FOR SIMULATION USE ONLY

OFFICIAL PUBLICATION

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AIRCRAFT FLIGHT MANUAL

IRIS PC-21

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Virtual Roulettes and IRIS Simulations are proud to introduce the IRIS PC-21 to flight-simulation enthusiasts worldwide. After months of rigorous development, in-depth formation-flight testing, and collaborative refinement, we're excited to deliver a product that marries cutting-edge realism with the precision artistry inspired by the RAAF Roulettes.

Whether you're flying on PC or Xbox Series X, you can now experience the thrill of piloting a world-class trainer aircraft—complete with authentic flight dynamics, high-resolution textures, and fully immersive cockpit systems.

The Virtual Roulettes are a dedicated virtual formation-flying team modelled on the Royal Australian Air Force's renowned aerobatic display team. Operating primarily in Microsoft Flight Simulator, they bring the Roulettes' signature precision and choreography to life in a digital arena. Equipped with high-end home rigs and VR headsets, the team rigorously evaluates frame-rate stability, loading performance, and control-input fidelity. Since tight-formation flying amplifies any simulation jitter or lag, their feedback drives continuous optimization of texture resolution, level-of-detail settings, and shader performance—resulting in a consistently smooth, immersive experience across diverse hardware configurations.

Each day, the Virtual Roulettes deploy their custom 8K RAAF Roulette texture set in a variety of lighting and weather scenarios. This real-time testing identifies decal misalignments, texture-popping issues, and resolution artifacts, allowing our artists and engineers to fine-tune every detail. The result is a polished, show-stopping RAAF colour scheme that meets—and often exceeds—the expectations of our community.

Through this unique, integrated partnership—combining the Virtual Roulettes' formation-flight expertise with IRIS's systematic engineering processes—the Virtual Roulettes play a vital role in evolving the IRIS PC-21. Their insights help us refine aerodynamics, avionics logic, and graphics performance, ensuring that our trainer module remains a high-fidelity, high-performance platform for detail-driven PC-21 enthusiasts.

For further details about the Virtual Roulettes—who they are, how they operate, and what drives their passion—please visit:
www.virtualroulettes.au

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ACKNOWLEDGEMENTS

Everybody should be able to experience and enjoy the unbeaten performance of the Pilatus PC-21 Next Generation Trainer with this software.

IRIS Simulations would like to thank Pilatus Aircraft Ltd for their support in the production of this product. The team at IRIS Simulations look forward to producing more exceptional Pilatus aircraft for Microsoft Flight Simulator in the future.

ROYAL AUSTRALIAN AIR FORCE

On behalf of IRIS Simulations Pty Ltd, we extend our sincere thanks to the Royal Australian Air Force for kindly granting us permission to accurately recreate the RAAF PC-21 liveries and to incorporate the official RAAF roundels within our simulation product. Your support in allowing us to honour the authentic appearance of Australia's premier training aircraft greatly enhances the realism and value of our offerings.

We recognize the significance of the RAAF's cooperation, and the trust placed in IRIS Simulations to represent these prestigious symbols faithfully. Your willingness to support our project not only enriches the experience for flight simulation enthusiasts worldwide but also pays tribute to the dedication and excellence of the Defence community.

Once again, thank you for your invaluable assistance and for enabling us to bring the PC-21's distinctive livery to life in our product. We look forward to continuing our collaboration and to future opportunities to showcase the RAAF's proud heritage.

CREDITS

IRIS Simulations would also like to credit the following additional individuals and businesses for their support and involvement in the production of this product.

Additional Artwork

Zach Bartig, Karl Derner, Martial Féron.

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Programming Support

CJ Simulations, IndiaFoxtEcho

IN MEMORIAM

This release of the IRIS PC-21 is dedicated to the memory of Karl Derner — a passionate aviator, devoted father, and a cherished member of our flight simulation community.

Karl was more than just a member of our developer community. He was a true enthusiast who brought a deep love for aviation and technical insight to every test flight, every feedback session, and every conversation. His passion for flight simulation was contagious, and his contributions played a meaningful role in shaping the fidelity and performance of this aircraft. Always generous with his time and knowledge, Karl tested our systems not only with precision, but with heart — driven by the same joy of flight that inspires everything we do at IRIS Simulations.

Beyond his work behind the scenes, Karl was a key figure in the multiplayer flight sim aerobatics scene, proudly flying as part of the Nyte Furys team. With flair and finesse, Karl helped lead a new generation of virtual aviators in formation flying and public displays, bringing energy and creativity to every routine. His love of the team and its mission is immortalised here in the IRIS PC-21 — this package includes two special Nyte Furys paintschemes created in his honour, celebrating the style and spirit he helped to cultivate.

Outside the cockpit, Karl was a loving partner and father of four, remembered by all who knew him for his quiet strength, kindness, and unwavering support for those around him. His recent return to motorcycling, another passion he held dear, was tragically cut short — but his legacy continues to soar in every detail of this aircraft.

We are proud to honour Karl's memory with this release — a symbol of the skies he so dearly loved. Every time you take to the virtual skies in the IRIS PC-21, we hope you feel a little of the spirit he shared with us: one of adventure, precision, and deep love for the flight simulation community.

Blue skies and tailwinds, Karl. You are deeply missed but never forgotten.

— The IRIS Simulations Team

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TRADEMARKS

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AIRCRAFT REFERENCES

Any reference to 'Pilatus PC-21' refers to the actual aircraft, whereas references to the 'IRIS PC-21' refers to this simulation product.

AUTHORITY

Users are to regard this Aircraft Flight Manual as an authoritative publication for this product. It is compiled from data available from the aircraft manufacturer under licence, as well as public operating & technical sources.

These instructions provide you with a general knowledge of the simulated aircraft, its characteristics, and specific normal operating procedures. Instructions in this manual are for a pilot inexperienced in the operation of the simulation aircraft.

DESIGN SOURCES

All references to produce this product are from publicly available sources or from the aircraft manufacturer under licence.

Where required information was not available, modifications were made to provide an expected level of detail for simulation products of this type.

As such IRIS Simulations Pty Ltd cannot guarantee the accuracy of the product or its component parts.

INTENDED USE

This product is for recreational purposes only.

In accordance with the IRIS Simulations Pty Ltd EULA, this product cannot be used as part of any real-world aviation training.

This product does not cover all aspects of flight operations; accordingly, it may contain errors, limitations, and variations from the actual aircraft.

Should you require use for other applications or purposes, please contact help@irissimulations.com.au to discuss your requirements.

APPLICABILITY

This Flight Manual applies to the IRIS PC-21 for Microsoft Flight Simulator (MSFS) by IRIS Simulations Pty Ltd

OPERATING INSTRUCTIONS

This manual provides the best possible operating instructions, however, on occasions these instructions may prove to be a poor substitute for sound judgment. Adverse weather, terrain and other considerations may require modification of the procedures listed.

PERMISSIBLE OPERATIONS

The Flight Manual takes a 'positive approach' and normally states only what you can do. Unusual operations and configurations are prohibited unless specifically covered herein.

CONTROL AND IDENTIFICATION MARKINGS

The use of block capitals in the text, when identifying switches, controls etc. indicates the actual markings on that item.

AIRSPEEDS

All airspeeds quoted in this manual are 'indicated' unless otherwise stated.

USE OF THE FLIGHT MANUAL

To use the Flight Manual correctly, it is essential to understand the division of the manual into its sections and the subsequent division of the sections. Each section has a table of contents, and best use will be obtained from the Manual by becoming familiar with the table of contents for each section. The index enables easy reference to a particular topic or item by page number.

FREQUENTLY ASKED QUESTIONS

The following are frequently asked questions during testing.

Q. Why can't I open/close the canopy?
A. To close the canopy, make sure the CFS Pin has been removed, your helmet put on and the engine is shut down. To open it, make sure the canopy is unlocked and the engine is shut down. If the above conditions are met, the canopy latch should work.

Q. Why doesn't the MAP button show me a moving map display?
A. The MAP button on the Left MFD provides a moving map display, whereas sectional charts and airspace overlays are provided via downloadable community Virtual RMM files and can be accessed via the CHART button.

Virtual RMM files used by the Virtual Roulettes Air Academy are available on the Virtual Roulettes website at https://virtualroulettes.au

Q. Why do my textures differ in resolution at different points in the aircraft?
A. Cockpit textures do differ in resolution throughout the product. These are in keeping with memory usage across medium end systems, and especially looking toward to Xbox Compatibility.

We have focused on high detail where it is needed (decals and the like) and lower where it is deemed non-essential.

Q. I am an Air Force PC-21 pilot; can I use this for flight training?
A. This is not a training aid, nor is it permitted for being used on any other platform than Microsoft Flight Simulator.

For more information, please refer to the INTENDED USE paragraph on Page 7 for more information on permitted use cases.

Q. I have found a bug or would like to request a suggestion, where do I go?
A. Our online issue tracker is available to submit bugs via the link below.

IRIS PC-21 Submit a Bug Form
https://wkf.ms/3zsQbSO

If you want to see the status of an issue, or if your issue has been submitted before, please visit the following link to view the online issue tracker.
IRIS PC-21 - Issue Tracking System (Public)
https://view.monday.com/3281096012-1578f58667621e782ae1ea907de198b4?r=use1

UPDATING/INSTALLING

IMPORTANT – IF YOU ARE MANUALLY UPGRADING YOUR PACKAGE FROM A PREVIOUS VERSION, PLEASE DELETE THE PREVIOUS VERSION FIRST!

This package is distributed both on the Microsoft Marketplace, Orbx Central and other vendors.

If you have purchased the package though the Microsoft Marketplace or through Orbx Central and you have followed the on-screen instructions, no further action is required from your end, as the plane should be available in the aircraft selection menu as the other default planes and should be automatically updated.

If you have purchased the package directly from the IRIS Simulations storefront and the aircraft is provided as a .zip file containing the iris-aircraft-pc21 folder, simply copy and paste it into your COMMUNITY folder.

NOTE: The exact location of the folder will depend on your selection where you have installed Microsoft Flight Simulator.

Once you have indicated where your COMMUNITY folder is, just follow the on-screen instructions.

NOTE: If you DO NOT know where the community folder is located, you can follow this procedure:

Within Microsoft Flight Simulator loaded, go to Options / General.

1. Click on "Developers" which you will find at the bottom of the list on the left.

2. Switch Developers Mode on.

3.On the Dev Menu select Tools / Virtual File System.

4. The Community folder location can be found under "Watched Bases"

NOTE: If copying the contents into the Community folder fails because files names are too long you can proceed as follows:

1. Extract the package folder on your desktop or in any known and easily acceptable location.

2. Rename the package folder from “iris-aircraft-pc21” to anything short and recognizable such as “IRIS-PC21” or just “PC21”.

3. Place the renamed package folder in the Community folder.

Alternatively for EXPERT WINDOWS USERS ONLY, it is possible to edit the "LongPathsEnabled” entry in the Windows registry key:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\FileSystem

Once the aircraft is installed in the Community folder, it will be available in the aircraft selection menu next time you start Flight Simulator.

If Flight Simulator was running during the install process, you need to close it and restart it for the aircraft to appear.

NOTES FROM THE DEVELOPERS

FLIGHT MODEL

Please note that the IRIS PC-21 flight model is designed to work with the new Flight Simulator flight model (Options->General Options->Flight Model->MODERN).

This is the default option for Microsoft Flight Simulator, and it should be your setting unless you have changed it.

Some users may have changed the flight model to "LEGACY" to use older FSX derived add-on planes. In this case you must revert to the "MODERN" flight model.

With the modern flight model, the IRIS PC-21 should behave well and be quite stable and easy to fly within the regular flight envelope.

With the above considered, please note that different control devices, sensitivities and calibration may provide a wide range of results. You may need to adjust your control sensitivities and settings to find a setting that feels comfortable for your experience.

Please also note that while this flight model is designed to perform accurately across the flight envelope, stall and spin characteristics may differ to that expected.

INTERACTION

Please note that the IRIS PC-21 is designed to work with the 'LOCK' Cockpit Interaction System (Options->General Options->Accessibility->Cockpit Interaction System->LOCK).

This is the default option for Microsoft Flight Simulator, and it should be your setting unless you have changed it.

Some users may have changed the flight model to 'LEGACY' for personal preference. While the IRIS PC-21 does function with the 'LEGACY' interaction system, knobs and switches will operate differently than designed.

DISPLAY GRAPHICS

The IRIS PC-21 has been designed using XML based graphics on displays. If you experience blurry gauges and displays, please change your antialiasing setting to 'DLAA'
(Options->General Options->Graphics->Anti-Aliasing->DLAA).

REMOVABLE MEMORY MODULE (RMM)

The Left MFD CHART, OVERLAY backgrounds and pre-set frequency trigrams (STUDS) are configurable via editing of accessible files.

Virtual RMM files can be found on the Virtual Roulettes website under 'Our Aircraft' and will provide example sectionals, airspace overlays and studs for RAAF Base East Sale (1FTS/CFS) and RAAF Base Pearce (2FTS) in Australia for those looking to take their recreational flight simulation roleplaying to the extreme!

POWER MANAGEMENT SYSTEM (PMS)

The PMS in the aircraft is a Pilatus patented system and not simulated in this product.

The IRIS PC-21 PMS functions to mitigate the air density thrust issue carried over from earlier Microsoft Flight Simulator products to provide more accurate power/attitude/performance settings from sea level to cruise.

Turning PMS off will provide full power availability and will result in an unrealistic overpowered condition at sea level.

FLIGHT MANAGEMENT SYSTEM (FMS)

While the aircraft uses the CMC Flight Management System, due to technical limitations, we have a modified FMS based on the MSFS 747 unit.

TRIM AID DEVICE (TAD)

The TAD is not simulated in this product, though handling has been improved to reduce the requirement of TAD For those wanting to significantly reduce the rudder requirement in the IRIS PC-21, we recommend using Auto Rudder.

(Options->Assistance Options->Piloting->AUTO-RUDDER).

EXTERNAL SMOKE GENERATORS (ESG)

To operate the smoke effects on any of the aircraft for aerobatics, please ensure you have a control binding tied to the 'TOGGLE LOGO LIGHTS' function.

