, fig. 4-43] - Check **CLOSE**.
4. Fuselage Tank Switch [6, fig. 4-43] - Check **OFF**.
5. Both Air Ignition Switches [1, 16, fig. 4-27] - **OFF**, except if required (see section 7).

Cruise

To switch from the wing tanks to the center fuselage tank when the remaining fuel quantity in either wing tank is below 300 pounds and the Low Fuel Remaining Annunciator [2, fig. 4-30] is illuminated, proceed as follows:

1. Fuselage Tank Switch [6, fig. 4-43] - **XFER**. If there is more than 50 gallons of fuel (about 335 pounds) remaining in the center fuselage tank, the red Low Fuel Remaining Annunciator will go out. The green Fuselage Tank Transfer Pump ON Annunciator [26, fig. 4-30] will illuminate, indicating that the fuselage tank transfer pump is operating and that both engines are fed from the center fuselage tank.

This procedure is similar to transferring fuel from the fuselage tank to the wing tanks in the real aircraft.

Crossfeeding

To balance fuel between wing tanks, proceed as follows:

1. Fuselage Switch [6, fig. 4-43] - **OFF**.
2. Crossflow Valve Switch [3, fig. 4-43] - **OPEN**.
3. To crossfeed fuel from the left wing tank to both engines:
 - Left Standby Pump Switch [9, fig. 4-43] - **ON**.
 - Right Standby Pump Switch [8, fig. 4-43] - **OFF**.
4. To crossfeed fuel from the right wing tank to both engines:
 - Left Standby Pump Switch [9, fig. 4-43] - **OFF**.
 - Right Standby Pump Switch [8, fig. 4-43] - **ON**.
5. Monitor fuel balance as it takes little time for fuel to balance unless out of balance by large amounts.
6. When wing tanks are balanced, set both

Standby Pump Switches [8-9, fig. 4-43] to **OFF**.

7. Crossflow Valve Switch [3, fig. 4-43] – **CLOSE**.

Note: In the sim, the Crossflow (crossfeed) Switch cannot be used to transfer fuel from one wing tank to the other, like on the real aircraft.

Single Engine Operation

To crossfeed fuel to operating engine, proceed as follows:

1. Fuselage Tank Pump Switch [6, fig. 4-43] – **OFF**.
2. Crossflow Valve Switch [3, fig. 4-43] – **OPEN**.
3. Standby Pump Switch [8 or 9, fig. 4-43] of operative engine – **OFF**.
4. Standby Pump Switch [8 or 9, fig. 4-43] of inoperative engine – **ON**.

Fuel System Limitations (GLJ 25D)

- Maximum ramp weight: 15,300 lbs.
- Maximum takeoff weight: 15,000 lbs.
- Maximum landing weight: 13,300 lbs.
- Zero fuel weight: 11,400 lbs. including everything except fuel.
- Maximum altitude with no jet or standby pumps: 25,000 ft.
- If fuel temperature is -30° or below: Do not take off
- Maximum wingtip tank landing weight: 800 lbs. each tank
- Do not crossfeed with Jet Pumps inoperative
- With Low Fuel Remaining Annunciator [2, fig. 4-30] on, limit nose up attitude to a maximum of 25 degrees

AUTOMATIC FLIGHT CONTROL SYSTEM (AFCS)

The GLJ Model 25 SE add-on is equipped with a modified J.E.T. FC-110 autopilot and a modified Collins FD 108 flight director. Both units have been modified from the ones installed in the real aircraft because of some limitations in the simulator but also to benefit from additional flight modes that are available in the sim but not available in the real aircraft.

Autopilot



The autopilot reduces the pilot's workload by flying the airplane to and maintaining desired altitudes, attitudes and headings. It can also capture and track VOR/ILS radio signals, among other functions.

The modified J.E.T. FC-110 autopilot installed in the GLJ Model 25 SE add-on can:

- Hold the wings level so that the airplane does not turn
- Maintain a selected altitude
- Maintain a selected rate of climb or descent
- Maintain the aircraft's current pitch attitude
- Maintain a selected heading
- Follow a VOR radial
- Track a localizer or localizer back course

- Track the localizer and glide slope of an instrument landing system (ILS)
- Track a GPS course
- Take off the aircraft or make it go-around
- Maintain a selected airspeed or Mach number
- Remove unwanted yaw (yaw damping)
- React in case of overspeed or stall condition by automatically pulling or pushing the stick

The flight controller (FC-110 control panel) [2, fig. 4-42] is mounted on the center pedestal, below the fuel panel. The system requires DC and AC power: Battery [8-9, fig. 4-28] and/or Generator Switches [6, 11, fig. 4-28] **ON**, Inverter Switches [10, 12, fig. 4-27] **ON**, and Master Radio (avionics) Switch [14, fig. 4-27] **ON**.

The flight controller contains all of the AFCS mode buttons, engage button, on/off lights, roll turn knob, and pitch command wheel. Yaw damper on/off buttons are also included. The dual yaw damper system is independent from the autopilot and additional controls are available on the yaw damper panel on the center pedestal, below the flight controller [4, fig. 4-42].



Autopilot effort indicators, normally installed on the main instrument panel in front of the pilot, are not available in the simulator and have been replaced by surface trim indicators [24, fig. 4-2].

On the real aircraft, the autopilot controls are separate from the flight director controls. On the GLJ Model 25 SE addon, the autopilot modes are shared with the flight director modes to comply with the way the autopilot and the flight director work in the simulator. As a benefit, additional autopilot modes are



now available by depressing Korry switches located on the copilot instrument panel [12, fig. 4-17].

A NAV1/GPS Switch [20, fig. 4-2] is provided on the main instrument panel for selecting which navigation receiver signal – either from the NAV1 radio [Fig. 4-19] or from the GPS [Fig. 4-24] – is sent to the autopilot/flight director.

Flight Director



The flight director helps the pilot do manually what the autopilot would do if it were engaged. It provides visual commands to the pilot to manually maintain a desired altitude, capture and maintain a desired heading, capture and maintain a desired VOR course, and capture and maintain an ILS course and glide path.

The flight director requires the pilot to select an operating mode. With the flight director turned on and autopilot modes selected – but the autopilot not engaged – the flight director shows what the autopilot would do were it engaged. When both the flight director and

the autopilot are engaged, the flight director shows what the autopilot is doing.

The Collins FD 108 flight director installed in the GLJ Model 25 SE add-on includes:

- A flight director power switch [21, fig. 4-2]
- An attitude director indicator (ADI) [Figure 4-7]
- A horizontal situation indicator (HSI) [Figure 4-8]
- Course [1, fig. 4-8] and heading [2, fig. 4-8] selector knobs located on the HSI
- Two mode selector panels with Korry switches [Figure 4-22a, 4-22b]
- Two annunciator panels [Figure 4-6]
- A pitch sync button located on the control yokes [6, fig. 4-50]

The flight director provides indication of airplane heading on the HSI and roll and pitch attitude and sideslip on the ADI.

Two yellow flight director command bars on the ADI [5, fig. 4-7] – sometimes called chevron or V-bars – indicate deviation from the suggested heading and pitch attitude. The idea is to move the yoke to keep the orange chevron [4, fig. 4-7] (that represents the aircraft) nestled just under the yellow command bars. In other words, to follow the command bars or to keep them centered.

The aircraft should be maneuvered to satisfy the flight director command bars on the ADI. However, the flight director may sometimes command a momentary large correction to an important deviation from the calculated attitude. The pilot should not follow these large variations implicitly but rather interpret them as advisory.

Remember: You are still hand-flying the aircraft, so common sense still applies and exaggerated attitudes should be avoided.

The command bars are biased out of view when the flight director is not engaged. The basic attitude reference mode is energized when AC and DC power is applied to the airplane but with no modes selected on the

mode selector panels and on the flight controller.

The Flight Director Power Switch, marked FD ON/OFF, [21, fig. 4-2] toggles the flight director on and off.

Known issue: On some occasions, it might be necessary to reset the flight director if the V-bars are not responding properly (sometimes after the autopilot has been turned on and off). If you suspect that the flight director is not giving you correct indications, simply turn the Flight Director Power Switch to **OFF**, then back to **ON** again. This is a simulator issue.

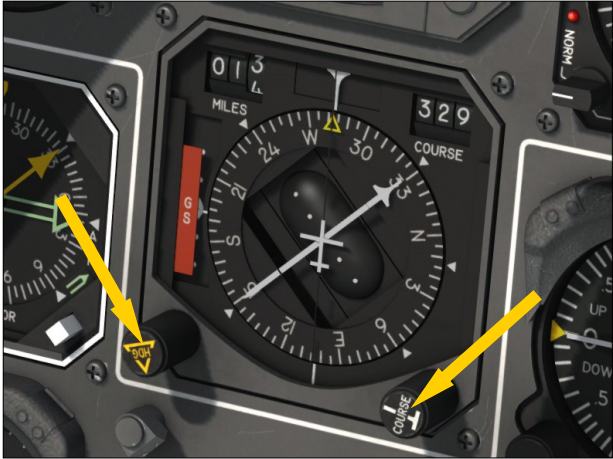
Attitude Direction Indicator (ADI)



The attitude director indicator (ADI) [Figure 4-7] provides a presentation of the airplane attitude, localizer and glideslope deviation, bank angle, and airplane slip or skid.

When the flight director is engaged, command bars on the ADI appear in view to provide the computed roll and pitch commands. These bars move up or down to command pitch, and clockwise or counterclockwise to command bank. The pilot must maneuver the airplane so that the airplane symbol (the orange chevron) is “flown into” the command bars and the two are aligned to satisfy the commands (see “Flight Director”, above).

Horizontal Situation Indicator (HSI)



The horizontal situation indicator (HSI) [Figure 4-8] displays airplane position and heading with respect to magnetic north, selected heading, slant range DME distance from a selected station, lateral deviation from a selected VOR or localizer course, and vertical deviation from the center of a glideslope beam.

Two controls are located on the HSI:

- **Heading Selector Knob [2, fig. 4-8]** – Rotating the HDG selector knob sets the yellow heading marker (bug) to the desired heading as read on the azimuth card.
- **NAVI Course Knob [1, fig. 4-8]** – The COURSE selector knob rotates the course arrow to a magnetic heading and/or selects a VOR or localizer course tuned on the NAV1 radio [Figure 4-19].

Autopilot/Flight Director Buttons, Switches, Knobs and Lights

While all the mode buttons on the real aircraft are solenoid engaging and stay depressed until cancelled by other operations, the buttons on the add-on are of the momentary type.

When the ENGAGE button or any mode button on the flight controller is depressed, a light inside the button will illuminate and ex-

tinguish when the mode is disengaged, like on the real aircraft.

A/P (Autopilot Engage) Button and Light [1, fig. 4-44]

When depressed, this button engages the autopilot – making the other settings and options available –, holds the current pitch attitude and levels the wing. When the autopilot is engaged, the pilot cannot control the aircraft. Either the autopilot is controlling the aircraft, or the pilot is. When the autopilot is engaged, it controls both pitch and roll, and the flight director displays both pitch and roll commands.



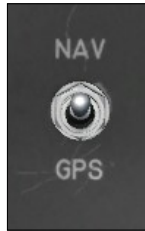
Important: If any autopilot mode (for example, HDG, ALT or NAV) is selected when the autopilot is engaged, the autopilot immediately maneuvers the aircraft to turn to that heading, climb/descend to that altitude, or intercept that course. For this reason, it is good practice to verify that the heading bug, altitude select, and course select are properly set before engaging the autopilot (see below).

Known issue: Repositioning the add-on at altitude with the map while the autopilot is engaged may lead to unpredictable aircraft behavior. To avoid this issue, turn off the autopilot before repositioning the add-on with the map. This is a simulator issue.

Note: The yaw damper system operates independently of the autopilot and may be engaged with or without the autopilot engaged.

NAV1/GPS Switch [20, fig. 4-2]

This switch, located on the main instrument panel, is used for selecting which navigation receiver signal – either from the NAV1 radio [Fig. 4-19] or from the GPS [Fig. 4-24] – is sent to the autopilot/flight director. If the NAV1/GPS Switch is set to NAV, the autopilot intercepts, captures and tracks the VOR course or localizer tuned on the NAV1 radio [figure 4-19] and set on the course pointer on the HSI [7, fig. 4-8]. If the NAV1/GPS Switch is set to GPS, the autopilot will follow the programmed GPS course to each lateral waypoint in sequence. The GPS does not provide vertical guidance to the autopilot.



Note: Like on the real aircraft, the autopilot/flight director cannot track signals coming from the NAV2 radio.

Turn Command Knob [2, fig. 4-44]

This knob will command the ailerons and bank angles up to 30°, but it will disengage any horizontal modes (HDG, NAV/LOC, REV CRS, APPR) that were engaged before. Use the mouse wheel to control the bank. Click the knob to center both the knob and the ailerons.

REV CRS (Reverse Course Approach Mode) Button and Light [3, fig. 4-44]

The REV CRS button engages the autopilot's back course approach mode, enabling automatic tracking of a localizer (or GPS) back course for instrument approaches. The navigation radio must be tuned to a localizer frequency and when engaged, the function is similar to an approach mode, except the glide slope is disabled and the autopilot's response to a localizer signal is reversed. In the sim, disengaging the APPR mode or engaging the NAV LOC mode also disengages the REV CRS function, which is different from in the real world. Engaging the G/S mode also disengages the REV CRS mode. When the

REV CRS button is depressed, the HDG mode will disengage and vice versa. The ATT, WING LEV and LOC modes will also disengage. Turning the Turn Command Knob [2, fig. 4-44] out of detent will disengage the REV CRS mode.

NAV (Navigation Hold Mode) Button and Light [4, fig. 4-44]

The NAV button is pressed to activate the autopilot automatic tracking of a VOR course, GPS course, or localizer for navigation. If the NAV1/GPS Switch on the main instrument panel [21, fig. 4-2] is set to NAV, the autopilot intercepts, captures and tracks the VOR course or localizer tuned on the NAV1 radio [figure 4-19] and set on the course pointer on the HSI [7, fig. 4-8]. If the NAV1/GPS Switch is set to GPS, the aircraft captures and tracks the course to the next GPS waypoint. Engaging the NAV mode in the sim will disengage the HDG, APPR and REV CRS modes. Turning the Turn Command Knob [2, fig. 4-44] out of detent will disengage the NAV mode.

HDG (Heading Hold Mode) Button and Light [5, fig. 4-44]

The HDG button is pressed to activate the heading hold mode of the autopilot. This mode commands the autopilot to turn the airplane as necessary and fly a heading selected by the position of the heading bug on the HSI [10, fig. 4-8]. The maximum bank angle available using this mode is 28°. In the sim, this button will cancel the NAV, APPR and REV CRS modes if engaged. Turning the Turn Command Knob [2, fig. 4-44] out of detent will disengage the HDG mode.

G/S ARM (Glideslope Only Hold Mode) But- ton and Light [6, fig. 4-44]

When the G/S ARM button is depressed, the autopilot will capture and track the ILS glideslope signal. For G/S ARM mode to function, the NAV1 radio [figure 4-19] must be tuned to a localizer frequency, an active glideslope signal must be present, and REV CRS mode must not be engaged. In order for the autopilot to capture a glideslope, you

must intercept it from below. Although it is possible to capture a glideslope from above, standard operating procedure is to intercept and capture glideslopes from below. In the sim, the G/S ARM button is also illuminated when the APPR mode is selected. The G/S ARM mode is disengaged when the HDG, REV CRS and APPR modes are disengaged. The G/S ARM mode can be re-engaged after re-engaging the HDG mode.

ALT (Altitude Hold Mode) Button
[7, fig. 4-44]



The ALT button engages the autopilot's altitude hold mode. When engaged, the aircraft climbs/descends to the altitude set on the Altitude Preselector [figure 4-23] at the rate set with the Vertical Speed Selector Knob [1, fig. 4-12]. By varying the selected vertical speed, pitch control is obtained. As the 20 Series has amazing climb performance, power management during climb is very important. Using the Pitch Command Wheel on the flight controller [10, fig. 4-44] will disengage altitude hold.

Autopilot OFF Light
[8, fig. 4-44]

The amber Autopilot OFF Light is illuminated anytime the AFCS has power available but the autopilot is not engaged.

Autopilot ON Light
[9, fig. 4-44]

In the sim, the green Autopilot ON Light is

illuminated when the autopilot is engaged. On the real aircraft, it is illuminated only when the autopilot pitch and/or roll axes are engaged.

Pitch Command Wheel
[10, fig. 4-44]

When the Pitch Command Wheel is rotated, the autopilot will change airplane pitch attitude in response to the pitch command rotation. In the sim, rotating the pitch command wheel will disengage the SPD/MACH, ALT, APPR, ATT, WING LEV, LOC and G/S ARM modes if previously selected. Use the mouse wheel to control the pitch. Click the knob to reset the pitch reference and the knob.

Primary Yaw Damper Buttons
[11-12, fig. 4-44]



The YAW DAMPER ON Button engages the primary yaw damper system which helps eliminate unwanted aircraft yaw and keeps turns coordinated. Depressing the YAW DAMPER OFF Button will disengage the primary yaw damper system. The GLJ Model 25 SE add-on is equipped with dual (primary and secondary) yaw damper systems, like the real aircraft. Each system is completely independent and only one yaw damper system can be engaged at a time. To engage the primary yaw damper system, the Selector Switch on the yaw damper panel [1, fig. 5-45] must be set to PRI YAW DAMPER. Selecting the secondary yaw damper system will disengage the primary yaw damper system.

Yaw Damper Selector Switch [1, fig. 5-45]



The Yaw Damper Selector Switch on the yaw damper panel selects the primary yaw damper system when set to PRI YAW DAMPER and the secondary yaw damper system when set to SEC YAW DAMPER. Only one yaw damper system can be engaged at a time.

Secondary (Emergency) Yaw Damper Switch [2, fig. 4-45]

The SEC YAW DAMPER ENGAGE Switch on the yaw damper panel engages or disengages the secondary yaw damper system in case of an emergency. To engage the secondary yaw damper, the Selector Switch on the yaw damper panel [1, fig. 5-45] must be set to SEC YAW DAMPER. Selecting the primary yaw damper will disengage the secondary yaw damper.

Autopilot Effort Indicators (Surface Trim Indicators in the simulator) [24, fig 4-2, Fig. 4-14]

In the real aircraft, an autopilot effort monitor senses the autopilot output signals (forces being applied to the autopilot servactuators). Autopilot effort indicators, normally installed on the main instrument panel in front of the pilot, are not available in the simulator and have been replaced by surface trim indicators [24, fig. 4-2, Fig. 4-14]. We believe that installing surface trim indicators in front of the pilot is much more convenient

than their real-world location at the bottom of the center pedestal.

Note: This panel is essentially a repeater of the Trim Indicator Panel installed on the center pedestal [7-9, fig. 4-45].



Known issue: If the autopilot is tested or engaged before flight, the autopilot will move the horizontal stabilizer (elevator trim) out of range for takeoff. Prior to takeoff, disengage the autopilot and set the elevator trim correctly for takeoff - normally about one needle thickness below center. This is a simulator issue.

Autopilot Vertical Speed Selector Knob [1, fig. 4-12]



The Vertical Speed Selector Knob (and bug) on the Vertical Speed Indicator (VSI) enables

the selection of a climb/descent rate for the autopilot to use when climbing or descending to the altitude set on the Altitude Preselector [figure 4-23] when the ALT mode is engaged (by default, 1,000 ft./min.). By varying the selected vertical speed with the Vertical Speed Selector Knob [1, fig. 4-12], pitch control is obtained. As the 20 Series has amazing climb performance, power management during climb is very important.

GA (Takeoff/Go-Around) Button [21, fig. 4-41]



Depressing the GA Button, located on the throttle quadrant, disengages the autopilot pitch and roll hold modes (if the autopilot is engaged) and engages the takeoff/go-around mode. Throttles automatically advance to takeoff power, wings level, vertical speed is set to 4,500 fpm, and the flight director indicates takeoff pitch. TO/GA mode can be used for takeoff, or for a go-around on landing. Releasing the button disengages the TO/GA mode and engages the ATT hold mode if the autopilot is engaged.

Note: Autothrottle is not available in the real aircraft.

A/P PITCH REL (Autopilot Pitch Release) Button [23, fig. 4-41]

When depressed, this button, located on the throttle quadrant, disengages the autopilot pitch hold modes and the SPD or MACH hold mode. Releasing the switch engages the ATT

hold mode, maintaining the airplane pitch attitude.

Mode Selector Panels

Additional autopilot/flight director modes are available by depressing Korry switches on two mode selector panels located on the main instrument panel [Figures 4-22a and 4-22b]. The green light under each switch indicates that the mode is engaged.



A/P (Autopilot Engage) Switch and Light [1 fig. 4-22a]

Same as the A/P ENGAGE Button on the flight controller (see above).

ALT (Altitude Hold Mode) Switch and Light [2, fig. 4-22a]

Same as the ALT Hold Mode Button on the flight controller (see above).

HDG (Heading Hold Mode) Switch and Light [3, fig. 4-22a]

Same as the HDG Hold Mode Button on the flight controller (see above).

NAV LOC (Navigation/Localizer Hold Mode) Switch and Light [4, fig. 4-22a]

Same as the NAV Hold Mode Button on the flight controller (see above).

APPR (Coupled Approach Mode) Switch and Light [5, fig. 4-22a]

The APPR switch engages the autopilot's coupled (navigation plus glideslope) approach mode, enabling automatic tracking of a VOR

course, GPS course, localizer and glideslope for instrument approaches. Localizer capture in the APPR mode is identical with the NAV/LOC hold mode. In addition, the APPR mode provides for glideslope arm and capture.

If the NAV1/GPS Switch on the main instrument panel [21, fig. 4-2] is set to NAV, the autopilot intercepts, captures and tracks the VOR course, localizer and glideslope tuned on the NAV1 radio [figure 4-19] and set on the course pointer on the HSI [7, fig. 4-8]. If the NAV1/GPS Switch is set to GPS, the autopilot will follow the programmed GPS course to each lateral waypoint in sequence. The GPS does not provide vertical guidance to the autopilot.

Engaging the APPR mode in the sim will disengage the HDG, LOC only and REV CRS modes. Turning the Turn Command Knob [2, fig. 4-44] out of detent will disengage the APPR mode.

When the APPR mode is engaged, the autopilot will capture and track the ILS glideslope signal. For G/S ARM mode to function, the NAV1 radio [figure 4-19] must be tuned to a localizer frequency, an active glideslope signal must be present, and REV CRS mode must not be engaged.

When a valid ILS signal is present on the NAV1 receiver, the system will intercept and capture the localizer path and the glideslope. It is recommended that the interception be initiated on heading hold mode until a shallow interception angle is established.

In order for the autopilot to capture a glideslope, you must intercept it from below. Although it is possible to capture a glideslope from above, standard operating procedure is to intercept and capture glideslopes from below. In the sim, the G/S ARM Button is also illuminated when the APPR mode is selected.

SPD (Speed Hold Mode) Switch and Light [1, fig. 4-22b]

This switch, when depressed, will engage the autopilot speed (SPD) hold mode. The SPD hold mode maintains the aircraft at the indicated airspeed that existed when the switch

was depressed. The SPD Hold Switch must be used at altitudes below 29,000 feet. Like on the real aircraft, above 29,000 feet, the autopilot will automatically switch to the Mach hold mode. In the sim, speed hold is accomplished by the autothrottle.

Note: Autothrottle is not available in the real aircraft. The autopilot maintains speed by varying the pitch of the aircraft.



MACH (Mach Hold Mode) Switch and Light [2, fig. 4-22b]

This switch, when depressed, will engage the autopilot MACH hold mode. The MACH hold mode maintains the aircraft at the Mach number that existed when the switch was depressed. The MACH Hold Switch must be used at altitudes above 29,000 feet. Like on the real aircraft, below 29,000 feet, the autopilot will automatically switch to the SPD hold mode. In the sim, Mach hold is accomplished by the autothrottle.

Note: Autothrottle is not available in the real aircraft. The autopilot maintains speed by varying the pitch of the aircraft.

WING LEV (Wing Leveler) Switch and Light [3, fig. 4-22b]

The Wing Leveler Switch disengages the HDG hold mode and engages the wing leveler which keeps the aircraft's wings level. The WING LEV mode is engaged by default when the autopilot is engaged and when the ATT hold mode is engaged. When the ATT hold mode is disengaged, the WING LEV mode is disengaged. Turning the Turn Command Knob [2, fig. 4-44] or the Pitch Command

wheel [10, fig. 4-44] out of detent will disengage the WING LEV mode.

ATT (Attitude Hold Mode) Switch and Light [4, fig. 4-22b]

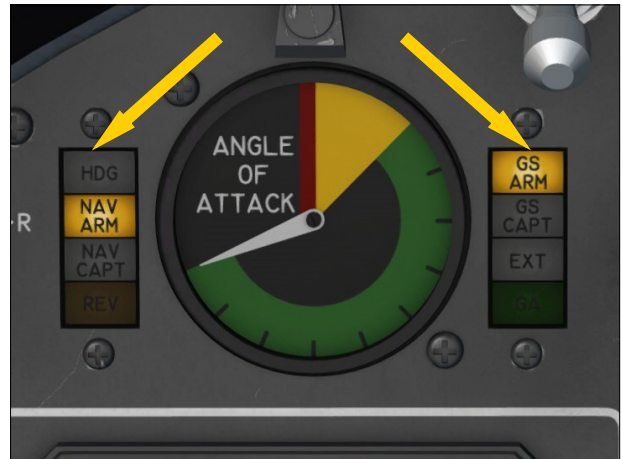
The ATT Hold Switch disengages the HDG and ALT hold modes and engages the attitude mode which keeps the aircraft's pitch and roll at the state that existed when the switch was depressed. The ATT hold mode is engaged by default when the autopilot is engaged. Turning the Turn Command Knob [2, fig. 4-44] or the Pitch Command Wheel [10, fig. 4-44] out of detent will disengage the ATT hold mode.

