Expert Series 02: Piper M600

Aircraft Manual

V1.2

THIS AIRCRAFT MANUAL IS FOR SIMULATION USE ONLY

V1.2

Introduction

1. introduction

The M600 experience

Welcome and thank you for buying the **M600 Expert Series** by FSReborn/Microsoft!

Bringing this aircraft to Microsoft Flight Simulator 2024 has been a work of passion for me and the team here at FS Reborn and everything in this aircraft has been made with love and attention to detail. For me and many of my team of testers, flightsim is in our bones. We wanted to bring the community something unique – a high fidelity aircraft with great system depth allowing core simmers to closely follow real world procedures, but also something that was intuitive, highly configurable, and fun to fly.

The **M600** has been developed using the latest tools available in MSFS, including the latest Computational Fluid Dynamics (CFD) flight modelling. As it does not rely on any external software modules, it will be available to all MSFS pilots – both on PC and Xbox. Many of the core systems, such as the turboprop operating temperatures and cabin pressurization system have been custom coded and are unique to the **M600.**

The development of the **M600** was made in partnership with pilots who fly single engine turboprops of a similar specification in real-life and the aircraft is as faithful as possible to the systems and performance typical for this class of light, pressurized cabin single-engine turboprops.

Meanwhile, enjoy the unique experience of flying this luxurious, state-of-the-art aircraft – the whine of the PT6A turbine with accurate start logic and temperatures (and a real risk of a 'hot start' if you have realism on!), the crisp and lively handling that makes hand-flying it a joy all the way up to cruise at FL300 and much, much, more giving a truly immersive start-to-end **M600** experience.

Disclaimer

This aircraft has been developed by FSReborn/Microsoft solely for home entertainment purposes only and should not be used for real-world aviation training.

Using this manual

This manual is part pilot's guide and part reference manual. Designed to give you all the information you need to fly the **M600**, this is where you will find key information on the aircraft, its main systems, procedures, and performance data.

This is a *big* manual as befits a complex aircraft like the **M600**. But don't worry you don't need to read it all to enjoy the aircraft! Just pick and choose the sections as you need them:

- If you are new to the aircraft and just want to get flying, use the **Quick Start** guide below.
- **Section 2** will get your controls configured and **Section 3** gives some of the essential performance data like maximum range and speed etc.
- The cockpit layout is clean and intuitive too, but **Section 5** will give you the complete walkthrough of what switch does what.
- If you are new to the G3000 avionics, you will want to check out **Section 7**. This also details how the autopilot functions as well as the radios (handy for on-line flying).
- **Section 9** will give you tips on how to start the engine without breaking it and how to best fly the aircraft.

- The **M600** comes with fully interactive in-sim checklists, but if you prefer a paper version, then **Section 10** has the normal checklists you can print out.
- If you want to fly with failures and start to really maximize the realism, then you will want to study **Section 6** – this gets into the detail of the aircraft systems. You will also need to study **Section 11** on failures and the emergency checklists.
- If you like your numbers then check the performance tables in **Annex A**.
- Home cockpit builders or those with external devices will find all the L:VARS and EVENTS used in **Annex B** as well as some suggestions on how to configure the throttle using SPAD.next.

Even with such a comprehensive manual as this, the **M600** is a hi-fidelity model, and it cannot cover every system or related aspect of aviation. A full explanation of the G3000 Avionics suite alone would probably add an extra 80 pages! For more in-depth information there are many excellent real-world sources of information.

When referring to an MSFS setting this will be denoted (for example) as:

MSFS>WORLD MAP>AIRCRAFT>CUSTOMIZATION

- When referring to in real life aviation systems, procedures or behavior, this will be flagged as 'IRL' (when not obvious).
- When referring to MSFS simulated systems, procedures or behavior this will be flagged as 'sim' (if not obvious).
- Notes and Tips will be highlighted at various points with a blue bordered text box.
- Cautions related to aircraft operation are noted in an amber bordered text box.
- Warnings related to critical aircraft operation or procedure that may lead to a failure or aircraft crash are highlighted with a red bordered text box.

Note

App is enabled when describing the expected behavior of the aircraft unless specifically noted.
When describing systems and processes this manual assumes that all the realism settings within the EFB

2. Getting Started

GETTING STARTED

Installation & Updates

The **M600** is only available for purchase via the MSFS Marketplace. MSFS will stream it directly after purchase or in addition you can locally download it from Your Library tab within the Marketplace, if you wish to keep it locally downloaded, please note that updates might need to be manually updated whereas streamed aircraft will automatically get the new updated when pushed.

> **Tip**
>
> If you experience any issues the first time you load a flight following installation (such as switches not animating), you may want to end the flight and start a new one. This will help ensure that ensure that MSFS has fully compiled all the files.

Controller calibration

The **M600** was flight-tested using a range of controller devices in their default settings. For most devices little further calibration should be necessary other than for personal preference how light or heavy you want your controls.

Yokes

Hardware yokes that offer full 180 degrees range on the roll axis may benefit from linear (0) curves on the roll axis. Likewise, higher-end yokes with a long 'throw'/range or travel on the pitch axis in addition to FFB yokes may also benefit from a linear curve on the pitch axis.

Rudder-pedals

Rudder pedals preferences mostly comes down to the specific model and hardware you have but generally the team prefers either a linear curve on hardware with long travel or a -0.15 on both sensitives inputs to have a bit smoother input. You can tune this to your liking if you find it too responsive, especially with MSFS 2024's ability to make a profile unique to an airframe.

Many rudder pedals also have very sensitive toe-brake axes. Setting a dead zone may help prevent accidental operation of the brakes when using the yaw axis.

Throttle Configuration

The **M600** has a custom-modelled throttle that permits the use of 'beta' and 'reverse' power settings, which are essential features of the ground operation of the aircraft and allow smooth and controlled taxiing and reduction of the landing rollout distance. In the **M600**, Beta can only be engaged on the ground. In addition, the autopilot features a fully modeled auto throttle system.

To take full advantage of this feature you will need to control or configure your throttle axis using one of several methods.

1. Use the mouse to click and drag the throttle in the VC aft past the idle detent.

2. Use the mouse to highlight the throttle using LOCK mode interaction in the VC and use the mouse wheel to move the throttle forward/aft.

3. Use a controller device with both a positive and negative axis range. If you bind the MSFS control: *THROTTLE AXIS* to it, MSFS should configure the negative part of the axis to the beta and reverse range automatically.

Bind the MSFS action: *HOLD/TOGGLE THROTTLE REVERSE THRUST* a button or key. After triggering the command, pushing your controller throttle axis forward will actually move the VC throttle backwards and so into Beta and then Reverse. Using the button below the axis detent present on most controllers that lack a negative axis is a popular method. This method has the significant disadvantage that if the toggle action is not registered, you will actually add power at a time when you are trying to reduce power and may lead to a failed landing. Using an 'On Release' trigger rather than 'On Press' may reduce the risk of this.

4. Use MSFS actions *THROTTLE DECREASE* & *THROTTLE INCREASE* on key-binds. Using Decrease will allow you to enter Beta & Reverse.

5. Use SPAD. Next or another 3rd party driver to create a custom throttle axis. See Annex B for some examples of what SPAD configurations can be used.

> **What is 'beta' range?**
>
> Beta refers to a range of reduced prop-pitch angle that produces less forward thrust. In the **M600**, it is only used on the ground and is entered by pulling the throttle back past the idle detent. Pulling the throttle even further back will put the props into a negative pitch angle and produce reverse thrust. See 'Propeller' in Section 6 for more information.