Operation of the smoke system through the above function is dependent on the following factors:

1. **ESGs are then added via the Ground Crew page on the Right MFD (Right MFD->INST->G/CREW).**
2. **The SMOKE switch on the right-hand console behind the ECS panel is moved to the ARM position.**
3. **When you then use the control binding for the LOGO LIGHTS, an Asterisk is indicated on the HUD Smoke display to indicate that smoke is being dispensed.**

Using the appropriate button on the Right MFD while on the G/CREW page, you can cycle the stores options through the following configurations.

a. **STORES: CLEAN – No stores fitted**
b. **STORES: ESG – ESGs fitted, smoke emits from both units.**
c. **STORES: ESG/UWT – External Fuel Tanks fitted, ESGs mounted in transit location and are INOP**
d. **STORES: UWT – ESGs not fitted, External Fuel Tanks in place**

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SECTION 1

DESCRIPTION AND OPERATION

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SECTION 1

CHAPTER 1

DESCRIPTION AND OPERATION

THE AIRCRAFT

THE ULTIMATE TRAINING SYSTEM

To train the next generation of military pilots, Pilatus developed the next generation trainer: the PC-21, designed and built specifically with student pilots in mind.

With air force budgets under continuous pressure, the PC-21 provides a cost-effective and highly efficient training solution. On the PC-21, pilots destined to fly fighter aircraft do not need to transition to jets until much later than those flying conventional trainer aircraft, reducing cost and training time.

To achieve this, Pilatus significantly expanded the design and performance envelope to take this single-engine turboprop into an area that was, until now, exclusively the domain of jet trainer aircraft.

IRIS PC-21 General Arrangement

AB-INITIO TO ADVANCED TRAINING

The PC-21 is as benign and easy to fly for the ab-initio student as it is challenging and rewarding for the pilot preparing for the front line. The capabilities of the PC-21 make it ideally suited to a very wide training envelope.

It can be used from day one, eliminating the need for an elementary flying training fleet and bridging the performance gap between traditional turboprop trainers and expensive lead-in fighters. In this respect, the PC-21 provides significant advantages over traditional turboprops and jet trainers.

NEXT GENERATION TRAINING FOR NEXT GENERATION AIR FORCES

The PC-21 design ensures a predictable operating cost profile. An innovative concept, modern materials, and validation with a full-scale fatigue test, result in an aircraft that is ideal for both conventional and performance-based operations. Experience with existing PC-21 customers has shown that it is possible to reduce the cost of taking a student to wings graduation by more than 50 per cent.

FULLY CUSTOMISABLE TO YOUR NEEDS

Systems integration is at the heart of the PC-21 cockpit philosophy. As an advanced trainer aircraft, the cockpit display and control systems are configured to match the latest generation front-line aircraft as closely as possible.

Trainees are exposed to an operational cockpit environment at the earliest stages of their training. This enables aircrew to acquire skills that are of direct relevance to front-line aircraft from day one.

ENHANCED TRAINING FOR EACH PHASE

The PC-21 is designed not only to satisfy the requirements for basic and advanced military pilot training but also to provide enhanced training for all aircrew in the following skills: mission planning and tactical navigation, mission system management, civil flight management, electronic warfare, air-to-air operations and air-to-ground operations including radar training, simulated weapons employment and night vision goggles operation.

The PC-21 is enhanced by the ability to adapt the aircraft avionics to the requirements of each phase of training. The front and rear cockpits can be de-coupled for independent operation or to allow instructor access to training modes and data not available to the trainee.

MAXIMISE TRAINING EFFICIENCY ON THE GROUND

The objective of a modern pilot training system is to produce a pilot capable of meeting the demands of flying today's sophisticated aircraft. With increasing cost of equipment, resources and time, this goal needs to be achieved as economically as possible.

Preparation on the ground saves perspiration and failure in the air. By the time students fly, they should be familiar with aircraft systems and avionics functionality. The PC-21 Ground-Based Training System translates student learning into an airborne context.

PC-21 The Next Generation Trainer, Pilatus Aircraft Ltd
Accessed 16th October 2022. https://www.Pilatus-aircraft.com/en/fly/pc-21

THE COCKPIT - GENERAL

PILOT & INSTRUCTOR

IRIS PC-21 Front Seat General Arrangement

IRIS PC-21 Rear Seat General Arrangement

GENERAL

The pressurised tandem cockpit has an automated cockpit conditioning system, an anti-g system, and an on-board oxygen generation system (OBOGS).
The Martin Baker Mark 16L zero-zero ejection seat has command ejection. The pilots have good all-round views.

DISPLAYS

Each cockpit is fitted with three 152mm×203mm (6in×8in) active-matrix liquid crystal displays (AMLCD).

The central liquid crystal display is the primary flight display (PFD), with a multi-function display (MFD) either side of the PFD.
The bezel-mounted display buttons and up-front control panel (UFCP) buttons are used to select the navigation, mission, systems, and tactical data displayed on the two outer multi-function displays.

Two 761mm Meggitt secondary back-up displays alongside the UFCP show the primary flight display, systems, and essential engine data.
All the PC-21 cockpit displays, and lighting systems are night vision NVIS class B compatible.

HEAD UP DISPLAY

The forward cockpit is fitted with a Flight Visions SparrowHawk head-up display (HUD) with a FVD-4000 HUD symbol generator and the rear cockpit is equipped with a full colour HUD repeater display showing the view from the HUD camera, overlaid with HUD symbology information.

The front and rear cockpits can be fully decoupled, allowing the instructor access to training modes and sensor data unavailable to the trainee pilot.

MISSION SYSTEMS

The aircraft's CMC Electronics FV-4000 mission computer is fitted with 500MHz Power PC G4 processors, each with 512MB memory for real-time, high refresh rate data processing. The open system avionics architecture allows for adaptation and system upgrade.

The navigation suite includes an integrated laser inertial navigation sensor, a global positioning system and Kalman filter. The systems have ARINC and military-standard 1553B data bus interfaces.

Pilatus PC-21 Turboprop Trainer Aircraft, Airforce Technology.
Accessed 16th October 2022, https://www.airforce-technology.com/projects/pc_21/

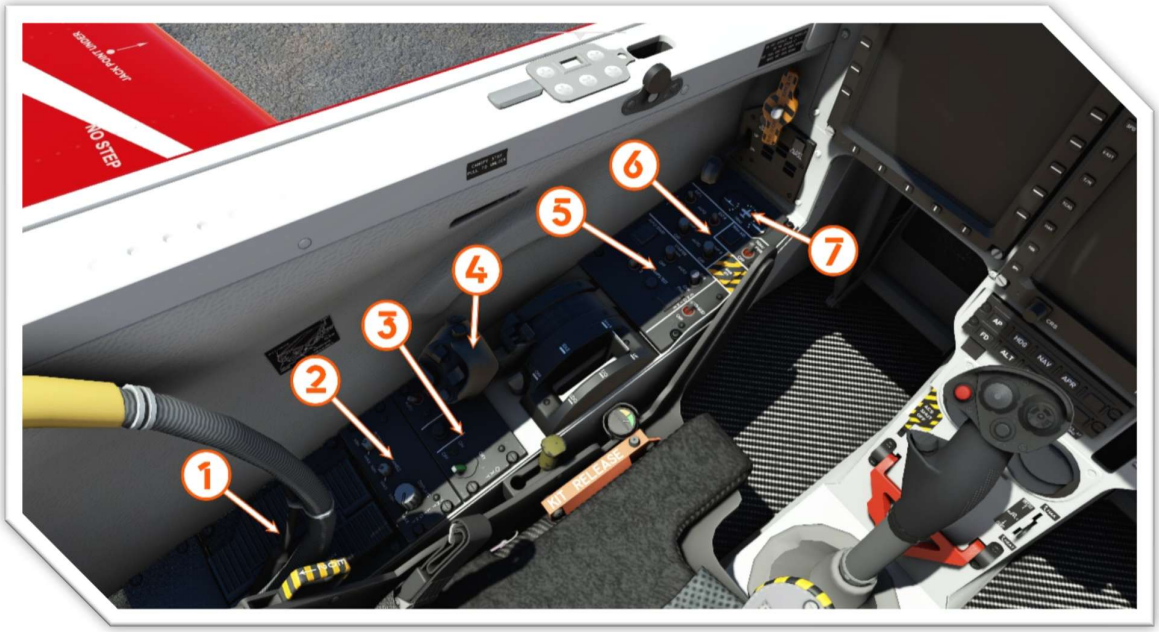
THE COCKPIT – IN DETAIL

GENERAL

The following sections will detail the pilot's seat in the front of the aircraft cockpit. Due to the similarities between the front and rear seats, the rear seat will not be covered unless specific details are required, in which case they will be outlined at the end of this section.

The sections below will be outlined in order of typical cockpit workflow for aircraft of this type.

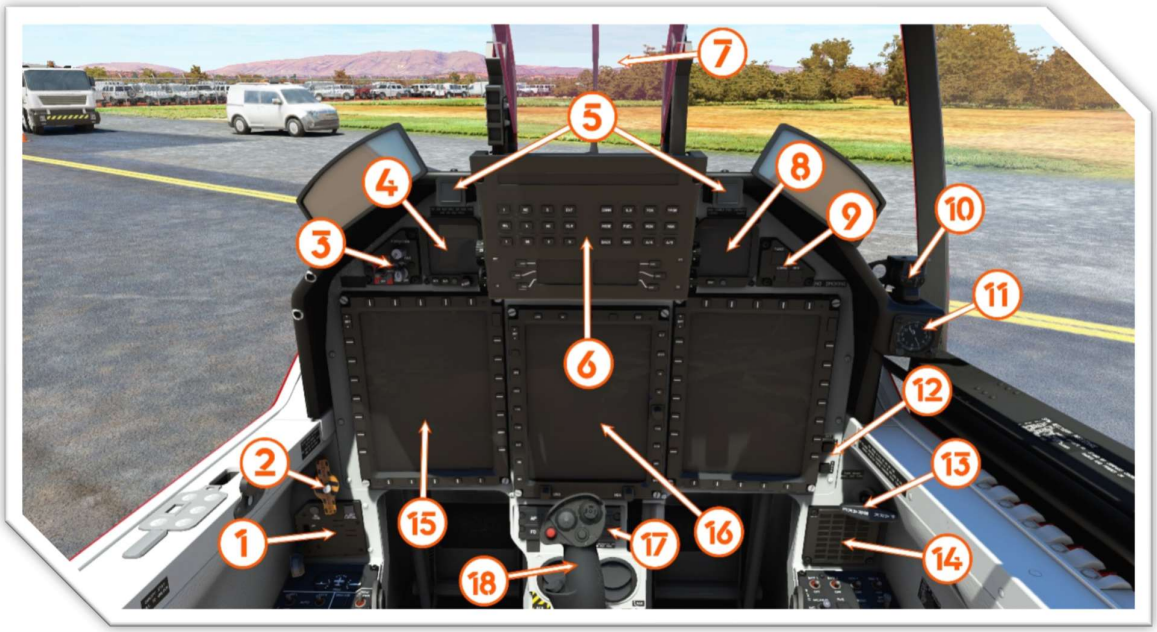
LEFT CONSOLE



The following are details of the numbered items shown in the image above.

1. **Mission Data Recorder (MDR) & FUEL/HYD Cutoff (not shown)**
2. **Internal Lighting Panel**
3. **Oxygen Panel**
4. **Power Control Lever (PCL) & Flaps Lever**
5. **Engine Control Panel**
6. **Fuel Panel**
7. **Trim Indicator Panel**

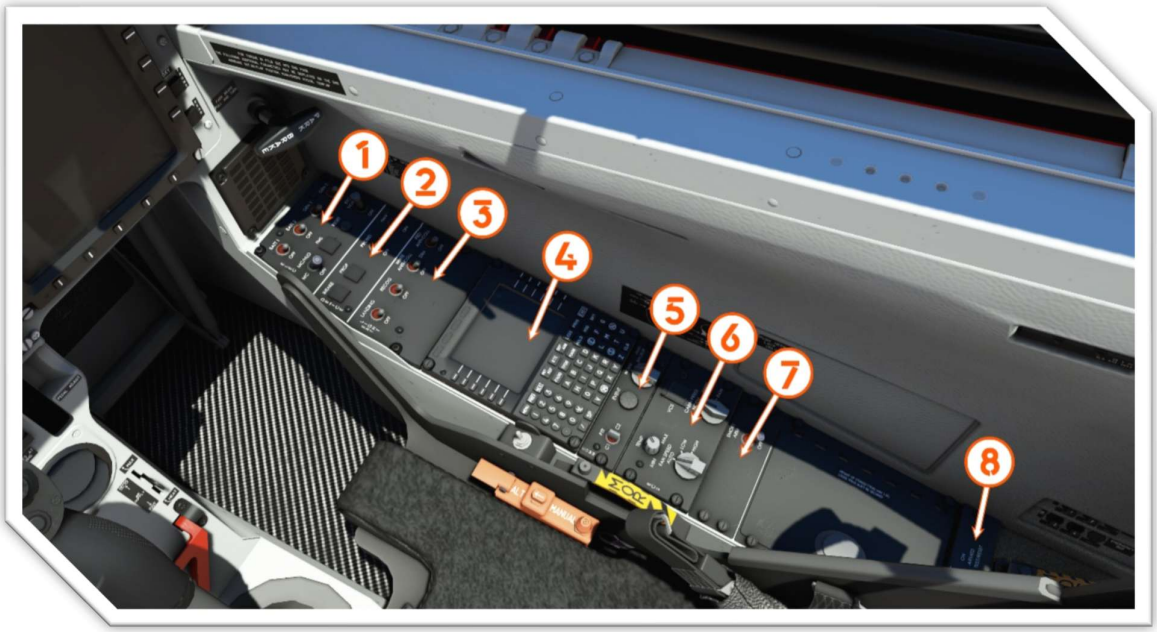
INSTRUMENT PANEL



The following are details of the numbered items shown in the image above.