LOC (Localizer Only Hold Mode) Switch and Light [5, fig. 4-22b]

The LOC Switch engages the autopilot's "localizer only" mode, enabling automatic tracking of a localizer for instrument approaches. Localizer capture is identical with the NAV/LOC hold mode or the APPR mode. Engaging the LOC hold mode in the sim will disengage the HDG, NAV and REV CRS modes. Turning the Turn Command Knob [2, fig. 4-44] out of detent will disengage the LOC hold mode.



Flight Director Annunciators



HDG (Heading Hold Mode) Annunciator [4, fig. 4-6]

This white annunciator, when illuminated, indicates that the heading (HDG) hold mode is engaged.

NAV ARM (Navigation Hold Arm) Annunciator [3, fig. 4-6]

In the sim, this amber annunciator, when illuminated, indicates that the NAV/NAV LOC/LOC/APPR/REV CRS mode is engaged but that a course signal has not yet been captured. When course capture is achieved, the NAV ARM Annunciator will go off and the NAV CAPT Annunciator will illuminate.

NAV CAPT (Course Capture) Annunciator [2, fig. 4-6]

This white annunciator, when illuminated, indicates that course capture is achieved.

REV (Reverse Course Mode) Annunciator [1, fig. 4-6]

This amber annunciator, when illuminated, indicates that the reverse course mode is engaged.

GS ARM (Glideslope Arm) Annunciator [6, fig. 4-6]

In the sim, this amber annunciator, when illuminated, indicates that the APPR/GS mode is

engaged but that a glideslope has not yet been captured. When the glideslope is captured, the GS ARM Annunciator will go off and the GS CAPT Annunciator will illuminate. Glideslope capture is independent of localizer capture. Glideslope capture is possible when the aircraft approaching the glideslope from below or from above the actual glideslope.

GS CAPT (Glideslope Capture) Annunciator [7, fig. 4-6]

This white annunciator, when illuminated, indicates that glideslope capture is achieved.

EXT (Course and Glideslope Capture) Annunciator [8, fig. 4-6]

This white annunciator, when illuminated, indicates that both navigation course and glideslope are captured.

GA (Takeoff/Go-Around Mode) Annunciator [9, fig. 4-6]

This green annunciator, when illuminated, indicates that the takeoff/go-around mode is engaged.

Control Yoke Buttons



While it is not easy to click buttons on a moving yoke during a simulated flight, you may program switches and buttons on your con-

troller (joystick/yoke) to execute much of the same actions described below, such as temporarily disconnecting the autopilot or individual modes. Please refer to your simulation platform's documentation for more information about how to assign commands to buttons on your controller.

Four-Way Trim Switch [4, fig. 4-50]

On the real aircraft, when the autopilot is engaged and without the center arming button depressed, this four position switch is used to change the attitude of the aircraft. This switch is not simulated in the sim. However, buttons can be programmed on your controller/yoke for pitch and roll trim.

Trim Switch Arming Button [3, fig. 4-50]

In the sim, when the center button on the four-way trim switch is momentarily depressed, the autopilot ALT and ATT hold modes are disengaged.

Maneuver Control Button [5, fig. 4-50]

Depressing this switch in the sim momentarily disconnects the autopilot pitch and roll modes (ALT, ATT). When the switch is released, the ATT hold mode is re-engaged.

Pitch Sync Button [6, fig. 4-50]

When depressed, this button disengages the autopilot pitch hold modes and the SPD or MACH hold mode. Releasing the switch engages the ATT hold mode, maintaining the airplane pitch attitude.



Autopilot Test Switches



Switches are provided on the center pedestal, between the main instrument panel and the throttle quadrant, to test the autopilot. These switches are now functional and can be used to simulate standard procedures.

AFC/SS (Autopilot/Stability System) Test Switch

[10, fig. 4-41]

In the sim, this 3-position switch, when set to the AFC/SS position, is used to test the bulbs in all the AFCS and flight director lights and annunciators. On the real aircraft, it also tests the AFCS stability system.



Autopilot Roll Monitor Test Button

[17, fig. 4-41]

This button, marked ROLL MON is used to test the autopilot disengage function when an improper electrical signal is introduced to the roll function. The button has two position: hold to TEST and a spring-loaded OFF position. In the sim, pushing this button to TEST will disengage the autopilot.

Stick Nudger/Puller

Autopilot Stick Nudger/Puller Switch

[20, fig. 4-41]

In the sim, this switch, marked STICK N/P, is used to turn on or off the autopilot stick nudger (pusher)/puller. If this switch is set to **ON**, the autopilot will automatically push the stick in case of a stall condition or pull the stick in case of an overspeed condition. By default, this switch is set to **ON**.

Autopilot Pitch Trim Monitor Switch

[18, fig. 4-41]

This 3-position switch, marked TRIM MON UP/DN, is used to test the autopilot disengage function when an improper electrical signal is introduced to the pitch function. The switch is spring-loaded to the middle, OFF position. In the sim, setting this switch to UP or DN will disengage the autopilot.



This section presents a set of simplified criteria for planning your GLJ Model 25 flights on your simulation platform. In the real world, you would normally use many complicated charts and tables to determine the exact performance criteria required for a flight. We have purposely omitted this complexity from your new add-on's procedures because we feel that virtual pilots should be flying and having fun, instead of worrying about numbers.

Nonetheless, there are a few steps that are definitely required:

1. **Determine the fuel required and the gross weight** — The gross weight is the total weight of the aircraft including fuel and payload. This number is crucial to the aircraft's performance.
2. **Determine takeoff data** — Takeoff data includes V_1 decision speed, V_r rotation speed, and V_2 takeoff safety speed. Run-

way length requirements are also important, especially in hot-and-high conditions with a heavy aircraft.

3. **Plan climb and cruise** — Calculate fuel requirements based on time, distance, altitude and temperature.
4. **Determine approach and landing data** — Approach and landing data includes V_{ref} landing reference speed and runway length requirements, again quite important in hot-and-high conditions with a heavy aircraft.

DETERMINE THE FUEL REQUIRED AND THE GROSS WEIGHT

- Assume a cruise at FL450, at Mach 0.78.
- On a standard day, your true air speed (TAS) will be around 460 knots.

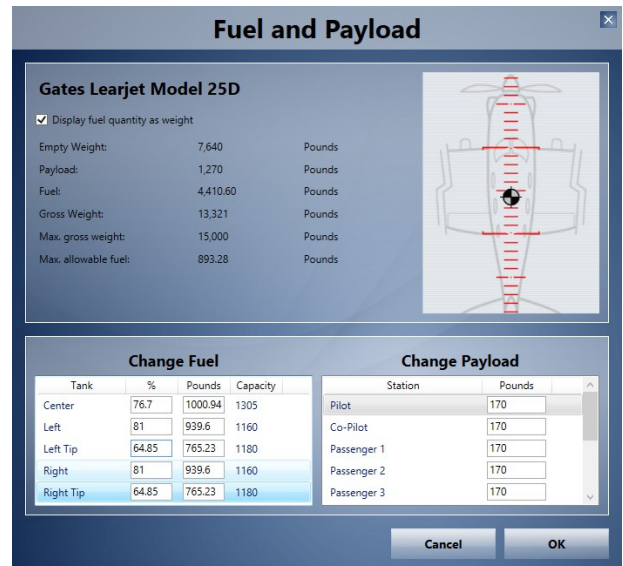
- Assume 100 nautical miles for climb.
- Assume 100 nautical miles for descent.
- Estimate around 1,000 lbs. of fuel for takeoff and climb (100% RPM for takeoff; 90% RPM for climb).
- Estimate around 1,300 lbs. of fuel for the first hour of cruise.
- Estimate around 1,200 lbs. of fuel for the second hour of cruise.
- Estimate around 1,100 lbs. of fuel for the third hour of cruise
- Add 1,000 lbs. of fuel for reserve.

See table 6-1 below:

Table 6-1 ESTIMATED FUEL REQUIREMENTS (see above assumptions)	
	APPROX FUEL BURN (LBS.)
Takeoff + climb	1,000
First hour cruise	1,300
Second hour cruise	1,200
Third hour cruise	1,100
Descent + landing	350

Flight plan distance = 950 nautical miles

- Allow 100 nautical miles for climb. Fuel burn = 1,000 lbs.
- Allow 100 nautical miles for descent. Fuel burn = 350 lbs.
- Remaining distance = $950 - 100 - 100 = 750$ nautical miles.
- At 460 KTAS, 750 NM = 98 minutes = 1 hour + 38 minutes
- First hour fuel burn: 1,300 lbs.
- Remaining 38 minutes: $38 / 60 \times 1200 = 760$ lbs.
- Reserves: 1,000 lbs.
- Total fuel required: $1,000 + 1,300 + 760 + 350 + 1,000 = 4,410$ lbs.



On the “Fuel and Payload” page, add the necessary fuel for your flight and load the required passengers (see example above, may vary depending on your simulation platform). Read the total gross weight and use it to determine the takeoff data below.

DETERMINE TAKEOFF DATA



Takeoff data in this case refers to three critical speeds (V_1 , V_r and V_2) that you will need during takeoff. Refer to “Normal Procedures” and “Abnormal/Emergency Procedures” in sections 7-8 for more details.

Your add-on’s Airspeed Indicators [Fig. 4-9] are equipped with independent speed bugs. It is suggested to set the captain’s bug on V_1 and the copilot’s bug on V_r (or the reverse if the copilot is performing the takeoff). The pilot

flying (PF) decides to abort at V_1 or to continue, and the pilot not flying (PNF) calls for rotation.

To determine the takeoff data, you will also need the outside air temperature (OAT), which you can get either from the weather menu, from ATC if an ATIS service is available at your departure airport or better still, from your add-on's Ram Air Temperature Gauge [18, fig. 4-35].

It is assumed that 100 % RPM will be used for takeoff power and the flaps will be extended 8 degrees [1, fig. 4-28]. First, from table 6-2 (right), determine your V_1 takeoff decision speed. This speed will be used to decide if you abort or continue the takeoff, should an engine failure occur. Refer to "Abnormal/Emergency Procedures" in section 8 for more details.

Next, from table 6-4 (below), determine the rotation speed (V_r) and the takeoff safety speed (V_2). During the takeoff roll, the pilot should raise the nose at V_r . Once airborne, accelerating to V_2 will ensure single-engine climb performance.

Finally, you need to determine if you have enough runway to perform the takeoff. In order to do this, you first need to know the density altitude of the departure field. This depends on the outside air temperature (OAT) and the field elevation and can be extrapolated from table 6-3 (right).

Once you know the density altitude of the field, you can determine the runway distance necessary for takeoff from table 6-5 (next page).

Table 6-2 V₁ TAKEOFF DECISION SPEED (KIAS) Flaps 8°						
	OUTSIDE AIR TEMPERATURE °C					
GROSS WT	20	24	28	32	36	38
16,000	135	135	136	136	138	140
15,000	130	130	132	134	134	136
14,000	127	127	129	129	130	132
13,000	122	124	126	126	128	128
12,000	118	118	119	120	120	121
11,000	112	113	114	114	115	116
10,000	106	106	106	110	110	112
9,000	105	105	106	108	109	110

Table 6-3 DENSITY ALTITUDE (FEET)					
	DEPARTURE FIELD ELEVATION (FEET)				
OAT °C	S.L.	2,500	5,000	7,500	10,000
-30	-5,000	-2,000	1,200	4,500	7,500
-20	-4,000	-500	2,500	5,500	8,500
-10	-3,000	2,000	3,500	6,500	9,500
0	-2,000	2,000	5,000	7,500	11,000
10	-500	3,500	6,000	9,000	12,500
20	500	4,000	7,000	10,000	13,000
30	1,500	5,000	8,000	11,000	14,000
40	3,500	6,500	9,500	13,500	15,500

Table 6-4 V_r ROTATION SPEED / V₂ TAKEOFF SAFETY SPEED (KIAS) Flaps 8°								
	GROSS WEIGHT (LBS.)							
	9,000	10,000	11,000	12,000	13,000	14,000	15,000	16,000
V_r	120	124	124	128	132	134	136	140
V₂	124	128	130	132	136	138	140	144

Table 6-5 TAKEOFF DISTANCE REQUIREMENTS (FEET)								
DENSITY ALTITUDE	GROSS WEIGHT (LBS.)							
	9,000	10,000	11,000	12,000	13,000	14,000	15,000	16,000
-5,000	2,000	2,200	2,400	2,600	2,900	3,200	3,500	4,000
-2,500	2,500	2,700	2,900	3,100	3,400	3,700	4,000	4,500
0	2,500	2,700	2,900	3,300	3,700	4,100	4,500	5,500
2,500	3,000	3,300	3,600	4,000	4,500	5,000	5,500	6,500
5,000	3,500	3,800	4,200	4,700	5,200	5,800	6,500	7,000
7,500	4,000	4,400	4,800	5,400	6,000	6,500	7,000	9,500
10,000	4,500	5,000	6,600	7,200	8,000	8,800	9,500	11,000
12,500	5,000	6,000	7,000	8,000	9,000	10,000	11,000	12,500
15,000	5,500	6,500	7,700	8,800	9,900	11,000	12,500	14,000

CLIMB AND CRUISE DATA



This section contains simplified tables for planning your climb and cruise. The numbers are for reference only as many factors can affect fuel consumption in the simulator which sometimes differs from the real world.

You should monitor your fuel counter [15, fig. 4-43] and your fuel quantity gauge [17, fig. 4-43] at all time during flight and follow the standard procedures for switching from the wing tanks to the fuselage tank when fuel in the wing tanks reaches critical level. Refer to "20 Series Fuel System" in the previous section for more details.

After a few flights, you will be able to plot your own charts and tables, based on your

own flying habits. Advanced users may find more complete charts and tables about climb/cruise planning on the Internet.

Table 6-6 CLIMB TIME (MIN) / FUEL (LBS) / DISTANCE (NM)							
ALT X 1,000 FT		INITIAL CLIMB WEIGHT X 1,000 LBS					
		15	14	13	12	11	10
45	TIME	-	-	32.9	22.0	17.3	14.2
	FUEL	-	-	1,136	845	700	596
	DIST	-	-	218	145	114	94
41	TIME	24.5	19.7	16.5	14.2	12.3	10.6
	FUEL	1,050	881	761	665	58.3	512
	DIST	162	130	104	93	80	70
35	TIME	13.8	12.3	10.9	9.8	8.7	7.7
	FUEL	742	666	598	536	479	425
	DIST	90	80	71	63	56	50
25	TIME	7.7	7.0	6.4	5.8	5.2	4.7
	FUEL	498	454	414	375	338	303
	DIST	49	44	40	36	33	29
11	TIME	2.4	2.2	2.1	1.9	1.7	1.5
	FUEL	191	175	161	147	133	120
	DIST	14	12	11	10	9	9

300 KIAS up to 25,000 ft.
Inlet Mach 0.70 up to 45,000 ft.
Inlet Mach 0.72 above 45,000 ft.
Both engines running, OAT 15 °C

Table 6-7 FUEL REQUIREMENTS — CRUISE FL250								
OAT °C	MACH 0.77	GROSS WEIGHT (LBS.)						
		9,000	10,000	11,000	12,000	13,000	14,000	15,000
-10	LBS./HR	1,985	2,032	2,072	2,123	2,166	2,211	2,264
	KTAS	438	438	438	438	438	438	438
0	LBS./HR	2,069	2,118	2,159	2,213	2,258	2,304	2,359
	KTAS	447	447	447	447	447	447	447
10	LBS./HR	2,160	2,211	2,255	2,310	2,357	2,405	2,462
	KTAS	457	457	457	457	457	457	457
20	LBS./HR	2,247	2,300	2,344	2,402	2,451	2,501	2,560
	KTAS	466	466	466	466	466	466	466

Table 6-8 FUEL REQUIREMENTS — CRUISE FL350								
OAT °C	MACH 0.77	GROSS WEIGHT (LBS.)						
		9,000	10,000	11,000	12,000	13,000	14,000	15,000
-10	LBS./HR	1,351	1,387	1,442	1,499	1,558	1,629	1,703
	KTAS	425	425	425	4425	425	425	425
0	LBS./HR	1,415	1,452	1,510	1,570	1,632	1,706	1,783
	KTAS	435	435	435	435	435	435	435
10	LBS./HR	1,481	1,520	1,580	1,643	1,708	1,785	1,866
	KTAS	445	445	445	445	445	445	445
20	LBS./HR	1,547	1,588	1,651	1,716	1,784	1,855	1,949
	KTAS	455	455	455	455	455	455	455

Table 6-9 FUEL REQUIREMENTS — CRUISE FL410								
OAT °C	MACH 0.77	GROSS WEIGHT (LBS.)						
		9,000	10,000	11,000	12,000	13,000	14,000	15,000
-10	LBS./HR	1,145	1,210	1,275	1,358	1,444	1,541	1,653
	KTAS	428	428	428	428	428	428	428
0	LBS./HR	1,197	1,265	1,332	1,419	1,509	1,610	1,727
	KTAS	437	437	437	437	437	437	437
10	LBS./HR	1,256	1,327	1,397	1,488	1,583	-	-
	KTAS	448	448	448	448	448	-	-
20	LBS./HR	1,309	1,383	-	-	-	-	-
	KTAS	457	457	-	-	-	-	-

Table 6-10
FUEL REQUIREMENTS — CRUISE FL450

OAT °C	MACH 0.77	GROSS WEIGHT (LBS.)						
		9,000	10,000	11,000	12,000	13,000	14,000	15,000
-10	LBS./HR	1,077	1,151	1,246	1,345	1,468	-	-
	KTAS	431	431	431	431	431	-	-
0	LBS./HR	1,128	1,205	1,305	1,409	-	-	-
	KTAS	441	441	441	441	-	-	-
10	LBS./HR	1,180	1,261	-	-	-	-	-
	KTAS	451	451	-	-	-	-	-
20	LBS./HR	1,233	-	-	-	-	-	-
	KTAS	461	-	-	-	-	-	-

My Own Table
FUEL REQUIREMENTS — CRUISE FL _____

OAT °C	MACH 0.77	GROSS WEIGHT (LBS.)						
		9,000	10,000	11,000	12,000	13,000	14,000	15,000
-10	LBS./HR							
	KTAS							
0	LBS./HR							
	KTAS							
10	LBS./HR							
	KTAS							
20	LBS./HR							
	KTAS							

My Own Table
FUEL REQUIREMENTS — CRUISE FL _____

OAT °C	MACH 0.77	GROSS WEIGHT (LBS.)						
		9,000	10,000	11,000	12,000	13,000	14,000	15,000
-10	LBS./HR							
	KTAS							
0	LBS./HR							
	KTAS							
10	LBS./HR							
	KTAS							
20	LBS./HR							
	KTAS							

DETERMINE APPROACH & LANDING DATA



The same way you determined takeoff data, you will need to determine the landing reference speed (V_{ref}) at which you will cross the runway threshold. For this, you need to know the landing weight of the aircraft which differs from the takeoff weight by the amount of fuel used for the flight.

You may pre-compute this weight and cross-check it during approach using the Fuel Counter (totalizer) [15, fig. 4-43]. During the pre-landing checks, the airspeed bugs may be set to V_{ref} .

It is assumed that flaps will be fully extended at 40 degrees for landing, however other speeds are available from table 6-11 (right) for partial flaps. No-flaps landing should only be attempted in an emergency.

You may now determine the landing distance required. Again, you will require the density altitude from table 6-13 (next page), but this time of the destination field.

You need an approximation of the outside air temperature (OAT) on the ground which means you cannot use the add-on's Ram Air Temperature Gauge while in flight. Determine the landing distance required from table 6-12 (right).

The data assumes a full-flaps landing, spoilers extended and thrust reversers deployed on touchdown and normal braking effort with anti-skid engaged.

Check that the chosen airfield has enough runway for the conditions of your flight. If not,

Table 6-11
 V_{ref} LANDING REFERENCE SPEED (KIAS)

GROSS WT (LBS.)	FLAPS POSITION			
	40°	20°	8°	UP
16,000	136	142	161	166
15,000	134	140	157	164
14,000	130	139	152	160
13,000	126	137	148	156
12,000	122	135	144	152
11,000	118	132	140	148
10,000	114	128	136	144
9,000	112	124	134	142
8,000	110	120	130	140

Table 6-12
DENSITY ALTITUDE (FEET)

OAT °C	DESTINATION FIELD ELEVATION (FEET)				
	S.L.	2,500	5,000	7,500	10,000
-30	-5,000	-2,000	1,200	4,500	7,500
-20	-4,000	-500	2,500	5,500	8,500
-10	-3,000	2,000	3,500	6,500	9,500
0	-2,000	2,000	5,000	7,500	11,000
10	-500	3,500	6,000	9,000	12,500
20	500	4,000	7,000	10,000	13,000
30	1,500	5,000	8,000	11,000	14,000
40	3,500	6,500	9,500	13,500	15,500

you may need to either unload the aircraft, choose another airfield or wait for colder weather.

Jot down your reference speeds so you have them available during flight and you should be ready for a successful flight in your new GLJ Model 25 SE add-on.

Table 6-13
LANDING DISTANCE REQUIREMENTS (FEET)

DENSITY ALTITUDE (FEET)	LANDING WEIGHT (LBS.)						
	9,000	10,000	11,000	12,000	13,000	14,000	15,000
-5,000	4,500	4,600	4,700	4,800	4,900	5,000	5,200
-2,500	4,500	4,600	4,800	4,900	5,000	5,100	5,200
0	4,500	4,600	4,700	4,900	5,000	5,300	5,500
2,500	5,000	5,100	5,200	5,300	5,400	5,500	5,500
5,000	5,000	5,100	5,300	5,500	5,700	5,900	6,000
7,500	5,500	5,600	5,700	5,800	5,800	5,900	6,000
10,000	5,500	5,700	5,800	5,900	6,000	6,300	6,500
12,500	6,000	6,100	6,200	6,300	6,400	6,500	6,500
15,000	6,000	6,200	6,400	6,700	6,900	7,200	7,500



NORMAL PROCEDURES AND CHECK LISTS

SECTION 7



This section contains detailed procedures and check lists for the operation of the Xtreme Prototypes GLJ Model 25 Special Edition add-on aircraft on your simulation platform. Following each step presented in this section will teach you how to prepare and how to fly your new GLJ Model 25 add-on and will make your overall experience more realistic and enjoyable.

A condensed version of these procedures is provided in section 9. You may refer to the “quick start” procedures when you are more familiar with both your simulation platform and your new GLJ Model 25 add-on.

Refer to section 8 for abnormal and emergency procedures and to section 6, for flight planning. Aircraft reference information is contained in Appendix 1.

The operation of the GLJ Model 25 add-on is very similar to the operation of the real aircraft. For proper operation and enhanced real-

ism, it is suggested that users follow the procedures presented in this section carefully.

The following procedures are inspired or adapted from the original Gates Learjet 20 Series flight manuals and other sources.

GETTING STARTED

The Xtreme Prototypes GLJ Model 25 Special Edition is an add-on software package that requires your simulation platform (Lockheed Martin® Prepar3D® or Microsoft® Flight Simulator X) to be installed on your computer. Refer to “Minimum System Requirements” in section 2 for more information.

Starting your Flight Simulation Platform

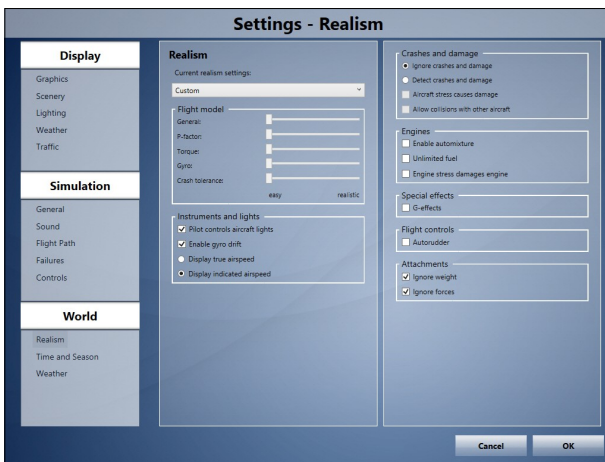
1. Please make sure that your simulation platform and the GLJ Model 25 add-on are

properly installed on your computer before proceeding.

2. Make sure your controller (joystick/yoke) and pedals are properly connected to your computer and have been previously tested with your simulation platform. A joystick/yoke is essential to fly the GLJ Model 25 add-on. Rudder pedals are optional but recommended.
3. Make sure your mouse has a center wheel. A wheel mouse is essential to actuate some controls in the virtual cockpit, such as 3-position switches and knobs.
4. Start your simulation platform.

Note: The user interface may vary between Prepar3D® and Flight Simulator X. However the commands and settings are essentially the same.

Recommended Settings for Beginners



These optional settings will make your first flights in the GLJ Model 25 add-on more enjoyable. You can reset them to their default state when you have more experience as a virtual pilot:

1. On the "Settings - Realism" page, set the followings:
 - a. All "Flight model" settings – **EASY** (all cursors to the left).
 - b. Pilot controls aircraft lights – **SE-**

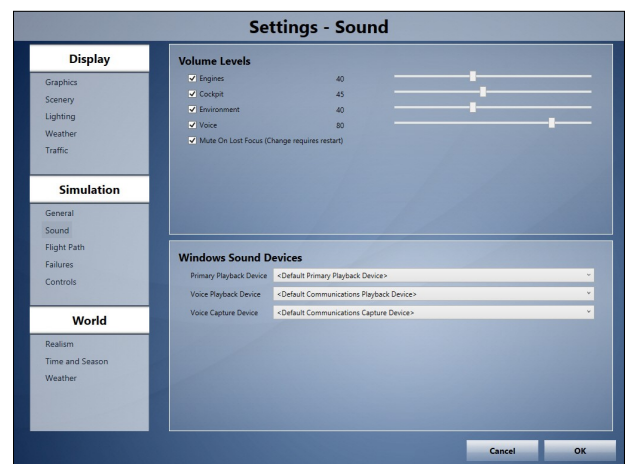
LECTED.