Condition Lever

The condition lever is controlled using MSFS Mixture events. Even though it is a lever on an axis, it actually only has two positions: RUN and CUT-OFF/FEATHER, so you can use the following MSFS events to more it between the two positions:

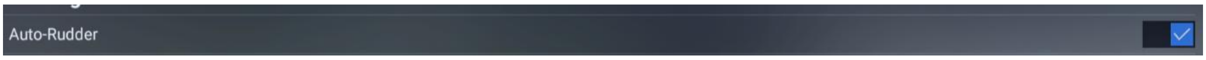
Other actions such as *INCREASE* and *DECREASE MIXTURE* will allow more incremental control. You can also make it an axis. See Annex B for an example of a custom mixture axis in SPAD.next.

Xbox controllers

Players using an Xbox controller should also consider configuring the sensitivity curves of the shoulder-triggers axes if these are used to control the yaw (rudder) axis.

MSFS have also provided an Assistance setting to reduce sensitivity to aid flying with an Xbox controller:

You may find that using the MSFS auto rudder assistance will help if you are finding it difficult to get smooth yaw control and acceptable take-off/landings:



Both assistance options can be selected in MSFS SETTINGS > ASSISTANCE OPTIONS > PILOTING ASSISTANCE.

Key bindings

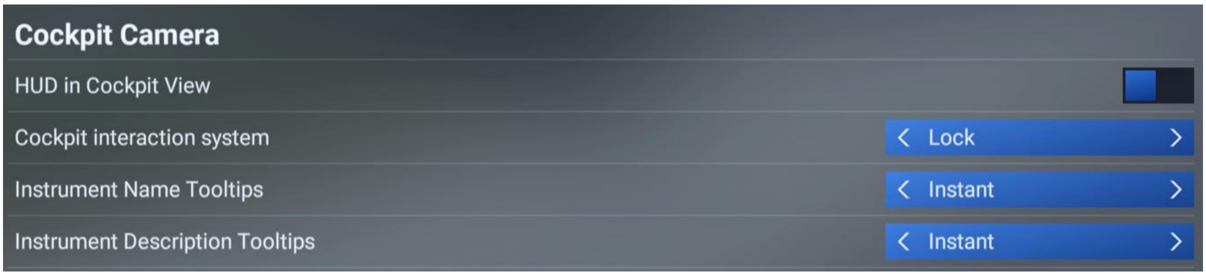
The **M600** uses standard MSFS controls wherever possible and most key controls inside the virtual cockpit (VC) can be mapped to buttons or keys on peripheral devices.

The **M600** does use custom 'Simevents' and LVARS as well for those who wants to bind specific systems to their home cockpit solutions. These are listed at the end of the Manual under Annex B.

Tool-tips and Assisted Checklists

A good way to learn the layout of the cockpit and the controls is to use the in-game 'tool-tips' and aircraft Checklists:

Tool tips. When starting it can be helpful to turn on instrument name & description tool-tips in MSFS OPTIONS > GENERAL > FLIGHT INTERFACE > COCKPIT CAMERA



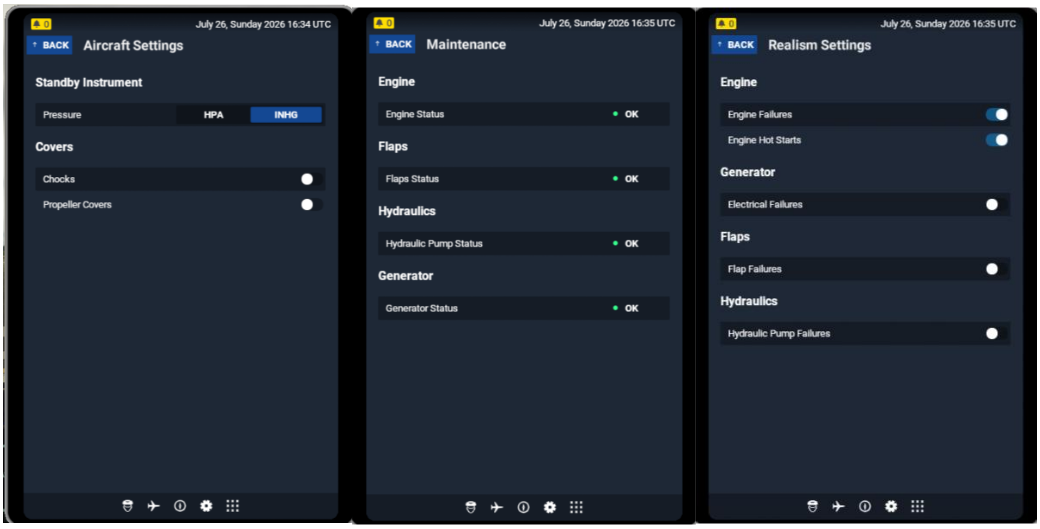
Checklist. You can find checklists for each phase of the flight within the EFB under **Aircraft** > **Checklists** page. Clicking the eye symbol on each item will face the camera towards that control and highlight it in blue.

Quick-start flight

The following jargon-free quick-start process gives a simplified set of steps to follow to successfully fly a route. You might find it helpful to read some more of this manual first. Section 7 on the G3000 has useful illustrations showing the arrangement of all the control dials and flight instruments.

EFB APP

To enable realism features and do maintenance of the very complex simulations of this aircraft you can use the M600 dedicated app within the Microsoft Flight Simulator 2024 EFB. The EFB features 3 different pages of configuration: *Aircraft Settings, Maintenance, Realism.*



Default realism

When you first start the **M600**, all realism settings inside the EFB app are set to have Engine failures & Hot Starts on. If you want to just get flying without worrying about breaking anything on the plane or while learning the planes limits, go to Realism page on the EFB app and turn everything off! If you have realism settings turned on in MSFS itself, you may still crash, but that won't be because of an **M600** created failure.

> **NOTE**
> if you are hearing a repeating warning 'chime' at any point press the 'Alert' softkey. This is the right-most 'softkey' below the PFD screen.

Flying a route

To fly, simply select an airport and departure runway in the **MSFS FREE FLIGHT WORLD MAP**

If you want to create a custom route to an airport, you can also select a departure & destination within the *Flight Planner - Route* tab of the EFB and select *Find Route* and it will automatically create a route for you. *This can be VFR (visual flight rules) and will be a direct route, or IFR (instrument flight rules), High or Low and if so will have a number of legs and waypoint.* Just make sure to fill up with enough fuel on board (you will start with about 500nm worth by default). You can either start on the runway with the engine running or select a parking spot and go through the start-up process yourself.

NOTE

If you are new to flying, it may be better to start with pre-set weather. Go to **FLIGHT CONDITIONS > WEATHER AND TIME > PRESET** and select 'Clear Skies'. This will give you perfect clear skies and very light winds.

After that, simply press *FLY* then *READY TO FLY*.

If you selected a runway starting point you will start with the engine running and the aircraft fully configured for take-off (flaps 10. You can set them to flaps 0 if you prefer).

You can then get on with the flight and follow these steps:

Take-Off

1. Release the parking brake (push the lever under the yoke in). TIP: If the yoke gets in the way of your view, click on it to make it disappear.

2. Smoothly set maximum power using the Throttle, but try to avoid any flashing red on the 'ITT' or 'Ng' gauges on the MFD. If it's a short runway (less than 3000 feet long), hold down the toe brakes until you have set the power. Then release the brakes and start to roll.

3. Watch the runway and use the rudder to maintain the dashed white centerline – the aircraft will want to pull to the left at first even if there is no wind, so use some right rudder to correct that. Monitor the airspeed indicator on the left-hand side of the Primary Flight Display (PFD - the main screen in front of you).

4. When the speed reaches 85 knots, smoothly pull back on your stick/controller to no more than halfway, hold it there and let the plane take off. Be patient if it doesn't take off right away and don't keep pulling the stick back or you might put the nose too high, stall and crash.

Climb

5. One you are up in the air, retract the landing gear by pressing the *Landing Gear* key bind or operating the gear position lever in the cockpit to the right of the yoke. You will hear the gear

retract and the 3 green lights on the MFD will go out. Retract the flaps if necessary. On the overhead panel, you can put both the fuel pumps and ignition switches to 'AUTO'.