1. Landing Gear Panel
2. Emergency Landing Gear
3. Arm Panel
4. Secondary Flight Display (SFD)
5. Attention Getters
6. Up-Front Control Panel (UFCP)
7. Head Up Display (HUD)
8. Engine Monitoring Display (EMD)
9. TAWS Panel
10. Compass
11. Clock
12. Front and Rear Oxygen Flow Indicators
13. Park Brake
14. Dedicated Warning Panel (DWP)
15. Multi-Function Display (MFD)
16. Primary Flight Display (PFD)
17. Autopilot Mode Control Panel (MCP)
18. Control Column (Click to Hide/View)

RIGHT CONSOLE



The following are details of the numbered items shown in the image above.

1. **Electrical Panel**
2. **De-Ice Panel**
3. **External Lighting Panel**
4. **Flight Management System (FMS)**
5. **Communications Panel**
6. **Environmental Control Systems (ECS) Panel**
7. **External Smoke Generators (ESG) Panel**
8. **Emergency Location Transmitter (ELT) (not shown)**

LEFT CONSOLE – IN DETAIL

MISSION DATA RECORDER (MDR)

The MDR is used as a storage device for uploading data, including digital maps from the Mission Planning System (MPS) to the aircraft and as a mission recording device during flight for replay on the Mission Debriefing System (MDS). The MDR uses a removable memory module (RMM) for data transfer.

INTERNAL LIGHTING PANEL

The internal lighting panel consists of three rotary knobs, (from left to right).

- **Cockpit Flood Lights**
- **Panel Backlighting**
- **Display Brightness**

Cockpit Flood Lights

The FLOOD knob controls the intensity of the cockpit flood lights located on the cockpit sidewalls in the front and rear. For the purposes of the product, internal lighting is duplicated in front and rear, so operating the lighting in the front cockpit will operate both front and rear at the same time.

Panel Backlighting

The PANELS knob controls the intensity of the panel backlighting. This covers both front and rear side consoles, instrument panel and UFCP backlighting.

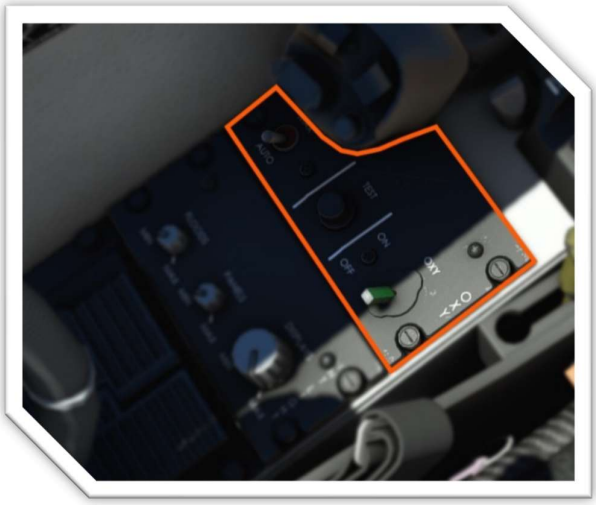
Display Brightness

The DISPLAYS knob controls the intensity of front and rear digital displays. These include.

- **Left & Right Multi-Function Displays (MFD)**
- **Primary Flight Display (PFD)**
- **Engine Monitoring Display (EMD)**
- **Secondary Flight Display (SFD)**
- **Flight Management System (FMS)**

Note: that the brightness of the UFCP and HUD displays are controlled by their own separate rotary knobs and are detailed later in this document.

OXYGEN PANEL



The Oxygen panel consists of two dual position switches & a pushbutton, (from left to right).

- **Oxygen Mixture Switch**
- **Oxygen Test Pushbutton**
- **Oxygen Power Switch**

Oxygen Mixture Switch

The oxygen mixture switch toggles between maximum oxygen mix and automatic oxygen mixture control. When in the MAX position, a green M-OXY indication is shown on the Dedicated Warning Panel (DWP)

Oxygen Test Pushbutton

Pressing the oxygen test pushbutton will provide positive pressure to the oxygen mask. This is commonly performed during initial checks to determine if the mask has a suitable seal. This is not simulated in this product.

Oxygen Power Switch

The oxygen power switch turns on the Onboard Oxygen Generation System (OBOGS) to provide oxygen to the aircrew. When this switch is in the ON position, a flashing oxygen blinker indication will appear on the oxygen flow indicators on the bottom right of the instrument panel. When turned off, a red OXY indication will appear on the Right MFD.

POWER CONTROL LEVER (PCL) & FLAPS

The Power Control Lever (PCL) area features the following items.

1. Power Control Lever (PCL)
2. Fuel Cut-off Lever
3. Flap Position Lever

Power Control Lever (PCL)

The PCL provides the aircrew with the ability to adjust the power of the aircraft engine affecting thrust.

Fuel Cut-Off Lever

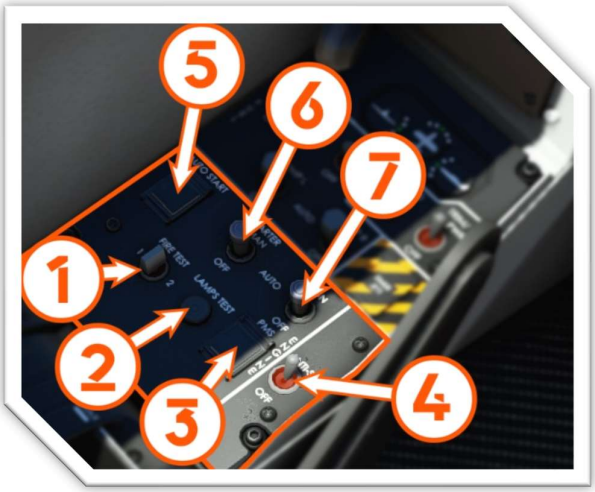
The fuel cut-off lever when pulled, will move the PCL from the IDLE position to the OFF position, stop fuel flow to the engine and shut the engine down.

On engine start, clicking the PCL will move the PCL from the OFF position to the IDLE position and introduce fuel to the engine.

Flap Position Lever

The flap position lever is used to move the aircraft wing trailing edge flaps through the UP, TAKE-OFF (T/O) and LAND (LDG) positions.

ENGINE PANEL



The Engine Panel features the following items.

1. Fire Test Switch
2. Lamps Test Switch
3. Power Management System (PMS) Pushbutton
4. Anti-Skid System Switch
5. Auto Start Cover & Pushbutton
6. Starter Switch
7. Ignition Switch

Fire Test Switch

The Fire Test switch is a three-position momentary switch which allows the pilot to evaluate the fire warning circuits.

Pushing the switch to the left, tests circuit 1 and is indicated by a red FIRE 1 indication on the Right MFD and flashing attention getters.

Pushing the switch to the right, tests circuit 2 and is indicated by a FIRE 2 indication on the Right MFD and flashing attention getters.

Lamps Test Switch

The LAMPS TEST pushbutton will illuminate various lamps around the cockpit allowing the pilot to ensure there are no inoperative lights or indicators of importance.

Power Management System (PMS) Pushbutton

The Power Management System (PMS) pushbutton is a guarded pushbutton which toggles the PMS on and off. The PMS is on by default, with a red OFF indication when turned off by the pilot. While some indications are shown, accurate functionality of the PMS is not simulated in this product. Please see the NOTES FROM THE DEVELOPERS section for more information.

Anti-Skid System Switch

The Anti-Skid System Switch is a two-position toggle switch which turns on or off anti-skid braking. When not available, an amber ANTISKID indication is shown on the right MFD, and an amber SKID indication is shown on the DWP.

Note: Anti-Skid Braking is not available if hydraulic pressure is below 1500 psi.

Auto Start Cover & Pushbutton

The Auto Start Pushbutton provides a one press function for starting the PC-21 engine. The button is a guarded pushbutton and requires lifting the cover prior to pressing the pushbutton.

Providing suitable conditions are met, the auto start pushbutton will begin to spool the engine, and at above 10% NG, the PCL is moved from OFF to the IDLE position for engine start.

Starter Switch

The Starter switch is a three-position switch. In the OFF position, the starter is disengaged. In the AUTO position, the starter is controlled by the Auto Start system & in the ON position, the starter engages separate to the Auto Start system.

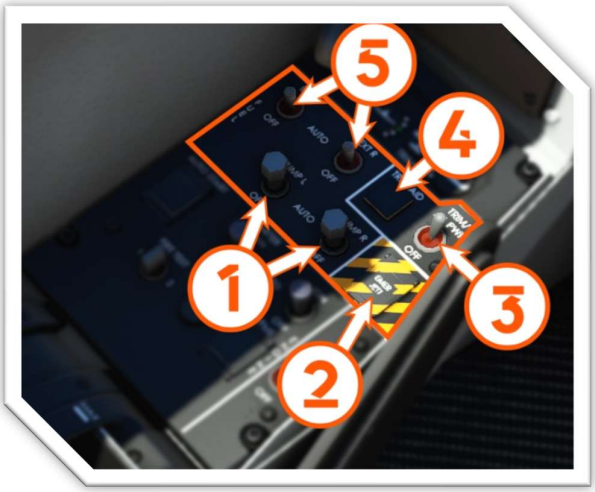
This is left in the AUTO position for normal use.

Ignition Switch

The Ignition switch is a three-position switch. In the OFF position, the ignitors are disengaged. In the AUTO position, the ignitors are controlled by the Auto Start system & in the ON position, the ignitors engage separate to the Auto Start system.

This is left in the AUTO position for normal use.

FUEL PANEL



The Fuel Panel features the following items.

1. Internal Fuel Pump Switches
2. Emergency Jettison Pushbutton
3. Trim/Aileron Power Switch
4. Trim Aid Device (TAD) Pushbutton
5. External Fuel Pump Switches

Internal Fuel Pump Switches

The Internal Fuel Pump switches are three-position switches. In the OFF position, the Fuel Pump is unpowered. In the AUTO position, the fuel pumps are controlled by the PCL position, and in the ON position, the fuel pumps are turned ON regardless of other settings.

This is left in the AUTO position for normal use.

The Emergency Jettison Pushbutton

The Emergency Jettison Pushbutton provides a one press function for jettisoning wing stores. The button is a guarded pushbutton and requires lifting the cover prior to pressing the pushbutton. This is not simulated in this product.

Trim/Aileron Power Switch

The Trim/Aileron Power switch controls if the powered trim and aileron function is on or off. While the effects of the Trim/Aileron Power switch are not simulated in the product, appropriate indications will appear on the DWP and Right MFD HYD page.

Trim Aid Device (TAD) Pushbutton

The Trim Aid Device Pushbutton toggles the Trim Aid Device function on and off.

When turned OFF, it is indicated by a Cyan OFF indication on the pushbutton.

This function is not toggleable within the aircraft; however, the TAD can be simulated through the simulation use of the AUTORUDDER flight assistance setting.

(Options->Assistance Options->Piloting->AUTO-RUDDER).

External Fuel Pump Switches

The External Fuel Pump switches are three-position switches. In the OFF position, the Fuel Pump is unpowered. In the AUTO position, the fuel pumps are controlled by the PCL position, and in the ON position, the fuel pumps are turned ON regardless of other settings.

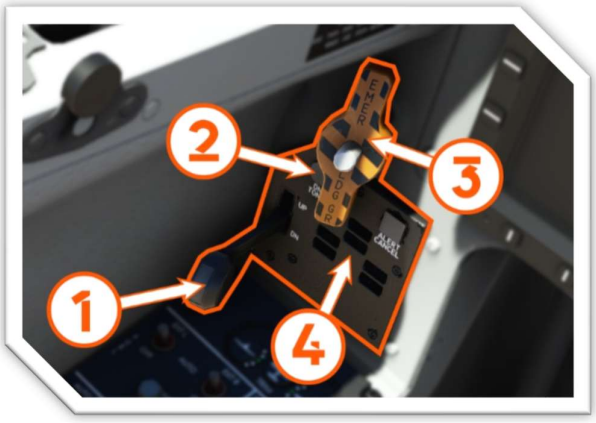
This is left in the AUTO position for normal use.

TRIM INDICATOR PANEL

The Trim Indicator Panel displays (from left to right) Aileron, Rudder & Elevator trim indications.

INSTRUMENT PANEL – IN DETAIL

GEAR LEVER



The Gear Panel features the following items.

1. **Gear Lever**
2. **Down Tone Pushbutton**
3. **Emergency Landing Gear Handle**
4. **Landing Gear Indicator Lights**

Gear Lever

The landing gear lever is used to raise or lower the aircraft landing gear. A flashing red indication on the landing gear handle is illuminated if the flaps are placed into the LDG position with the gear up, or if the LAMPS TEST pushbutton is pressed.

Down Tone (DN TONE) Pushbutton

The Down Tone pushbutton when pressed will indicate a constant beep noise over the COMM 1 frequency to alert ATC that the gear is down, locked and verified by the pilot. In this simulation, the tone is played but not transmitted.

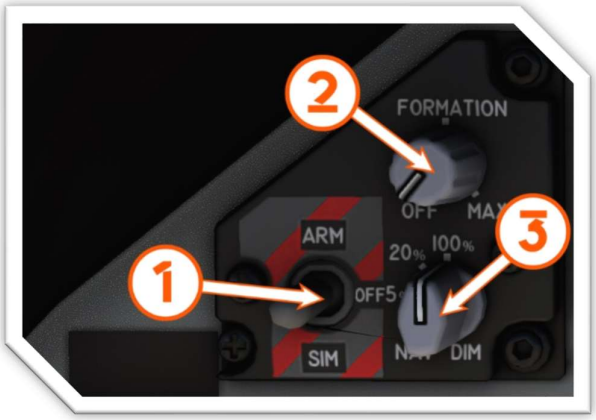
Emergency Landing Gear Handle

The emergency landing gear handle will lower the landing gear in the event of hydraulic pressure loss.

Landing Gear Indicator Lights

The landing gear indicator lights will illuminate a red UNLCK indication when raising or lowering, a green down arrow when down and locked and will extinguish completely when raised.

ARM PANEL



The ARM Panel features the following items.

1. ARM Switch
2. Formation Light Rotary Knob
3. NAV DIM Rotary Knob

ARM Switch

The ARM switch is a three-position switch controlling the synthetic weapons system on the PC-21. This toggles between ARM, OFF and SIM. This is not simulated in this product.

Formation Light Rotary Knob

The Formation Light rotary knob controls the intensity of the green formation light strips on the fuselage, horizontal stabilizer, and underwing area.