- c. Enable gyro drift – **SELECTED.**
- d. Display indicated airspeed – **SELECTED.**
- e. Ignore crashes and damages – **SELECTED.**
- f. Enable automixture – **UNSELECTED.**
- g. Unlimited fuel – **UNSELECTED.**
- h. G-effects – **UNSELECTED.**
- i. Autorudder – **UNSELECTED.**

2. Click **OK** to close the "Settings - Realism" page.

For more setting options, refer to section 2.

Adjusting the Sound Volume



Depending on your sound system and settings, you may want to adjust the volume levels in the "Settings - Sound" page for your simulation platform:

1. On the "Settings - Sound" page, under "Volume Levels", adjust the volume levels for the engine and other sounds. Make sure all sounds are selected.
2. Click **OK** to close the "Settings - Sound" page.

To reduce the volume of the engine, try a setting of between 30% to 50%. If you like more rumble, noise and vibrations, try anything

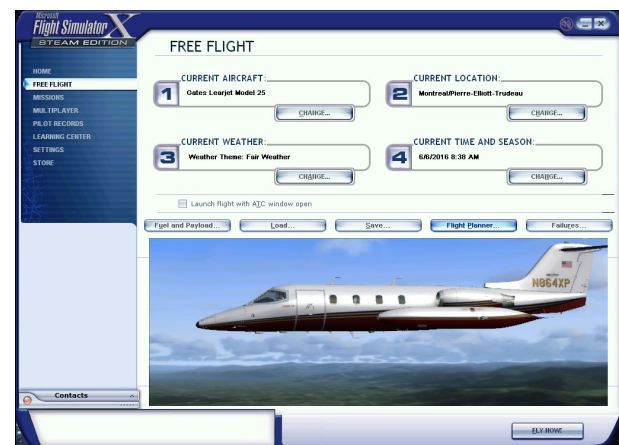
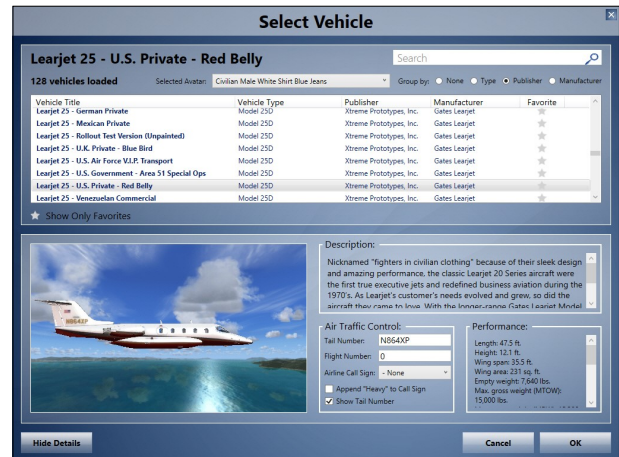
from 50% to 80%. A setting of about 50% seems acceptable for most computer sound systems and will produce the level of noise, whine and rumble one would expect from the noisy CJ-610 engine. A little experimentation may be necessary in order to find the optimal settings, depending on your own sound system configuration and personal preferences.

Feel free to adjust your sound system's volume and bass depending on your preferences. Please note that the CJ-610 engines will produce a high level of noise, especially when in the outside views.

Known Issues

- In addition to the basic aircraft sounds that are controlled by the simulator's own sound engine, the GLJ Model 25 SE addon features more than 45 extra sound effects, mainly cockpit sounds, that are managed by the addon's special systems but played by a third-party sound module. Due to software limitations, some cockpit sounds can still be heard from the external views or when the simulator is paused. Volume adjustment in the simulator has no effect on these sounds. This has no impact on the overall simulation.
- While we took great care to adjust the extra cockpit sound effects individually so they fit well in the overall sound mix, there is no separate control to adjust the volume of the extra cockpit sounds in this software version. This is mainly due to limitations in the current simulation platforms. However, it is possible to balance the extra cockpit sounds with the basic aircraft sounds that are controlled by the simulator by using the master volume control of your computer sound system. First, adjust the master volume on your computer so that the cockpit sounds are at a correct level. Cockpit sounds can be heard by clicking some of the switches, levers and knobs in the virtual cockpit. Then adjust the basic aircraft sounds in the "Settings - Sound" page, under "Volume Levels" for the proper balance. This has no impact on the overall simulation and needs to be done only once.

CREATING A FLIGHT



Refer to the documentation included with your simulation platform for complete instructions on how to create a new flight (scenario). Make sure to select one of the Xtreme Prototypes GLJ Model 25 SE aircraft variations included with your add-on package and start a new flight. If some aircraft variations are not visible, make sure the "Show all variations" option is selected on the "Select Aircraft" page (FSX).

Note: Your "Select Vehicle/Aircraft" page may be different from the ones shown above, depending on your simulation platform.

Important

- You must be in the virtual cockpit to fly this addon. The GLJ Model 25 SE has no 2D panels. If your addon appears to have no cockpit, make sure you are in the **VIRTUAL COCKPIT** view or press **F9**.



IMMEDIATE TAKEOFF OR “COLD AND DARK” STARTUP

At this time, it is assumed that the GLJ Model 25 has been serviced by the simulator when first loaded and that the engines are running. You can either take off immediately or move the aircraft to a gate/parking with the map, shut down the engines and follow the normal procedures to simulate a true “cold and dark” startup (engines, lights and systems off).

After the aircraft is parked, proceed as follows:

1. Simultaneously press the **CTRL-SHIFT-F1** keys on your keyboard (this will shut down the engines, if running).
2. Simultaneously press the **SHIFT-M** keys on your keyboard (this will turn off electric power, if already on).

Tip

- After the engines have been shut down and the power turned off, you can save your current flight and use it as a template for subsequent flights, from a “cold and dark” cockpit.

EXTERIOR INSPECTION

An exterior description of the GLJ Model 25 add-on is available in section 3 of the manual [Fig. 3-1 and 3-2]. It is recommended to familiarize yourself with the general external arrangement of the aircraft before proceeding.

1. Select the **LOCKED SPOT PLANE** view.

This will allow you to inspect the exterior of the aircraft. You can use the “top hat” button on your controller (or the arrow keys on your numeric keypad) to move around the aircraft. Use the “+/=” or “_-/” keys on your keyboard to zoom in and out.

To open (or close) the main entry door, simultaneously press the **SHIFT-E** keys on your keyboard.

On some simulation platforms, it is possible to observe the movement of all control surfaces, including the flaps and spoilers, at this time. Other platforms would require electrical and/or hydraulic power in order to move some control surfaces (which in most cases is more realistic). This can generally be achieved after the aircraft has been powered up, with the en-

gines running or the electric auxiliary hydraulic pump energized.

1. Use your controller (joystick/yoke) and/or pedals to control and observe movements of the rudder, elevator and ailerons. These surfaces are cable actuated and can be controlled manually at all time. While moving the ailerons, you can also observe the movement of their balance tabs.
2. On some platforms, you can observe the movements of the horizontal stabilizer and of the trim tabs on the left aileron and on the rudder even if the aircraft is not powered up (known simulator issue). The trim tabs are electrically actuated and controlled.
3. To extend or retract the flaps, press the **F6/F7** keys on your keyboard or the corresponding button on your controller. You can also use the Flaps Switch [25, fig. 4-41] on the power quadrant in the cockpit. Flaps are electrically actuated and hydraulically controlled.
4. To extend or retract the spoilers, press the “ / ” key on your keyboard. You can also use the Spoilers Switch [24, fig. 4-41] on the power quadrant in the cockpit. Spoilers are electrically actuated and hydraulically controlled.

Return to the **VIRTUAL COCKPIT (F9)**.

CHECK LISTS

Cockpit Preparation (Power OFF)

1. “Remove Before Flight” Items [1, fig. 4-50] – **REMOVED**. *Click the center logo on the copilot’s yoke to remove the items (visible on the exterior model).*
2. Flight Crew [1, fig. 4-50] – **ON BOARD**. *Click the center logo on the captain’s yoke to bring the crew on board (visible on the exterior model).*
3. Seats – **ADJUST ARMRESTS** (see section 4, page 9).
4. Flight controls – **FREE**. Hide control columns and yokes [9, fig. 4-1] **if desired**. *Control columns can be hidden by clicking on their respective boot. Refer to section 4, page 7 for details.*
5. Parking brake [8, fig. 4-41] – **SET**.
6. All switches – **OFF**.
7. All circuit breakers – **CLOSED**.
8. Oxygen Pressure Gauge [1, fig. 4-37] – **IN GREEN**.
9. Emergency Air Pressure Gauge [3, fig. 4-37] – **IN GREEN**.
10. Passenger Oxygen Flow Valve [7, fig. 4-47] – **NORM**, if passengers present.



11. Passenger Oxygen Mask Valve [5, fig. 4-47] – **AUTO**, if passengers present.
12. Landing Gear Selector Switch [5, fig. 4-28] – Check **DOWN**.
13. Bleed Air Switch [1, fig. 4-39] – Check **OFF**.
14. Pressurization Mode Switch [4, fig. 4-39] – **AUTO**.
15. Auto Rate Control Knob [2, fig. 4-39] – Check **CENTERED**.
16. Windshield Defog Knob [7, fig. 4-41] – **IN (NORMAL)**.

Cockpit Preparation (Power ON)



1. Battery Switches [8-9, fig. 4-28] – **ON**.
2. Emergency Battery Switch [2, fig. 4-15] – **ON**.
3. Battery Switches [8-9, fig. 4-28] – **OFF**. Check amber light next to the Emergency Battery Switch [2, fig. 4-15] **ON**.
4. Standby Gyro [Fig. 4-16] – Check **OPERATIONAL**. Uncage and adjust pitch scale [8, fig. 4-16] if necessary.
5. Battery Switches [8-9, fig. 4-28] – **ON**.
6. Emergency Battery Switch [2, fig. 4-15] – **OFF**.
7. Landing Gear Selector Switch and Lights [5, 3, fig. 4-28] – Check **DOWN + 3 GREEN**.
8. Both Primary and Secondary Inverter Switches [10,12, fig. 4-27] – **ON**.

9. Radio Master Switch (Avionics) [14, fig. 4-27] – **ON**.
10. Instrument Warning Flags – **OUT OF VIEW**.
11. Annunciators:
 - a. Annunciator Panel Test Button [31, fig. 4-30] – **DEPRESS (ON)**.
 - b. All annunciators – **ON**.
 - c. Marker beacon lights [1-3, fig. 4-5] – **ON**.
 - d. Decision height lights – **ON**.
 - e. Altitude alert lights – **ON**.
 - f. Annunciator Panel Test Button [31, fig. 4-30] – **RELEASE (OFF)**.
12. Electric Auxiliary Hydraulic Pump Switch [19, fig. 4-27] – **ON**.
13. Hydraulic Pressure Gauge [2, fig. 4-37] – **IN GREEN**.
14. Electric Auxiliary Hydraulic Pump Switch [19, fig. 4-27] – **OFF**.

Warning Systems Tests



1. Landing Gear Warning System Test Switch [4, fig. 4-28] – **TEST**. Check all six Landing Gear Position Lights [3, fig. 4-28] **ON** with aural warning.
2. Landing Gear Warning System Test Switch [4, fig. 4-28] – **CENTER (OFF)**.
3. No Smoking/Seat Belt Switch [9, fig. 4-41] – **TEST (BOTH POSITIONS)**. Return switch to **OFF** after test.

4. Electric Auxiliary Hydraulic Pump Switch [19, fig. 4-27] – **ON**.
5. Stall warning system test:
 - a. Both Stall Warning Switches [4, 6, fig. 4-27] – **ON**. Check annunciators [3, 6, fig. 4-30] **OFF**.
 - b. Stall Warning Test Vane Selector Switch [13, fig. 4-41] – **RIGHT**.
 - c. Stall Warning System Test Switch [14, fig. 4-41] – **ON**.
 - d. Right Angle-of-Attack Indicator [7, fig. 4-35] – **IN RED**. Check for aural alert, stick shaker, stick nudger (pusher) and Right Stall Warning Annunciator [6, fig. 4-30] **FLASHING**.
 - e. Stall Warning Test Vane Selector Switch [13, fig. 4-41] – **LEFT**.
 - f. Left Angle-of-Attack Indicator [11, fig. 4-2] – **IN RED**. Check for aural alert, stick shaker, stick nudger (pusher) and Left Stall Warning Annunciator [3, fig. 4-30] **FLASHING**.
 - g. Stall Warning System Test Switch [14, fig. 4-41] – **OFF**.
 - h. Both Stall Warning Switches [4, 6, fig. 4-27] – **OFF**. Check annunciators [3, 6, fig. 4-30] **ON**.
6. Anti-skid system test:
 - a. Anti-Skid Power Switch [8, fig. 4-27] – **ON**. Check Anti-Skid Generator Lights [4, fig. 4-15] **OFF**.
 - b. Anti-Skid System Test Switch [15, fig. 4-41] – **FORWARD (OUTBOARD)**. Check Anti-Skid Generator Lights [4, fig. 4-15] **OUTBOARD ON**.
 - c. Anti-Skid System Test Switch [15, fig. 4-41] – **AFT (INBOARD)**. Check Anti-Skid Generator Lights [4, fig. 4-15] **INBOARD ON**.
 - d. Anti-Skid System Test Switch [15, fig. 4-41] – **CENTER (OFF)**.
 - e. Anti-Skid Power Switch [8, fig. 4-27] – **OFF**. Check Anti-Skid Generator Lights [4, fig. 4-15] **ON**.
7. Overspeed warning test:
 - a. Cabin Altitude Warning/Mach Test Switch [12, fig. 4-41] – **AFT (MACH TEST)**. Check for aural alert and stick puller.
 - b. Cabin Altitude Warning/Mach Test Switch [12, fig. 4-41] – **CENTER (OFF)**.
8. Electric Auxiliary Hydraulic Pump Switch [19, fig. 4-27] – **OFF**.
9. Fire detection system test:
 - a. Fire Detection System Test Switch [11, fig. 4-41] – **ON**. Check both captain and copilot fire annunciators [Fig. 4-31 and 4-33] **ON** or **FLASHING**.
 - b. Fire Detection System Test Switch [11, fig. 4-41] – **OFF**. Check both captain and copilot fire annunciators [Fig. 4-31 and 4-33] **OFF**.
10. Cabin altitude warning test:
 - a. Cabin Altitude Warning/Mach Test Switch [12, fig. 4-41] – **FORWARD (CABIN ALT TEST)**. Check Cabin Altitude Annunciator [30, fig. 4-30] **FLASHING** (with aural alert).
 - b. Cabin Altitude Warning/Mach Test Switch [12, fig. 4-41] – **CENTER (OFF)**. Check Cabin Altitude Annunciator [30, fig. 4-30] **OFF**.

Before Starting Engines



1. Thrust reversers:
 - a. Thrust Reverser Lights Test Switch [11, fig. 4-34] – **TEST**. Check all thrust reverser annunciators and lights **ON**.

- b. Thrust Reverser Lights Test Switch [11, fig. 4-34] – **NORM**. Check all thrust reverser annunciators and lights **OFF**.
 - c. Engine Throttles [1, 3, fig. 4-41] – **IDLE (F1 or FULL AFT** on your controller) if released, or **CUTOFF** if locked. *Throttles cannot be moved if locked.*
 - d. Thrust Reverser Subthrottles [6,16, fig. 4-41] – **PUSHED FORWARD** or **IDLE (F1)**.
 - e. Thrust Reverser Arm Switches [13-14, fig. 4-34] – **ARM**. Check Thrust Reverser Armed Annunciators [7, 8, fig. 4-34] **ON**.
 - f. Thrust Reverser Arm Switches [13-14, fig. 4-34] – **OFF**. Check Thrust Reverser Armed Annunciators [7, 8, fig. 4-34] **OFF**.
 - g. Thrust Reverser Emergency Stow Switches [2-3, fig. 4-34] – **NORM (UP)**. Check Thrust Reverser Emergency Stow Lights [1-4, fig. 4-34] **OFF**.
 - h. Thrust Reverser Unsafe Annunciators [5, 10, fig. 4-34] – **OFF**.
 - i. Thrust Reverser Deployed Annunciators [6, 9, fig. 4-34] – **OFF**.
2. Autopilot check:
- a. AFC/SS Test Switch [10, fig. 4-41] – **FORWARD (AFCS TEST)**. Check all AFCS (autopilot/flight director) mode annunciators and lights **ON**.
 - b. AFC/SS Test Switch [10, fig. 4-41] – **CENTER (OFF)**.
 - c. Autopilot Engage Button [1, fig. 4-44] – **PRESS ON** to engage, then **PRESS OFF** to disengage. Check for aural alert when autopilot is disengaged.
 - d. Autopilot Engage Button [1, fig. 4-44] – **PRESS ON**.
 - e. Autopilot Roll Monitor Test Button [17, fig. 4-41] – **DEPRESS TO TEST**. Autopilot will disengage. Release to **OFF**.
 - f. Autopilot Engage Button [1, fig. 4-44] – **PRESS ON**.
 - g. Autopilot Pitch Trim Monitor Switch [17, fig. 4-41] – **TEST UP AND DOWN**. Autopilot will disengage. Reset to **CENTER (OFF)**.
 - h. Autopilot Engage Button [1, fig. 4-44] – **PRESS ON**.
 - i. Turn Command Knob [2, fig. 4-44] – **TEST (ROTATE) LEFT/RIGHT**, then reset to **CENTER**. *Click to center.*
 - j. Pitch Command Wheel [10, fig. 4-44] – **TEST (ROTATE) UP/DOWN**, then reset to **CENTER**. *Click to center.*
 - k. Autopilot Engage Button [1, fig. 4-44] – **PRESS OFF**.
 - l. Yaw Damper Selector Switch [1, fig. 4-45] – **PRI YAW DAMPER**.
 - m. Primary Yaw Damper ON Button [12, fig. 4-44] – **PRESS ON** to engage.
 - n. Primary Yaw Damper OFF Button [11, fig. 4-44] – **PRESS OFF** to disengage. Check for aural alert when primary yaw damper is disengaged.
 - o. Yaw Damper Selector Switch [1, fig. 4-45] – **SEC YAW DAMPER**.
 - p. Secondary Yaw Damper Switch [2, fig. 4-45] – **ENGAGE**.
 - q. Secondary Yaw Damper Switch [2, fig. 4-45] – **OFF**. Check for aural alert when secondary yaw damper is disengaged.
 - r. Yaw Damper Selector Switch [1, fig. 4-45] – Back to **PRI YAW DAMPER**.
3. Emergency Pitch Trim Switch [3, fig. 4-27] – **NORM**.
4. Trim:
- a. Elevator trim (on your controller) – Check that Pitch Trim Indicator [3, fig. 4-14] is about **one needle thickness below center**. Listen for trim in motion clicker (autopilot must be disengaged).
 - b. Takeoff Trim Alert Annunciator [2, fig. 4-31] – **OFF**.
 - c. Aileron trim (on your controller) – **CHECKED**.
 - d. Rudder trim [11, fig. 4-45] – **CHECKED**.
5. Fuel quantity [17, fig. 4-43]:



- a. Check **sufficient quantity** for flight. Refer to “Flight Planning”, in section 6 for details.
- b. Check for **imbalance** between L/R tanks. Refer to “Flight Planning”, in section 6 for details.
6. Fuel counter [15, fig. 4-43] – **RESET TO ZERO**. Fuel counter indicates fuel consumed since last engine start (after reset). Must be reset manually.
7. Crosflow (Crossfeed) Switch [2, fig. 4-43] – **CLOSE**. Refer to “20 Series Fuel System” in section 5 for more information about crossfeeding fuel.
8. Fuselage Tank Switch [6, fig. 4-43] – **OFF (CENTER)**.
9. Fuel Jettison Switch [1, fig. 4-43] – **OFF**. Refer to “20 Series Fuel System” in section 5 for more information about the fuel jettison system.
10. Jet pumps:
 - a. Jet Pumps Switches [11-12, fig. 4-43] – **ON**.
 - b. Motive Flow Valve Lights [10, 13, fig. 4-43] – **ON** for one second (valve in transit), then **OFF**.
 - c. Engine Low Fuel Pressure Annuncia-

tors [1,4, fig. 4-25] – **OFF**.

11. Standby Pumps Switches [8-9, fig. 4-43] – **OFF**.
12. Main Cabin Door [24, fig. 3-1] – **CLOSED AND SECURE (SHIFT-E)**.
13. Door Unsecured Annunciator [10, fig. 4-30] – **OFF**.

Engine Start



1. Right Engine Throttle [3, fig. 4-41] – **IDLE (F1 or FULL AFT on your controller)** if released, or **CUTOFF** if locked. *Throttle cannot be moved if locked (see 3, below)*.
2. Right Thrust Reverser Subthrottle [16, fig. 4-41] – **FULL FORWARD (IDLE or F1)**.
3. Right Throttle Release Lever [4, fig. 4-41] – Click to **LOCK** or **CTRL-SHIFT-F1** (release lever down, throttle set to cutoff, fuel valve closed).
4. Right Engine Throttle [3, fig. 4-41] – Check **CUTOFF** (locked, down position).
5. Rotating Beacon Lights [13, fig. 4-27] – **ON**.
6. Right Engine Starter/Generator Switch [6, fig. 4-28] – **START**. Check for Right Ignition Light [17, fig. 4-27] **ON**.
7. Check **10% RPM** [6, fig. 4-25].
8. Right Throttle Release Lever [4, fig. 4-41] – Click to **RELEASE** (release lever up, throttle set to idle, fuel valve open).
9. Right Engine Throttle [3, fig. 4-41] – Check **IDLE (F1 or FULL AFT on your controller)**.

10. Monitor Right EGT Gauge [4, fig. 4-25] and make sure **WITHIN GREEN ARC**.
 11. Check about **50% RPM** [6, fig. 4-25].
 12. Set Right Starter/Generator Switch [6, fig. 4-28] to **OFF**, then to **GEN** when engine is stable at **IDLE**.
 13. Right Engine Ignition Light [17, fig. 4-27] – **OFF**.
 14. Right Generator Inoperative Annunciator [23, fig. 4-30] – **OFF**.
 15. Right DC Ammeter [5, fig. 4-26] – **CHARGING**.
 16. Engine Low Fuel Pressure Annunciator [4, fig. 4-25] – **OFF**.
 17. Check right engine oil pressure and temperature [7, fig. 4-25 and 2, fig. 4-26] – **BOTH IN GREEN**.
 18. Fuel flow [8, fig. 4-25] – **NORMAL**.
 19. Hydraulic pressure [2, fig. 4-37] – **IN GREEN**.
- Repeat above procedures for left engine.**
- Before Taxi**
1. Primary & Secondary Inverter Switches [10, 12, fig. 4-27] – Check **ON**.
 2. Auxiliary Inverter Switch [5, fig. 4-27] – Check **OFF**.
 3. Radio Master Switch [14, fig. 4-27] – Check **ON**.
 4. Engine instruments [Fig. 4-25] – **CHECKED**.
 5. Navigation Lights [15, fig. 4-27] – **ON**.
 6. Strobe Lights [11, fig. 4-27] – **ON**.
 7. Recognition Lights [9, fig. 4-27] – **ON, IF REQD**.
 8. Taxi Lights [20, fig. 4-27] – **ON**.
 9. Emergency Lights Switch [5, fig. 4-45] – **ARM**. Check Emergency Lighting System OFF Warning Light [4, fig. 4-45] **OFF**.
 10. Spoilers:
 - a. Spoilers Switch [24, fig. 4-41] – Check **RET**.
 - b. Spoilers Extended Annunciator [7, fig. 4-30] – Check **OFF**.
 11. Bleed Air Switch [1, fig. 4-39] – **NORMAL**.
 12. Anti-ice:
 - a. Wing and Stabilizer Heat Switch [3, fig. 4-4] – **AS REQD**.
 - b. Windshield Heat Switches [4, fig. 4-4] – **AS REQD**.
 - c. Nacelle Heat Switches [2, fig. 4-4] –



AS REQD.

13. Parking brake [8, fig. 4-41] – **RELEASED**.
14. Anti-Skid Power Switch [8, fig. 4-27] – **ON**.
15. Anti-Skid Generator Lights [4, fig. 4-15] – **ALL OFF**.

Taxi

1. ATC clearance – **OBTAINED** from appropriate authority. Set radios accordingly.
2. Flight controls – **CHECKED**.
3. Thrust reversers controls [Fig. 4-34] – **CHECKED**.
4. Nose wheel steering:
 - a. Nose Gear Steer Lock Switch [7, fig. 4-4] – **DEPRESS MOMENTARILY** to **ENGAGE** electric nose wheel steering.
 - b. Nose Wheel Steering Engaged Annunciator [14, fig. 4-30] – **ON**.
5. Aircraft rolling above 5 knots:
 - a. Toe brakes – **APPLIED**. Listen for “birds in the cockpit” sounds.
 - b. Verify aircraft deceleration.
 - c. Toe brakes – **RELEASED**.
6. Engine Throttles [2-3, fig. 4-41] – **AS NEEDED** for taxiing.