6. You can either hand-fly trimming the aircraft to maintain a steady pitch up, or use the autopilot to manage the climb: first use the ALT SEL knob on the autopilot controller panel (above the MFD) to choose what altitude you want to get to – it will be shown in cyan color on the top right of the PFD. Then press the VS or FLC button on the autopilot panel. This will engage 'Vertical Speed' or 'Flight Level Change' modes respectively. To change the climb rate: In VS mode you adjust the climb rate using the UP/DN wheel. A good climb rate is about 1200-1800feet per minute (fpm). You vertical speed is shown on the right-hand side of the PFD, just to the right of the Altimeter tape that shows your current altitude. If you're using FLC *(Flight Level Change)* the plane will pitch to keep the speed you set using the SPD knob *(for manual adjustments it needs to be in MAN mode, in FMS mode it will follow what the Flight Plan has been programmed to or constraints)*

7. The maximum altitude the **M600** can go to is 30,000ft. How high you go in the cruise is up to you or what the flight plan gives you. Or you will be told by the game ATC if you are using it.

Navigate

8. If you created a flight plan via the sim EFB, use the Multi-Function Display (MFD – the big screen in the middle) to see it on the display and the GTC units Flight Plan page to make changes/add procedures and use the yoke to fly towards the magenta line – this is the currently active leg your route.

9. Whenever you bank the aircraft to turn, look out the front at the horizon and gauge your bank angle – try not to go over 30 degrees. You can also use the artificial horizon in the middle of the PDF to see how much you are banked or pitched up.

10. Once you get close to your route, you can use the autopilot to follow it. If you haven't already, engage the autopilot by first pressing the 'Nav' and then 'AP' button on the autopilot control panel (above the MFD). If you are close enough a green 'GPS' indicator at the top of the PFD will show, meaning the autopilot is going to follow the GPS route (the magenta line). A green 'AP' and 'YD' will also show meaning the Autopilot and Yaw Damper are engaged. If the GPS stays white, then you need to get closer to the magenta line before it will 'capture' and track the route.

Cruise

11. Once you reach your target selected altitude, the autopilot will level the aircraft off for you. Now just let it fly your route – if the Auto throttle is engaged by pressing the AT button on the autopilot panel the plane will now automatically adjust throttle to keep the selected speed (either manually selected speeds or the FMS speeds shown in magenta).

Descent

12. Once you start getting close to your destination airport, you can start your descent. Make sure to start down in good time if your flight plan doesn't have a Top of Descent indicator (VNAV calculated). A good rule of thumb is to allow 3nm for every 1000ft you need to descend – so if you are cruising at 30,000ft (or 'Flight level 300') and the airport you want to land at is at sea level, you would need to start descending 90nm from the airport (3 x 30 = 90). A good rate of descent is about 1200-2000 (fpm) and you can set this by pressing the VS button and adjusting the rate of descent with the wheel on the autopilot control panel. Be careful not to overspeed. One trick is to use the FLC button instead and then the speed knob to set a speed of 175kt. If you're using Auto throttle the plane will now idle the engine and pitch down to keep a stable 175kt

13. Either way, be careful to check your speed in the descent – don't go faster than 180knots. if you get too fast the autopilot will pitch the aircraft nose up to prevent you from over-speeding. If you cut the power manually with AT off too much (below 300 on the torque gauge) a 'CHECK GEAR' alarm will sound *(this is to act as a warning to stop you landing without putting your gear down – the alarm will not sound with the gear down).*

Landing

14. Select a runway for landing – try to pick one so you are landing into the wind (tip: tune the airport ATIS via the MSFS ATC window to get information about which runway to use or use the Waypoint information in the GTC) and get lined up for it in good time.

15. Reduce the power either manually or set speed using AT until it is below 158knots. At about 6 nm to the airport, you can put your flaps down by 1 step. This will help you slow down more. At about 3 nm to the airport, you can lower your landing gear and put the flaps down another step. You will really slow down now with all the extra drag. Descent towards the runway on a gentle (3 degree) descent path (tip: use the green circle on the PFD at the -3-degree position on pitch indicator and use the throttle to maintain a speed of 85 knots

16. As you approach, maintain the 'extended centerline'. Look at the runway shape – if it looks wide and flat you are too low. If it is long and skinny, you are too high. Look for the big white squares just after the runway starts – these are the 'aiming' points. If you are on a good glidepath they will stay in the same relative position in your view. If they start to slide up, you will land short. If they start to slide down, getting close to the glareshield, you will overshoot and land long. At this phase it is recommended to cut off the Auto throttle and continue using manual power. *(The plane is only rated for full Autoland controls using AT with the Garmin Emergency Autoland HALO system)*

17. Once you cross the end of the runway (the 'threshold'), smoothly reduce you power to zero as the plane slows, it will sink – pull pack gently on the yoke so it doesn't sink too fast, and just before the plane reaches the runway, pull back on your yoke some more to make sure the two main wheels at the back touch down first (this is the 'flare'). Try not to pull back too much or you will start to climb and 'float' down the runway. Once the main wheels are down, you can relax the stick, let the nose come down and brake once all three wheels are in contact with the runway.

18. If you want to slow down faster, you can use the mouse the drag the power lever back into first the 'Beta' and then 'Reverse' range (you will hear the aircraft noise change as the reverse thrust engages). Let the plane come to a halt or taxi off and park somewhere and congratulate yourself of a successful landing!

Quick Engine Starts

If you started your flight at a parking spot 'cold & dark', you can start the engine using *CTRL + E* you will need to make sure 'Hot Starts' are OFF in EFB Realism page or you will blow the engine. If you want to do the engine start yourself, you can follow the following abbreviated quick-start procedure.

> **Caution**
> This procedure omits some actions and should only be used when M600 realism settings are OFF or you may cause engine damage (EFB Realism page, turn all to OFF).

1. Press the BAT and AVIONICS buttons to power-up the aircraft (overhead, left side)
2. Turn on the NAV light. (overhead, right side)
3. Make sure all covers and the chocks are removed during the walkaround
4. Turn the fuel pumps and ignition switches to MANUAL (overhead, left side)
5. Lift the cover on the START button (overhead, left side), press and release – the button will stay pressed, but will release automatically after the engine has started.
6. With the starter motor running, the prop will start to turn. Look at the engine gauges on the left side of the middle screen (the MFD). When the one marked 'Ng' reaches 16 or above, the engine is ready to receive fuel (or alternatively count to 10 seconds).
7. Now, place the Condition Lever (right of the main throttle with a red handle) from fully down, to fully up (click and drag with the mouse). Fuel will be introduced, ignition occurs, and the engine will continue to spin up to normal power.
8. With the engine started, press the GEN and ALT switches (Overhead, left side) to supply electrical power. If you don't do this the battery will eventually go flat and all the screens go dark.
9. You can turn fuel pumps and ignition to auto. (overhead, left side)
10. Now you can turn on exterior lights such as landing lights, strobes as desired (overhead, right side)
11. Below the pilot's yoke, push in the BLEED AIR lever and above it on the main panel, turn the 'ECS cabin comfort' dial to 'Norm'. This will turn on the cabin pressurisation system.
12. Release the Parking Brake (beside the BLEED AIR lever) by pushing it in, use some throttle to get rolling and begin your taxi, using the throttle to control you speed - you won't need much once rolling. Try not to go above 20knots when going straight and 10 knots when turning. Find your runway and take-off as per the quick start procedure above.

> **Note**
> In the rest of this manual any procedures described assume that all realism settings have been turned on and you are following IRL procedure. You can select whatever level of realism you want at any time., but we recommend taking your time to learn the correct procedures step-by-step before experiencing the challenges of system

Frequently Asked Questions

My Garmin units are not working, what could be the cause?

Check you have turned the master battery and the avionics master switch on. If this is the case, check your battery has enough voltage. The **M600** has custom electrics failures and it will simulate your battery suffering from severe discharge.