NAV DIM Rotary Knob

The NAV DIM rotary knob controls the intensity of the Navigation lights on the wingtips. These change between 5%, 20% and 100% brightness depending on the setting from the pilot.

SECONDARY FLIGHT DISPLAY (SFD)

The Secondary Flight Display (SFD) features the following items.

1. ALN/NAV Pushbuttons
2. SFD Screen
3. Barometric Pressure rotary knob

ALN/NAV Pushbuttons

Pressing the Align (ALN) pushbutton will force the SFD to align. This is performed automatically on power up and can be done at any time with this pushbutton.

Pressing the NAV pushbutton cycles between NAV1/2 functionality on the SFD. If NAV1/2 is an ILS localiser, the display indicates ILS1/2.

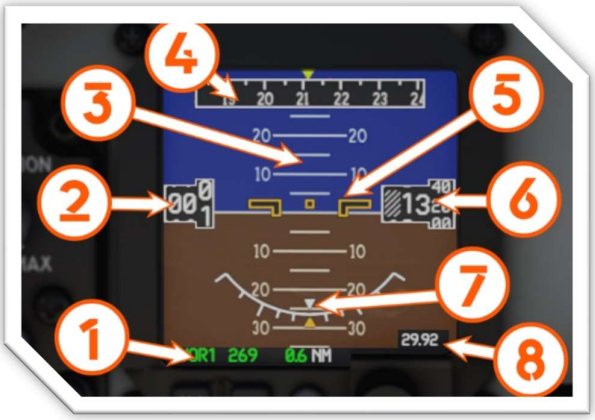
SFD Screen

See The Secondary Flight Display – In Detail section below for more information on the SFD functionality.

Barometric Pressure Rotary Knob

The Barometric Pressure Rotary Knob adjusts the calibration of the SFD barometric pressure. The readout can be toggled between inches of mercury (inHG) and hectopascals (MB) via the Right MFD Instructor (INST) page.

SECONDARY FLIGHT DISPLAY (SFD) – IN DETAIL



The Secondary Flight Display (SFD) screen features the following items.

1. NAV Readout
2. Indicated Airspeed
3. Pitch Ladder
4. Compass
5. Attitude Reference Symbol
6. Indicated Altitude
7. Roll Pointer
8. Barometric Pressure Readout

NAV1/2 Readout

The NAV Readout displays the following (from left to right).

- Active NAV (VOR1/2 or ILS1/2) cycled via the NAV pushbutton.
- Active NAV bearing to the tuned navaid.
- Distance in nautical miles to the tuned navaid.

Pressing the NAV pushbutton cycles between VOR1/VOR2 functionality on the SFD. If VOR1/VOR2 is an ILS localiser, the display indicates ILS1 or ILS2.

Indicated Airspeed

The Indicated Airspeed Readout will display rotating values of the current aircraft indicated airspeed in knots.

Pitch Ladder

The Pitch Ladder provides a 360-degree visualisation of the aircraft's pitch with blue indicating the sky and brown indicating the ground. Overlayed is a pitch 'ladder' with horizontal markings every 5 degrees and numbered markings every 10 degrees.

Compass

The compass at the top of the SFD shows the aircraft current magnetic heading in degrees.

Attitude Reference Symbol

The attitude reference symbol on the SFD indicates the aircraft orientation relative to the horizon, being represented by the pitch ladder.

Indicated Altitude

The indicated altitude readout displays the current altitude above mean sea level (MSL) in feet, as calibrated by the barometric pressure rotary knob.

Roll Pointer

The Roll Pointer aligns with the roll scale to show the angle of bank of the aircraft. Marks on the roll scale indicate bank angles of 10,20,30,45 and 60 degrees in either direction.

Barometric Pressure Readout

The barometric pressure readout displays the local barometric pressure in inches of mercury (InHG) or hectopascals (MB). The pilot can select either inHG or MB via the Right MFD Instructor page.

UP-FRONT CONTROL PANEL (UFCP)

The Up-Front Control Panel (UFCP) features the following items.

1. Numeric Keypad Pushbuttons
2. Master Mode Pushbuttons
3. UFCP Brightness Rotary Knob
4. COMM1 Volume Rotary Knob
5. Intercom Volume Rotary Knob
6. COMM2 Volume Rotary Knob

Not numbered

- Data Display
- Scratchpad
- LSK 1-3 Left Pushbuttons
- LKS 1-3 Right Pushbuttons

Numeric Keypad Pushbuttons

Used for numerical entry of data.
The ENT will enter and confirm any aircrew entered data into the system, whilst CLR will clear any data currently on the SCRATCHPAD prior to the aircrew pressing ENT.

Master Mode Pushbuttons

The master mode pushbuttons allow you to select one of the following master-modes.

- **COMM Page**
- **ILS Page**
- **TACAN (TCN) Page**
- **TRANSPONDER (TPDR) Page**
- **MODE Page**
- **FUEL Page**
- **MISSION (MSN) Page**
- **MARK (MRK) Page**

The NAV, A/A & A/G functions are inoperative on the UFCP in this product.

UFCP Brightness Rotary Knob

Moving the Brightness Knob with the mouse, adjusts the intensity of the UFCP LCD displays. It does not adjust the UFCP panel backlighting, as that is adjusted using the PANEL brightness knob.

COMM 1 Volume Rotary Knob

A variable position knob which controls the volume of the COMM 1 IDENT radio.

Intercom Volume Rotary Knob

This function is not supported in this product.

COMM 2 Volume Rotary Knob

A variable position knob which controls the volume of the COMM 2 IDENT radio.

Data Display & Scratchpad Readout

The DATA DISPLAY shows all necessary information to the aircrew as dictated by the UFCP mode selected. The SCRATCHPAD displays any aircrew entered data prior to acceptance by the UFCP system.

Right & Left Line Select Keys

The Right and Left Line Select Keys allow you to interact with the distinct options on the Option Screens when in different Master Mode Pages

Right & Left Option Screens

The Right and Left Options screens provide information relating to the master mode being displayed.

Head Up Display (HUD) Brightness Rotary Knob

The HUD Brightness knob is located to the rear left side of the UFCP. This can be accessed via a hidden hotspot between the UFCP Brightness Knob and COMM1 volume knob on the left of the UFCP.

Please see UP-FRONT CONTROL PANEL (UFCP) – IN DETAIL for more information on the operation and master modes of the UFCP.

ENGINE MONITORING DISPLAY (EMD)

The Engine Monitoring Display (EMD) features the following items.

1. Fuel Flow Indicator
2. Fuel Quantity Scale
3. Fuel Quantity Readout
4. Engine Torque Display
5. Oil Pressure Scale
6. Battery Bus Readout
7. Engine Interstage Turbine Temperature (ITT) Readout
8. Flaps & Airbrake indications (not shown)

Fuel Flow Indicator

The Fuel Flow indicator displays fuel consumption in pounds per hour.

Fuel Quantity Scale & Readout

The Fuel Quantity scale shows fuel quantity on a sliding scale, with arrows to the left and right indicating the left and right tank quantity, respectively. A digital readout at the top shows the current fuel quantity in pounds.

Engine Torque Display

The Engine Torque Display shows the current engine torque being produced in a percentage value. It is shown via a rotating needle, and corresponding digital readout.

Oil Pressure Scale

The Oil Pressure Scale shows the current oil pressure in a sliding scale. This mirrors the oil pressure in the Right MFD system page.

Battery Bus Readout

The Battery Bus readout displays voltage and amperage for the Battery Bus.

Engine ITT Readout

The Engine ITT Readout displays the engine interstage turbine temperature in degrees Celsius.

Engine NG Readout

The Engine NG Readout displays the engine Gas Generator speed in percent.

Flaps and Airbrake Indications

Located on the bottom right of the EMD is a flap position indicator, which mirrors that shown on the PFD. Additionally, at the bottom centre of the EMD is an AIRBRAKE caption which displays when the ventral airbrake is deployed.

TAWS PANEL

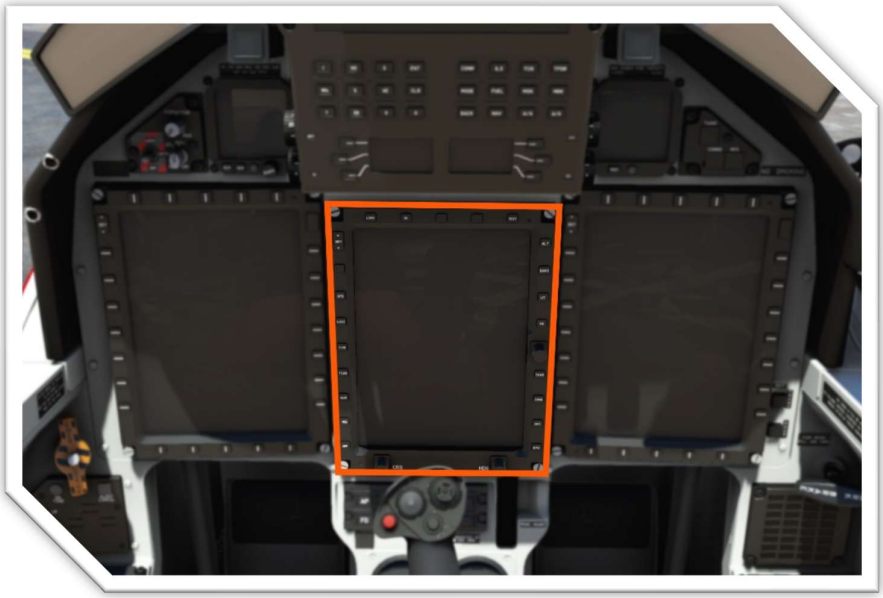
The TAWS function will play an audible 'PULL UP' cue if the HUD determines a risk to collision with terrain. When on, the TAWS indicator is blank, and when off, the TAWS indicator shows a cyan OFF indication.

MULTI-FUNCTION DISPLAYS (MFD)

The Left and Right Multi-Function Displays (MFD) are located to the left and right of the Primary Flight Display (PFD) and feature a single screen with pushbuttons on the surrounding bezel to interact with the features of the display.

For more information on the MFD, please refer to MULTI-FUNCTION DISPLAY (MFD) – IN DETAIL later in this document.

PRIMARY FLIGHT DISPLAY (PFD)



The Primary Flight Display (PFD) is located at the centre of the instrument panel directly below the UFCP. It features a single screen with pushbuttons on the surrounding bezel to interact with the features of the display.

Located on the Right bezel of the PFD is a multi-function knob supporting adjustments of the following.

- **Autopilot altitude hold value**
- **Barometric pressure**
- **Low altitude warning height**
- **Autopilot vertical speed adjustment**

On the bottom bezel of the PFD is the course select adjustment knob (CRS) and heading bug adjustment knob (HDG).

For more information on the PFD, please refer to
PRIMARY FLIGHT DISPLAY (PFD) – IN DETAIL later in this document.

AUTOPILOT MODE CONTROL PANEL (MCP)

The Autopilot Mode Control Panel (MCP) features the following items.

1. Autopilot Master Pushbutton
2. Heading Hold Pushbutton
3. NAV Hold Pushbutton
4. Approach Hold Pushbutton
5. Flight Director Pushbutton
6. Altitude Hold Pushbutton
7. Indicated Airspeed Hold Pushbutton
8. Vertical Speed Hold Pushbutton

Autopilot Master Pushbutton

Pressing the Autopilot Master pushbutton, toggles the Autopilot ON and OFF. When first pressed, the autopilot enters attitude hold mode, displaying ROLL and PITCH indications on the top of the PFD either side of a green AP indication.

When the AP pushbutton is pressed to turn off the autopilot, flight director symbology will remain, with the AP caption replaced by a green FD caption. Pressing the flight director pushbutton will remove all flight director indications.

Heading Hold Pushbutton

Pressing the HDG pushbutton will align the heading bug on the HSI to the aircraft heading and engage heading hold mode. This is indicated by any lateral autopilot caption changing to a green HDG indication.

NAV Hold Pushbutton

Pressing the NAV pushbutton will engage navaid hold mode. This is indicated by any lateral autopilot caption changing to a green NAV indication.

The autopilot NAV hold will steer the aircraft towards intercepting the CDI needle if the PFD NAV source is VOR1/2, ILS1/2 or TCN. If the PFD NAV source is MC or FMS, the simulation FMS or Mission Computer flight plan is automatically followed.

Approach Hold Pushbutton

Pressing the APR pushbutton will allow the aircraft to capture and fly an ILS approach providing the PFD NAV source is an ILS navaid. This is indicated by any lateral autopilot caption changing to a green APR indication.

Flight Director Pushbutton

Pressing the FD pushbutton will toggle the flight director symbology on and off regardless of autopilot state.

Altitude Hold Pushbutton

Pressing the ALT pushbutton will capture and hold the current altitude of the aircraft. This is indicated by any lateral autopilot caption changing to a green ALT indication.

Indicated Airspeed Hold Pushbutton

Pressing the IAS pushbutton above 200 feet AGL will engage the aircraft speed hold function and is indicated by a small cyan arrow on the PFD airspeed indicator showing the commanded airspeed to hold.

Vertical Speed Hold Pushbutton

Pressing the VS pushbutton will engage the aircraft vertical speed hold function. This is indicated by any vertical autopilot caption changing to a green VS indication.

Once the VS mode is selected, pressing the VS pushbutton on the PFD, and using the PFD multifunction knob will allow you to adjust the desired rate of climb/descent.

If an altitude is selected on the PFD using the PFD multifunction knob prior to engaging VS hold mode, the aircraft will automatically capture the required altitude and change from VS hold to ALT hold when the desired altitude is reached.

DEDICATED WARNING PANEL (DWP)

Located to the bottom right of the instrument panel below the park brake is the Dedicated Warning Panel (DWP).