Before Takeoff



1. Cabin pressurization:
 - a. Bleed Air Switch [1, fig. 4-39] – Check **NORMAL**.

- b. Cabin Altitude Controller Knob [5, fig. 4-39] – **SET** to **initial planned cruise altitude**.
 2. Cabin temperature:
 - a. Bleed Air Switch [1, fig. 4-39] – Check **NORMAL**.
 - b. Cabin Temperature Control Knob/Switch [1 or 2, fig. 4-40] – **SET** to **desired temperature**.
 - c. Check H-Valve Position Indicator [19, fig. 4-35] – **about 1/2**.
 - d. Lower cabin temperature **if necessary**.
 3. No Smoking/Seat Belt Switch [9, fig. 4-41] – **NO SMOKING AND SEAT BELTS (ON)**.
 4. Anti-ice:
 - a. Bleed Air Switch [1, fig. 4-39] – Check **NORMAL**.
 - b. Wing and Stabilizer Heat Switch [3, fig. 4-4] – **OFF** or **AS REQD**.
 - c. Windshield Heat Switches [4, fig. 4-4] – **OFF** or **AS REQD**.
 - d. Nacelle Heat Switches [2, fig. 4-4] – **OFF** or **AS REQD**.
 5. All external lights, except landing lights [Fig. 4-27] – **ON**.
 6. Avionics:
 - a. ADI Gyro and Computer Warning Flags [10-11, fig. 4-7] – **OUT OF VIEW**.
 - b. HSI Compass Warning Flag [13, fig. 4-8] – **OUT OF VIEW**.
 - c. Radios and transponder [Fig. 4-18 to 4-21] – Check **ON** and **SET** according to flight plan and ATC clearance.
 - d. GPS and radar [1-2, fig. 4-17] – **ON** and **SET** (if needed).
 7. Gyro:
 - a. Directional Gyro Free/Slave Switch [9, fig. 4-5] – Check **SLAVE**.
 - b. Gyro Drift Compensation Switch [8, fig. 4-5] – If Directional Gyro Free/Slave Switch [9, fig. 4-5, see above] is set to **FREE** (magnetic references unreliable), **use as needed** to sync directional gyros with ground indica-



- tions (the Directional Gyro drift knob [5, fig. 4-2] can also be used).
8. Flight instruments:
 - a. Set barometric pressure on altimeters [1, fig. 4-11] according to nearest weather station.
 - b. Set airspeed bugs [1, fig. 4-9] to V_1 and V_R **as needed**. Refer to “Flight Planning”, in section 6.
 - c. Set **initial course** on HSI [1, fig. 4-8].
 - d. Set **initial heading** on HSI [2, fig. 4-8].
 - e. Set RMI [fig. 4-10] **as needed**.
 - f. Set DME head [fig. 4-36] **as needed**.
 - g. Check all directional indicators as aircraft turns while taxiing.
 9. Autopilot Altitude Preselector [4, fig. 4-23] – **SET to initial ATC clearance altitude**.
 10. Flight Director Switch [1, fig. 4-16] – **OFF, then ON (reset)**. Check Flight Director Command Bars [4, fig. 4-7] **IN RANGE** on ADI.
 11. Radio altimeter:
 - a. Radio Altimeter Power Switch [3, fig. 4-13] – **ON (to test)**.
 - b. Check radio altimeter flags [12, fig. 4-7; 6, fig. 4-13] – **OUT OF VIEW**.
 - c. Radio Altimeter Power Switch [3, fig. 4-13] – **OFF**.
 12. Spoilers:
 - a. Spoilers Switch [24, fig. 4-41] – Check **RET**.
 - b. Spoilers Extended Annunciator [7, fig. 4-30] – Check **OFF**.
 13. Flaps:
 - a. Flaps Switch [25, fig. 4-41] – **PUSH DOWN AS NEEDED**.
 - b. Check flaps position indicator [1, fig. 4-28] for correct **TAKEOFF POSITION (8° or AS NEEDED)**. Refer to “Flight Planning”, in section 6.
 14. Emergency Pitch Trim Switch [3, fig. 4-27] – Check **NORM**.
 15. Trim:
 - a. Elevator trim (on your controller) – **SET FOR TAKEOFF**. Check that Pitch Trim Indicator [3, fig. 4-14] is about **one needle thickness below center**. *Forward center of gravity requires more trim. No clicker sound with flaps extended more than 3°.*
 - b. Takeoff Trim Alert Annunciator [2, fig. 4-31] – Check **OFF**.
 - c. Aileron trim (on your controller) – **CHECKED**.
 - d. Rudder trim [11, fig. 4-45] – **CHECKED**.
 16. Fuel quantity [17, fig. 4-43] – Check for **imbalance** between L/R wing tanks. Refer to “20 Series Fuel System” in section 5 for more details.

Takeoff

1. Flight controls:
 - a. Check – **FREE**.
 - b. Hide control columns and yokes [9, fig. 4-1] **if desired**. Refer to section 4, page 7, for details.
2. Nose wheel steering:
 - a. Nose Gear Steer Lock Switch [7, fig. 4-4] – **DEPRESS MOMENTARILY** to **DIS-ENGAGE** electric nose wheel steering.
 - b. Nose Wheel Steering Engaged Annunciator [14, fig. 4-30] – **OFF**.
3. Anti-Skid Power Switch [8, fig. 4-27] – Check **ON**.
4. Anti-Skid Generator Lights [4, fig. 4-15] – Check **OFF**.
5. Engine Air Ignition Switches [1, 16, fig. 4-27] – Normally **OFF** (can be turned **ON** if wet or turbulent conditions).
6. Stall Warning Switches [4, 6, fig. 4-27] – Both **ON**. Check annunciators [3,6, fig. 4-30] **OFF**.
7. Pitot Heat Switches [1, fig. 4-4] – Both **ON**.
8. Thrust Reverser Arm Switches [13-14, fig. 4-34] – **ARM**.
9. Thrust Reverser Armed Annunciators [7, 8, fig. 4-34] – **ON**.
10. Annunciator panel:
 - a. **CHECKED, no warnings or abnormal indications**.
11. ATC clearance – **OBTAINED** from appropriate authority.
12. Taxi and Landing Lights [18, 20, fig. 4-27] and all external lights – **ON**.
13. Toe Brakes:
 - a. Brakes – **APPLIED**.

Takeoff Sequence

Notes

- In case of an engine failure, refer to “Abnormal/Emergency Procedures” in section 8.
- The GLJ Model 25 is a very high performance jet aircraft. The takeoff sequence happens quite fast and requires an efficient drill in order to observe and maintain altitude and speed clearances.



1. Throttles:
 - a. **ADVANCE** throttles [1,3, fig. 4-41] slowly to **takeoff power (100% RPM)**.
2. Toe Brakes:
 - a. Brakes – **RELEASED**.
3. Accelerate to V_1 :
 - a. If engine fails before V_1 , **ABORT** take-off. Refer to “Abnormal/Emergency Procedures” in section 8.
 - b. If engine fails after V_1 , **CONTINUE** takeoff. Refer to “Abnormal/Emergency Procedures” in section 8.
4. V_r attained:
 - a. **ROTATE** to **15° pitch**.
 - b. Set airspeed bugs [1, fig. 4-9] to V_2 as **needed**. Refer to “Flight Planning”, in section 6.
5. Angle-of-Attack:
 - a. Angle-of-Attack Indicator [5, fig. 4-6] – **MAINTAIN IN GREEN**.
6. Positive rate of climb:
 - a. Landing Gear Selector Switch [5, fig. 4-28] – **UP**.
 - b. Check Landing Gear Position Lights [3, fig. 4-28] – **RED ON** in transit, then all **OFF**.
 - c. Accelerate to $V_2 + 15$.
7. Flaps:
 - a. **Retract** [25, fig. 4-41] on schedule. Refer to “Maximum Flap Placard Speeds” in Appendix 1.
8. Landing and Taxi Lights [18, 20, fig. 4-27] – **OFF**.
9. Engine Air Ignition Switches [1, 16, fig. 4-27] – **OFF** (can be turned **ON** if wet or turbulent conditions).
10. Anti-Skid Power Switch [8, fig. 4-27] – **OFF**.
11. Anti-Skid Generator Lights [4, fig. 4-15] – Check **ON**.
12. Thrust Reverser Arm Switches [13-14, fig. 4-34] – **OFF**.
13. Accelerate to climb speed (**MAX 250 KIAS** if ATC-restricted, **MAX 306 KIAS** under

FL140). An aural alert will sound if airspeed is above 306 KIAS under 14,000 feet (bird strike protection).

14. Cabin pressure [6-7, fig. 4-39] – **CHECKED**.
15. No Smoking/Seat Belt Switch [9, fig. 4-41] – **OFF**.

Climb



1. Throttles [1, 3, fig. 4-41]:
 - a. **SET** to **climb power (90% RPM)**.
2. Anti-ice:
 - a. Bleed Air Switch [1, fig. 4-39] – Check **NORMAL**.
 - b. Wing and Stabilizer Heat Switch [3, fig. 4-4] – **AS REQD**.
 - c. Windshield Heat Switches [4, fig. 4-4] – **AS REQD**.
 - d. Nacelle Heat Switches [2, fig. 4-4] – **AS REQD**.
3. Cabin pressure [6-7, fig. 4-39] – **MONITORED**.
4. Transition level (18,000 feet maximum): Set barometric pressure on altimeters [1, fig. 4-11] to **29.92**.
5. Airspeed:
 - a. Accelerate to **0.7 Mach**.

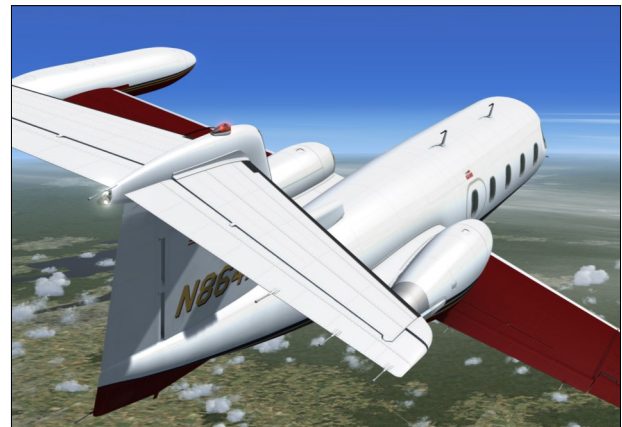
Cruise

1. Windshield Defog Knob [7, fig. 4-41] – **PULLED**, if needed.



2. Engine instruments [Fig. 4-25] – Check **WITHIN LIMITS**.
3. Cabin pressure [6-7, fig. 4-39] – **MONITORED**.
4. Engine Sync Switch [22, fig. 4-41] – **ON**.
5. Engine Sync ON Annunciator [25, fig. 4-30] – **ON**.
6. Yaw Damper Selector Switch [1, fig. 4-45] – Check **PRI YAW DAMPER**.
7. Primary Yaw Damper ON Button [12, fig. 4-44] – **PRESS ON (primary yaw damper engaged)**.
8. Fuel status:
 - a. Monitor fuel **at all time** [17, fig. 4-43; 2, fig. 4-30].
 - b. Ensure fuel burn [15, fig. 4-43] is **consistent with flight plan**. Refer to “Flight Planning”, in section 6.
 - c. **SWITCH TO THE FUSELAGE TANK** if fuel level in the wing tanks **becomes critically low** [6, fig. 4-43]. Refer to “20 Series Fuel System” in section 5
9. Autopilot Engage Button [1, fig. 4-44] – **PRESS ON**, if desired, to engage autopilot.
10. Autopilot Speed/Mach Hold Mode Switch [1 or 2, fig. 4-22b] – **PRESS ON** to engage, if desired.
11. Other autopilot modes [Fig. 4-22a; Fig. 4-22b; Fig. 4-44] – **PRESS ON** to engage, if desired.

for full procedures, including cross-feeding and fuel jettisoning.



Descent



1. ATC clearance – **OBTAINED**. Set radios accordingly.
2. Windshield Defog Knob [7, fig. 4-41] – **PULLED**, if needed.
3. Pressurization:
 - a. Set **destination field elevation** [5, fig. 4-39]. Refer to “Flight Planning” in section 6.
4. Anti-ice:
 - a. Bleed Air Switch [1, fig. 4-39] – Check **NORMAL**.
 - b. Wing and Stabilizer Heat Switch [3, fig. 4-4] – **AS REQD.**
 - c. Windshield Heat Switches [4, fig. 4-4] – **AS REQD.**
 - d. Nacelle Heat Switches [2, fig. 4-4] – **AS REQD.**
5. Pitot heat:
 - a. Pitot Heat Switches [1, fig. 4-4] – Check both **ON**.
6. Fuel quantity [17, fig. 4-43] – **MONITORED**.
7. Hydraulic Pressure Gauge [2, fig. 4-37] – **IN GREEN**.
8. Throttles:
 - a. During descent, maintain **75% RPM** minimum until 12,000 ft.
9. Use spoilers [24, fig. 4-41] **as required**.
10. Altimeters:
 - a. Passing transition level (18,000 feet

maximum), set barometric pressure [1, fig. 4-11] to **local setting**.

Approach

1. ATC clearance – **OBTAINED**. Set radios accordingly.
2. Fuel balance between L/R wing tanks [17, fig. 4-43] – **CHECKED**.
3. Thrust Reverser Arm Switches [13-14, fig. 4-34] – **ON**. Thrust Reverser Armed Annunciators [7, 8, fig. 4-34] will remain **OFF** until the aircraft touches down. *Thrust reversers cannot be armed with the engine throttles in forward thrust above idle.*
4. Hydraulic Pressure [2, fig. 4-37] – **IN GREEN**.
5. Emergency Air Pressure [3, fig. 4-37] – **IN GREEN**.
6. No smoking/seat belts sign:
 - a. No smoking switch [9, fig. 4-41] – **NO SMOKING and SEATBELTS ON**.
7. Cabin pressure [6-7, fig. 4-39] – **CHECKED**.
8. Engine Sync Switch [22, fig. 4-41] – **OFF**.
9. Engine Sync ON Annunciator [25, fig. 4-30] – **OFF**.
10. Spoilers:
 - a. Spoilers Switch [24, fig. 4-41] – Check **RET**.
 - b. Spoilers Extended Annunciator [7, fig. 4-30] – Check **OFF**.
11. Radio altimeter:
 - a. Radio altimeter power switch [3, fig. 4-13] – **ON**.

Before Landing

1. Landing gear:
 - a. Landing Gear Selector Switch [5, fig. 4-28] – **DOWN**.
 - b. Check Landing Gear Position Lights [3, fig. 4-28] – **RED ON** in transit, then all **GREEN**.
2. Landing and Taxi Lights [18, 20, fig. 4-27]

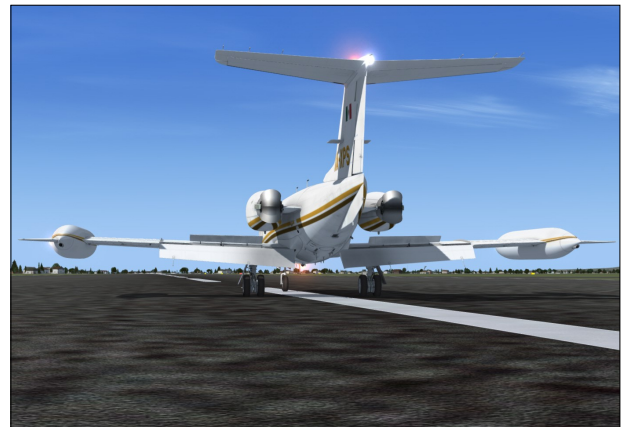


- Both **ON**.

3. Parking brake [8, fig. 4-41] - Check **RELEASED**.
4. Anti-Skid Power Switch [8, fig. 4-27] - **ON**.
5. Anti-Skid Generator Lights [4, fig. 4-15] - Check **OFF**.
6. Flaps:
 - a. **DOWN AS REQD** [25, fig. 4-41; 1, fig. 4-28]. Refer to "Flight Planning" in section 6.
7. Engine Air Ignition Switches [1, 16, fig. 4-27] - Normally **OFF**, or **ON** if wet or turbulent conditions.
8. Primary Yaw Damper OFF Button [11, fig. 4-44] - **PRESS OFF (primary yaw damper disengaged)**.

Landing (after Touchdown)

1. Spoilers:
 - a. Spoilers Switch [24, fig. 4-41] - **EXT.** (spoilers extended as needed).
 - b. Spoilers Extended Annunciator [7, fig. 4-30] - **ON**.



2. Thrust reversers (if needed):
 - a. Thrust Reverser Subthrottles [6, 16, fig. 4-41] - **PULLED AFT (F2 AS NEEDED) to deploy thrust reversers. Up to 85% RPM in reverse.**
 - b. Thrust Reverser Deployed Annunciators [6, 9, fig. 4-34] - **ON**.
3. Thrust reversers (after deceleration):
 - a. Thrust Reverser Subthrottles [6, 16, fig. 4-41] - **PUSHED FORWARD (F1 to IDLE)**.
 - b. Thrust Reverser Deployed Annunciators [6, 9, fig. 4-34] - **OFF**.

4. Thrust Reverser Arm Switches [13-14, fig. 4-34] – **OFF**.
5. Thrust Reverser Armed Annunciators [7, 8, fig. 4-34] – **OFF**.
6. Spoilers (after deceleration):
 - a. Spoilers Switch [24, fig. 4-41] – **RET. (spoilers retracted)**.
 - b. Spoilers Extended Annunciator [7, fig. 4-30] – **OFF**.

- b. Nose Wheel Steering Engaged Annunciator [14, fig. 4-30] – **ON**.

After Clearing the Runway



Before Clearing the Runway

1. Anti-Skid Power Switch [8, fig. 4-27] – **OFF**.
2. Anti-Skid Generator Lights [4, fig. 4-15] – Check **ON**.
3. Flaps:
 - a. Flaps Switch [25, fig. 4-41] – **UP (AS NECESSARY)**.
 - b. Confirm flaps position [1, fig. 4-28] – **FULL UP**.
4. Nose wheel steering:
 - a. Nose Gear Steer Lock Switch [7, fig. 4-4] – **DEPRESS MOMENTARILY to ENGAGE** electric nose wheel steering.

1. Engine Air Ignition Switches [1, 16, fig. 4-27] – **OFF**. Check Engine Air Ignition Lights [2, 17, fig. 4-27] **OFF**.
2. Landing Lights [18, fig. 4-27] – **OFF**.
3. Taxi Lights [20, fig. 4-27] – Check **ON**.
4. Strobe Lights [11, fig. 4-27] – **OFF**.
5. Recognition Lights [9, fig. 4-27] – **OFF**.



6. Both Stall Warning Switches [4, 6, fig. 4-27] – **OFF**.
7. Anti-ice:
 - a. Bleed Air Switch [1, fig. 4-39] – Check **NORMAL**.
 - b. Wing and Stabilizer Heat Switch [3, fig. 4-4] – **OFF** or **AS REQD**.
 - c. Windshield Heat Switches [4, fig. 4-4] – **OFF** or **AS REQD**.
 - d. Nacelle Heat Switches [2, fig. 4-4] – **OFF** or **AS REQD**.
 - e. Pitot Heat Switches [1, fig. 4-4] – **OFF** or **AS REQD**.
8. Bleed Air Switch [1, fig. 4-39] – **OFF**, if not needed for anti-ice or cabin temperature control.
9. Unnecessary avionics – **OFF**.
10. Emergency Lights Switch [5, fig. 4-45] – **DISARM**.

Shutdown

Once the aircraft is parked:

1. Parking brake:
 - a. Parking Brake Lever [8, fig. 4-41] –

SET.

2. Anti-ice:
 - a. Wing and Stabilizer Heat Switch [3, fig. 4-4] – **OFF**.
 - b. Windshield Heat Switches [4, fig. 4-4] – **OFF**.
 - c. Nacelle Heat Switches [2, fig. 4-4] – **OFF**.
 - d. Pitot Heat Switches [1, fig. 4-4] – **OFF**.
3. Bleed Air Switch [1, fig. 4-39] – **OFF**.
4. Engine Starter/Generator Switches [6, 11, fig. 4-28] – **OFF**.
5. Engine shutdown:
 - a. Thrust Reverser Subthrottles [6, 16, fig. 4-41] – **FULL FORWARD TO IDLE (F1)**.
 - b. Throttles [1, 2, fig. 4-41] – **FULL AFT TO IDLE (F1** or **FULL AFT** on your controller) .
 - c. Throttle Release Levers [2, 4, fig. 4-41] – Click to **LOCK** or **CTRL-SHIFT-F1** (release levers down, throttles set to cutoff, fuel valves closed). *Engines will shut down.*
 - d. Jet Pump Switches [11-12, fig. 4-43] – **OFF**.



- e. Standby Pump Switches [8-9, fig. 4-43] – Check **OFF**.
- 6. Rotating Beacon Lights [13, fig. 4-27] – **OFF**.
- 7. All remaining exterior lights [Fig. 4-27] – **OFF**.
- 8. Emergency Battery Switches [2-3, fig. 4-15] – Check **OFF**.
- 9. Standby Gyro [Fig. 4-16] – **CAGED**.
- 10. Radio Master Switch (Avionics) [14, fig. 4-27] – **OFF**.
- 11. Primary, Secondary and Auxiliary Inverter Switches [10,12, 5, fig. 4-27] – **OFF**.
- 12. All remaining panel switches – **OFF**.
- 13. Battery Switches [8-9, fig. 4-28] – **OFF**.
- 14. Controls – **LOCKED**.
- 15. Main Cabin Door [24, fig. 3-1] – **OPEN (SHIFT-E)**.
- 16. Flight Crew [1, fig. 4-50] – **ABSENT**. *Click the center logo on the captain's yoke for*



the crew to leave the aircraft (visible on the exterior model).

- 17. “Remove Before Flight” Items [1, fig. 4-50] – **INSTALLED**. *Click the center logo on the copilot's yoke to install the items (visible on the exterior model).*
- 18. Main Cabin Door [24, fig. 3-1] – **CLOSED AND LOCKED (SHIFT-E)**.

Welcome to your destination!



ABNORMAL / EMERGENCY PROCEDURES

SECTION 8



This section contains the procedures in case of abnormal operation or emergency.

ENGINE FAILURE

Engine Failure on Takeoff

If below V_1 , ABORT TAKEOFF – may require spoilers/thrust reversers and maximum braking energy.

If above V_1 :

1. Maintain directional control.
2. Perform single engine takeoff.
3. Accelerate to $V_2 + 10$.
4. Trim rudder as needed.
5. Inform ATC and request amended clearance if possible.
6. Return for landing if cleared by ATC.

Engine Failure in Cruise

1. Maintain directional control.
2. Trim rudder as needed.
3. Attempt in-flight engine restart.

If engine won't restart:

1. Affected engine – **SECURED**:
 - a. Throttle and Subthrottle [1 or 3, 6 or 16, fig. 4-41] – **to IDLE (F1)**.
 - b. Throttle Release Lever [2 or 4, fig. 4-41] – **LOCKED (fuel valve closed)**. This will set throttle to **CUTOFF**.
 - c. Manual and air ignition [6 or 11, fig. 4-28; 1 or 16, fig. 4-27] – **OFF**.
2. Inform ATC.

3. Evaluate fuel status [16-17, fig. 4-43].
4. Fuel Crossfeed Switch [3, fig. 4-43] and Standby Pump Switches [8-9, fig. 4-43] – **as required**. Refer to “20 Series Fuel System” in section 5 for complete crossfeeding procedures.
5. Complete flight at lower altitude if possible or perform precautionary landing if needed.

Engine Failure on Approach

1. Same as above. Engine restart and cross-feeding optional.
2. Maintain directional control and trim rudder as needed.
3. Inform ATC.
4. Perform normal approach at slightly higher speed if field length allows (may preclude full flaps).

ENGINE FIRE

1. Fire Alarm Annunciator [6, fig. 4-31 or 2, fig. 4-33] – **ON**. Identify engine on fire.
2. Throttle back engine and monitor Fire Warning Annunciator.



3. If fire persists after 10 seconds, press Firewall Shutoff Button [6, fig. 4-31 or 2, fig. 4-33]. Open button guard first.
4. Confirm firewall shutoff:
 - a. Pinlight [8, fig. 4-31 or 1, fig. 4-33] – **ON with engine shutdown**.
5. Affected engine – **SECURED**:
 - a. Throttle and Subthrottle [1 or 3, 6 or 16, fig. 4-41] – **to IDLE (F1)**.
 - b. Throttle Release Lever [2 or 4, fig. 4-41] – **LOCKED (fuel valve closed)**. This will set throttle to **CUTOFF**.
 - c. Manual and air ignition [6 or 11, fig. 4-28; 1 or 16, fig. 4-27] – **OFF**.

6. Confirm extinguishers armed [4-5, fig. 4-31 or 4-5, fig. 4-33] – **ON**.

7. If fire persists after 10 seconds, push First Fire Extinguisher Discharge Button.



8. If fire persists after 10 seconds, push Second Fire Extinguisher Discharge Button.
9. If fire persists after 10 seconds, declare emergency to ATC and land as soon as possible.





ELECTRICAL AND/OR HYDRAULIC SYSTEMS FAILURE

Simplified procedures in case of total engine/generator failure

1. Engine Starter/Generator Switches (if generators failed) [6, 11, fig. 4-28] - **OFF**.
2. Auxiliary Inverter Switch (if needed, main inverters failed) [5, fig. 4-27] - **ON**.
3. Primary and Secondary Inverter Switches [10,12, fig. 4-27] (if failed) - **OFF**.
4. Reduce electrical load by turning **OFF** all unnecessary equipment.
5. Electric Auxiliary Hydraulic Pump Switch [19, fig. 4-27] - **ON** to test, then **OFF** and **ON** again when hydraulic power is needed (Flaps, Spoilers, Landing Gear, Brakes).
6. Hydraulic Pressure Gauge [2, fig. 4-37] - **IN GREEN** when electric auxiliary hydraulic pump is **ON**.
7. Frequently check airspeed/Mach, altitude, attitude and angle-of attack.

8. Declare emergency to ATC and land as soon as practical.

After main batteries are depleted:

1. Emergency Battery Switch [2, fig. 4-15] - **ON**. The amber light next to the switch will come **ON** after about 1 to 3 seconds, indicating that power is supplied to the aircraft by the emergency batteries.
2. Standby Emergency Battery Switch [2, fig. 4-15] - **ON**. The amber light next to the



switch will come **ON**.