You can check the battery voltage via the gauges on the MFD/PFD. If your battery doesn't have sufficient charge, proceed to the maintenance section in the EFB and you can repair the generators if your engine was running. If the battery is correctly charged, then a more severe issue with your simulator must be preventing the units from working correctly.

My airspeed indicator is not working, why?

Check you removed the pitot tube cover before take-off, during walkaround mode**.**

When I apply power to the aircraft it doesn't move, not matter what I do it seems stuck on the ground. What can I do?

Check you removed the wheel chocks from the front wheel, during walkaround mode**.**

My engine refuses to start unless I use CTRL+E.

A possible cause for this behavior is when you forget to turn on the fuel condition lever check you have pushed it all the way up after Ng is above 13%. When you use CTRL+E, all these steps are taken on your behalf by our custom physics engine, so this is the reason why it only works with this hotkey. But also, if you do use CTRL+E, you must have MSFS engine damage turned OFF in MSFS OPTIONS > ASSISTANCE or you will hot-start the engine.

It is recommended to use the EFB checklist, they are complete and fully interactive, allowing you to get familiar with the aircraft and procedures with the assistance of the virtual co-pilot.

What does T/O Config mean and how do I get rid of it?

This means that you have not configured the aircraft properly for take-off. It is white (advisory) at first, but will turn red if you apply power. Follow the correct before take-off checklists. See Section 9 for more information on the T/O Config.

I opened the door mid-air and now it is lost!

Correct, this is by design. You will need to land to install a new door. You can do this via the Maintenance page with the engine off and while on ground.

How do I stop the 'beeping' sound?

These are usually 'chimes' indicating a Master Warning or Master Caution – i.e. things to worry about! The Cautions can usually be muted by pressing the right-most ('Alert') softkey on the PFD. The Warnings cannot usually be muted this way and the only way to stop it is to take the necessary corrective action.

What does 'Check Gear' mean and how do I make it stop?

This is a warning to prevent you landing with the gear still up. It will trigger if the power is less than 420 lb-ft and the gear is still up or if the flaps are more than 10°. The full logic that triggers the warning is a little more complex than that though. To make it stop, either increase power, reduce the flaps, or put your gear down.

My engine keeps having severe failures each flight, they occur between 5 to 10 minutes after taking off.

Check you are not constantly running the engine above the required Torque. The PT6-42A engine is rated to run at maximum of 1575 lbs/ft for 1 minute. If you run the engine at the max rated speed for long periods of time it will cause severe damage to the engine.

Remember also you need to perform regular maintenance to your engine in order to ensure its normal operation. This can be done via the maintenance page in the EFB app. If you don't, you increase the chances of suffering an engine failure. The more you neglect your engine, higher the risk to suffer a catastrophic failure. You can disable all engine failures via the EFB Realism page.

What is an engine overhaul?

It is an operation which will replace all mayor parts on your engine, therefore in accordance with FAA and EASA rules, your engine tacho hours get reset to zero. It is the closest you get to have a new engine. When you perform an engine overhaul via the maintenance tab, the mechanic will also perform a change of fluids such as oil and coolant. Engine overhauls are very expensive in real world, and they are only required after many hours of operation of your engine.

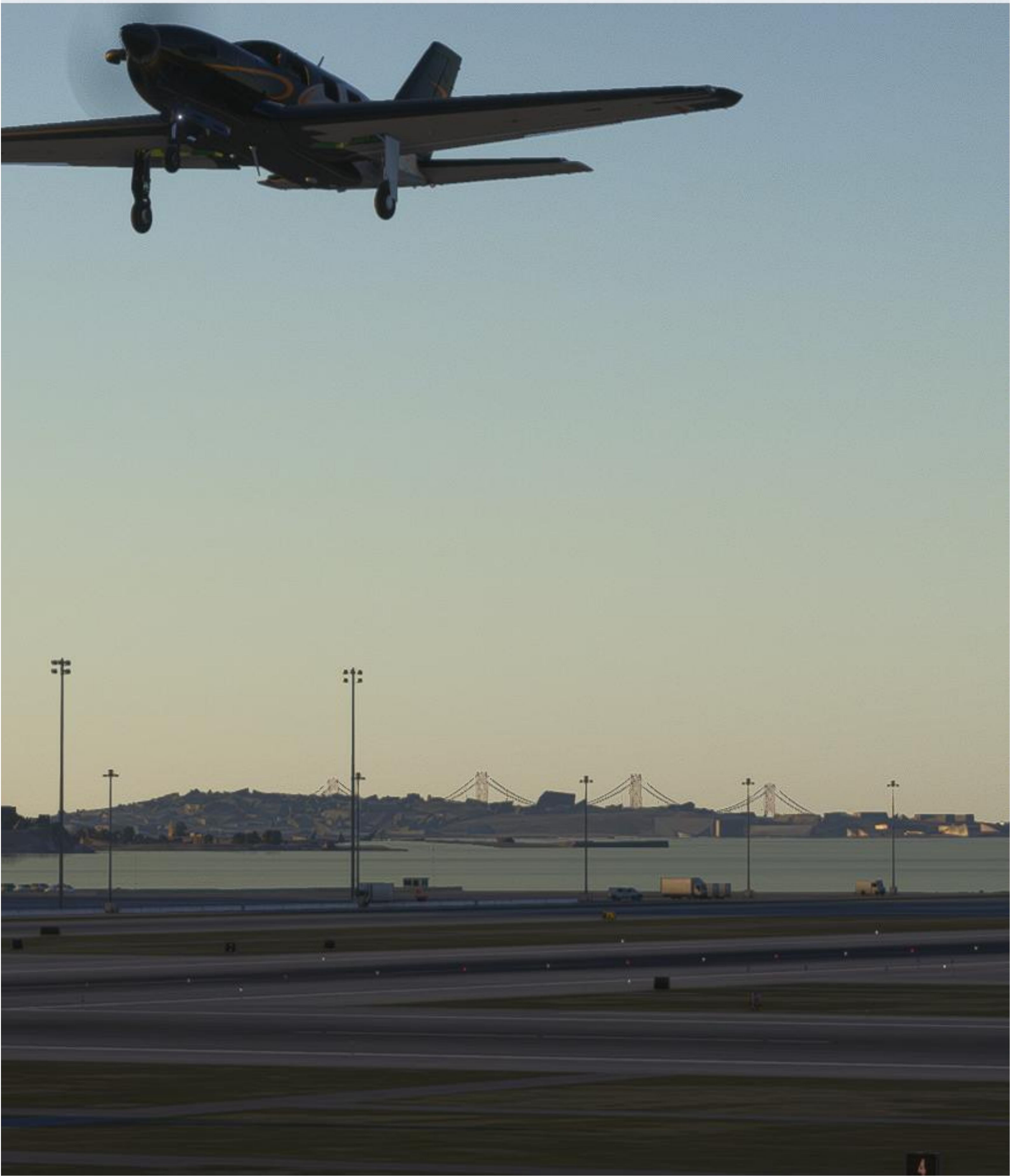
I have made too many mistakes to my aircraft maintenance, how I start again?

Easy, go to the maintenance page and repair each component that has failed. This will reset all systems for your aircraft as if it was brand new.

I have a question not listed here, where I can get some extra help?

You can visit the MSFS official forums and either report bug reports or check out the thread related to the M600.

3. Specifications



SPECIFICATION

Overview

The **M600** is a low-wing, metal-composite airframe, retractable gear aircraft with a pressurized cabin. It is powered by a Pratt & Whitney PT6A-42A turboprop engine delivering a flat-rated 600shp to a 5 bladed, constant speed, variable-pitch propeller. It has a fully integrated Garmin G3000 avionics suite. A full suite of ice-protection systems allows for flight in known icing conditions ('FIKI'). The sophisticated avionics allow for single-pilot IFR operation and integrated weather radar and XM radio data-links providing NEXRAD weather information, allow effective weather-avoidance in flight. The upgraded autopilot system compared to previous variants of the Malibu family now also features an auto throttle system.