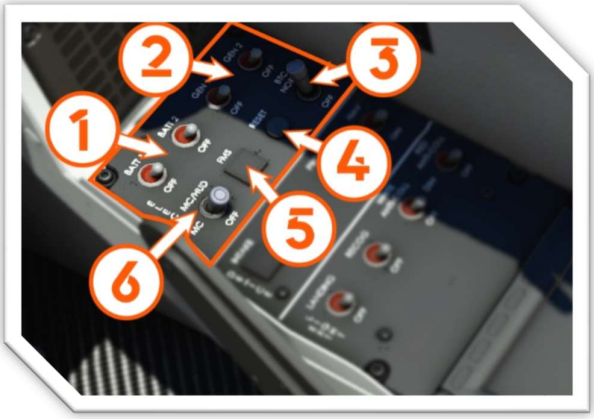
The DWP will display warnings, cautions and advisories in red, amber, and green as required for the pilot's attention. Any warnings or cautions that appear will coincide with the triggering of the flashing attention getters and aural warning.

Commonly any warnings or cautions on the DWP will also be accompanied by text on the bottom of the right MFD to support troubleshooting any issues.

Caption	Description
FIRE	Engine on fire, or Fire Test switch in 1 or 2 position.
PMS	Power Management System turned off.
OIL	Oil Pressure below or above limits.
OXY	Oxygen Switch in front or rear cockpit in the OFF position.
FPR	Not simulated.
HYDS	Hydraulic pressure below 1500 psi.
GENS	GEN 1 and 2 off.
OVPR	Engine TQ above 100% with PMS OFF.
FUEL	Fuel below UFCP Bingo setting.
HYD	Hydraulic pressure below 2000 psi.
GEN1	Generator 1 not providing power.
GEN2	Generator 2 not providing power.
CHIP	Not simulated.
SKID	Anti-skid system turned off, or hydraulic pressure below 1500 psi.
ICE	OAT below 5 degrees Celsius and PROBE switch not ON.
CNPY	Canopy unlocked.
START	Engine starters engaged.
IGN	Engine ignition engaged.
F-PMP	Fuel pumps engaged.
M-OXY	Oxygen mixture set to 100%.
I-BYP	Intake De-Ice set to BYPASS.
PROP	Prop De-Ice ON.
PROBE	Probe Heat ON.

RIGHT CONSOLE – IN DETAIL

ELECTRICAL PANEL



The Electrical Panel features the following items.

1. Battery 1 and 2 Bus Switches
2. Generator 1 and 2 Bus Switches
3. Bus Tie Contactor (BTC) Switch
4. Electrical Reset Pushbutton
5. FMS Power Pushbutton
6. Mission Computer (MC) / HUD Power Switch

Battery 1 and 2 Bus Switches

The Battery 1 and 2 Bus switches control the power from the Battery 1 and 2 Bus to the aircraft's systems.

Generator 1 and 2 Bus Switches

The Generator 1 and 2 Bus switches control the power from the aircraft powerplant to recharge the aircraft's battery buses.

Electrical Reset Pushbutton

The electrical reset function is not simulated in this product.

FMS Power Pushbutton

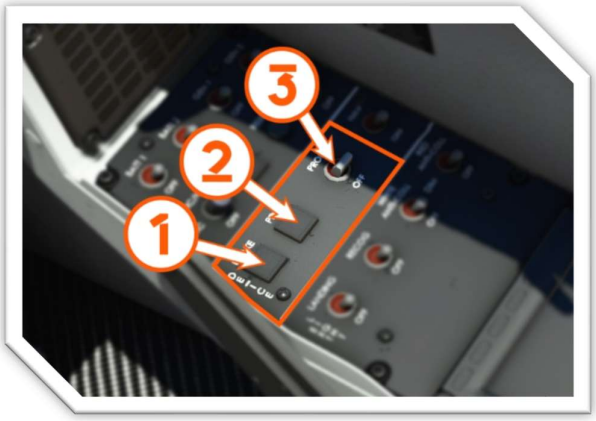
The FMS power pushbutton turns the Flight Management System on and off as required. When OFF, the FMS pushbutton is illuminated with a cyan OFF indication.

Mission Computer (MC) / HUD Power Switch

The Mission Computer / HUD Power switch is a three-position switch which controls the Mission Computer (UFCP/PFD and Left MFD displays and power) and Head Up Display.

The positions are OFF, MC (Mission Computer Only) and MC/HUD (Mission Computer and HUD).

DE-ICE PANEL



The De-Ice Panel features the following items.

1. Intake Bypass Pushbutton
2. Prop De-Ice Pushbutton
3. Probe Heat Switch

Intake Bypass Pushbutton

The Intake Bypass pushbutton will indicate a cyan BYPASS indication on the pushbutton and green I-BYP on the DWP.

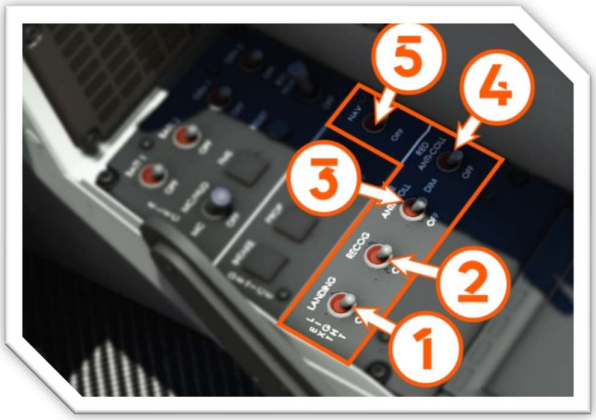
Prop De-Ice Pushbutton

The Prop De-Ice Pushbutton heats the leading edge of the five bladed propeller. It will indicate a cyan PROP on the Pushbutton and green PROP indication on the DWP when active.

Probe Heat Switch

The Probe Heat Switch turns the pitot probe heat on and off. When ON, the DWP will indicate a green PROBE indication.

EXTERNAL LIGHTING PANEL



The External Lighting Panel features the following items.

1. Landing Light Switch
2. Recognition Light Switch
3. White Anti-Collision Light Switch
4. Red Anti-Collision Light Switch
5. Navigation Light Switch

Landing Light Switch

The Landing Light switch will toggle the nose gear mounted landing lights on and off. The lights on the landing gear nose are extinguished when the gear is retracted regardless of the switch position.

Recognition Light Switch

The Recognition Light switch will toggle the recognition lights mounted to the outer leading edges of the wing. These are recommended to be ON during daytime operations and OFF at night due to the light reflection on the propeller blades affecting pilot visibility.

White Anti-Collision Light Switch

The White Anti-Collision Light switch will toggle the white anti-collision lights mounted on the aircraft wingtips on or off.

Red Anti-Collision Light Switch

The Red Anti-Collision Light switch will toggle the red anti-collision lights mounted on the aircraft wingtips on or off.

Navigation Light Switch

The Navigation Light switch will toggle the green and red navigation lights mounted on the aircraft wingtips on or off.

FLIGHT MANAGEMENT SYSTEM (FMS)

The FMS in the PC-21 is based on the default 747 functionality. Please refer to any Microsoft documentation supporting that device for further information.

COMMUNICATIONS PANEL

The Communications Panel features the following items.

1. **Push to Talk Switch**
2. **Event Pushbutton**
3. **Audio Management Unit (AMU) Control Knob**

Push to Talk Switch

The momentary three position Push to Talk switch will select COM1 or COM2 as the transmitting radio based on switch position.

Event Pushbutton

The EVENT pushbutton is not simulated in this product.

Audio Management Unit (AMU) Control Knob

The AMU Control Knob is not simulated in this product.

ENVIRONMENTAL CONTROL SYSTEM (ECS) PANEL

The Environmental Control System (ECS) Panel features the following items.

1. **ECS Temperature Rotary Knob**
2. **Vapour Cycle Cooling (VCS) Power Pushbutton**
3. **Cabin Pressure Mode Rotary Knob**
4. **ECS Fan Speed Rotary Knob**

ECS Temperature Rotary Knob

The ECS Temperature Rotary Knob allows the pilot to adjust the temperature of the VCS cooling system providing air conditioning in the cockpit.

Vapour Cycle Cooling (VCS) Power Pushbutton

The Vapour Cycle Cooling (VCS) pushbutton turns the VCS air conditioning on and off. When off, this is indicated by an amber OFF indication.

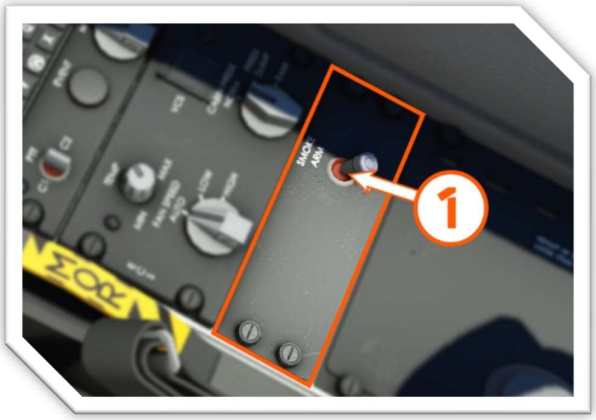
Cabin Pressure Mode Rotary Knob

The Cabin Pressure Mode function is not simulated in this product.

ECS Fan Speed Rotary Knob

The ECS Fan Speed function is not simulated in this product.

EXTERNAL SMOKE GENERATORS (ESG) PANEL



The External Smoke Generator (ESG) Panel features the following items.

1. **Smoke Arm Switch**

Smoke Arm Switch

The Smoke Arm switch is used in conjunction with ESGs to allow the aircraft to produce smoke from the ESG units. Please refer to the Developer notes for information on the conditions required to generate smoke.

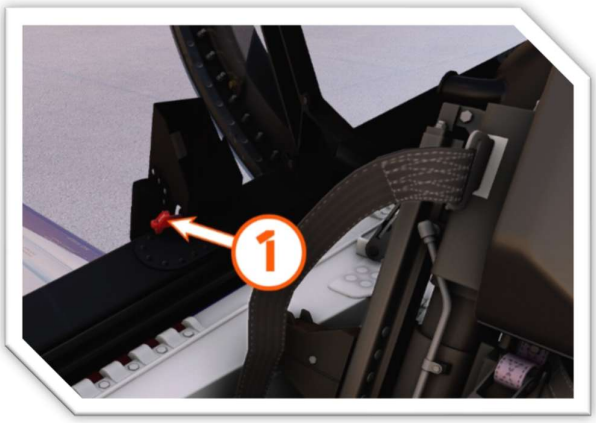
AIRCRAFT CANOPY – IN DETAIL

PILOT HELMET

When first entering the cockpit on the apron, your pilot helmet will be resting on the canopy frame. Click the helmet to wear it and note a darker view due to the visor being down. Dark and Clear visors can be toggled via the Right MFD Configuration page.

(Right MFD->INST->CFG)

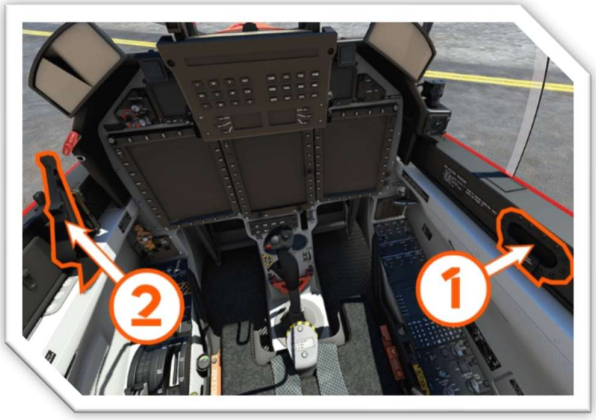
CANOPY FRACTURE SYSTEM (CFS) PIN



The Canopy Fracture System (CFS) Pin is stowed in the right canopy sidewall when safe and moved into the cockpit glareshield when armed.

Within the simulation, the CFS pin must be removed from the canopy and stowed in the glareshield before the canopy can be closed.

CANOPY LATCH & LOCKING SYSTEM



The Canopy Latch and Locking system features the following items.

1. **Canopy Latch Handle**
2. **Canopy Locking Lever**

Canopy Latch Handle

The Canopy Latch handle can be pulled to open or close the canopy when your helmet is on, and the CFS pin is removed and stowed.

Canopy Locking Lever

The Canopy Locking Lever is pushed forward to lock and pulled rearwards to unlock the canopy prior to operating the Canopy Latch handle. If the canopy locking lever is unlocked, a red CANOPY indication is shown on the Right MFD and amber CNPY indication is shown on the DWP.

REAR COCKPIT

NOTABLE DIFFERENCES

In the rear cockpit, notable differences are as follows.

- **Addition of a HUD repeater instead of the front seat HUD**
- **No FIRE TEST switch**
- **No External Fuel Tank Pump Switches**
- **No Emergency Landing Gear Handle**
- **No TAD Pushbutton**
- **No ARM Panel**
- **No MC/HUD Switch, BTC Switch or FMS Power Pushbuttons**
- **No De-Ice Panel**
- **No External Lighting Panel**
- **Reduced ECS panel**
- **No ESG Panel**

UP-FRONT CONTROL PANEL (UFCP) – IN DETAIL

INS ALIGN PAGE

On initial power up, after moving the MC/HUD switch into the MC or MC/HUD position, the Inertial Navigation System (INS) will begin to align. In this product, this process takes 120 seconds and the UFCP will display as above.

The Scratchpad will indicate TTA < 2MIN indicating the Time to Align (TTA) is less than 2 minutes.

After alignment, the UFCP will move to the MODE INIT Page automatically, where you should synchronise the SYS time with the GPS time, then move to the COMM page.

COMM PAGE

The COMM page on the UFCP is used to view and change radio communication frequencies and pre-set channels (STUDS).

The UFCP COMM page features the following displays.

DATA DISPLAY	COM1 STUD, Trigram or Active Frequency, COM2 STUD, Trigram or Active Frequency and scratchpad.
LSK1 LEFT	COM1 Indicator
LSK2 LEFT	COM1 VHF Monitor
LSK3 LEFT	INOP
LSK1 RIGHT	COM2 Indicator
LSK2 RIGHT	COM2 VHF Monitor
LSK3 RIGHT	Guard Frequency Assign

Changing the COM Frequency or STUD

To alter the COM Frequency or STUD, follow the procedure below.