3. Standby Gyro [Fig. 4-16] – **UNCAGED and CHECKED**.
4. Battery Switches [8-9, fig. 4-28] – **OFF**.

Note: Emergency batteries are not available in the simulator. However, setting either Emergency Battery Switch [2 or 3, fig. 4-15] to **ON**, will start the add-on's APU to simulate emergency battery backup in case of a power failure. There is no APU in the real aircraft. *Refer to fig. 4-15 for more details.*

On approach:

1. Electric Auxiliary Hydraulic Pump Switch [19, fig. 4-27] – **ON**.
2. Hydraulic Pressure Gauge [2, fig. 4-37] – **IN GREEN**.
3. Spoilers:
 - a. Spoilers Switch [24, fig. 4-41] – Check **RET**.
 - b. Spoilers Extended Annunciator [7, fig. 4-30] – Check **OFF**.
4. Flaps:
 - a. **DOWN AS REQD** [25, fig. 4-41]. *Refer to "Flight Planning" in section 6.*
 - b. Confirm flaps position [1, fig. 4-28] – **DOWN**.
5. Landing gear:
 - a. Landing Gear Selector Switch [5, fig. 4-28] – **DOWN**.
 - b. Check Landing Gear Position Lights [3, fig. 4-28] – **RED ON** in transit, then all **GREEN**.

If electric auxiliary hydraulic pump fails, on approach:

1. Check Emergency Air Pressure Gauge [3, fig. 4-37] – **IN GREEN**.
2. Spoilers:
 - a. Spoilers Switch [24, fig. 4-41] – Check **RET**.
 - b. Spoilers Extended Annunciator [7, fig. 4-30] – Check **OFF**.
3. Flaps:

- a. **DOWN AS REQD** [25, fig. 4-41]. *Refer to "Flight Planning" in section 6.*
- b. Confirm flaps position [1, fig. 4-28] – **DOWN**.

4. Landing gear:
 - a. Landing Gear Selector Switch [5, fig. 4-28] – **DOWN**.
 - b. Check Landing Gear Position Lights [3, fig. 4-28] – **RED ON** in transit, then all **GREEN**.

If landing gear won't extend:

1. Check Emergency Air Pressure Gauge [3, fig. 4-37] – **IN GREEN**.
2. Landing Gear Selector Switch [5, fig. 4-28] – **DOWN**.
3. Emergency Gear Extension Lever [5, fig. 4-41] – **DOWN (click once)**.
4. Frequently check airspeed/Mach, altitude, attitude and angle-of attack.
5. Land as soon as possible.





The following simplified procedures can be used to prepare and to fly the Xtreme Prototypes GLJ Model 25 SE addon without going through the detailed procedures presented in section 7. We recommend that you use the following check lists only if you are familiar with both your simulation platform and the GLJ Model 25's systems described in sections 4 and 5.

We assume that you have already started your simulation platform, created a flight and configured the simulator with the optimal settings for your system. We also assume that the engines are shut down, that power is off and that you are in the virtual cockpit mode.

Note: An even more condensed version of these procedures is now included in the pilot's kneeboard ("Checklist" tab).

CHECK LISTS

Cockpit Preparation (Power OFF)

1. "Remove Before Flight" Items - **REMOVED.**
2. Flight Crew - **ON BOARD.**
3. Seats - **ADJUST ARMRESTS.**
4. Flight controls - **FREE.** Hide control columns and yokes if necessary.
5. Parking brake - Check **SET.**
6. All switches - Check **OFF.**
7. All circuit breakers - **CLOSED.**
8. Oxygen Pressure Gauge - **IN GREEN.**
9. Emergency Air Pressure Gauge - **IN GREEN.**
10. Passenger Oxygen Flow Valve - **NORM,** if passengers present.
11. Passenger Oxygen Mask Valve - **AUTO,** if

passengers present.

12. Landing Gear Selector Switch – Check **DOWN**.
13. Bleed Air Switch – Check **OFF**.
14. Pressurization Mode Switch – **AUTO**.
15. Auto Rate Control Knob – Check **CENTERED**.
16. Windshield Defog Knob – **IN (NORMAL)**.

Cockpit Preparation (Power ON)

1. Battery Switches – **ON**.
2. Emergency Battery Switch – **ON**.
3. Battery Switches – **OFF**. Check amber light next to the Emergency Battery Switch **ON**.
4. Standby Gyro – Check **OPERATIONAL**. Uncage and adjust pitch scale if necessary.
5. Battery Switches – **ON**.
6. Emergency Battery Switch – **OFF**.
7. Landing Gear Selector Switch and lights – Check **DOWN + 3 GREEN**.
8. Both Primary and Secondary Inverter Switches – **ON**.
9. Radio Master Switch (Avionics) – **ON**.
10. Instrument Warning Flags – **OUT OF VIEW**.
11. Annunciators:
 - a. Annunciator Panel Test Button – **DEPRESS (ON)**.
 - b. All annunciators – **ON**.
 - c. Marker beacon lights – **ON**.
 - d. Decision height lights – **ON**.
 - e. Altitude alert lights – **ON**.
 - f. Annunciator Panel Test Button – **RELEASE (OFF)**.
12. Electric Auxiliary Hydraulic Pump Switch – **ON**.
13. Hydraulic Pressure Gauge – **IN GREEN**.
14. Electric Auxiliary Hydraulic Pump Switch – **OFF**.

Warning Systems Tests

1. Landing Gear Warning System Test Switch – **TEST**. Check all six Landing Gear Position Lights **ON** with aural warning.
2. Landing Gear Warning System Test Switch – **CENTER (OFF)**.
3. No Smoking/Seat Belt Switch – **TEST (BOTH POSITIONS)**. Return switch to **OFF** after test.
4. Electric Auxiliary Hydraulic Pump Switch – **ON**.
5. Stall warning system test:
 - a. Both Stall Warning Switches – **ON**. Check annunciators **OFF**.
 - b. Stall Warning Test Vane Selector Switch – **RIGHT**.
 - c. Stall Warning System Test Switch – **ON**.
 - d. Right Angle-of-Attack Indicator – **IN RED**. Check for aural alert, stick shaker, stick nudger (pusher) and Right Stall Warning Annunciator **FLASHING**.
 - e. Stall Warning Test Vane Selector Switch – **LEFT**.
 - f. Left Angle-of-Attack Indicator – **IN RED**. Check for aural alert, stick shaker, stick nudger (pusher) and Left Stall Warning Annunciator **FLASHING**.
 - g. Stall Warning System Test Switch – **OFF**.
 - h. Both Stall Warning Switches – **OFF**. Check annunciators **ON**.
6. Anti-skid system test:
 - a. Anti-Skid Power Switch – **ON**. Check Anti-Skid Generator Lights **OFF**.
 - b. Anti-Skid System Test Switch – **FORWARD (OUTBOARD)**. Check Anti-Skid Generator Lights **OUTBOARD ON**.
 - c. Anti-Skid System Test Switch – **AFT (INBOARD)**. Check Anti-Skid Generator Lights **INBOARD ON**.
 - d. Anti-Skid System Test Switch – **CENTER (OFF)**.
 - e. Anti-Skid Power Switch – **OFF**. Check Anti-Skid Generator Lights **ON**.

7. Overspeed warning test:
 - a. Cabin Altitude Warning/Mach Test Switch – **AFT (MACH TEST)**. Check for aural alert and stick puller.
 - b. Cabin Altitude Warning/Mach Test Switch – **CENTER (OFF)**.
8. Electric Auxiliary Hydraulic Pump Switch – **OFF**.
9. Fire detection system test:
 - a. Fire Detection System Test Switch – **ON**. Check both captain and copilot fire annunciators **ON** or **FLASHING**.
 - b. Fire Detection System Test Switch – **OFF**. Check both captain and copilot fire annunciators **OFF**.
10. Cabin altitude warning test:
 - a. Cabin Altitude Warning/Mach Test Switch – **FORWARD (CABIN ALT TEST)**. Check Cabin Altitude Annunciator **FLASHING** (with aural alert).
 - b. Cabin Altitude Warning/Mach Test Switch – **CENTER (OFF)**. Check Cabin Altitude Annunciator **OFF**.

Before Starting Engines

1. Thrust reversers:
 - a. Thrust Reverser Lights Test Switch – **TEST**. Check all thrust reverser annunciators and lights **ON**.
 - b. Thrust Reverser Lights Test Switch – **NORM**. Check all thrust reverser annunciators and lights **OFF**.
 - c. Engine Throttle – **IDLE (F1** or **FULL AFT** on your controller) if released, or **CUTOFF** if locked.
 - d. Thrust Reverser Subthrottles – **PUSHED FORWARD** or **IDLE (F1)**.
 - e. Thrust Reverser Arm Switches – **ARM**. Check Thrust Reverser Armed Annunciators **ON**.
 - f. Thrust Reverser Arm Switches – **OFF**. Check Thrust Reverser Armed Annunciators **OFF**.
 - g. Thrust Reverser Emergency Stow Switches – **NORM**. Check Thrust Reverser Emergency Stow Lights **OFF**.
 - h. Thrust Reverser Unsafe Annunciators – **OFF**.
 - i. Thrust Reverser Deployed Annunciators – **OFF**.
2. Autopilot check:
 - a. AFC/SS Test Switch – **FORWARD (AFCS TEST)**. Check all AFCS (autopilot/flight director) mode annunciators and lights **ON**.
 - b. AFC/SS Test Switch – **CENTER (OFF)**.
 - c. Autopilot Engage Button – **PRESS ON** to engage, then **PRESS OFF** to disengage. Check for aural alert when autopilot is disengaged.
 - d. Autopilot Engage Button – **PRESS ON**.
 - e. Autopilot Roll Monitor Test Button – **DEPRESS TO TEST**. Autopilot will disengage. Release to **OFF**.
 - f. Autopilot Engage Button – **PRESS ON**.
 - g. Autopilot Pitch Trim Monitor Switch – **TEST UP AND DOWN**. Autopilot will disengage. Reset to **CENTER (OFF)**.
 - h. Autopilot Engage Button – **PRESS ON**.
 - i. Turn Command Knob – **TEST (ROTATE) LEFT/RIGHT**, then reset to **CENTER**.
 - j. Pitch Command Wheel – **TEST (ROTATE) UP/DOWN**, then reset to **CENTER**.
 - k. Autopilot Engage Button – **PRESS OFF**.
 - l. Yaw Damper Selector Switch – **PRI YAW DAMPER**.
 - m. Primary Yaw Damper ON Button – **PRESS ON** to engage.
 - n. Primary Yaw Damper OFF Button – **PRESS OFF** to disengage. Check for aural alert when primary yaw damper is disengaged.
 - o. Yaw Damper Selector Switch – **SEC YAW DAMPER**.
 - p. Secondary Yaw Damper Switch – **ENGAGE**.
 - q. Secondary Yaw Damper Switch – **OFF** (test for aural alert when secondary yaw damper is disengaged).
 - r. Yaw Damper Selector Switch – Back to

PRI YAW DAMPER.

3. Emergency Pitch Trim Switch – **NORM.**
4. Trim:
 - a. Elevator trim (on your controller) – Check that Pitch Trim Indicator is about **one needle thickness below center**. Listen for trim in motion clicker (autopilot must be disengaged).
 - b. Takeoff Trim Alert Annunciator – **OFF.**
 - c. Aileron trim (on your controller) – **CHECKED.**
 - d. Rudder trim – **CHECKED.**
5. Fuel quantity:
 - a. Check **sufficient quantity** for flight.
 - b. Check for **imbalance** between L/R tanks.
6. Fuel counter – **RESET TO ZERO.**
7. Crosflow (Crossfeed) Switch – **CLOSE.**
8. Fuselage Tank Switch – **OFF (CENTER).**
9. Fuel Jettison Switch – **OFF.**
10. Jet pumps:
 - a. Jet Pumps Switches – **ON.**
 - b. Motive Flow Valve Lights – **ON** for one second (valve in transit), then **OFF.**
 - c. Engine Low Fuel Pressure Annunciators – **OFF.**
11. Standby Pumps Switches – **OFF.**
12. Main Cabin Door – **CLOSED AND SECURE (SHIFT-E).**
13. Door Unsecured Annunciator – **OFF.**

Engine Start

1. Right Engine Throttle – **IDLE (F1 or FULL AFT** on your controller) if released, or **CUTOFF** if locked.
2. Right Thrust Reverser Subthrottle – **FULL FORWARD (IDLE or F1).**
3. Right Throttle Release Lever – Click to **LOCK** or **CTRL-SHIFT-F1** (release lever down, throttle set to cutoff, fuel valve closed).

4. Right Engine Throttle – Check **CUTOFF** (locked, down position).
5. Rotating Beacon Lights – **ON.**
6. Right Engine Starter/Generator Switch – **START.** Check for right ignition light **ON.**
7. Check **10% RPM.**
8. Right Throttle Release Lever – Click to **RELEASE** (release lever up, throttle set to idle, fuel valve open).
9. Right Engine Throttle – Check **IDLE (F1 or FULL AFT** on your controller).
10. Monitor Right EGT Gauge and make sure **WITHIN GREEN ARC.**
11. Check about **50% RPM.**
12. Set Right Starter/Generator Switch to **OFF**, then to **GEN** when engine is stable at **IDLE.**
13. Right Engine Ignition Light – **OFF.**
14. Right Generator Inoperative Annunciator – **OFF.**
15. Right DC Ammeter – **CHARGING.**
16. Engine Low Fuel Pressure Annunciator – **OFF.**
17. Check right engine oil pressure and temperature – **BOTH IN GREEN.**
18. Fuel flow – **NORMAL.**
19. Hydraulic pressure – **IN GREEN.**

Repeat above procedures for left engine.

Before Taxi

1. Primary & Secondary Inverter Switches – Check **ON.**
2. Auxiliary Inverter Switch – Check **OFF.**
3. Radio Master Switch – Check **ON.**
4. Engine instruments – **CHECKED.**
5. Navigation Lights – **ON.**
6. Strobe Lights – **ON.**
7. Recognition Lights – **ON, IF REQD.**
8. Taxi Lights – **ON.**
9. Emergency Lights Switch – **ARM.** Check Emergency Lighting System OFF Warning

- Light **OFF**.
10. Spoilers:
 - a. Spoilers Switch – Check **RET**.
 - b. Spoilers Extended Annunciator – Check **OFF**.
 11. Bleed Air Switch – **NORMAL**.
 12. Anti-ice:
 - a. Wing and Stabilizer Heat Switch – **AS REQD**.
 - b. Windshield Heat Switches – **AS REQD**.
 - c. Nacelle Heat Switches – **AS REQD**.
 13. Parking brake – **RELEASED**.
 14. Anti-Skid Power Switch – **ON**.
 15. Anti-Skid Generator Lights – **ALL OFF**.

Taxi

1. ATC clearance – **OBTAINED** from appropriate authority. Set radios accordingly.
2. Flight controls – **CHECKED**.
3. Thrust reversers controls – **CHECKED**.
4. Nose wheel steering:
 - a. Nose Gear Steer Lock Switch – **DEPRESS MOMENTARILY** to **ENGAGE** electric nose wheel steering.
 - b. Nose Wheel Steering Engaged Annunciator – **ON**.
5. Aircraft rolling above 5 knots:
 - a. Toe brakes – **APPLIED**. Listen for “birds in the cockpit” sounds.
 - b. Verify aircraft deceleration.
 - c. Toe brakes – **RELEASED**.
6. Engine Throttles – **AS NEEDED** for taxiing.

Before Takeoff

1. Cabin pressurization:
 - a. Bleed Air Switch – Check **NORMAL**.
 - b. Cabin Altitude Controller Knob – **SET** to **planned cruise altitude**.
2. Cabin temperature:
 - a. Bleed Air Switch – Check **NORMAL**.

- b. Cabin Temperature Control Knob/Switch – **SET** to **desired temperature**.
 - c. Check H-Valve Position Indicator – **about 1/2**.
 - d. Lower cabin temperature **if necessary**.
3. No Smoking/Seat Belt Switch – **NO SMOKING AND SEAT BELTS (ON)**.
 4. Anti-ice:
 - a. Bleed Air Switch – Check **NORMAL**.
 - b. Wing and Stabilizer Heat Switch – **OFF** or **AS REQD**.
 - c. Windshield Heat Switches – **OFF** or **AS REQD**.
 - d. Nacelle Heat Switches – **OFF** or **AS REQD**.
 5. All external lights, except landing lights – **ON**.
 6. Avionics:
 - a. ADI Gyro and Computer Warning Flags – **OUT OF VIEW**.
 - b. HSI Compass Warning Flag – **OUT OF VIEW**.
 - c. Radios and transponder – Check **ON** and **SET** according to flight plan and ATC clearance.
 - d. GPS and radar – **ON** and **SET** (if needed).
 7. Gyro:
 - a. Directional Gyro Free/Slave Switch – Check **SLAVE**.
 - b. Gyro Drift Compensation Switch – If Directional Gyro Free/Slave Switch is set to **FREE** (magnetic references unreliable), **use as needed** to sync directional gyros with ground indications (the Directional Gyro drift knob can also be used).
 8. Flight instruments:
 - a. Set barometric pressure on altimeters according to nearest weather station.
 - b. Set airspeed bugs to V_1 and V_R **as needed**.
 - c. Set **initial course** on HSI.
 - d. Set **initial heading** on HSI.

- e. Set RMI **as needed**.
 - f. Set DME head **as needed**.
 - g. Check all directional indicators as aircraft turns while taxiing.
9. Autopilot Altitude Preselector – **SET to initial ATC clearance altitude**.
 10. Flight Director Switch – **OFF, then ON (reset)**. Check Flight Director Command Bars **IN RANGE** on ADI.
 11. Radio altimeter:
 - a. Radio Altimeter Power Switch – **ON (to test)**.
 - b. Check radio altimeter flags – **OUT OF VIEW**.
 - c. Radio Altimeter Power Switch – **OFF**.
 12. Spoilers:
 - a. Spoilers Switch – Check **RET**.
 - b. Spoilers Extended Annunciator – Check **OFF**.
 13. Flaps:
 - a. Flaps Switch – **PUSH DOWN AS NEEDED**.
 - b. Check flaps position indicator for correct **TAKEOFF POSITION (8° or AS NEEDED)**.
 14. Emergency Pitch Trim Switch – Check **NORM**.
 15. Trim:
 - a. Elevator trim (on your controller) – **SET FOR TAKEOFF**. Check that Pitch Trim Indicator is about **one needle thickness below center**.
 - b. Takeoff Trim Alert Annunciator – Check **OFF**.
 - c. Aileron trim (on your controller) – **CHECKED**.
 - d. Rudder trim – **CHECKED**.
 16. Fuel quantity – Check for **imbalance** between L/R wing tanks.
 - b. Hide control columns and yokes if **necessary**.
2. Nose wheel steering:
 - a. Nose Gear Steer Lock Switch – **DEPRESS MOMENTARILY** to **DISENGAGE** electric nose wheel steering.
 - b. Nose Wheel Steering Engaged Annunciator – **OFF**.
 3. Anti-Skid Power Switch – Check **ON**.
 4. Anti-Skid Generator Lights – Check **OFF**.
 5. Engine Air Ignition Switches – Normally **OFF** (can be turned **ON** if wet or turbulent conditions).
 6. Stall Warning Switches – Both **ON**. Check annunciators **OFF**.
 7. Pitot Heat Switches – Both **ON**.
 8. Thrust Reverser Arm Switches – **ARM**.
 9. Thrust Reverser Armed Annunciators – **ON**.
 10. Annunciator panel:
 - a. **CHECKED, no warnings or abnormal indications**.
 11. Taxi and Landing Lights and all external lights – **ON**.
 12. Toe Brakes:
 - a. Brakes – **APPLIED**.

Takeoff Sequence

Notes

- In case of an engine failure, refer to “Abnormal/Emergency Procedures” in section 8.
- The GLJ Model 25 is a very high performance jet aircraft. The takeoff sequence happens quite fast and requires an efficient drill in order to observe and maintain altitude and speed clearances.

1. Throttles:
 - a. **ADVANCE** throttles slowly to **takeoff power (100% RPM)**.
2. Toe Brakes:
 - a. Brakes – **RELEASED**.

Takeoff

1. Flight controls:
 - a. Check – **FREE**.

3. Accelerate to V_1 :
 - a. If engine fails before V_1 , **ABORT** takeoff. Refer to “Abnormal/Emergency Procedures” in section 8.
 - b. If engine fails after V_1 , **CONTINUE** takeoff. Refer to “Abnormal/Emergency Procedures” in section 8.
4. V_r attained:
 - a. **ROTATE** to **15° pitch**.
 - b. Set airspeed bugs to V_2 **as needed**.
5. Angle-of-Attack:
 - a. Angle-of-Attack Indicator – **MAINTAIN IN GREEN**.
6. Positive rate of climb:
 - a. Landing Gear Selector Switch – **UP**.
 - b. Check Landing Gear Position Lights – **RED ON** in transit, then all **OFF**.
 - c. Accelerate to $V_2 + 15$.
7. Flaps:
 - a. **Retract** on schedule.
8. Landing and Taxi Lights – **OFF**.
9. Engine Air Ignition Switches – **OFF** (can be turned **ON** if wet or turbulent conditions).
10. Anti-Skid Power Switch – **OFF**.
11. Anti-Skid Generator Lights – Check **ON**.
12. Thrust Reverser Arm Switches – **OFF**.
13. Accelerate to climb speed (**MAX 250 KIAS** if ATC-restricted, **MAX 306 KIAS** under FL140).
14. Cabin pressure – **CHECKED**.
15. No Smoking/Seat Belt Switch – **OFF**.

Climb

1. Throttles:
 - a. **SET** to **climb power (90% RPM)**.
2. Anti-ice:
 - a. Bleed Air Switch – Check **NORMAL**.
 - b. Wing and Stabilizer Heat Switch – **AS REQD**.
 - c. Windshield Heat Switches – **AS REQD**.

d. Nacelle Heat Switches – **AS REQD**.

3. Cabin pressure – **MONITORED**.
4. Transition level (18,000 feet maximum): Set barometric pressure on altimeters to **29.92**.
5. Airspeed:
 - a. Accelerate to **0.7 Mach**.

Cruise

1. Windshield Defog Knob – **PULLED**, if needed.
2. Engine instruments – Check **WITHIN LIMITS**.
3. Cabin pressure – **MONITORED**.
4. Engine Sync Switch – **ON**.
5. Engine Sync ON Annunciator – **ON**.
6. Yaw Damper Selector Switch – Check **PRI YAW DAMPER**.
7. Primary Yaw Damper ON Button – **PRESS ON (primary yaw damper engaged)**.
8. Fuel status:
 - a. Monitor fuel **at all time**.
 - b. Ensure fuel burn is **consistent with flight plan**.
 - c. **SWITCH TO THE FUSELAGE TANK** if fuel level in the wing tanks **becomes critically low**.
9. Autopilot Engage Button – **PRESS ON**, if desired, to engage autopilot.
10. Autopilot Speed/Mach Hold Mode Switch – **PRESS ON** to engage, if desired.
11. Other autopilot modes – **PRESS ON** to engage, if desired.

Descent

1. ATC clearance – **OBTAINED**. Set radios accordingly.
2. Windshield Defog Knob – **PULLED**, if needed.
3. Pressurization:
 - a. Set **destination field elevation** [5, fig. 4-39].

4. Anti-ice:
 - a. Bleed Air Switch – Check **NORMAL**.
 - b. Wing and Stabilizer Heat Switch – **AS REQD.**
 - c. Windshield Heat Switches – **AS REQD.**
 - d. Nacelle Heat Switches – **AS REQD.**
 5. Pitot heat:
 - a. Pitot Heat Switches – Check both **ON**.
 6. Fuel quantity – **MONITORED**.
 7. Hydraulic Pressure Gauge – **IN GREEN**.
 8. Throttles:
 - a. During descent, maintain **75% RPM** minimum until 12,000 ft.
 9. Use spoilers **as required**.
 10. Altimeters:
 - a. Passing transition level (18,000 feet maximum), set barometric pressure to **local setting**.
- a. Radio altimeter power switch – **ON**.

Before Landing

1. Landing gear:
 - a. Landing Gear Selector Switch – **DOWN**.
 - b. Check Landing Gear Position Lights – **RED ON** in transit, then all **GREEN**.
2. Landing and Taxi Lights – Both **ON**.
3. Parking brake – Check **RELEASED**.
4. Anti-Skid Power Switch – **ON**.
5. Anti-Skid Generator Lights – Check **OFF**.
6. Flaps:
 - a. **DOWN AS REQD.**
7. Engine Air Ignition Switches – Normally **OFF**, or **ON** if wet or turbulent conditions.
8. Primary Yaw Damper OFF Button – **PRESS OFF (primary yaw damper disengaged)**.

Approach

1. ATC clearance – **OBTAINED**. Set radios accordingly.
2. Fuel balance between L/R wing tanks – **CHECKED**.
3. Thrust Reverser Arm Switches – **ON**. Thrust Reverser Armed Annunciators will remain **OFF** until the aircraft touches down.
4. Hydraulic Pressure – **IN GREEN**.
5. Emergency Air Pressure – **IN GREEN**.
6. No smoking/seat belts sign:
 - a. No smoking switch – **NO SMOKING and SEATBELTS ON**.
7. Cabin pressure – **CHECKED**.
8. Engine Sync Switch – **OFF**.
9. Engine Sync ON Annunciator – **OFF**.
10. Spoilers:
 - a. Spoilers Switch – Check **RET**.
 - b. Spoilers Extended Annunciator – Check **OFF**.
11. Radio altimeter:

Landing (after Touchdown)

1. Spoilers:
 - a. Spoilers Switch – **EXT**. (spoilers extended as needed).
 - b. Spoilers Extended Annunciator – **ON**.
2. Thrust reversers (if needed):
 - a. Thrust Reverser Subthrottles – **PULLED AFT (F2 AS NEEDED) to deploy thrust reversers. Up to 85% RPM in reverse**.
 - b. Thrust Reverser Deployed Annunciators – **ON**.
3. Thrust reversers (after deceleration):
 - a. Thrust Reverser Subthrottles – **PUSHED FORWARD (F1 to IDLE)**.
 - b. Thrust Reverser Deployed Annunciators – **OFF**.
4. Thrust Reverser Arm Switches – **OFF**.
5. Thrust Reverser Armed Annunciators – **OFF**.
6. Spoilers (after deceleration):
 - a. Spoilers Switch – **RET. (spoilers re-**

tracted).