The mission profile of the aircraft is diverse. Good fuel economy and single-pilot IFR capability through the sophisticated avionics, and a luxury passenger cabin, make it popular for private owner-pilots and commercial charter operators alike, who can carry up to 4 passengers and 100lbs of baggage in the comfortable, pressurized, cabin. A service ceiling of 30,000 feet and a range of 1000nm at a cruise speed of 257TAS makes it ideal for IFR cruising and this is its primary role. Although the aircraft can operate from grass fields and other hard unsealed surfaces, it is not STOL-capable or intended for off-field utility cargo operations.

Essential performance specifications

Maximum Ramp Weight	6050lb (2744kg)
Maximum Take-Off Weight	6000lb (2721kg)
Maximum Landing Weight	5800lb (2631kg)
Propeller	1 x 5 blade, 82.5 in. Blademaster.
Engine	Pratt & Whitney PT6A-42A turboprop with 600SHP
Ng	Max = 101.8%
Torque (lb-ft)	1580
Seating	Maximum 6 persons (2 crew, 4 passenger) With up to 100lbs of passenger baggage
Avionics	G3000 integrated avionics suite with Garmin GMC710 Automatic Flight Control System (AFCS)
Range	1000nm
Operating Ceiling	30,000ft
Fuel	263gal JET-A or JET-A1

TABLE 3-1:PERFORMANCE SPECS

Operating Speeds

The following table sets out all the key operating speeds for the **M600**

Operating Speeds (V Speeds)	KIAS		
V_{MO} (maximum operating speed – never exceed this speed)	251		
V_O (maximum maneuvering speed – no full/abrupt control movements above this speed)	153 (6000lb) 121 (3750lb)		
V_{FE} (maximum flap extension speed) **T/O** **LND**	 147 112		
V_{LO} (maximum landing gear operation) **Extension** **Retraction**	 170 130		
V_R (rotation speed)	85		
V_X (best angle of climb)	95		
V_Y (best rate of climb)	122		
Vglide	115 (6000lb 110 (5500lb) 100 (4500lb)		
V_{SO} (stall speed at maximum take-off weight and 0, 30 and 45 bank angle)	0°	30°	40°
Clean (no flaps, gear up)*	73	78	83
Landing (flaps LND, gear down)	62	66	70
V_{REF} (landing speed - full flaps)	85		
V_{REF} (landing speed - no flaps)	100		
Maximum demonstrated crosswind velocity	17		

TABLE 3-2: OPERATING SPEEDS

Aircraft Dimensions

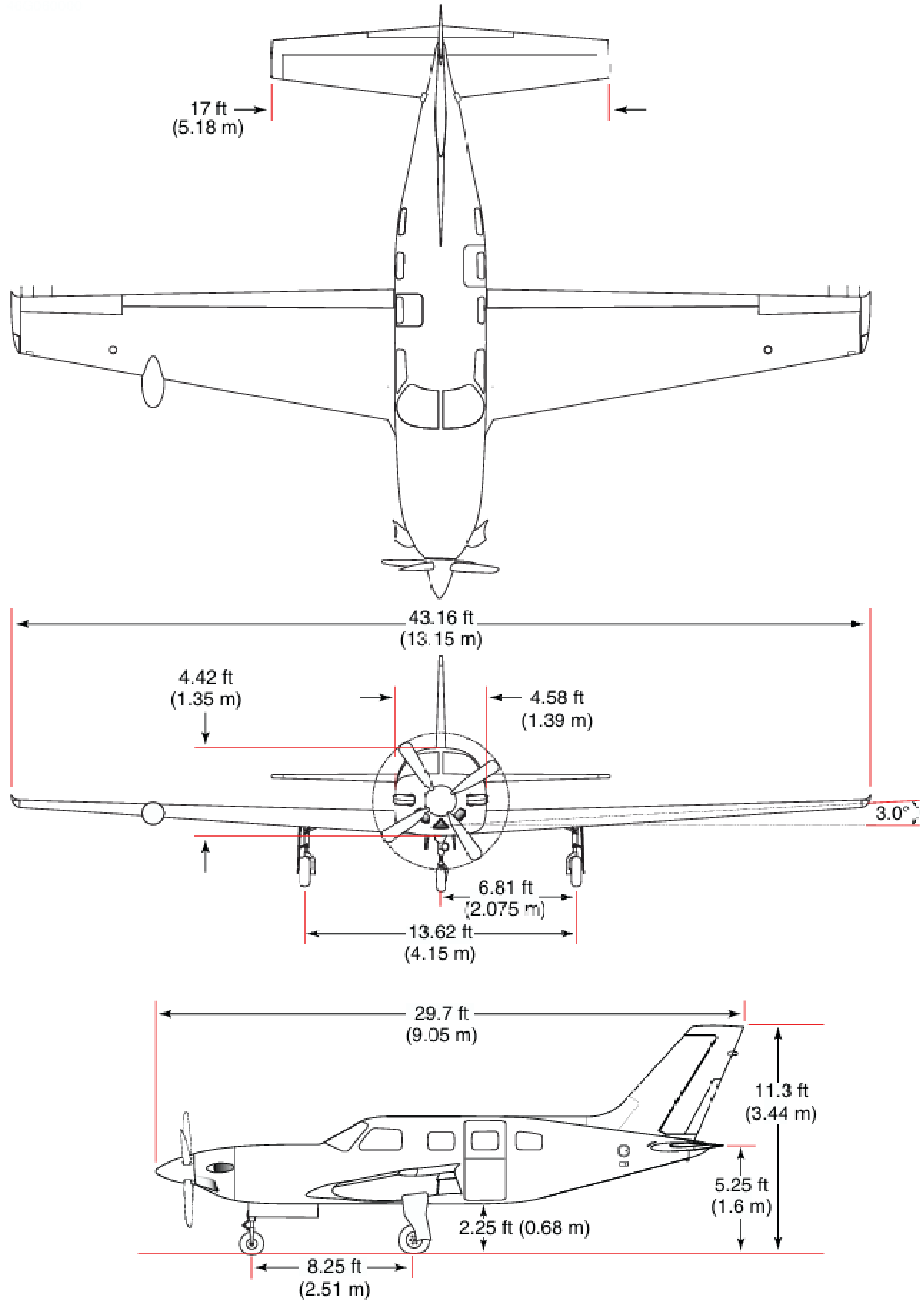


FIGURE 3-1: AIRCRAFT DIMENSIONS

4. Cockpit Layout

COCKPIT LAYOUT

Cockpit Overview

The **M600** has a modern, all-glass cockpit design built around the Garmin G3000 avionics suite, arranged for a pilot (left hand seat) and co-pilot (right hand seat). The operational design has significant systems automation to reduce pilot workload, making it safer for single-pilot operation in IFR conditions.

Stylish, integrated, LED lighting provides excellent illumination of the dials and switches in all conditions, with matte, non-reflective materials used on the main instrument panel to reduce glare. There are two operable sunshades at each pilot position (click and drag, or use the mouse wheel).

The main areas of the cockpit are:

FIGURE 4-1: COCKPIT OVERVIEW

1	Instrument Panel
2	Autopilot Panel
3	Garmin Touch Control
4	Pedestal
5	Overhead Switches
6/7	Control Wheels (yoke)
8	Circuit Breakers

TABLE 4-1

Switches and controls

The following diagrams and tables indicate the position of each switch and gives a brief description of its function. For fuller descriptions please see Section 6: Aircraft Systems.

- Most switches are push-button ON/OFF and when pressed down are ON, indicated with a green bar LED.
- Some switches are 3-position rocker switches, as well as a variety of dials and push-pull knobs.