1. **Using the numeric keypad, push in the desired radio frequency (up to six digits) or STUD (up to two digits) without the decimal point and press the ENT key. (e.g., 124.850 would be entered in by the value 124850)**

2. **Confirm the value in the UFCP SCRATCHPAD**

3. **Assign the Frequency or STUD from the SCRATCHPAD to the COM 1 or COM 2 radios by pressing LSK1 LEFT for C1, or LSK1 RIGHT for C2**

ILS PAGE

The ILS page on the UFCP is used to view and change navigation aid frequencies.

The UFCP ILS page features the following displays.

DATA DISPLAY	NAV1 Active Frequency, NAV2 Active Frequency and scratchpad.
LSK1 LEFT	NAV1 Indicator
LSK2 LEFT	NAV1 IDENT
LSK3 LEFT	NAV1 Audio MUTE/UNMUTE function
LSK1 RIGHT	NAV2 Indicator
LSK2 RIGHT	NAV2 IDENT
LSK3 RIGHT	NAV2 Audio MUTE/UNMUTE function

Changing the NAV Frequency

To alter the NAV Frequency or STUD, follow the procedure below.

1. Using the numeric keypad, push in the desired radio frequency (up to six digits) or STUD (up to two digits) without the decimal point and press the ENT key. (e.g., 109.50 would be entered in by the value 109500)

2. Confirm the value in the UFCP SCRATCHPAD

3. Assign the Frequency or STUD from the SCRATCHPAD to the NAV 1 or NAV 2 radios by pressing LSK1 LEFT for N1, or LSK1 RIGHT for N2

TCN PAGE

The TACAN page on the UFCP is used to view and change Tactical Air Navigation Aid (TACAN) frequencies.

The UFCP TCN page features the following displays.

DATA DISPLAY	TACAN MODE, TACAN channel and band and scratchpad.
LSK1 LEFT	TACAN Active Channel/Scratchpad Swap
LSK2 LEFT	TACAN Active Channel/Scratchpad Swap
LSK3 LEFT	TACAN Scratchpad Band toggle (X/Y)
LSK1 RIGHT	Air-to-Air TACAN function (not simulated)
LSK2 RIGHT	Transmit-Receive TACAN function
LSK3 RIGHT	Receive only TACAN function

Changing the TACAN Mode

To alter the TACAN Mode, follow the procedure below.

1. Using the numeric keypad, push in the desired TACAN channel and press the ENT key.

2. Confirm the value in the UFCP SCRATCHPAD

3. Adjust the TACAN Band in the UFCP SCRATCHPAD by pressing LSK3 LEFT as required.

4. Assign the TACAN Channel from the SCRATCHPAD to the ACTIVE by pressing LSK1 LEFT or LSK2 LEFT

TPDR PAGE

The TRANSPONDER page on the UFCP is used to view and change the IFF frequency of the aircraft.

The UFCP TPDR page features the following displays.

DATA DISPLAY	Transponder MODE and code
LSK1 LEFT	Transponder Code Data Entry key
LSK2 LEFT	Not used
LSK3 LEFT	Not used
LSK1 RIGHT	IFF Mode C. Provides 4-digit octal code for aircraft's pressure altitude.
LSK2 RIGHT	IFF Mode S. Provides a Standby mode for use on the ground.
LSK3 RIGHT	IDENT. Press to transmit an IDENT signal to ATC.

Changing the Transponder Code & Mode

To alter the Transponder Code, follow the procedure below.

1. Using the numeric keypad, push in the desired TACAN channel and press the ENT key.

2. Confirm the value in the UFCP SCRATCHPAD

3. Assign the Transponder Code from the SCRATCHPAD to the ACTIVE by pressing LSK1 LEFT or LSK2 LEFT.

4. Set Transponder Mode C by pressing LSK 1 RIGHT and Mode S by pressing LSK 2 RIGHT. To set IDENT, press LSK 3 RIGHT when Transponder is set to Mode C.

MODE PAGE

The MODE page on the UFCP is used to view fuel Present Position (PP) or Point of Interest (POI) Latitude and Longitude values.

The UFCP MODE page features the following displays and options.

DATA DISPLAY	Present Position (PP) or Point of Interest (POI) Latitude and Longitude
LSK1 LEFT	STOPWATCH Page. Press to move to the STOPWATCH page
LSK2 LEFT	Not used
LSK3 LEFT	DISPLAY mode. Toggle Data Display between PP and POI modes
LSK1 RIGHT	HUD Page. Press to move to the HUD page
LSK2 RIGHT	INIT Page. Press to move to the INIT page
LSK3 RIGHT	HEADING Function. INOP.

STOPWATCH PAGE

The STOPWATCH page on the UFCP is used to view and set the UFCP Stopwatch function which links into the HUD.

The UFCP MODE page features the following displays and options.

DATA DISPLAY	Stopwatch Timer.
LSK1 LEFT	START – STOP – RESUME function. Start, Stop and Resume the stopwatch timer
LSK2 LEFT	RESET function. Press to reset the timer to zero, either when the clock is running or stopped.
LSK3 LEFT	Not used
LSK1 RIGHT	Not used
LSK2 RIGHT	Not used
LSK3 RIGHT	Not used

HUD PAGE

The HUD page on the UFCP is used to set various Head Up Display (HUD) options.

The UFCP HUD page features the following displays and options.

DATA DISPLAY	Not used
LSK1 LEFT	Glideslope Reference Bar (GRB) value
LSK2 LEFT	Aircraft Reference Symbol (ARS) display
LSK3 LEFT	HUD Clock Format (UTC/LOCAL/SYS & STW)
LSK1 RIGHT	HUD Declutter (DCLTR) value
LSK2 RIGHT	HUD Brightness (BRT) mode
LSK3 RIGHT	HUD Symbology Type (TYPE) value. Not used

Changing the Glideslope Reference Bar value

To alter the GRB value, follow the procedure below.

1. Using the numeric keypad, push in the desired GRB value in degrees and press the ENT key.

2. Confirm the value in the UFCP SCRATCHPAD

3. Assign the GRB value from the SCRATCHPAD to the GRB function by pressing LSK 1 LEFT.

HUD PAGE (continued)

Adjusting the ARS display

Toggle the ARS display from AUTO to ON using LSK 2 LEFT. When in AUTO, the ARS will remain visible when the aircraft is on the ground and below 50 KIAS.

Adjusting the CLOCK display

Toggle the HUD clock display between UTC (Universal Coordinated Time), LCL (Local Time), SYS (System Time) and STW (Stopwatch Time) by repeatedly pressing LSK 3 LEFT.

Adjusting the DCLTR Mode

Toggle the HUD Declutter mode between Mode 1, Mode 2 and OFF by repeatedly pressing LSK 1 RIGHT.

The declutter modes are as follows

OFF	**No Declutter**
MODE 1	**Lower Left and Right Data Blocks (NAV/TIME/SPD) information restricted**
MODE 2	**Altitude and Airspeed Dials restricted**

FUEL PAGE

The FUEL page on the UFCP is used to view fuel status and adjust DETOTE, BINGO and JOKER fuel values.

The UFCP FUEL page features the following displays.

DATA DISPLAY	DETOTE, JOKER, BINGO values and SCRATCHPAD
LSK1 LEFT	SET DETOTE (Total) fuel in pounds.
LSK2 LEFT	Set JOKER fuel value
LSK3 LEFT	Set BINGO fuel value
LSK1 RIGHT	Not used
LSK2 RIGHT	Not used
LSK3 RIGHT	Not used

Changing the DETOTE Fuel Value

To alter the JOKER fuel value in pounds, follow the procedure below.

1. Using the numeric keypad, push in the desired DETOTE value in pounds and press the ENT key.

3. Confirm the value in the UFCP SCRATCHPAD

4. Assign the DETOTE value from the SCRATCHPAD to the FUEL system function by pressing LSK 1 LEFT.

Note: This method will accept fuel values from 0 – 2250 pounds, with 0-1293 being internal fuel, and any additional fuel being added to External Fuel Tanks (EFT).

If a value great enough to require EFT's is entered into the DETOTE value, the stores will be automatically updated to carry UWTs.

The above sequence can also be used via the appropriate LSK to modify the JOKER and BINGO fuel values.

MSN PAGE

The Mission (MSN) page on the UFCP is used to view Mission Data imported from MSFS flight plans or through FMS functions.

The UFCP MSN page features the following displays.

DATA DISPLAY	MSN number, Active Waypoint IDENT, Departure ICAO, Destination ICAO & Month/Year of flight
LSK1 LEFT	Not used
LSK2 LEFT	Not used
LSK3 LEFT	Not used
LSK1 RIGHT	Not used
LSK2 RIGHT	Not used
LSK3 RIGHT	Not used

LEFT MULTI-FUNCTION DISPLAY (MFD) – IN DETAIL

NAVIGATION PAGE OVERVIEW

The Left MFD focuses on navigation information. It consists of a moving map display (programmed through the RMM) and overlays in relation to navigation.

The Left MFD displays a red cross until the INS is successfully aligned.

Around the bezel of the MFD are a total of twenty-eight pushbuttons. Starting from the top left, we'll work clockwise around the device and explain the functions in the following table.

Pushbutton Number	Item Name	Function
PB1	ALL	Not simulated
PB2	MAP	Display/Hide MSFS Moving Map
PB3	MCTL	Not simulated
PB4	OVRLY	Display/Hide Additional Map Overlay
PB5	OCTL	Not simulated
PB6	STR	Display current waypoint icon
PB7	AUT	Not simulated
PB8	Up Arrow	Increase Map range
PB9	Dn Arrow	Decrease Map range
PB10	RTE	Display/Hide flight planned route
PB11	MSN	Not simulated
PB12	OPS	Not simulated
PB13	INST	Instructor page, only available on Right MFD
PB14	NAV	Navigation page, only available on Left MFD
PB15	WARN	DWP Warning indication repeater
PB16	SYS	System Page, only available on Right MFD
PB17	CTR	Centre or North Up map orientation
PB18	CHART	Display/Hide sectional charts and overlays from the RMM
PB19	DLINK	Display/Hide ADSB traffic overlay
PB20	LIST	Not simulated
PB21	INFO	Not simulated
PB22	Dn Arrow	Move upwards through available waypoints
PB23	Up Arrow	Move backwards through available waypoints

NAVIGATION PAGE – WAYPOINT DATA

Within the centre of the display, is a compass rose which orients to the aircraft heading, (in CTR mode) or North Up heading (in NUP mode).

When a mission is loaded into the FMS or MC by an MSFS flight plan, additional features are shown as above. They are as follows.

1. **Upper Left Waypoint Window**
2. **Upper Right Waypoint Window**
3. **Active Waypoint Bearing Indicator.**
4. **Ground Track Indicator**
5. **Fuel & Endurance Window.**

Upper Left Waypoint Window

The upper left waypoint window contains the following readout

a. **Active waypoint number, bearing and distance in nautical miles.**
b. **ETA at the waypoint number in Zulu time.**
c. **Estimated Fuel Remaining at arrival at the active waypoint.**

Upper Right Waypoint Window

The upper right waypoint window contains the following readout

a. **Active waypoint ICAO IDENT, bearing and distance in nautical miles.**
b. **Time to Go (TTG) to the active waypoint.**
c. **Estimated Time Enroute to the flight plan destination.**

Fuel & Endurance Window

The fuel & endurance window contains the following readout

a. **Total Fuel in Pounds on the aircraft.**
b. **Joker fuel value.**
c. **Bingo fuel value.**
d. **Endurance in hours and minutes based on current speed and altitude.**

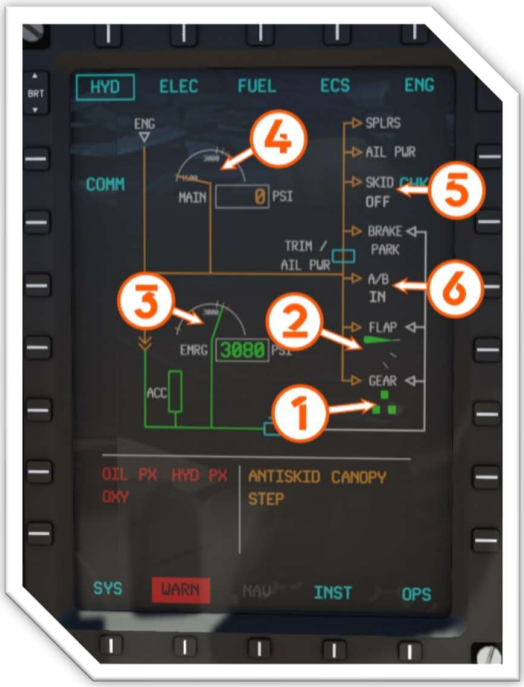
RIGHT MULTI-FUNCTION DISPLAY (MFD) – IN DETAIL

SYSTEM PAGE

The System (SYS) Page is the commonly used page on the Right MFD. It consists of the following information

1. **Caution/Warning Display**
2. **Outside Air Temperature (Celsius)**
3. **Engine Gas Generator (NG) Value**
4. **Engine Interstage Turbine Temperature (ITT) Value**
5. **Engine Torque (TQ) Percentage**
6. **Fuel Information window (from top to bottom).**
    a. **Fuel Flow (lbs/hr)**
    b. **Detote Fuel (lbs)**
    c. **Internal Fuel (lbs)**
7. **Park Brake indicator**
8. **Cabin Pressure Altitude (ft)**

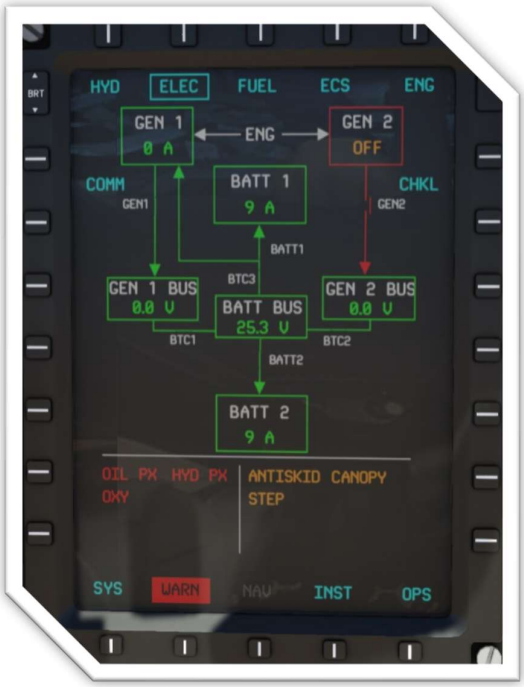
HYDRAULIC PAGE



The Hydraulic (HYD) Page shows the current condition of the aircraft's hydraulic systems. It consists of the following information.