- b. Spoilers Extended Annunciator – **OFF**.

Before Clearing the Runway

1. Anti-Skid Power Switch – **OFF**.
2. Anti-Skid Generator Lights – Check **ON**.
3. Flaps:
 - a. Flaps Switch – **UP (AS NECESSARY)**.
 - b. Confirm flaps position – **FULL UP**.
4. Nose wheel steering:
 - a. Nose Gear Steer Lock Switch – **DE-PRESS MOMENTARILY to ENGAGE** electric nose wheel steering.
 - b. Nose Wheel Steering Engaged Annunciator – **ON**.

After Clearing the Runway

1. Engine Air Ignition Switches – **OFF**. Check Engine Air Ignition Lights **OFF**.
2. Landing Lights – **OFF**.
3. Taxi Lights – Check **ON**.
4. Strobe Lights – **OFF**.
5. Recognition Lights – **OFF**.
6. Both Stall Warning Switches – **OFF**.
7. Anti-ice:
 - a. Bleed Air Switch – Check **NORMAL**.
 - b. Wing and Stabilizer Heat Switch – **OFF** or **AS REQD**.
 - c. Windshield Heat Switches – **OFF** or **AS REQD**.
 - d. Nacelle Heat Switches – **OFF** or **AS REQD**.
 - e. Pitot Heat Switches – **OFF** or **AS REQD**.
8. Bleed Air Switch – **OFF**, if not needed for anti-ice or cabin temperature control.
9. Unnecessary avionics – **OFF**.
10. Emergency Lights Switch – **DISARM**.

Shutdown

Once the aircraft is parked:

1. Parking brake:
 - a. Parking Brake Lever – **SET**.
2. Anti-ice:
 - a. Wing and Stabilizer Heat Switch – **OFF**.
 - b. Windshield Heat Switches – **OFF**.
 - c. Nacelle Heat Switches – **OFF**.
 - d. Pitot Heat Switches – **OFF**.
3. Bleed Air Switch – **OFF**.
4. Engine Starter/Generator Switches – **OFF**.
5. Engine shutdown:
 - a. Thrust Reverser Subthrottles – **FULL FORWARD TO IDLE (F1)**.
 - b. Throttles – **FULL AFT TO IDLE (F1** or **FULL AFT** on your controller) .
 - c. Throttle Release Levers – Click to **LOCK** or **CTRL-SHIFT-F1** (release levers down, throttles set to cutoff, fuel valves closed).
 - d. Jet Pump Switches – **OFF**.
 - e. Standby Pump Switches – Check **OFF**.
6. Rotating Beacon Lights – **OFF**.
7. All remaining exterior lights – **OFF**.
8. Emergency Battery Switches – Check **OFF**.
9. Standby Gyro – **CAGED**.
10. Radio Master Switch (Avionics) – **OFF**.
11. Primary, Secondary and Auxiliary Inverter Switches – **OFF**.
12. All remaining panel switches – **OFF**.
13. Battery Switches – **OFF**.
14. Controls – **LOCKED**.
15. Main Cabin Door – **OPEN (SHIFT-E)**.
16. Flight Crew – **ABSENT**.
17. “Remove Before Flight” Items – **INSTALLED**.
18. Main Cabin Door – **CLOSED AND LOCKED (SHIFT-E)**.

APPENDICES

Aircraft Reference Information	A1
Selected Bibliography	A2
Help and Support	A3
Frequently Asked Questions	A4
Known Issues	A5



XTREME PROTOTYPES GLJ MODEL 25 SE FOR PREPAR3D® AND FSX AIRCRAFT REFERENCE INFORMATION

For detailed instructions on how to install, optimize and fly this add-on aircraft on your simulation platform, please refer to your **GLJ Model 25 SE Flight Manual**.

Maximum Gross Weight - GLJ Model 25D	15,000 lbs.
--------------------------------------	-------------

Note: To adjust fuel load, on the "Aircraft" menu, click "Fuel and Payload".

V _{MO} - Maximum Operating Speed	359 KIAS
M _{MO} - Maximum Operating Mach	.82 Mach
V _A - Maneuvering Speed 10,000 lbs. (sea level)	160 KIAS
V _A - Maneuvering Speed 10,000 lbs. (20,000 ft.)	165 KIAS
V _A - Maneuvering Speed 10,000 lbs. (45,000 ft.)	170 KIAS
V _A - Maneuvering Speed 15,000 lbs. (sea level)	200 KIAS
V _A - Maneuvering Speed 15,000 lbs. (20,000 ft.)	205 KIAS
V _A - Maneuvering Speed 15,000 lbs. (45,000 ft.)	220 KIAS
V _{LO} - Maximum Gear Operating Speed	200 KIAS
V _{LE} - Maximum Landing Gear Extension Speed	265 KIAS

Maximum Flap Placard Speeds

Flaps degrees	KIAS
8	202
20	200
40	153

Note: For complete V-speed tables covering various loading and atmospheric conditions, please refer to Section 6 ("Flight Planning") in your **GLJ Model 25 SE Flight Manual**. For explanations of speeds used on this tab, see "V-speeds" in your simulator's **Learning Center**.

V₁ - Takeoff Decision Speed

(dry runway, standard temperature, flaps 8°)

9,000 lbs.	105 KIAS
15,000 lbs.	135 KIAS

V_r - Rotation Speed

(dry runway, standard temperature, flaps 8°)

9,000 lbs.	120 KIAS
15,000 lbs.	138 KIAS

V₂ - Minimum Climb Speed

(dry runway, standard temperature, flaps 8°)

9,000 lbs.	124 KIAS
15,000 lbs.	140 KIAS

V_{REF} - Landing Reference Speed

(flaps 40°, standard temperature, sea level pressure altitude)

8,000 lbs.	110 KIAS
15,000 lbs.	134 KIAS



These books, manuals and films provided us with invaluable information during the development of the GLJ Model 25 Special Edition addon and we highly recommend them to all Learjet fans. Most are out of print but still available online or at local public libraries.

Books

Stormy Genius:

The Rags to Riches Life of Bill Lear

Richard Rashke

Publisher: KR Books (1985, 2017 reprint)

Paperback: 351 pages

ISBN-13: 978-1499217858

Learjets: The World's Executive Aircraft

Donald J. Porter

Publisher: Tab Books (1990)

Paperback: 120 pages

ISBN: 0-8306-2440-6

Flying the Classic Learjet (Models 35/36)

Peter D. Condon

Publisher: Peter D. Condon (2007)

Paperback: 210 pages.

ISBN: 978-0-646-48135-7

Learjets

Geza Szurovy

Publisher: Motorbooks International (1996)

Paperback: 96 pages

ISBN: 0-7603-0049-6

Manuals

Learjet 20 Series Pilot Training Manual Volume 1 — Maneuvers and Procedures

Publisher: Flight Safety (1998)

Paperback: 65 pages

Learjet 20 Series Pilot Training Manual Volume 2 — Aircraft Systems

Publisher: Flight Safety (2005)

Paperback: 373 pages

Learjet 24/25

Cockpit Reference Handbook

Publisher: CAE SimuFlite (2010)

Paperback: 592 pages

Learjet 25

Operating Handbook

Publisher: CAE SimuFlite (2005)

Paperback: 132 pages

Gates Learjet 25B/C/D/F Manuals

Publisher: Gates Learjet Corporation (1969 and 1977)

Paperback: 1,500 pages (approx.)

DVDs (Video)

Ameristar Learjet 24/Falcon 20 DVD

Studio: WorldAirRoutes

DVD Release Year: 2005

Run Time: 185 minutes



Answers to most technical questions can be found in the present manual. We've added a "Frequently Asked Questions" section at the end of the manual to help you find answers to most questions and issues you may encounter while installing or flying the GLJ Model 25 SE addon on your simulation platform.

Known issues are discussed in the "Known Issues" section.

If you don't find what you are looking for in the present manual and need some assistance, please contact us. We'll try our best to answer you the same day or within two business days.

We offer free, personalized technical support via email to registered users only.

HOW TO CONTACT US

The best way to reach us is via the contact forms on our website.

For sales support or general inquiries – If you need customer support or simply want to send us a message, please use our general contact form:

<https://xtremeprototypes.com/en/shopcustcontact.asp>

For technical support – If you need technical

support for your addon, please fill out our technical support request form:

<https://xtremeprototypes.com/en/shopcustcontactsupport.asp>

Make sure all the required fields in the form are filled out correctly and provide us with as much information as possible about your technical issue.

Find us on 

<https://www.facebook.com/XtremePrototypes/>

PATCHES AND UPDATES

Please visit our "Downloads" section on our website for the latest patches and updates for your addon:

<http://xtremeprototypes.com/en/downloads.asp>

MANUALS

Manuals are updated regularly. Please make sure you have the latest version:

http://xtremeprototypes.com/en/manuals_downloads.asp

WE NEED YOUR FEEDBACK

Our products are designed to evolve with time, according to the feedback we receive from our most valuable users. Please let us know your comments, ideas and suggestions. We thank you for helping us developing great addons.

If you were involved in the development of the real Gates Learjet Model 25 during the 1960's/70's, it would be an honor to hear from you.

FREQUENTLY ASKED QUESTIONS

APPENDIX 4



Answers to most questions can be found in the present manual. Answers to other questions may be found in this section.

GENERAL

What do I get with my GLJ Model 25 SE addon?

Your software license gives you:

- 10 variations of the GLJ Model 25 SE addon, for three simulation platforms (FSX, FSX: Steam® Edition and Prepar3D® v3.x). The version for Prepar3D® v3.x is a native version. The addon is also fully compatible with Prepar3D® v1.x and v2.x.
- A 220-page printable PDF manual.
- Free patches and updates.
- Free personalized technical support via email, in English or French. We try our best to answer our users the same day or within two business days.

For the list of features included with the Xtreme Prototypes GLJ Model 25 SE addon, please refer to "Addon Description", in section 1 of the manual.

Is the GLJ Model 25 Special Edition add-on (version 2.1) an update to your previous 20 Series Business Jets add-on (version 1.0)?

No. The new GLJ Model 25 Special Edition is a completely redesigned product that features new high resolution models and textures, an entirely new virtual cockpit with full 3D gauges, additional systems and functionalities, new animations, new sounds and an updated 220-page flight manual, among many other features. Version 1.0 is now a legacy product and is no longer supported.

Is the manual available in print form or PDF?

Yes. A printable PDF manual (the present document) is available for this addon. Registered users can print copies of the manual for their own use.

Where is the manual?

You can download the complete 220-page manual for this addon from our "Downloads" section on our website (select "Manuals"). All our manuals are free and available to the public. Registered users can print copies of the manual for their own use.

Le manuel est-il disponible en français ? (Is the manual available in French?)

Un guide complet des procédures normales et d'urgence en français - sections 7 et 8 du manuel - est actuellement disponible et peut être téléchargé à partir de notre site Internet. Bien que le manuel complet de ce nouveau produit ne soit pour l'instant disponible qu'en anglais, nous offrons à nos utilisateurs francophones enregistrés une assistance

technique en ligne personnalisée en français pour l'ensemble de nos produits.

Is there an online manual available for this addon?

Not at this time. Although we believe online manuals are more convenient and have a number of advantages over PDF manuals, like being always up-to-date, most of our users still prefer printable PDF manuals. Unless there is a significant demand for an online manual for the GLJ Model 25 SE addon, only the PDF version will be available.

Are all the Learjet 25 systems simulated?

Nearly all systems that can be reproduced in Lockheed Martin® Prepar3D® or Microsoft® Flight Simulator X are simulated, except where otherwise noted in the documentation.

Due to limitations in the currently available simulation platforms, some systems may operate differently from those in the real aircraft. In the case of systems that are not fully simulated, we have strived to provide you with working switches and knobs to allow you to fully follow the procedures outlined in the manual for a more realistic experience. The virtual cockpit allows for complete IFR flight, and contains all the instruments, radios, annunciators, switches and knobs necessary to do so.

How realistic is the GLJ Model 25 SE addon?

The operation of the addon is very similar to the operation of the real aircraft. Nearly all systems, gauges, switches, light indicators and instruments are functional and behave like their original counterparts.

While we regard this addon more as a mini aircraft simulator rather than a game, we cannot pretend that it is one hundred percent historically or technically accurate or that it truly reproduces all the systems and flight characteristics of the real Learjet 25 aircraft. Nevertheless, we tried our best to develop a unique

and sophisticated product that looks and behaves as realistically as possible, within the limitations of the simulator.

This addon strives to bring you the spirit and the actual feeling of flying a high performance aircraft at a time when LCD screens, GPS and powerful computers didn't exist and pilots needed to know how to fly and navigate with minimal resources.

Version 2.1 was developed under the supervision of an aeronautical engineer and a real-world Learjet 25D pilot. We believe it is the most advanced, detailed and faithful classic Learjet simulation you can find.

I am a Learjet fan but a beginner desktop pilot. Is the GLJ Model 25 SE addon too complex for me?

While this addon allows for comprehensive procedural IFR flight, we at Xtreme Prototypes recognize that not everyone has the time, patience or inclination to read, understand and learn a complete manual, which is why the our GLJ Model 25 SE addon remains relatively simple to operate. Anyone who masters the simulator's default jets can fly the Model 25 addon. It's up to the user to decide which level of complexity he/she wants to achieve.

If you are a true Learjet fan and already have some knowledge about the aircraft and a desire to learn more, this addon is for you. This is your chance to go beyond books and films and jump in the cockpit of this extraordinary aircraft in a compelling simulation environment.

All the necessary information to fly the GLJ Model 25 SE addon is in the manual. There are two sets of instructions: a detailed set, which contains all the procedures with images and additional information, and a condensed set called "quick start procedures", for those who want a shorter check list.

The addon reproduces nearly all functionalities of the real Learjet 25 aircraft. Like a real Learjet pilot, the virtual pilot needs some time to become familiar with the cockpit and the operation of the aircraft, and to be able to remember and perform the required procedures

listed in the manual.

If you're feeling overwhelmed by the cockpit of the GLJ Model 25 SE addon, we suggest giving the manual a chance, as it was written with non-experienced pilots in mind. The aircraft is quite rewarding once mastered, but as most things in life, practice makes perfect!

Does my GLJ Model 25 SE addon come with a virtual cockpit?

Yes. The GLJ Model 25 SE addon contains a completely redesigned, VR-ready, fully functional 3D virtual cockpit.

What is a VR-ready, full-3D virtual cockpit?

Most virtual cockpits found in other addons use standard FSX 2D gauges that are "projected" on the various instrument panels. When viewed from an angle, these gauges appear flat even though they might contain needles, buttons, knobs and other movable parts that should not be flat. 2D gauges are generally created with layers of drawings (bitmaps) that are animated, while some may also include vector text and graphics.

The stock FS9/FSX Garmin 500 GPS unit is a good example of a "flat" 2D gauge that contains both bitmaps and vector graphics. Viewed from the side, the knobs and buttons look flat. Also, many 2D gauges use low-resolution graphics and are limited in size.

Xtreme Prototypes' full-3D virtual cockpits don't use low resolution flat 2D gauges found in so many virtual cockpits, except for LCD screens which are flat by nature, such as in the GPS. They contain fully modeled high resolution instruments and gauges with real 3D moving parts.

This, along with the highly detailed aircraft interior, makes this addon an ideal candidate for new virtual reality applications such as FlyInside®. Equipped with the necessary software and 3D glasses/VR goggles, the desktop pilot really feels he's/she's inside the real aircraft, in front of the real instrument panel, not merely a 2D drawing of a panel.

The virtual cockpit and passenger cabin were meticulously modeled to conform as closely as possible to the interior of a typical Gates Learjet Model 25D of the 1970's. Nothing was spared in our efforts to reproduce the original panels, carefully modelling, animating and programming each mechanical device found in the real aircraft.

Does my GLJ Model 25 SE addon come with 2D panels?

No. Xtreme Prototypes next generation addons no longer include 2D panels found in older products. They are replaced by fully functional, VR-ready, full-3D virtual cockpits. You must be in the virtual cockpit view to operate this addon.

Is a paintkit available so I can repaint the aircraft?

Yes. A comprehensive paintkit (Adobe® Photoshop® CS5 file format) is available for registered users. Please visit our "Downloads" section:

<http://xtremeprototypes.com/en/downloads.asp>

What is the maximum speed of my GLJ Model 25 SE addon?

Your GLJ Model 25 SE addon can cruise at Mach 0.82 at altitude. Maximum airspeed is 359 KIAS (306 KIAS under FL140).

What is the maximum altitude than can be reached with my GLJ Model 25 SE addon?

Your GLJ Model 25 SE addon can reach FL510 at lighter weights. 51,000 feet is the absolute ceiling. 45,000 feet is the service ceiling.

Is there a NAV1/GPS toggle switch provided with this addon?

Yes. A NAV1/GPS toggle switch is provided on the main panel to allow for full GPS/Autopilot

navigation.

Although the GLJ Model 25 is a 1970's aircraft intended for classical IFR (VOR/ADF) navigation, we've retrofitted the cockpit so the virtual pilot can choose between NAV1 or GPS navigation when in autopilot mode.

Please note that there is no FMS, CAT I/II/III Autoland, Tacan, glass cockpit or head-up display in this classic aircraft.

Is the radar unit on the main panel functional?

No. Developing a fully-functional radar unit for this addon was beyond the scope of this project. However, users can replace the dummy radar panel with a functional third-party radar unit. See next topic.

Can I replace the default GPS unit with a third-party GPS or glass cockpit?

Yes. Two optional, user-selectable and configurable instrument panels can replace the default GPS/radar panel on the main instrument panel in the virtual cockpit. Users can install their own 2D gauges, GPS, radar or glass cockpit systems acquired from third-party vendors in the virtual cockpit on these two optional panels. This is done by modifying a few lines in the addon's "panel.cfg" file. Users can cycle between two different optional panels and the default GPS/radar panel by clicking an icon on the main panel.

We cannot guarantee support for third-party gauges and we didn't try them all. However, as a rule of thumb, as long as these systems are contained in standard 2D gauges (XML or DLL) that are compatible with P3D and/or FSX, you can add them to the optional panels in the VC. If you were able to add these systems to the VCs of default (stock) aircraft or other addons on your simulation platform, you shouldn't normally have any problem adding them to the GLJ Model 25 SE addon.

As an example, we've installed the stock FSX Lear 45 PFD on the first optional panel and the FSX Lear 45 EICAS on the second optional panel. These two gauges are standard XML gauges

contained in a cabinet file included with FSX. By clicking the icon marked "OPT PANEL" located right above the default GPS unit, you can cycle between the default GPS/radar panel and the two other optional panels (PFD and EICAS).

You are only limited by the space available on these two panels, so you probably won't be able to have both your third-party GPS and radar units on the same panel, unless you change their size. Space is rather limited on the Model 25 main panel which was not originally designed for modern instruments with large LCD screens. In this case, you would install your GPS on one panel and your radar on the second panel. Please note that a little experimentation may be required to fit your third-party gauges in the optional panels (ideal size and position).

Most third-party gauges are installed like standard P3D/FSX gauges in the virtual cockpit. Instructions are provided in section 4 of the manual to show you how to modify the addon's "panel.cfg" file to install third-party gauges and systems. Third-party gauges may be installed differently and may have their own installers, so please make sure that they are standard P3D/FSX gauges fully compatible with your simulation platform. Always backup the "panel.cfg" file before attempting to install third-party gauges in your new GLJ Model 25 SE addon.

These third-party gauges can also be added as "popup" gauges available from the simulator's top menu. For example, you can use them for a better view in detached windows as the display in the virtual cockpit will generally be too small. In all cases, you will need to modify the "panel.cfg" file accordingly.

Refer to the instructions provided with your third-party gauges for details about installation and to your simulation platform's SDK for more information about how to modify the addon's "panel.cfg" file.

Refer to section 4 in the manual for more details.

Can I replace the displays in both the default GPS and dummy radar units with displays from my own third-party gauges?

Yes. This would require some modifications in the addon's "panel.cfg" file. Refer to section 4 of the manual for more details. Please note that replacing the display (what appears on the screen) will have no effect on the buttons which are at this time hard-coded in the 3D model. For full button functionality, you will need to install the full 2D gauge, including screen, frame and buttons, on one of the supplied optional instrument panels - see previous topic.

Why didn't you model a full-3D glass cockpit or GTN units for this addon?

Let's put the record straight. This addon strives to bring you the spirit and the actual feeling of flying a high performance business jet at a time when LCD screens, GPS and powerful computers didn't exist and pilots needed to know how to fly and navigate with minimal resources and to rely on their own experience, abilities and judgment. This is how real-world Learjet 25 pilots, like our special contributor Alan Velazquez, are still flying today (see "Foreword", page 12, in the manual).

While retrofitting the main panel with modern instruments can be fun, it must be remembered that the Gates Learjet Model 25 is a 1970's aircraft equipped with the original analog instruments from that period. Nothing was spared in our efforts to reproduce the original panels, carefully modelling, animating and programming each mechanical device found in the real aircraft.

For classic aircraft enthusiasts, a carefully planned VFR or IFR flight is sure to be a rewarding, if not challenging experience. This addon provides all the instruments, controls and features necessary for complete IFR flight, in addition to a fully modeled (FSX) Garmin 500 GPS receiver which is widely installed in retrofitted Learjet 25 still in service today.

While we recognize the merit of some of our users' requests for more modern avionics, it was never part of this project to design a full glass cockpit for this legendary aircraft which would be unrealistic from a historical point of view and difficult to achieve in the real world due to the cost of implementing the technology to a legacy panel and getting the installation FAA approved. In our view, replacing the

"steam gauges" with LCD screens would kill the spirit of what we wanted to achieve with this project.

This is why we absolutely wanted to keep the look and feel of the original instrument panel while at the same time giving users the possibility to add their own gauges acquired from third-party vendors, even though space was rather limited on the main panel.

Are there passengers in the cabin?

No. Over the years, we found out that whoever characters we've put in the cabin, some users didn't like it. So we've decided to install the pilots only in the exterior model and no passenger in the cabin. We preferred to keep those precious polygons for other, more important aircraft features.

Where's the parabrake?

Although a parabrake was installed on some 20 Series aircraft, your GLJ Model 25 SE addon doesn't have one. Thrust reversers on both engines are now available in version 2.x. Use the thrust reversers and the spoilers instead of the parabrake for deceleration.

SOFTWARE INSTALLATION AND SETUP

I have trouble downloading my addon. The file transfer keeps getting interrupted. What can I do?

The installers for the GLJ Model 25 SE addon are contained in a 1.5 GB "zip" file. Normally, it should take no more than about 10 to 15 minutes to download the file on a high speed Internet connection.

If you don't have a high speed Internet connection, or experience intermittent connection issues, you may be timed out or disconnected while transferring the file. If you are not able to download your addon after several attempts, we recommend using another and better connection either at work (if allowed) or at a parent's or friend's. If you don't have access to another connection, and still cannot solve

the issue, please contact us for other options.

We recommend using your Internet browser (Internet Explorer, Chrome, etc.) to download your addon. Do not use a third-party download manager or you may experience problems that were reported by a number of users.

Some antivirus programs may also prevent you from downloading your addon. Make sure your antivirus does not interfere with your downloads. Also, some antivirus won't allow you to download ".zip" (or ".exe") files. You can disable your antivirus program temporarily (while downloading your addon) to solve this issue. Don't forget to reactivate your antivirus after the file is downloaded.

What are the minimum system requirements for installing the GLJ Model 25 SE addon?

The GLJ Model 25 SE is an add-on software package that requires Microsoft® Flight Simulator X with Acceleration Expansion Pack (or Flight Simulator Gold fully installed), Microsoft® Flight Simulator X: Steam® Edition or Lockheed Martin® Prepar3D® v3.x, v2.x or v1.x to be installed on your computer. The software is not a stand-alone product and cannot be used without the underlying simulation platform. Make sure that your simulation platform has been properly installed according to the instructions provided by the manufacturer.

Xtreme Prototypes addons are designed to take advantage of the new and more powerful personal computer systems that are available today. They require better video cards and more processing power and RAM than other more conventional addons. Increased performance will be noticed on more powerful systems.

Refer to "Minimum System Requirements" in section 2 of the manual for more details.

How do I install the addon I've purchased?

Refer to "Software Installation" in section 2 of the manual.

Will version 2.1 replace version 2.0 on my computer?

No. The installer will not erase nor replace version 2.0, if already installed on your computer. Version 2.1 will be installed in different folders. However, because version 2.1 is an updated version of version 2.0, we strongly recommend removing version 2.0 from your computer before installing version 2.1. This is to avoid confusion between aircraft bearing the same name. The previous version can be removed from the Windows Control Panel (Program/Uninstall a Program), like any other program. Do not use the uninstallation program (uninstall.exe) directly.

Will version 2.1 replace version 1.0 on my computer?

No. The installer will not erase nor replace the original 20 Series Business Jets addon (version 1.x), if installed on your computer. Version 2.1 will be installed in different folders. You may choose to delete or keep version 1.x before installing the new version. Please note that the original 20 Series Business Jets addon is now a legacy product for which we can no longer offer support.

The installer asks for my product activation key. Where do I find it?

Your activation key was issued when you purchased your addon online and was sent to you by email. Please contact us if you did not receive your activation key or were unable to download your addon after your order was processed.

Can I re-download my addon if I lose the original file?

Yes. You can download your addon again at any time by logging in to our website. Once you are logged in, on the "Your Account" page, select "Review previous orders", click on your order number, and click the link to download your addon. You may download the file a limited number of times. After that, you will need to contact us if you need the file again.

Please note that the replacement of lost downloaded files is not guaranteed. You must make backup copies for your own personal use in the future. Please refer to the end-user software agreement for more details.

I've lost my personal activation key, can I contact you to obtain another one?