- Reversionary Mode refers to the PFD mode when the MFD display is not on for any reason. See Section 7: The G3000 Avionics Suite for more information on Reversionary Mode.

Instrument Panel

These are the main controls and switches on the instrument panel:

FIGURE 4-2: INSTRUMENT PANEL

1	Display Backup - pilot side	Press if the PFD fails to automatically enter reversionary mode or to command the MFD to enter reversionary mode.
2	Autopilot Level mode	Press to activate the Autopilot LVL mode and bring the wings level and command 0fps vertical speed.
3	GMC-710 Autopilot control panel	The 'autopilot controller'. This panel is used to control the GFC-700 Auto flight control system (AFCS). A full description of this panel is in AFCS entry in Section 7.
4	Emergency Auto Land HALO	Press to engage the Garmin Emergency Autoland System.
5	Display Backup - copilot side	Press if the PFD fails to automatically enter reversionary mode or to command the MFD to enter reversionary mode.
6	PFD1	Pilot side Primary-Flight Display – See Section 7 for more information
7	MFD	Multi-function display – see section 7 for more information.
8	PFD2	Co-Pilot side Primary-Flight Display – See Section 7 for more information
9	Climate Control Panel	Control the Air-conditioning and Vent Fans. See 'Environmental systems in Section 6
10	ESS CBs	Electrical Bus Tie circuit breakers
11	Parking Brake Lever	Pull out = parking brake SET. Push in = parking brake RELEASE.
12	Bleed Air Lever	Pulled out = bleed air OFF. Push in = bleed air ON. When ON the ECS system will receive bleed air to pressurize and warm the cabin.

13	Bleed Air Select	Environmental Control System. 4 position dial (OFF, LOW, HIGH, EMER). Controls the rate at which the cabin pressurization system will operate using conditioned bleed air drawn from the engine. This bleed air is always warmer than ambient and is also used to heat the cabin. Cabin Pressure Dump button next to it.
14	Landing Gear Selector	Lower position = Landing gear DOWN, Upper position = landing gear UP (retracted). Gear status is indicated on the G3000 MFD or PFD (in reversionary mode).
15	Garmin Touch Controller	Main computer of the airplane, handles flight planning, MFD pages and Utility pages like Fuel trip planning and performance calculations.
16	Flaps Lever	Electric flap position selector (3 positions: UP, T/O, LND)
17	BARO Knob	Adjusts the barometric pressure indicated on the PFDs
18	Defrost	This will use conditioned warm bleed air from the engine to defrost the windshield
19	Pilot Yoke Click Spot	Click here to un-hide the control wheel.
20	Co-Pilot Yoke Click Spot	Click here to un-hide the control wheel.
21	ELT	Emergency Locator Transmitter Switch.

TABLE 4-2

Standby Flight Instrument

Overhead Switch Panel

The overhead electrical Switch Panel is where many of the most important switches for controlling electrical systems are located.

The panel is divided into 3 zones – the pilot side switches, the central dimming control switches and the co-pilot side switches. When a switch is in the 'ON' position it is pressed down and a green LED will illuminate.

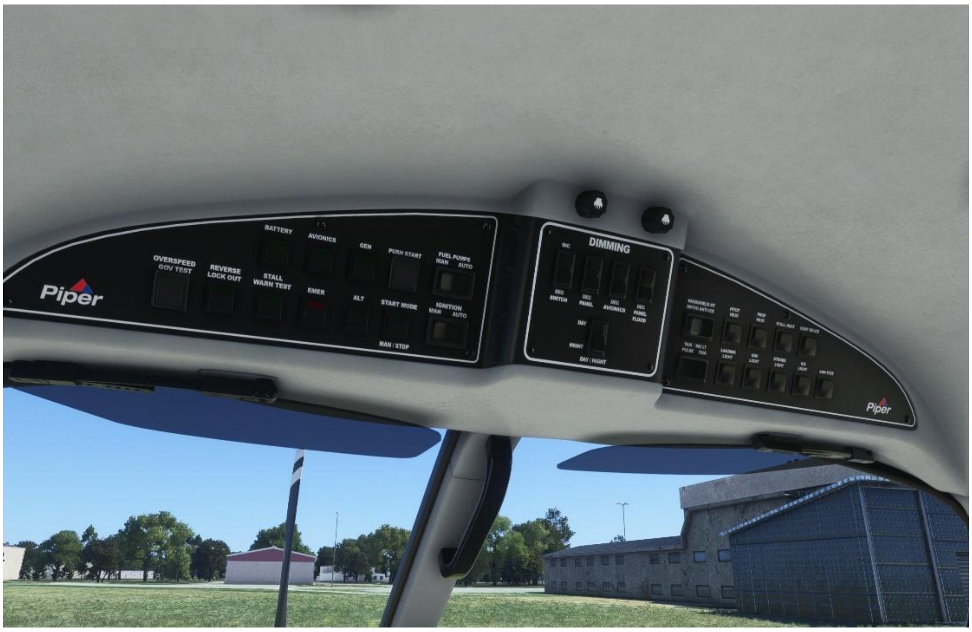


FIGURE 4-3: OVERHEAD SWITCH PANELS

Pilot side switches

These control the major electrical systems of the aircraft

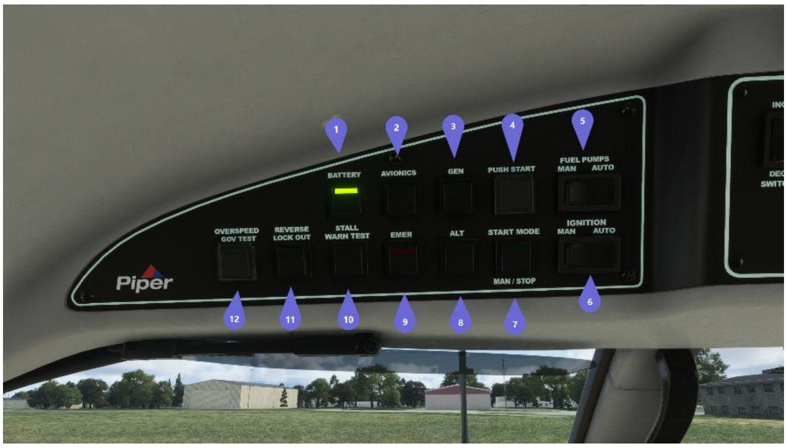


FIGURE 4-4: PILOT SIDE OVERHEAD SWITCHES

1	Battery	This connects the 24V battery which powers all the electrical systems and the starter motor. It will turn on the G3000 PFD1 in reversionary mode and the radios. (Main Bus & Avionics #1 bus)
2	Avionics	This will turn on the MFD and PFD2 and PFD1 will come out of reversionary mode. (Avionics #2 bus and non-essential bus).
3		Generator (GEN) Turns on the generator which supplies power one the engine has started. See Section 6 for more information.
4	Push Start	Protected by a cover. When pushed this will activate the starter motor and begin the engine start sequence. If in <u>Auto</u> start mode, the button can be released after being pressed momentarily and will cut out when engine Ng = 56%. When in <u>Manual</u> start mode, the button must be held down to operate the starter. It should be held for no more than 10s after moving the condition lever forward and never more than 30s.