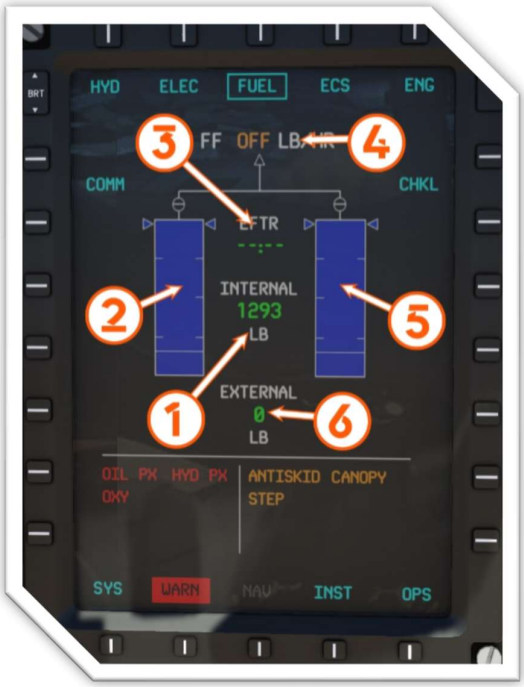
1. **Landing Gear Status**
2. **Flap Position**
3. **Emergency Hydraulic Pressure**
4. **Main Hydraulic Pressure**
5. **Anti-Skid System Status**
6. **Airbrake System Status**

ELECTRICAL PAGE



The Electrical System status page shows the current condition of the aircraft's electrical and generator buses.

FUEL PAGE



The Fuel page contains information relating to the aircraft's fuel systems. It consists of the following information

1. **Internal Fuel Quantity Readout**
2. **Left Internal Tank Quantity**
3. **Estimated Flight Time Remaining**
4. **Fuel Flow in lbs/hour**
5. **Right Internal Tank Quantity**
6. **External Tank Quantity Readout**

ECS PAGE

As of writing, the ECS page is inoperative due to lack of available information.

ENGINE PAGE

The Engine page is like the SYS Page; however, the right side of the screen shows Oil Pressure and Temperature values.

For information on the remainder of the above, refer to the SYS page.

INSTRUCTOR MODE – CONFIG PAGE

The instructor (INST) mode is used for other supporting features of the aircraft.

In this instance, for the CONFIG Page which is the default page when the INST button is pressed, they are as follows.

Pushbutton Number	Item Name	Function
PB1	CFG	Move to the CONFIG Page
PB2	VFI	Move to the Virtual Flight Instructor (VFI) Page
PB3	G/CREW	Move to the Ground Crew Page
PB4	TEAM	Move to the TEAM Page
PB5	STATE	Move to the STATE Page
PB19	VC AIRCREW	Toggle VC Aircrew (Pilot/Instructor) between VISIBLE, HIDDEN and AUTO
PB20	BARO UNITS	Toggle Barometric units between millibars (MB) and inches of mercury (inHG)
PB21	LEFT MFD	Toggle the Left MFD between the PC-21 style and GTN750 (if installed)
PB22	HUD	Toggle the HUD between the legacy (FSX) and modern (MSFS) versions
PB23	VISOR	Toggle the VISOR between DARK and CLEAR versions.

PRIMARY FLIGHT DISPLAY (PFD) – IN DETAIL

OVERVIEW

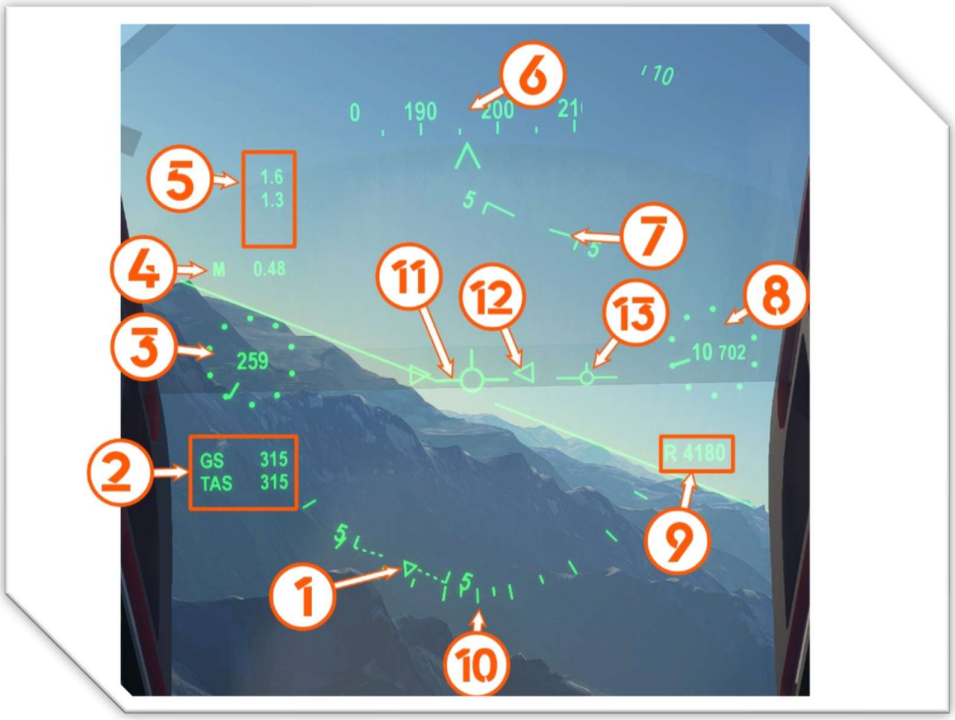
The PFD focuses on primary flight information.

Around the bezel of the MFD are a total of twenty-one pushbuttons. Starting from the top left, we will work clockwise around the device and explain the functions in the following table.

Pushbutton Number	Item Name	Function
PB1	LOOK	Not simulated
PB2	SG	Not simulated
PB3		Not used
PB4		Not used
PB5	TEST	Not simulated
PB6	ALT	Adjust Autopilot Altitude Select Value
PB7	BARO	Adjust PFD Barometric Pressure value
PB8	HT	Adjust Low Altitude Warning
PB9	VS	Adjust Autopilot Vertical Speed Hold
KNOB	M/F	Multifunction knob used in conjunction with PB6-9.
PB10	INC RNG	Not simulated
PB11	DEC RNG	Not simulated
PB12	ARC	Not simulated
PB13	BP2	Toggle Bearing Pointer 2 NAV source
KNOB	HDG	Adjust Heading Bug
KNOB	CRS	Adjust CDI Course Pointer (VOR1/VOR2/TCN only)
PB14	BP1	Toggle Bearing Pointer 1 NAV source
PB15	HSI	Toggle CDI/MAP modes
PB16	NAV	Cycle PFD NAV Source (VOR1/VOR2/TCN/MC/FMS/OFF)
PB17	TCAD	Not simulated
PB18	T/M	Not simulated
PB19	G-RST	Reset G-Meter
PB20	SPD	Cycle HUD & PFD Speed Readout (GS/TAS/OFF)
PB21		Not used

HEAD UP DISPLAY (HUD) – IN DETAIL

NAVIGATION MODE – PC-21 SYMBOLOGY



The Head Up Display (HUD) shows important flight information out the front of the cockpit using a projection on glass. A repeater in the rear seat shows the same information.

The HUD symbology above is described below.

1. **Angle of Bank Pointer**
2. **Ground/True Airspeed Readout**
3. **Indicated Airspeed in Knots**
4. **Mach number**
5. **AoA Window**
    a. **Angle of Attack in degrees**
    b. **Current G**
    c. **Maximum G sustained since last reset.**
6. **Compass Heading**
7. **Pitch Ladder**
8. **Aircraft Barometric Altitude**
9. **Aircraft Radar Altitude**
10. **Angle of Bank Scale**
11. **Climb/Dive Marker (CDM)**
12. **Power Chevrons**
13. **Flight Path Marker (FPM)**

SECTION 2

NORMAL PROCEDURES

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SECTION 2

CHAPTER 1

PREPARATION FOR FLIGHT

BEFORE STARTING

Check the aircraft livery is correct and validity and confirm aircraft weight and balance is correct. The image below should assist you in that setup.

Note the Centre of Gravity is ideally set to 25% MAC. This will NOT be the default position, so ensure to adjust as required.

After completing the external checks, enter the cockpit and set the pedals to a comfortable position.

Check the Parking Brake and press the toe brakes until positive pressure is felt.

One moderate application of pressure is normally sufficient but further pressure can be applied to the wheel brakes at any time by pressing down harder at the toe brakes.

Complete the cockpit checks in accordance with the appropriate checklist. If you find additional information is needed, refer to the in-sim checklist to aid you in your cockpit familiarisation.

Ensure you remove and stow the CFS pin prior to closing the canopy.

STARTING THE ENGINE

Check that the propeller area is clear and follow the checklist to start the engine.

As the NG rises, push the PCL into the IDLE position. Engine combustion should occur around 13% NG.

Monitor the ITT, NG and TQ values as the aircraft's engine spools up and stabilises

AFTER START

Conduct the After Start Checks as per the appropriate checklist.

To check the correct operation of the flaps, select the flaps from UP to T/O and then to LDG whilst visually checking the flap movement on both wings and the flap indication.

Check the spoiler indications are correct and in line with your checklist actions.

TAXIING

The PC-21 will taxi forward at idle power, using wheel brake as required to maintain a safe taxi speed.

Check the nose wheel steering and brakes for correct operation as soon as practicable. Confirm the correct functioning of the flight instruments as the opportunity arises on taxiing.

Full deflection of the rudder pedals will deflect the nose wheel sufficiently for most turns; for a tighter turn also apply brake on the inside wheel but avoid locking the wheel as this may cause tyre damage.

When taxiing crosswind in high winds there may be a tendency for the into-wind wing to lift; full aileron deflection may be needed to counter this tendency.

BEFORE TAKE-OFF

Ensure you follow the Before Take-off checks and verbalise any actions with your instructor. Ensure to arm both ejection seats unless the rear seat is vacant in which case it will remain in the safe position.

SECTION 2

CHAPTER 2

HANDLING IN FLIGHT

TAKE-OFF

After conducting the Line-Up Checks, align the aircraft with the take-off path, release the brakes and smoothly open the throttle fully.

With no crosswind the aircraft should maintain a steady straight line. The nose wheel steering and the rudder are effective for directional control. At 90 kts raise the nose wheel to fly cleanly off at 10 nose up.

Once safely airborne, raise the landing gear and at above 120 knots, raise the flaps. Adjust backpressure to maintain the 10 nose up until 180 knots.

INITIAL CLIMB

If remaining in the circuit, maintain 160 knots at 1,000 feet above ground level. If departing the circuit, allow the aircraft to accelerate to 180 knots, and increase aircraft pitch to align the CDM with the Power chevrons to maintain your 180-knot climb.

Perform your work cycles as required during the climb and any periodic checks as required.

GENERAL FLYING

The aircraft is stable although accurate trimming is not always easy. Ensure to keep a good lookout and follow your work cycles as required to maintain situational awareness.

DESCENDING

The standard descent technique is a 240-knot descent from cruise altitude maintaining 25% TQ.

Additionally, airbrake out descents can be conducted at IDLE with a significantly increased descent rate.

Gliding. The recommended gliding speed is 75 kts. In still air with the throttle closed, the clean aircraft travels approximately 1.25 nm per 1000 ft height loss with the RPM control set to HIGH and 1.5 nm per 1000 ft with LOW RPM set.

STALLING

The aircraft exhibits benign stall characteristics. Natural stall warning is experienced through mild airframe buffet and light vibration. The quality of the warning varies with aircraft configuration, decreasing in amplitude and margin with progressive extension of the flaps.

Artificial warning is given by a warning horn that activates at above 12 degrees AoA

Recovery from the stall in all cases is straightforward. Releasing the backpressure on the control column produces an immediate recovery.

SPINNING

Entry

With the aircraft trimmed for 120kts (the trim will be at the take-off position), decelerate with the throttle at idle, do not trim but maintain straight and level.

At 95kts move the control column fully back keeping the ailerons neutral; simultaneously apply full rudder in the direction of the required spin. The aircraft will initially pitch up and roll and then, after about 360° of roll, the nose of the aircraft will drop into a full spin.

The normal spin is maintained by holding the control column fully back with the ailerons central and full rudder deflection in the direction of spin. The spin will stabilise between 90kts and 100kts with each turn taking up to 3 seconds.

Recovery

There is only one recommended recovery technique from developed spins and deviation from this technique could prevent recovery. If the aircraft enters a fully developed spin the following recovery action must be taken:

a. Check height sufficient for recovery

b. Check throttle closed.

c. Check the direction of the turn needle.

d. Apply and hold full rudder to oppose the turn needle.

e. Pause (approximately one second).

f. Control column forward to the central position (smoothly keeping the ailerons neutral).

g. When the spin stops, centralise the rudder.

h. Recover from the ensuing dive.

The aircraft usually recovers from a normal spin within 1 - 2 seconds, completing about one additional turn as it does so.

Incipient Spins

Only the first 360° of roll may be considered as an incipient spin. To recover at the incipient stage, recovery action must be taken within this parameter and initiated as soon as possible after recognition of departure. Centralising all flying controls promptly produces a successful recovery.

SECTION 2

CHAPTER 3

CIRCUIT AND LANDING PROCEDURES

APPROACH PROCEDURES

Instrument approach settings are given below.

	Flap Position	IAS
Initial Descent	UP	180
Glidepath	T/O	160
Final	LDG	120

INITIAL & PITCH REJOIN

Initial Point

Fly towards the initial point at 240 knots and 1,000 feet AGL (5nm downwind from the runway threshold on the runway dead side). At the initial point, turn to track on runway heading while maintaining the 240 knots & 1,000 feet.

Pitching into the circuit

At mid-point down the runway after ensuring the runway is clear of departing traffic, roll into the circuit direction to a 60 AoB turn while simultaneously extending airbrake and bringing the PCL to IDLE.