Yes. You will be reissued the same activation key that is linked to your original purchase. Please use our general contact form:

<https://xtremeprototypes.com/en/shopcustcontact.asp>

Make sure you are using the same email address as the one that appears on your account page on our website. You will also need your original order number (the one you received by email or that appears on your account page).

I've installed my simulation platform in a custom folder, will the installer detect it?

No, but you can specify the correct path/folder during the installation process. Refer to "Software Installation" in section 2 of the manual.

Is the GLJ Model 25 SE addon compatible with Microsoft® Flight Simulator X?

Yes. The GLJ Model 25 SE addon is optimized for the latest versions of Microsoft® Flight Simulator X with Acceleration Expansion Pack (or Flight Simulator X Gold fully installed). It is not compatible with FSX with Service Pack 2 alone. You will need to install the Acceleration Expansion Pack in addition to FSX SP2.

Make sure that you install the correct addon version for your simulation platform. Refer to "Compatibility, Performance and Settings" in section 2 of the manual for more information.

Please note that due to software limitations, the FSX version may contain less features and animations than the Prepar3D® version.

Is the GLJ Model 25 SE addon compatible with Microsoft® Flight Simulator X: Steam® Edition?

Yes. The GLJ Model 25 SE addon is fully compatible with Microsoft® Flight Simulator X: Steam® Edition. A special installer is available from our "Downloads" section (free for registered users).

Please note that FSX: Steam® Edition is installed in a different way to the boxed version and occupies a different location on your computer. For this reason, we recommend using the special installer for FSX: Steam® Edition. Refer to section 2 of the manual for more details.

Please note that due to software limitations, the FSX version may contain less features and animations than the Prepar3D® version.

Is the GLJ Model 25 SE addon compatible with Microsoft® Flight Simulator 2004?

No. Refer to "Compatibility, Performance and Settings" in section 2 of the manual for more information.

Is the GLJ Model 25 SE addon compatible with Lockheed Martin® Prepar3D® version 4?

Yes. The GLJ Model 25 SE v2.1 addon now includes a native version for the new Prepar3D® v4 simulation platform. A special installer for Prepar3D® v4 is available from our "Downloads" section and the update is free for registered users.

Is the GLJ Model 25 SE addon compatible with Lockheed Martin® Prepar3D®?

Yes. The GLJ Model 25 SE addon is optimized for the latest versions of Lockheed Martin® Prepar3D® v4.x, v3.x, v2.x and v1.x. The versions for Prepar3D® v4.x and v3.x are native versions. Make sure that you install the correct addon version for your simulation platform. Refer to "Compatibility, Performance and Settings" in section 2 of the manual for more in-

formation.

Are the native versions for Prepar3D® v4.x or v3.x compatible with Prepar3D® v2.x, v1.x and Flight Simulator X?

No. The versions for Lockheed Martin® Prepar3D® v4.x and v3.x are native versions and they are not compatible with previous versions of Prepar3D® or Microsoft® Flight Simulator X. Make sure that you install the correct addon version for your simulation platform. Refer to "Compatibility, Performance and Settings" in section 2 of the manual for more information.

Is the addon version for Flight Simulator X compatible with Prepar3D® v4.x, v3.x, v2.x and v1.x?

Yes. However, we recommend installing the correct version for your simulation platform to benefit from the new features in Prepar3D® v4.x and v3.x. The version for FSX can be used for installation in Prepar3D® v2.x and 1.x.

Refer to "Compatibility, Performance and Settings" in section 2 of the manual for more information.

Please note that due to software limitations, the FSX version may contain less features and animations than the Prepar3D® version.

Is the GLJ Model 25 SE addon compatible with Laminar Research® X-Plane®?

Not at this time.

Is this addon compatible with the latest version of Windows®?

Yes. Windows® 10/8.1/8/7 or later is required to install and fly this addon. Please note that because of issues related to installation and performance, we cannot provide support for this addon if installed under Windows® Vista™ or Windows® XP®.

Is this addon compatible with Win-

dows® Vista™, XP®?

We are sorry we cannot support this addon if installed under Windows® Vista™ or Windows® XP®. Windows 10/8.1/8/7 or later is required in order to install and operate this addon (see "Minimum System Requirements" in section 2 of the manual).

Is this addon compatible with the latest version of DirectX®?

Yes. Refer to your simulation platform's manual for more information about the recommended version of DirectX®. However, we found that Flight Simulator X performs better under DirectX® 9. This is not an issue with Prepar3D®. Please note that Prepar3D® v4.x, v3.x and v2.x require DirectX® 11 (and a DirectX® 11-compatible video card). Refer to "Compatibility, Performance and Settings" in section 2 of the manual for details.

My GLJ Model 25 SE addon has no cockpit. How can it be possible?

Make sure you are in the virtual cockpit view ("F9" on your keyboard). The GLJ Model 25 SE addon has no 2D cockpit. Refer to "VR-Ready 3D Virtual Cockpits" in section 4 of the manual for details.

I've installed my new GLJ Model 25 SE addon but I only see one aircraft variation in the "Select Aircraft" page (FSX). Where are the other variations?

If some aircraft variations are missing and only one airplane seems to be installed, make sure the "Show all variations" option is selected on the "Select Aircraft" page (FSX only). Refer to "Installing your Addon" in section 2 of the manual for more information.

I hear no cockpit sounds. How can I solve this issue?

Make sure your speakers are turned on and that the sound volume is properly adjusted on your computer sound system. If you can hear

the basic aircraft sounds such as the engines, the flaps of the landing gear sounds, and you still cannot hear the custom cockpit sounds such as when a switch is clicked, it may be because the sound DLL was not installed properly during the installation process. You'll need to reinstall the addon to solve this issue.

If you are using FSX, make sure that you accept installing the sound DLL on your system when asked (you should click "YES" or "RUN" when the dialogs appear in the lower right corner of your Windows® desktop and when starting your simulation platform for the first time after installing the addon). This needs to be done only once. Refer to "Software Installation" in section 2 and to "Adjusting the Sound Volume" in section 7 of the manual for more information.

If you are using Prepar3D® v4, please make sure you have installed the native version for your new simulation platform.

If you have installed the FSX version in Prepar3D® v4, you will need to copy the included 64-bit sound DLL to the addon's "panel" folder. The DLL is available in the "64-bit sound" subfolder located in the main addon folder. Follow the instructions carefully. Without the 64-bit sound DLL, you will not be able to hear the cockpit sound effects.

How do I remove the GLJ Model 25 SE addon from my computer?

The addon can be removed from the Windows Control Panel (Program/Uninstall a Program), like any other program.

Do not use the uninstallation program (uninstall.exe) directly. The uninstallation program is located in the application folder that was created during the installation process and is used by the Windows Control Panel.

It is recommended to remove the previous version (2.0) before installing version 2.1.

AIRCRAFT OPERATION AND PROCEDURES

How do I take off and fly my GLJ Model 25 SE addon?

Complete instructions on how to fly the GLJ Model 25 SE addon are in the manual. Refer to "Normal Procedures and Check Lists" in section 7.

What's the easiest way to start the engines without going through the entire check lists and procedures?

Going through the procedures makes for a much more enjoyable and realistic experience. That being said, CTRL-E will start the engines, but you may have to activate some custom systems manually, depending on the previous flight's saved state. Most important, the Inverter Switches must be turned **ON** for the avionics (radios, GPS, etc.) to function. Make sure the Radio Master Switch (avionics) is also turned **ON** or the radios will not work. Refer to "Normal Procedures and Check Lists" in section 7 of the manual for more details.

Can I use "CTRL+E" to start the engine?

Yes. See previous topic.

Why can't I reach the maximum altitude?

If you are using FSX, make sure you have the latest version and that the Acceleration Expansion Pack is installed. Refer to "Minimum System Requirements" in section 2 of the manual for details.

Maximum cruise altitude can only be reached with lighter weights (all platforms). As your aircraft burns fuel during cruise, you may step-climb from FL410 up to FL510 at a low vertical speed (sometimes not greater than 500 feet per minute).

It must be remembered that FL510 is never reached during normal operation. To reach this level, you would need perfect conditions, an empty plane and about 2,000 pounds of

fuel.

With the real aircraft, there is no way you can reach this high level directly after taking off with 5,000 pounds of fuel and 7 passengers plus crew. It is normal to climb at 500 fpm above FL400. If your climb rate is more than 500 fpm above FL450, be careful!

I noticed that you need to put a lot of power for the plane to begin rolling. Is this normal?

It depends how much fuel and payload are on board. With the maximum ramp weight, to break the inertia you sometimes have to apply more than 85% RPM with the real aircraft, according to our real-world Learjet pilot. In the sim, it's around 70% RPM and it is perfectly normal. Make sure to be properly trimmed for takeoff.

I've just installed my GLJ Model 25 SE addon and loaded my first flight but I cannot see the cockpit. What's the problem?

If you cannot see the virtual cockpit, make sure you are in the virtual cockpit view ("F9" on your keyboard). This addon has no 2D cockpit. Try cycling the different views by pressing the "S" and "A" keys on your keyboard until you get the virtual cockpit view. Refer to "VR-Ready 3D Virtual Cockpits" in section 4 of the manual for details.

The landing gear won't retract. What do I do?

We suspect your landing gear was damaged during takeoff because of the strong acceleration (the GLJ Model 25 is equipped with powerful engines and has an astonishing climb performance). The landing gear must be retracted as soon as the aircraft is airborne to avoid it being damaged by excessive speed. Resetting the flight should correct the problem or simply select the "Ignore crashes and damage" option on the simulator's "Settings - Realism" page. Refer to "Compatibility, Performance and Settings" in section 2 of the manual and to "Recommended Settings for Beginners" in

section 7 for more information.

Some switches in the virtual cockpit don't work when clicked on. Is this an issue?

No. It sometimes occurs that the pilot's viewpoint has been adjusted too far back and lays inside the pilot seat's backrest, rendering the switches unclickable. When this happens, simply move your viewpoint forward a little. Also, 3-position switches and knobs require the use of a wheelmouse. Refer to "How to Activate the Switches, Buttons, Knobs and Levers" in section 4 of the manual for more information.

Please note that the FSX version contains switches and controls that are not animated due to software limitations, and until a fix becomes available. These controls have no impact on the overall simulation and many of them are still functional (ex.: knobs, side switches, etc.).

The radios, the autopilot and the GPS don't work, the AP altitude preselector cannot be changed, ADF is not working and not tunable. Please help!

Please make sure that the avionics are powered up. You need to have both Inverter Switches **ON**, the Radio Master Switch **ON** and the Battery Switches **ON** (or the engines running and the generators **ON**). Refer to sections 4 and 7 of the manual for more details.

The throttles cannot be moved. How come?

The Engine Throttles and Subthrottles cannot be moved if they are locked (CUTOFF position), like on the real aircraft. Click the Throttle Release Lever (under each Throttle) to release and set the Throttle to IDLE. Refer to sections 4 and 7 of the manual for more details.

The fuel tanks are empty of half full at the beginning of a new flight. How is this possible?

We always take for granted that all tanks are full before starting a new flight. However, the simulator might have kept fuel levels from a previous or saved flight. Please make sure to check your fuel status at the beginning of a new flight and refuel the aircraft if necessary. Refer to "20 Series Fuel System" in section 5 and to "Flight Planning" in section 6 for more details.

I experience extremely low frame rate while flying the GLJ Model 25 SE addon. Is this normal?

No. Refer to "Compatibility, Performance and Settings" in section 2 of the manual.

We've noticed that on some systems, when the mouse cursor is moved inside the main window when in the virtual cockpit mode, the frame rate would drop significantly. When the mouse is moved out of the window, the frame rate would resume to normal. We believe this is a simulator issue and not an addon issue. Of course, it will be more apparent with more complex addons such as the GLJ Model 25 SE, especially on slower systems and graphic cards. We recommend moving the mouse cursor out of the main simulation window when not needed. Increased performance will be noticed on more powerful systems.

I can't see the tooltips in the virtual cockpit. What's wrong?

If you can't see the tooltips in the virtual cockpit, make sure the "Show cockpit tooltips" option is selected in your simulator's display settings. Refer to "Compatibility, Performance and Settings" in section 2 of the manual for details.

I've installed my new GLJ Model 25 SE addon and nothing works! The switches don't work, the radios don't work, I cannot get the engines start by all means and I cannot move the throttles. Please help!

May we strongly recommend that you revise sections 4 and 7 of the manual?

Under normal circumstances, this situation will never occur unless the simulator freezes! In this case, restarting the simulator and starting a new flight is the only solution.

It sometimes occurs that the pilot's viewpoint has been adjusted too far back and lays inside the pilot seat's backrest, rendering the switches unclickable. When this happens, simply move your viewpoint forward a little.

Some switches and knobs can only be actuated with the mouse wheel, some with left or right clicks or a combination of both.

Please make sure that the avionics are powered up. You need to have both Inverter Switches **ON**, the Radio Master Switch **ON** and the Battery Switches **ON** (or the engines running and the generators **ON**). Refer to sections 4 and 7 of the manual for more details.

The Engine Throttles and Subthrottles cannot be moved if they are locked (CUTOFF position), like on the real aircraft. Click the Throttle Release Lever (under each Throttle) to release and set the Throttle to IDLE.

TROUBLESHOOTING

I have a number of installation, display and performance issues with my new GLJ Model 25 SE addon. Could you help me troubleshooting my problems?

If you're experiencing many issues with your new GLJ Model 25 SE addon, please read carefully the information provided in the "Getting Started" section (section 2 of the manual).

If you still cannot solve your issue(s) by reading the manual and the present FAQ section, please consider the followings:

1. **Is your simulation platform running smoothly on your system?** If not, this might be a simulator issue. Please review your installation instructions carefully and reinstall your simulator if necessary.
2. **Did you install the latest service packs for your simulator?** The GLJ Model 25 SE addon is compatible with Microsoft® Flight Simulator X SP2 with Acceleration Expan-

sion Pack (or Flight Simulator X Gold fully installed), Flight Simulator X: Steam® Edition, and Lockheed Martin® Prepar3D® v3.x, v2.x and v1.x only. Make sure the latest service packs, if any, are installed.

3. **Is the GLJ Model 25 SE add-on the only add-on aircraft installed on your computer that is experiencing or causing the issue(s)?** If not, the add-on is not causing the issue(s).
4. **Do you have the latest version of the GLJ Model 25 SE add-on?** Please visit our "Downloads" page to check for new patches or updates for your add-on.
5. **Did you install the correct version of the GLJ Model 25 SE add-on for your simulation platform?** Make sure that you install the correct add-on version for your simulation platform. Because of differences between the simulation platforms, the installers are not interchangeable. Refer to "Package Description" in section 2 of the manual.
6. **If you are using FSX SP2, did you install the Acceleration Expansion Pack?** Please install the AEP.
7. **Is your version of DirectX® compatible with your simulation platform and video card?** If you are using FSX, uncheck the "DirectX® 10 preview" option box in the FSX "Settings - Display" page. FSX seems to perform better under DirectX® 9. Prepar3D® v2.x and v3.x require DirectX® 11 (and a DirectX® 11-compatible video card).
8. **If you are using FSX, is the "Light bloom" option selected in the FSX display settings page?** While this should not cause an issue in the current software version, try unchecking the "Light bloom" option box in the FSX display settings page. This may also improve your frame rate. Refer to "Recommended Settings for Flight Simulator X" in section 2 of the manual.
9. **Can you actually see at least one GLJ Model 25 SE aircraft in the "Select Aircraft" (or "Select Vehicle") page?** If not, the add-on is not installed properly or there is a display or compatibility issue. Refer to "Compatibility, Performance and Settings" in section 2 of the manual. Make sure you have the correct settings for your simulation platform.
10. **Can you select/load the GLJ Model 25 SE aircraft in the simulator (at the start of a new flight)?** If not, the add-on is not properly installed or there is a display or compatibility issue. Refer to "Compatibility, Performance and Settings" in section 2 of the manual. Also some third-party add-ons or FS utilities may interfere with the correct installation of the GLJ Model 25 SE add-on. These programs may also alter the appearance of your add-on aircraft by modifying the textures and the materials in the model files. If the different GLJ Model 25 SE aircraft variations are correctly displayed in the "Select Aircraft" page but you are unable to select any one of them, or worse if selecting them causes FSX to crash, suspect such third-party programs. Remove these programs to solve the issue.
11. **Do you see the GLJ Model 25 SE aircraft in the spot plane view?** If the add-on is properly installed and loaded and you don't see the aircraft in the spot plane view, there is a display or compatibility issue. Refer to "Compatibility, Performance and Settings" in section 2 of the manual. Make sure you have the correct settings for your simulation platform.
12. **Do you see the GLJ Model 25 SE virtual cockpit?** If the add-on is properly installed and loaded and you don't see the aircraft in the spot plane view and there is no virtual cockpit, there is a display or compatibility issue. Refer to "Compatibility, Performance and Settings" in section 2 of the manual. Make sure you have the correct settings for your simulation platform. If you see the aircraft in the spot plane view and there is no virtual cockpit, make sure you are in the virtual cockpit view ("F9" on your keyboard).
13. **Did you try resetting the flight or reloading the GLJ Model 25 SE aircraft?** Sometimes, it works.
14. **Did you install the latest service packs for your Windows® operating system?**

Make sure your Windows® operating system is up to date. Windows® 10/8.1/8/7 or later is required to install and fly this addon. We are sorry we cannot provide support for this addon if installed under Windows® Vista™ or Windows® XP®.

15. **Did you install the latest driver for your video card (for your operating system)?** Sometimes, it solves display issues.
16. **Did you try tweaking your parameters in the simulator, especially your display settings?** If you experience reduced frame rate, lower your display parameters. Reducing the traffic and weather settings may also improve the overall system performance. Refer to "Compatibility, Performance and Settings" in section 2 of the manual.
17. **Do you suspect the GLJ Model 25 SE installer file you downloaded from our website to be corrupted?** You can try downloading the latest version of the software from our website and reinstalling the addon. You will need to login to your user account.
18. **Do you have the minimum system requirements?** You may need a new computer or video card (especially with Prepar3D®). Refer to "Minimum System Requirements" in section 2 of the manual.

Note to FSX: Steam® Edition Users

- The GLJ Model 25 SE addon is fully compatible with Microsoft® Flight Simulator X: Steam® Edition. A special installer is available from our "Downloads" section (free for registered users).
- Please note that FSX: Steam® Edition is installed in a different way to the boxed version and occupies a different location on your computer. For this reason, we recommend using the special installer for FSX: Steam® Edition.

If you are still not able to solve your issue(s) please contact us for technical support.

TECHNICAL SUPPORT AND CONTACT INFORMATION

I have another question about my GLJ Model 25 SE addon, can I contact you?

Yes. We'll try our best to answer you the same day or within two business days.

For sales support or general inquiries - If you need customer support or simply want to send us a message, please use our general contact form:

<https://xtremeprototypes.com/en/shopcustcontact.asp>

For technical support - If you need technical support for your addon, please fill out our technical support request form:

<https://xtremeprototypes.com/en/shopcustcontactsupport.asp>

Make sure all the required fields in the form are filled out correctly and provide us with as much information as possible about your technical issue.

How do I get product patches and upgrades?

Please login to your account on our website. Then visit our "Downloads" section and follow the instructions.

<http://xtremeprototypes.com/en/downloads.asp>

I have some ideas about improving the GLJ Model 25 SE addon, or future exciting addons. Can I contact you?

Yes. We'll be most happy to hear from you. Please use our general contact form.

<https://xtremeprototypes.com/en/shopcustcontact.asp>

I was involved in the development of the real Gates Learjet Model 25 during the 1960s/70's and I would be interest-

**ed in helping you improving this addon.
Can I contact you?**

Yes. It will be an honor to hear from you.
Please use our general contact form.

[https://xtremeprototypes.com/en/
shopcustcontact.asp](https://xtremeprototypes.com/en/shopcustcontact.asp)



As it is always the case with computer software, and especially with addons to existing third-party platforms over which there is limited control, there are some known issues with the current addon version, depending on which simulation platform you are using. Some of these issues are related to the simulator, in which case there is little that can be done from our side, except going around them and expect a fix in the near future. Other issues are related to the addon itself, in which case we are working hard to get them resolved.

We appreciate constructive feedback from our users, so please don't hesitate to report any issue or bug you might have experienced when flying the GLJ Model 25 SE addon.

To report issues, please fill out our technical support request form:

<https://xtremeprototypes.com/en/shopcustcontactsupport.asp>

Please make sure that all the required fields in the form are filled out correctly and provide us with as much information as possible about your technical issue.

Because there are as many computer systems as there are users, you may or may not experience the following issues depending on:

- Your computer and graphics hardware (and settings)
- Your operating system (and settings)
- Your version of DirectX®
- Your simulation platform (and settings)
- Your GLJ Model 25 SE addon version (including patches and updates, if any)

Windows® security warnings appear when installing the software or starting the simulation platform (FSX)

In addition to many other files, important software components (DLLs) need to be installed on your system for the GLJ Model 25 SE addon to function properly. These DLLs are copied to the addon's panel folder during the installation process. You must answer YES (or RUN) when asked by Windows® or your simulation platform if you trust these modules and allow them to be installed and to run on your computer.

Standard Windows® security warning dialogs will appear on your desktop and in your simulator's main window the first time you run your simulation platform after installing the GLJ Model 25 SE addon. Click the "YES" button (or the "RUN" button) when these dialogs appear. The dialogs will appear only once.

Important: The GLJ Model 25 SE addon will not work properly without these modules. You must allow them to be installed.

Refer to "Installing your Addon" in section 2 of the manual for more details.

Some cockpit sounds can be heard from the external views or when the simulation is paused

In addition to the basic aircraft sounds that are controlled by the simulator's own sound

engine, the GLJ Model 25 SE addon features more than 45 extra sound effects, mainly cockpit sounds, that are managed by the add-on's special systems but played by a third-party sound module. Due to software limitations, some cockpit sounds can still be heard from the external views or when the simulator is paused. Volume adjustment in the simulator has no effect on these sounds. This has no impact on the overall simulation.

No volume control to adjust cockpit sounds

While we took great care to adjust the extra cockpit sound effects individually so they fit well in the overall sound mix, there is no separate control to adjust the volume of the extra cockpit sounds in this software version. This is mainly due to limitations in the current simulation platforms. However, it is possible to balance the extra cockpit sounds with the basic aircraft sounds that are controlled by the simulator by using the master volume control of your computer sound system. First, adjust the master volume on your computer so that the cockpit sounds are at a correct level. Cockpit sounds can be heard by clicking some of the switches, levers and knobs in the virtual cockpit. Then adjust the basic aircraft sounds in the "Settings - Sound" page, under "Volume Levels" for the proper balance. This has no impact on the overall simulation and needs to be done only once.

Frame rate drop when the mouse cursor enters the visual cockpit

We've noticed that on some systems, when the mouse cursor is moved inside the main window when in the virtual cockpit mode, the frame rate could drop significantly. When the mouse is moved out of the window, the frame rate resumes to normal. We believe this is a simulator issue and not an addon issue. Of course, it will be more apparent with more complex addons such as the GLJ Model 25 SE, especially on slower systems and graphic cards. We recommend moving the mouse cursor out of the main simulation window when not needed. Increased performance will be noticed on more powerful systems.

"Blue texture flashes" on exterior and interior models, before the addon textures are loaded (FSX)

This is a simulator issue. If you experience "blue texture flashes" in FSX while the addon textures are loading, especially when in the virtual cockpit, we recommend disabling the DirectX® 10 Preview option in your Display settings ("Graphics" tab). FSX seems to perform better under DirectX® 9. Third-party free DirectX® 10 shader fixers are also available in FSX forums. Note that a small delay (especially on slower computer systems) before the addon textures are loaded is normal on the current simulation platforms, especially when loading 4096 x 4096 high resolution textures. For more information, refer to section 2 of the manual.

Some textures are missing or appear black on the exterior model and in the virtual cockpit after loading several variations of the addon in the simulator (FSX)

We don't know what might be causing this issue that we also observed after switching aircraft several times. We believe this is a simulator issue and not an addon issue. When this happens, simply reset the flight or restart the simulator.

In some views, some special effects like the aircraft lights are slightly askew; they're all positioned slightly to the left or right of their normal position

The aircraft lights and other special visual effects are properly positioned. This is a simulator issue. We've noticed the same thing depending on the view and the zoom level. Fortunately, it is not always noticeable.

Some special visual effects (engine contrails, vortices, etc.) look different from those in the manual

This is a simulator issue that is purely cosmetic and has no impact on the overall simulation.

The special visual effects (engine contrails,

wing vortices, aircraft lights, etc.) included with your GLJ Model 25 SE addon should look like the ones shown on the product page and in the manual. For reasons that are sometimes hard to define, special effects appearance may vary from system to system, depending on many factors including your simulation platform, your version of DirectX®, your view aspect ratio and your graphics hardware and settings.

The special effect engine was changed from CPU to GPU with the release of Prepar3D version 2. This has the advantage of freeing computer resources and improving performance on high-end graphics hardware. The GLJ Model 25 SE special visual effects were updated to conform to the Prepar3D v2 specifications. While the new P3Dv2 particle effects are visually identical to the FSX/P3Dv1 effects, there is a simulator issue affecting extrusion effects that still needs to be resolved. Until then, extrusion effects such as engine contrails, wing vortices and vaportrails may appear sawtoothed, wrongly oriented, faded, with repeating arrow patterns. This is normal until a fix is made available.

For other reasons, we noticed a similar issue in FSX: Steam® Edition, to a lesser degree. This is normal until a fix is made available.

Fire extinguishing can be performed only once during a flight

This is how the simulator works. The flight needs to be reset or a new flight initiated for the simulator's extinguishers (bottles) to recharge.

Electrically actuated/controlled trim tabs (including the horizontal stabilizer) can be moved without the aircraft powered up

Due to some limitations on all platforms, electrically powered trim tabs can be activated with your controller (joystick/yoke) buttons even when the aircraft is not powered up. This is a known simulator issue.