5	Fuel Pumps	This is a 3-way rocker switch. Left = Manual (MAN) will run the left- & right-wing tank auxiliary boost pumps ON, Middle = OFF, Right = Automatic (AUTO). In this mode the pumps will turn on if a low fuel pressure condition is sensed (less than 9 PSIG)
6	Ignition	This is a 3-way rocker switch. Left = Manual (MAN) will spark the dual igniters continuously. Middle = OFF, Right = Automatic (AUTO). In this mode the dual igniters will activate if torque drops below 240ftlbs and de-activate above 450 ft-lbs.
7	Start Mode	This will set the start mode to MANUAL when pressed (LED will be on). The default starter mode is AUTO (not pressed, LED off). Note: Pressing this will cause an Auto engine start in progress to stop. (necessary in the event of a ‘hung-start’/no light-off).
8	Alternator (ALT)	This will turn on the alternator, which will supply DC power to charge the aircraft battery. The alternator acts up as a back-up power source to the generator.
9	Emergency Switch (EMER)	This will activate the Emergency Bus to supply emergency power directly from the battery. If the Battery switch is also ON, a red LED will show. Turn the Battery to OFF to ensure correct operation of the Emergency power supply. See Section 6: Electrical System entry for more information.
10	Stall Warn Test	Press and hold to test the stall warning tone, “STALL, STALL”.
11		Reverse Lock Out Press and hold to test the system preventing the engagement of beta/reverse in the air. See Section 10 – Normal Procedures.
12	Overspeed Gov Test	Protected by a cover. Press and hold to test the correct functioning of the propeller governor and overspeed protection. See Section 10 – Normal Procedures.

TABLE 4-3

Dimming Switches

They are used to control lighting intensity in the interior of the aircraft. All are rocker switches with an increase (INC) and decrease (DEC) position. Press and hold to change the intensity of the lighting to the desired level.

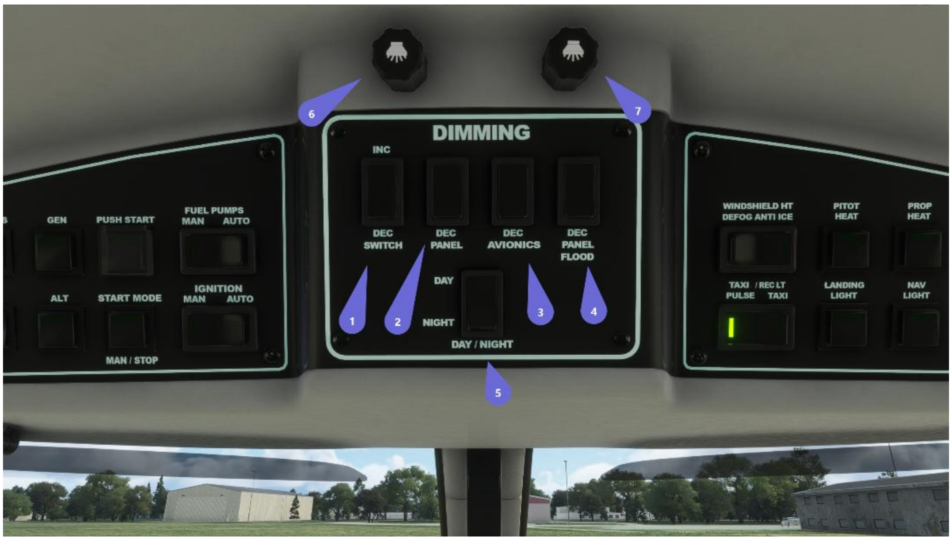


FIGURE 4-5: OVERHEAD DIMMING SWITCHES

1	Switch	Dims Overhead Switch Panel
2	Panel	Dims Circuit Breaker panels and Instrument Panel
3	Avionics	Dims G3000 PFDs and MFD and the GMC-710 autopilot controller panel
4	Panel Flood	Dims Embedded LED light strips
5	Day/Night	Cabin Pressure Dump and MIC SEL switches
6/7	Dome Lights	Clockwise = turn on/increase left overhead dome light. Anti-clockwise = decrease/turn off

TABLE 4-4

Copilot side switches

These control the ice protection systems and the exterior lights:

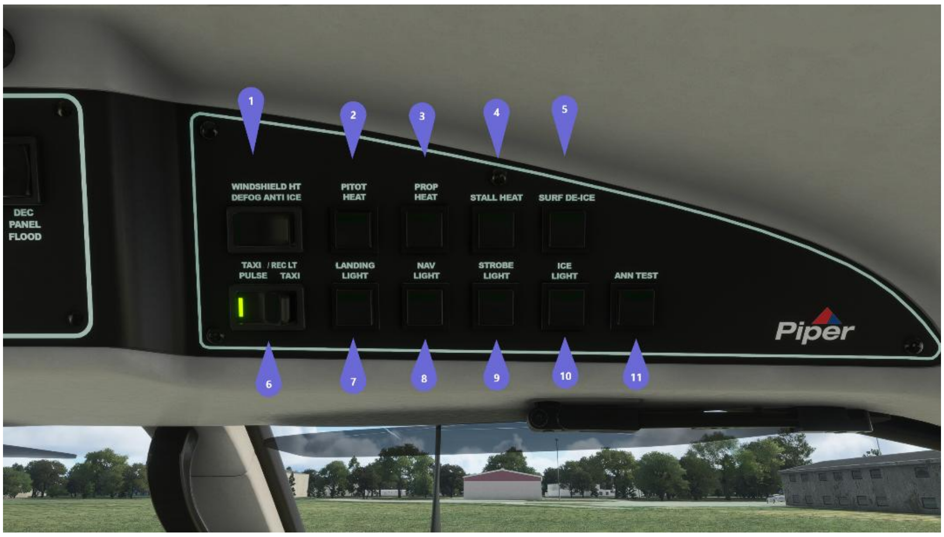


FIGURE 4-6: CO-PILOT OVERHEAD SWITCHES

1	Windshield Heat	Press to turn on the electric windshield heater.
2	Pitot Heat	Press to turn on the heater for pitot-heat system. Extended use on the ground may damage the system.
3	Prop Heat	Press to turns on the electric prop heating elements. Limited to 30s if used on the ground.
4	Stall Heat	Press to turn on the stall heat system. Will be inhibited (CAS advisory message) if OAT 5°C or above.
5	Surf de-ice	Activates the wing and elevator pneumatic de-ice boots.
6	Taxi/Rec Light	This is a 3 positions rocker switch. Left = Taxi lights (wing tip lights), Middle = off, Right = recognition lights (this pulses the wing tip lights)
7	Landing Light	Press to turn on the nose wheel mounted landing light. NOTE: The gear must be extended for the landing light to be visible.
8	Nav Light	Press to turn on the left (red) and right (green) wing-tip navigation (position) lights
9	Strobe Light	Press to turn on the high-intensity strobe light.
10	Ice Light	Press to turn on the ice light to allow observation of the wing leading edge surfaces for ice accumulation at night

11	Fire Det/Ann Test	Press and hold to test the fire detection and annunciation system.

TABLE 4-5

Control Quadrant

This is where all the main control levers for the engine are located.