Maintain the turn to your downwind heading and approaching 160 knots, retract the airbrake and maintain power for 160 knots.

When established on the downwind leg, perform your downwind work cycle, and configure the aircraft as per your Before Landing Checks.

CIRCUIT PROCEDURES

Normal speed downwind in the circuit is 160 kts. Conduct the Before Landing Checks and fly the finals turn at 120 knots with LDG flap, rolling out on the centreline at 400 ft. and just less than 1 mile from the runway threshold.

At 400 feet fly the final approach at 120 knots, on short finals start reducing the IAS with a small power reduction in time to achieve threshold speed of 110 knots as the runway threshold is crossed.

LANDING

The flare is commenced at a suitable height with backward movement of the control column and closure of the throttle. The nose is pitched up at a rate to control the now reducing rate of descent and the airspeed decays below the threshold speed (the stall audio may sound).

At touchdown, beyond the runway threshold, the aircraft is in a nose high attitude that ensures that the main wheels touch first and the rate of descent is reduced to almost nothing.

Gently lower the nose wheel several seconds after the main wheels settle on the runway. Accurate trimming does much to ensure a good touchdown.

GOING AROUND

When the decision is made to go around, smoothly apply full power and raise the nose to select the take-off attitude. If the aircraft was trimmed for a low airspeed on the approach the control column pitch force may be significant.

The aircraft accelerates and climbs safely with FULL flap; raise the flaps within the speed and height limitations and complete the After Take-off Checks.

BRAKING TECHNIQUES

As soon as the main wheels are on the ground lower the nose wheel to the runway. Apply the wheel brakes gently at first to avoid locking a wheel; it is difficult to detect if a wheel is locked from the cockpit.

Increase braking pressure as the groundspeed decreases. For optimum braking performance, as the nose pitches down with the first braking application, pull back progressively on the control column whilst keeping the nose low with increased braking.

AFTER LANDING

Complete the After Landing Checks after vacating the runway.

SHUTDOWN

When parked at the apron, close the throttle, apply the parking brake, and complete the Shutdown Checklist procedure.

SECTION 3

OPERATING LIMITATIONS

DIMENSIONS & WEIGHTS

DIMENSIONS

Wingspan	9.11 m
Horizontal tail span	4.00 m
Fuselage length	11.22 m
Fuselage width	1.00 m
Propeller diameter	2.39 m
Wing area	15.22 m2

WEIGHTS

Maximum ramp weight	3,120 kg
Maximum take-off weight	3,100 kg
Maximum landing weight	3,100 kg
Maximum zero fuel weight	2,750 kg
Maximum weight of stores	1,150 kg

ALTITUDES

Maximum operating altitude	25,000 ft

SPEEDS

Maximum operating speed (Vmo)	370 KEAS
Maximum operating Mach number (Mmo)	0.72 Mach
Stalling speed at MTOW in landing configuration	81 KCAS

OPERATING TEMPERATURES

Minimum	-55 Celsius
Minimum (for engine start)	-40 Celsius
Maximum	+55 Celsius

LOAD FACTORS

With landing gear up and locked, or down and locked:	
Maximum positive	+8.0 g (aero) / +5.0 g (stores)
Maximum negative	-4.0 g (aero) / -2.5 g (stores)
With flaps extended in take-off or land position:	
Maximum positive	+4.0 g (aero) / +4.0 g (stores)
Maximum negative	0 g (aero) / 0 g (stores)

PERFORMANCE

TAKE-OFF AND LANDING

Take-off ground roll, sea level	1,608 ft
Take-off distance to clear 50 ft obstacle, sea level	2,380 ft
Landing ground roll, sea level	1,969 ft
Landing distance to clear 50 ft obstacle, sea level	2,953 ft

CLIMB

Sea level	4,250 ft/min
10,000 ft	3,325 ft/min
20,000 ft	2,125 ft/min
Time to climb:	
10,000 ft	2 min 35 s
20,000 ft	6 min 20 s

CRUISE

Maximum horizontal speed, based on maximum power available.

Sea level	321 KTAS
10,000 ft	335 KTAS
20,000 ft	331 KTAS

SUSTAINED LOAD FACTOR

The maximum sustained load factor is as follows:

Sea level	3.4 g
10,000 ft	2.7 g
20,000 ft	1.9 g

ROLL RATE

The maximum steady roll rate in aerobatic configuration is 200 degrees per second at 10,000 ft and all speeds above 250 KIAS.

VERSION CONTROL

Version 1.5.0

- New Features
    - Addition of RAAF Artwork for
        - Aircraft Research & Development Unit (ARDU)
        - No.1 Flying Training School
        - No.1 Flying Training School (evolution concept)
        - No.2 Flying Training School
        - No.4 Squadron
        - Central Flying School (Roulettes)
          All Royal Australian Air Force badges, emblems or insignia are reproduced with the permission of the Royal Australian Air Force.
    - Added embedded Virtual Flight Instructor (VFI) for real-time checklist and mission support
    - Added GTN750 integration to Left MFD as a toggleable option
    - TAWS functionality added
    - Added invisible multiplayer camera ship for use with YourControls and Multiplayer camera tracking.

- Avionics/Systems
    - *General*
        - Updated MFD's to show more accurate displays when performing INS alignment
        - Updated Left MFD to power of if GEN1 and GEN2 Buses are not connected
        - Reduced deployment/retraction speed of gear and flaps to be more realistic
        - Restructured Avionics code and back end to accommodate more flexibility in future Virtual Removable Memory Module (RMM) downloads which include.
            - *Custom Charts (Moving Map Display)*
            - *Custom Airspace Overlays*
            - *Custom STUDS for COM and NAV*
            - *RMM Product Version Control Information*
        - Updated cockpit lighting for more immersion at night.
        - Updated external light geometry and brightness.
        - Updated HUD brightness to be automatically controlled based on time of day by default (can be adjusted in the UFCP MODE page)
        - Updated cameras with improved showcase camera options
        - Aircraft External Smoke Generators (ESG) now have a time limit of 10 minutes and can be refilled by ground crew via the INST page
        - Added option to Rapid Align SFD and INS on the MFD INST page
        - Increased INS alignment time from 60 seconds to 2 minutes

- *Multi-Function Displays (MFD)*
  - Updated font typeface
  - Improved moving map display on Left MFD
  - Added Airspace Overlays and DLINK ADSB capabilities (DLINK only valid up to 10nm range)
  - Added Heading Bug to HSI overlay for improved functionality
  - Revised INST page for enhanced capabilities
  - Added GPU connection/disconnection function to ELEC page for improved usability
  - JOKER and BINGO readouts added to FUEL page
  - External Tank visual depictions added to FUEL Page
  - TRIM/AIL power off indication added to HYD Page
- *Primary Flight Display (PFD)*
  - Updated font typeface
  - Updated Autopilot readout to show 'LNAV' when NAV hold is engaged, and FMS/MC is the active navigation source and 'NAV' for when VOR/TCN is active navigation source
  - Updated multi-function knob to control ALT select more effectively. Pressing the ALT PB once now selects altitude in thousands of feet, pressing it twice allows adjustment of hundreds of feet
  - Added small indication next to the ALT/BARO/HT & VS PB's when the required Multi-Function Knob is active to show what value is being adjusted
  - Fixed incorrect BP1 and BP2 pointers
  - Added Ground Track pointer to HSI
  - Updated AoA Indexer to be always visible
  - Updated AoA indexer scale for improved accuracy
  - Updated RADALT visibility up to 5500ft AGL

- Added Autopilot Vertical Speed readout above VSI when VS mode engaged
- Fixed Rate of Turn Indicator showing Yaw Rate.
- Toe Brake function now shown on SYS page

- *Up-Front Control Panel (UFCP)*
  - UFCP completely recoded for more accuracy in data entry methods
  - NAV page now accepts preset 'studs' in line with COM page methodology
  - Updated UFCP to eliminate Stud lockout when starting on Runway or Airborne
  - Updated UFCP to show 'Star' transmit/receive icon when the radio is being used
  - Added MRK function to set current position.
  - Added Stopwatch function to UFCP MODE page
  - Refined MSN page for more accurate depiction
  - Added GRB adjust function to UFCP MODE page
  - Added Controls diagnostics to UFCP MODE page, providing metrics of control positions for diagnostic and calibration purposes
- *Heads-Up Display (HUD)*
  - Updated font typeface
  - Updated AOA indexer scale to be more accurate.
  - Refined ground track, heading and course indicators
  - Added adjustable Glideslope Reference Bar (GRB)
  - Added more realistic smoke indications
  - Refined Radar Altitude readout
  - Added Decision Height (HT) value display
  - HUD repeater and VID functions added to rear cockpit

- *Secondary Flight Display (SFD)*
  - Updated font typeface
  - Added SFD alignment feature
  - Updated ILS variables for improved accuracy
  - Fixed incorrect roll pointer bank values
- *Engine Monitoring Display (EMD)*
  - Updated font typeface
  - Refined size of EMD fuel indications
  - Added NG readout
  - Refined airbrake caption

- Visual Models
  - Added pilot helmets for solo and team photoshoot options
  - Added customisable pilot helmet in front seat
  - Added visor effect for front and rear seat to improve contrast in high brightness conditions (dawn/dusk)
  - Updated prop effect
  - Corrected misaligned mirror glass in front and rear seats
  - Updated pylon, external fuel tanks and external smoke generators
  - Updated pilot models to improve scale appearance
  - Toe brakes now animated
  - Control column now height adjustable for easier Mode Control Panel (MCP) access
  - Fixed disappearing canopy at long view distances
  - Adjusted TAWS indication to show when OFF, not ON.
  - Adjusted FMS indication to show when OFF, not ON.

- Flight Model
    - Engine model updated for improved accuracy
    - Internal fuel value updated for more accuracy
    - Fuel Burn updated for more accuracy
    - Elevator Trim adjusted for improved handling
    - Improved Nose Wheel Steering functionality
    - Adjusted oil pressure values to reduce instance of oil pressure warning at Idle power
    - Improved overall flight handling stability for turbulent weather
    - Improved edge of flight envelope handling characteristics (stall/spin performance.)
    - Added code to provide more accurate power/attitude/performance values including glide performance.
    - Ground effect improved
    - Pitch and Roll gyroscopic stability improved for a more realistic 'feel' in the aircraft
    - Refined drag model for more accurate performance when conducting circuits
- Audio
    - Created revised sound-pack to add custom cockpit sounds and support for Virtual Flight Instructor
    - Updated warnings/caution sounds for more accuracy
    - Updated external sounds for added realism based on real world recordings
    - NAV1 audio loop no longer plays when a NAV1 frequency is tuned.
- Artwork
    - Interior Cockpit Art upscaled to 8K
    - Outdated IRIS schemes removed
    - Updated Fuel tank artwork. (Change notice for texture artists)

- Fixed incorrect alignment of SAAF roundel on Silver Falcons paint scheme

Version 1.4.0

- Avionics/Systems
  - Legacy HUD incorporated into Instructor (INST) Page.
  - Refined NWS functionality.
  - 409SQN Australian Air Force Cadets Display Scheme added.

Version 1.3.0

- Avionics/Systems
  - MSFS Moving Map display integrated into Left MFD.
  - HUD reprogrammed in HTML format for improved system performance and true collimation.
  - Automatic Nose Wheel Steering functionality incorporated.

Version 1.1.0

- Avionics/Systems
  - Heading Hold (HDG) no longer captures current aircraft heading.
  - Airspeed Hold (IAS) now functions more accurately and consistently.
  - NAV Hold (NAV) now consistently captures both NAV1 and NAV2 sources.
  - ILS Hold (APR) now consistently captures both NAV1 and NAV2 sources.
  - TACAN functionality now compatible with MSFS TACAN stations.
  - Fixed BP1 and BP2 data blocks on PFD not showing correctly.
  - UFCP Transponder Page rewritten and code for Mode C/S & IDENT now functions with MSFS ATC and vPilot.
  - Pressing CDI knob now slaves to NAV1/2/TACAN radial direction, not to aircraft heading.
  - UFCP NAV1/2 frequencies no longer zero out on initial load.

  - UFCP COM1/2 entry now supports values down to 50Hz.
  - STUD frequencies now correctly synchronise with COM radios on adjustment.
  - COM now defaults to receive on both 1 and 2 by default.
  - Power system recoded. GPU now powers onboard systems correctly when applied.
  - Stall Warning added to EICAS area on right MFD.
  - FMS Power now only available with FMS and MC power in conjunction with MSFS Avionics Master.
  - PC-21 HUD now default HUD option on initialization.
  - PTT switch now enforces COM1 or COM2 transmit priority based on position.
  - UFCP now displays correct frequencies if COM1 or 2 does not match a studded frequency.
  - Rear HUD repeater now defaults to ON with system start.
- Visual Models
  - VCS Cover now visible and operative in front seat.
  - Cockpit now features audible buffet and shake with airbrake extended.
- Flight Model
  - Updates to performance model for more accurate power curve.
  - Updated engine.cfg to fix inaccurate ITT, Engine Oil Pressure & Temperature values.
- Effects
  - Visible engine heat removed from the aircraft. Instructor page updated to remove option.
- Artwork
  - FAB Logo on FAB paint scheme corrected to face the correct orientation.
  - Addition of Dark Nyte Furys paint scheme to the list of selectable liveries.

- Tips
    - Updated loading tips with additional RAAF Virtual information.

Version 1.0.2

- Avionics/Systems
    - Updated Right MFD to include controls for toggling VC aircrew ON or OFF.
    - When transitioning from Pitch to VS hold for climb profile, AP now captures current Vertical Speed value.
    - Refined Electrical systems to fix issue where GENS were not functioning correctly with the engine off.
    - Pitch hold now works up to 25 degrees nose up, 5 nose down on initial autopilot engagement.
    - On power up, COMM radios receive on both COM1 and COM2.
    - OXY/PINS INHIBIT feature added to Page 2 of Instructor page on the Right MFD. Toggle to inhibit to ignore OXY and SEAT warnings for both front and rear seats.
- Installer
    - Installer removed to deal with potential decompression issues causing missing or corrupt files impacting user experience.

Version 1.0.0

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