Hydraulically controlled spoilers and flaps are operable with low hydraulic pressure (FSX and Prepar3D® v1.x)

This is a known simulator issue in both FSX and Prepar3D® v1.x. It is no longer an issue in Prepar3D® v3.x and v2.x.

Setting the local time with the clock produces unexpected results, including freezing the screen (FSX)

Setting the local time with the aircraft clock sometimes produces unexpected results in FSX, including freezing the screen while the simulator is updating the environment and traffic. If you experience such an issue on your simulation platform, we recommend changing the local time on the "SELECT TIME AND SEASON" page in the simulator (available from the "World" menu item in the top menu bar) instead. This seems to be a minor simulator issue and we don't know of any fix at this time. We did not encounter this issue in Prepar3D®.

The aircraft cannot be selected in the "Select Aircraft" page, FSX crashes (FSX)

It has been reported during the beta phase that some third-party addons or FS utilities may interfere with the correct installation of the GLJ Model 25 SE addon. These programs may also alter the appearance of your add-on aircraft by modifying the textures and the materials in the model files. If the different GLJ Model 25 SE aircraft variations are correctly displayed in the "Select Aircraft" page but you are unable to select any one of them, or worse if selecting them causes FSX to crash, suspect such third-party programs. For unknown reasons, these programs may prevent the addon's system DLLs from being "trusted" by FSX and the addon will not work. Remove these programs to solve the issue.

Also, depending on security settings and permissions in Windows® Vista™, you may not be able to install critical software components (DLLs) and the addon will not work. We are sorry we cannot support this addon if installed under Windows® Vista™ or Windows® XP®. Windows 10/8.1/8/7 is required in order to install and operate this addon (see "Minimum

System Requirements" in section 2 of the manual).

The addon cannot be installed in Flight Simulator X: Steam® Edition (FSX Steam)

The GLJ Model 25 SE addon is fully compatible with Microsoft® Flight Simulator X: Steam® Edition but requires a special installer available from our "Downloads" section (free for registered users). Do not use the standard installer for FSX.

Please note that FSX: Steam® Edition is installed in a different way to the boxed version and occupies a different location on your computer. With the standard installer for FSX, you will need to specify a different path/root folder during the installation process to deploy the addon into FSX: Steam® Edition (by default: "C:\Program Files (x86)\Steam\steamapps\common\FSX").

Also, with the standard installer, you will need to copy your saved flights (if any) from the "C:\Users\your name\Documents\Flight Simulator X Files" folder to your "C:\Users\your name\Documents\Flight Simulator X - Steam Edition Files" folder. This is because FSX: Steam® Edition uses a different folder to store your saved flights.

For the above reasons, we recommend using the special installer for FSX: Steam® Edition.

Refer to "Installing your Addon" in section 2 of the manual for more information.

Some of the exterior lights are projected into the cabin or cockpit

Fortunately, we've been able to fix this issue with the rotating beacon lights in version 2.1.

This is a well known simulator issue. It happens that some of the exterior lights, under certain angles of view, can pass through walls, floor and ceiling (or any other 3D obstacle in the model) and appear in the cockpit and cabin. This is especially true for the landing/taxi lights and the default rotating beacon lights.

However, due to software limitations in the

simulation platforms, the addon still uses the default landing and taxi lights which, on some occasions and depending on your platform, may be visible inside in the cabin when the landing gear is retracted. The solution is to turn off the landing/taxi lights after retracting the landing gear, as listed in the procedures (see section 7 in the manual).

Unfortunately, we don't know of any fix at this time since we are using standard FSX/P3D light effects that should normally be blocked by opaque surfaces. It is not normal to see landing or taxi lights through the floor carpet in the cabin, for example.

The addon also uses optional external special effects to project the light coming from the landing/taxi lights under the aircraft. These "belly lighting" effects may reflect too much in the cabin or in the cockpit. These effects are controlled by the Wing Inspection Light Switch [3, fig. 4-45] on the center pedestal and can be switched on and off. This Model 25 has no wing inspection light.

Prepar3D® v4.x users: To avoid the landing and taxi lights, that are located under and behind the cockpit, to illuminate the VC, simply uncheck "Dynamic Lighting" in your graphics options. This addon does not support dynamic lighting at this time.

Some of the cockpit lights seem to interfere with each other

In addition to the lighting effects that are built into the textures (light maps), the GLJ Model 25 SE addon uses several so-called "virtual cockpit lights" to light up the cockpit, the instrument panel (flood lights), and the cabin.

We noticed that under certain conditions, these lights seem to interfere with each other, sometimes depending on the order in which they were turned on. For example, turning on the flood lights while the cabin lights are on, may dim the overall lighting in the cockpit instead of making it brighter. On other occasions, some of these lights may start flashing for an unknown reason. In all cases, we believe this is a simulator issue involving the "VC light"-type of special effect.

When this happens, simply turn off one of the

lights then turn it back on again. You might have to do this several times, with different lights in different orders in order to solve the issue. If you cannot get rid of the problem, simply turn off one of the lights (for example, do not turn on the panel flood lights when the cabin lights are on).

VC lights do not interfere with the light map effects that are built into the different textures. Those maps are responsible for the light coming from the instrument post lights, the instrument eyebrows and bezels, the backlit panels, the annunciators and panel lights, the cabin signs, the entry lights, the reading lights and the ceiling lights. Therefore, turning off the instrument lights in the cockpit would have no effect on solving possible VC light conflicts. Turn off the cabin or flood light instead.

No cockpit sounds when installing the FSX version in Prepar3D® v4.x

If you have installed the FSX version in Prepar3D® v4, you will need to copy the included 64-bit sound DLL to the addon's "panel" folder. The DLL is available in the "64-bit sound" subfolder located in the main addon folder. Follow the instructions carefully. Without the 64-bit sound DLL, you will not be able to hear the cockpit sound effects.

The throttles are shaking

We know. They all do. This seems to be a simulator issue that has no impact on the simulation.

The flight director behaves erratically

On some occasions, it might be necessary to reset the flight director if the V-bars are not responding properly (sometimes after the autopilot has been turned on and off). If you suspect that the flight director is not giving you correct indications, simply turn the Flight Director Power Switch to **OFF**, then back to **ON** again. This is a simulator issue.

The aircraft behaves erratically (lost of

control) after being repositioned at altitude with the map

Repositioning the addon at altitude with the map while the autopilot is engaged may lead to unpredictable aircraft behavior. To avoid this issue, turn off the autopilot before repositioning the addon with the map. This is a simulator issue.

The autopilot changes the elevator (pitch) trim setting if energized before flight, even after the elevator was trimmed correctly for takeoff

If the autopilot is tested or engaged before flight, the autopilot will move the horizontal stabilizer (elevator/pitch trim) out of range for takeoff. Prior to takeoff, disengage the autopilot and set the elevator trim correctly for takeoff - normally about one needle thickness below center. This is a simulator issue.

The fuel tanks are empty or half full at the beginning of a new flight

We always take for granted that all tanks are full before starting a new flight. However, the simulator might have kept fuel levels from a previous or saved flight. Please make sure to check your fuel status at the beginning of a new flight and refuel the aircraft if necessary. Refer to "20 Series Fuel System" in section 5 and to "Flight Planning" in section 6 for more details.

The aircraft textures appear blurred and in a much lower resolution than what is shown in the product screenshots

The GLJ Model 25 SE addon uses 4096 x 4096 high resolution textures. For optimal graphics quality in Prepar3D®, make sure the texture resolution is set to "Ultra - 4096x4096" in your graphics settings (under "Image and Texture Quality"). In FSX, you will need to modify two lines in the "fsx.CFG" file:

```
[Display]
TEXTURE_BANDWIDTH_MULT=80
```


[Graphics]
TEXTURE_MAX_LOAD=4096

Refer to section 2 in the manual for more details.

Some aircraft parts and textures are missing on both the exterior model and the virtual cockpit and the addon is not working properly

Try resetting the flight or restarting the simulator. If this does not solve the issue, it may be because some important software components are missing or were not installed properly during the installation process. You may need to reinstall the addon to solve this issue.

If you are using FSX, make sure that you accept installing the addon's system DLL when asked (you should click "YES" or "RUN" when the dialogs appear in the lower right corner of your Windows® desktop and when starting your simulation platform for the first time after installing the addon). This needs to be done only once. Refer to "Software Installation" in section 2 of the manual for more information.

The instrument panels appear "frozen" after a new aircraft is loaded

This is not likely to happen in this software version and with the latest simulation platforms. However if it does, simply end the flight and start a new flight. Restart the simulator if the problem persists.

Some parts are missing in the virtual cockpit and geometric figures are flying apart (Prepar3D® v4.0/v3.x)

The issue — There is a known issue in Lockheed Martin® Prepar3D® v4.0 and v3.x that affects geometry when a certain number of animations is exceeded in a complex model with many moving parts, such as our GLJ Model 25 SE.

Lockheed Martin® recently acknowledged that there was something wrong in their model optimization routine and that it would be fixed in

the next release. This issue no longer exists in the new Prepar3D® v4.1 that was released on October 10, 2017. Unfortunately, there is no fix yet for Prepar3D® v4.0 and v3.x.

If you don't want to upgrade to Prepar3D® v4.1, you will need to modify one line in the "Prepar3D.cfg" file in order for your GLJ Model 25 SE addon to display properly in the sim (see below). No modification is required if you are using Prepar3D® v4.1 and we encourage users to upgrade to the latest version of Prepar3D®.

Please note that this change is only required if you install one of the native versions for P3Dv4 or P3Dv3 in either Prepar3D® v4.0 or v3.x. The change is not required if you install the FSX version in Prepar3D®, because it contains fewer animations (see below).

Please note that the native versions for P3Dv4 and P3Dv3 are fully animated and have more features than the version for FSX. Because we obtained a temporary "solution" from Lockheed Martin® until a permanent fix would become available, we thought that our Prepar3D® users would like to benefit from a fully animated cockpit with many features and we've decided to release the addon fully animated with a note about how to temporarily solve the geometry issue.

In order to bring you this, we needed to exceed the number of animated objects that is currently supported by v4.0 and v3.x of Prepar3D® before the optimization routine starts creating problems. Under these conditions, it is normal for the interior model to display geometry issues such as missing parts, distorted objects, flying geometric figures, etc. This is an undocumented simulator issue, not an addon issue.

How to fix it — To solve this issue in Prepar3D® v4.0/v3.x, you will need to modify the "Prepar3D.cfg" file located in:

C:\Users*yourname*\AppData\Roaming\Lockheed Martin\Prepar3D v4 or v3

This is the only solution offered by Lockheed Martin® to solve this issue at this time.

Since it is not Xtreme Prototypes' policy to modify the user's "Prepar3D.cfg" file during

the installation process, this needs to be done manually by the user. Should you decide to make this change, please make sure that you've made a backup copy of your original "Prepar3D.cfg" file before proceeding:

1. Please exit Prepar3D® v4.0/v3.x and open the "Prepar3D.cfg" file with your text editor (ex.: Notepad).
2. Make the following change:

```
[SIM]
SYSCLOCK=0
OPTIMIZE_PARTS=0 <--- enter 0 (zero) here
```

3. Save the file and close your text editor.
4. Restart Prepar3D®.

Note: If you have more than one version of Prepar3D® installed on your system, please make sure the change was made in the right Prepar3D.cfg (they all have the same name) and that the entry was made correctly.

Also, other applications might change your Prepar3D.cfg and reset `OPTIMIZE_PARTS=1` without telling you. This is usually the case if you re-install Prepar3D® or third-party addons. Please make sure that `OPTIMIZE_PARTS` is set to zero (0) after updating your simulation platform or third-party addons and before flying your new GLJ Model 25 SE addon.

If you have a good computer with a high-end video card, you shouldn't be too concerned with the `OPTIMIZE_PARTS=0` issue. Based on our tests, we didn't notice any significant performance deterioration with `OPTIMIZE_PARTS=0` when flying the GLJ Model 25 SE addon in Prepar3D® v4.0 or v3.x.

Remember that this change is not required if you are using Prepar3D® v4.1.

The FSX version option — If you don't want to make the above modification to the "Prepar3D.cfg" file, you can install the FSX version in Prepar3D®. However, please note that the FSX version has less animated objects and features than the native Prepar3D® versions. Fortunately, version 2.1 for FSX has more animations and features than the previous v2.0. So if you don't want to edit your "Prepar3D.cfg", you can still install the FSX ver-

sion that is fully compatible with all versions of Prepar3D® and you will miss almost nothing. The version for FSX does not require `OPTIMIZE_PARTS=0` because it has fewer animations in the virtual cockpit. Aircraft systems and procedures are the same on all platforms and the simulation is not affected.

What we are doing about it — We've been exchanging for many months with Lockheed Martin® regarding this unfortunate issue. We were told very recently that the issue is now fixed in Prepar3D® v4.1. As mentioned previously, this was not an addon issue. It was an undocumented simulator issue and Lockheed Martin® thanked us for helping them tracking it down:

"We were able to revisit some of the logic of OPTIMIZE_PARTS combined with large counts of animations/visibility tags. We will have a change to support larger numbers in the next public release. Thanks for your assistance in tracking down this issue!" -Adam Breed, Prepar3D® Engineering Project Manager

No patch is required from our side. Prepar3D® users only need to upgrade their simulation platform to v4.1.

Gyro issues under certain conditions, including gyro drift and a brief movement of the gyro cards in the opposite direction at the beginning of a turn

Gyros in the GLJ Model 25 SE addon are of the electric type (as set in the "aircraft.cfg"):

```
[direction_indicators]
direction_indicator.0 = 2
// 0 = None, 1 = Vacuum gyro, 2 = Electric gyro, 3 = Electro-mag slaved compass, 4 = Slaved to another indicator
```

Gyro drift is normal for electric gyros. This type of gyros needs to be reset periodically to the heading on the magnetic compass (or from ground indications).

Selecting "type 3" (electro-mag slaved compass) would be similar to unslaving the gyro (Directional Gyro Free/Slave Switch set to FREE), but without the need to reset the gyro periodically. This is because this type of gyro

continuously compares the indicated heading to the value it receives from a magnetic sensing element (in other words, it is slaved to magnetic north).

The real Learjet 25 uses a magnetic flux valve to automatically correct the gyro drift when the switch is set to SLAVE but would still allow you to make manual corrections when the switch is set to FREE.

You can change the setting to "3" in the "aircraft.cfg" to reduce your workload during flight (for example, the basic Lear 45 and larger aircraft in FSX use type 3 gyros). However, due to some limitations in the simulator, the FREE position of the Directional Gyro Free/Slave Switch will no longer allow you to make manual corrections (they are no longer needed with this type of gyro in the simulator). This is why we've decided to set the direction indicator type in the "aircraft.cfg" to "2" (electric) instead of "3" but it can easily be changed to type "3" if you prefer.

Another option is to disable gyro drift in your sim settings.

We did notice a slight movement of the gyro card in the opposite direction of the turn at the beginning of a turn, under certain conditions (speed, altitude, length of the turn, geosition, etc. -- remember, the Lear 25 is a hot rod and it moves fast...). After one or two seconds, the card resets itself to the correct heading and there is no more lag.

We've looked at our code, which is pretty standard for gyro cards that receive their values directly from the simulator, and we can't find anything that would explain this behavior. It might be related to the way "type 2" electric gyros are programmed in the sim but we'll need to investigate this matter further to be certain. We would certainly like to find a fix for the next release.

Engines shut down with the fuselage tank switch set to FILL

The engines should obviously not shut down with the fuselage tank switch set to FILL and the wing tanks not empty. This is an issue that will be fixed in a future release. The reason it does that is because, in the current configura-

tion, the engines are fed from the fuselage tank when the switch is set to FILL. This should not be (as mentioned in the manual) and if the fuselage tank is empty, the engines will shut down. The issue was never reported during our beta tests because testers never checked the fuselage tank switch on the ramp with the fuselage tank completely empty.

Third-party GTN/GPS/radar bezels and knobs too bright at night

Maybe this is how the third-party developer wanted the bezel and knobs to be lit at night. Bezels should normally look dimmed or partly lit at night and brighter during the day.

The `no_luminous=1` line should be commented (//) or set to `no_luminous=0` for the gauge entry in the "panel.cfg". This gives the gauge developer the possibility to make some regions of the gauge (like the bezel) darker at night and other regions (like the screen) brighter.

In our model, the optional panels use the "blendUserControlled" method of blending at night for the gauges, which is the standard way for illuminating most gauges at night in FSX or Prepar3D® (we believe the method is not perfect, especially at dusk or dawn, but this is the best option we have for now).

Flood Lights and Cabin Lights are of the VC light type: they will illuminate the panel globally, including the gauges (screen and bezel).

If you turn off the Instrument Lights (with all other lights off), everything should go black at night, except if the Flood or Cabin Lights are on.

Please make sure there is only one entry for `no_luminous` in the "panel.cfg" and refer to the documentation included with your gauge or contact the developer. Again, maybe this is how the developer designed the gauge. They decide how the bezel should look at night.



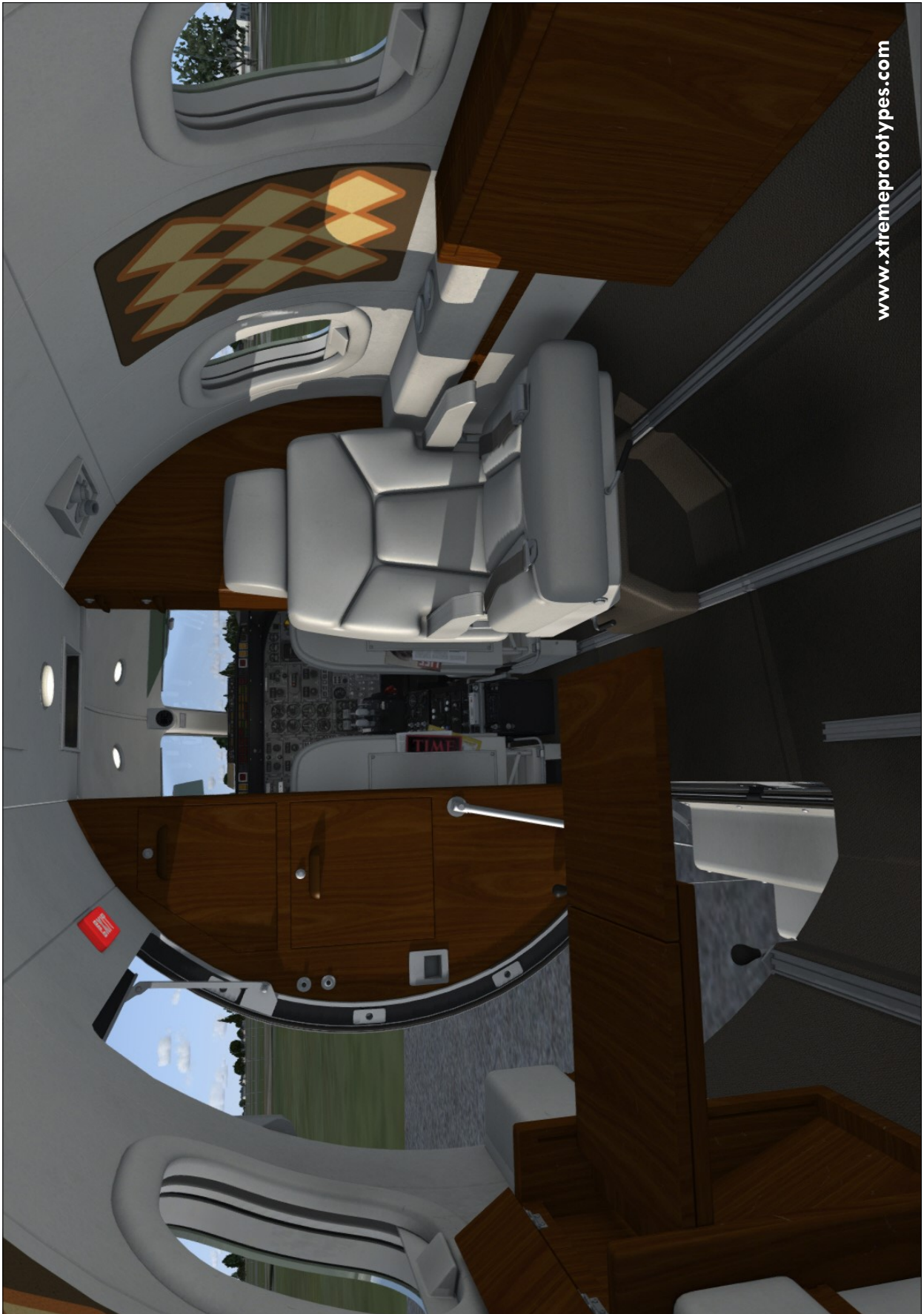
www.xtremeprototypes.com

F-GLXP preparing for takeoff.



www.xtremeprototypes.com

G-KEXP getting ready for takeoff.



www.xtremeprototypes.com

Cabin interior.



www.xtremeprototypes.com

F-GLXP's main landing gear (FSX, no shadows).



Virtual cockpit.



www.xtremeprototypes.com

Copilot's instruments.



Captain's instruments.





Fictitious "Special Ops Area 51" variation (N4251XP).



Fictitious U.S. Air Force V.I.P. Transport variation (6021 4XP).



www.xtremeprototypes.com

Fictitious Canadian Government V.I.P. Transport variation (150018XP).



www.xtremeprototypes.com

Cabin interior (FSX, no shadows).



Fictitious U.K. Private "Blue Bird" variation (G-KEXP).



Virtual cockpit (FSX, no shadows).



Fictitious U.S. Private "Red Belly" variation (N864XP).



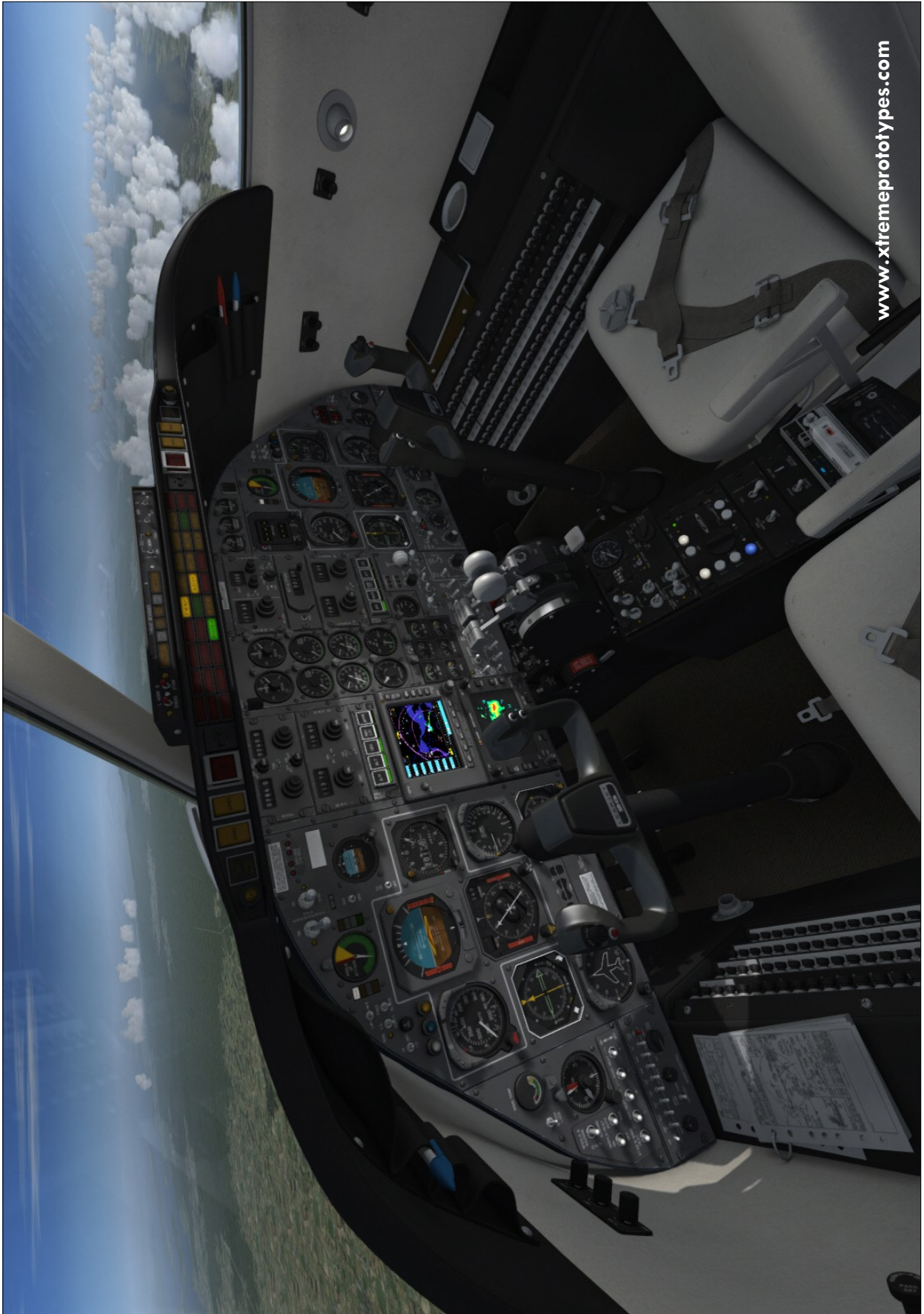
www.xtremeprototypes.com

Unpainted test aircraft (N486XP).



www.xtremeprototypes.com

Top view. Fictitious U.S. Private "Red Belly" variation (N864XP).



www.xtremeprototypes.com

Autopilot HDG, ALT and SPD hold modes engaged.



www.xtremeprototypes.com

G-KEXP cleared for takeoff.



www.xtremeprototypes.com

XA-XPS with full flaps, spoilers and thrust reversers deployed, arriving at Montreal-Trudeau airport (CYUL).

USER'S NOTES

USER'S NOTES

USER'S NOTES

USER'S NOTES



xtremeprototypes.com

Xtreme Prototypes, Inc.
Montreal, Quebec
CANADA

Find us on 

facebook.com/XtremePrototypes