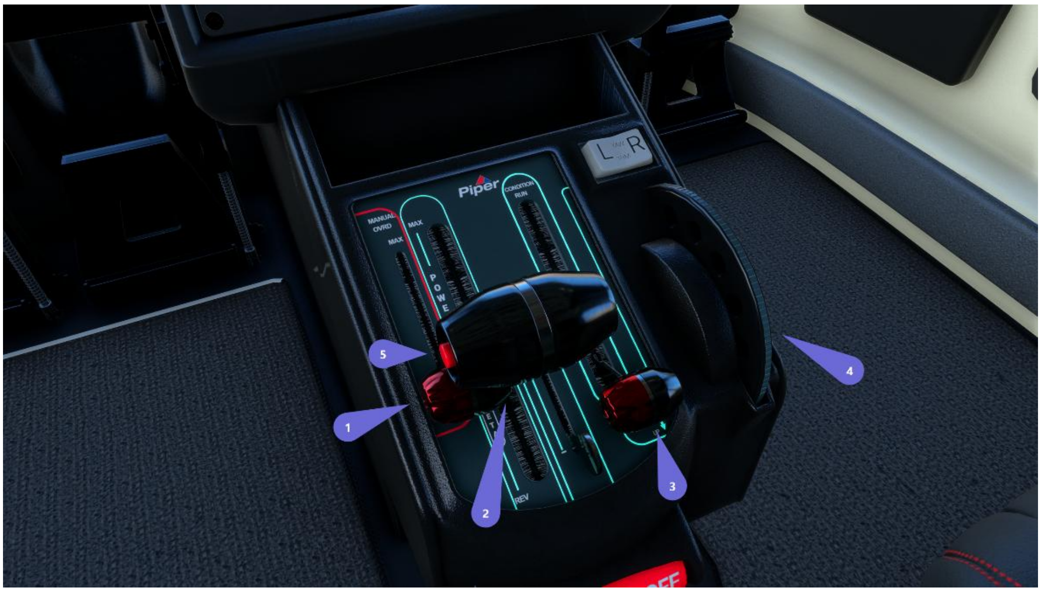


FIGURE 4-7: CONTROL QUADRANT

1	Manual Override Lever	The manual override lever (MOR) is used to control supply of fuel to the engine (INOP) in the event of a failure of the Fuel Control Unit (FCU). It is essentially a backup throttle.
2	Throttle	The main way of controlling the power (torque) produced by the engine. It has 3 ranges: IDLE – MAXIMUM, BETA and REVERSE.
3	Condition Lever	This controls the supply of fuel to the engine. It only has two positions: CUT OFF/FEATHER (fully aft) and RUN (fully forward). Placing the condition lever into CUT OFF/FEATHER will automatically feather the prop also.
4	Elevator Trim Wheel	This supplements the electric elevator trim switches on the control wheel. Take-off range trim is indicated by the white hatched area and current trim position by the white needle.
5	Autothrottle Disconnect	Disconnects the auto throttle and gives the pilot manual throttle responsibility.

TABLE 4-6

Control Wheel (yoke)

There are two control wheels – pilot side and co-pilot. They are identical in their arrangement of switches and buttons.

FIGURE 4-8: CONTROL WHEEL (YOKE)

1	Electric Elevator Trim	A split rocker switch. Press both forward to move elevator trim nose down and switches aft to move nose up. Both must be pressed at once to reduce the risks of runaway trim. Pressing one or both in any direction will disconnect the autopilot if engaged.
2	CWS (INOP)	Control Wheel Steering. Pressing this button allows the pilot flying to suspend the autopilot operation allowing them to hand-fly the aircraft without disconnecting the autopilot. The state the autopilot assumes once the CWS button has been released depends on what modes were active when the CWS was engaged.
3	Autopilot Disconnect/Trim Interrupt	Pressing this button will disconnect the autopilot and yaw damper. Note it cannot be used to engage the autopilot.
4	Mic (INOP)	Active transmit com Push-to-talk (PTT). INOP.
5	IDENT (INOP)	This will squawk an 'ident' signal via the aircraft transponder.

TABLE 4-7

Circuit Breaker Panels

There are three circuit breaker panels – one on the pilot side (left) fuselage, one on the main instrument panel below and left of the pilot-side yoke and one on the co-pilot side (right) fuselage. Each circuit breaker (CB) protects a particular electrical system as labelled on the panels themselves.

A raised CB means it has 'popped' to protect the system. Push it back in highlighting/selecting and left clicking. You can also manually pop a CB the same way. This might be to simulate a failure or be a necessary part of an emergency procedure checklist.

The **M600** electrical system is fully modelled and each CB for an implemented system is functional. It is therefore important to inspect them before each flight as they can pop, particularly as the aircraft battery ages.

Tip

Inspecting the CB panels can be awkward – try setting up custom cockpit views by positioning your view using 'freelook' mode and the keyboard arrow keys and then use **CTLR+ALT+[number from 0-9]** to set a cockpit custom camera view. To then move to that view, press **ALT+[num]** , or bind it to a key or switch in MSFS control settings.

Please refer to the Electrical System entry in Section 6: Aircraft Systems for more information on the Circuit Breaker panels.

Passenger Cabin Overview

The cabin features a polar-white interior, with white leather seating and matched carpeting, all in a factory-fresh condition.

FIGURE 4-9: M600 CABIN - FACING FORWARD

There are 4 passenger seats: 2 facing aft and 2 facing forward. There are 6 windows, with sliding blinds (click and drag), the over-wing right-side window also acts as an emergency exit.

The main cabin door is on the left-hand fuselage, aft of the wing. It can be opened or closed using click spot. Opening the door in flight will result in the loss of cabin pressurization. If the door is open with the engine running a Warning CAS Message DOOR AJAR will display.

The rear of the cabin has a baggage stowage area for up to 100lbs of baggage.

Individual seat courtesy cabin lighting is provided by and overhead light and can be turned on/off by a switch on each passenger seating control panel.

A folding table is on the right-hand side and can be open and closed by highlighting the click spots on the cover (to fold out) or underside of the table (to stow).

FIGURE 4-10: PASSENGER SEAT CONTROLS

FIGURE 4-11: M600 PASSENGER CABIN - FACING AFT

5. Systems

SYSTEMS

Systems overview

This section gives simplified descriptions all the major **M600** systems including:

- Engine and propeller;
- Electrical systems;
- Flight controls;
- Pressurisation;
- Landing gear and hydraulics;
- Brakes and tyres;
- Fuel System;
- Ice Protection systems; • Environmental System;
- Other secondary systems.

Note: We have only included systems that are, or will be, modelled.

The engine

The **M600** is equipped with a Pratt & Whitney PT6A-42A turboprop engine delivering a flat-rated 600 shaft horsepower (SHP) and maximum constant propeller speed of 2000RPM. The PT6A has many variants are used in with a wide range of aircraft, delivering high performance and reliability with low fuel consumption, making them a popular choice.

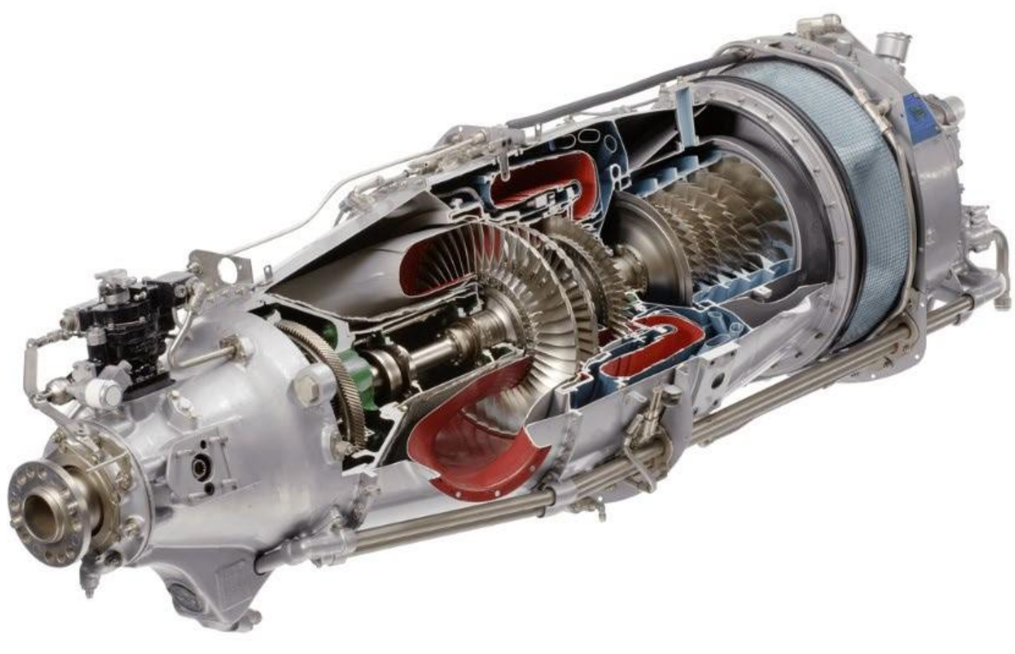


FIGURE 5-1: PRATT & WHITNEY PT6A-42A

For many private owners, progression from a piston-engine to a turboprop marks a significant step up. The extra performance of a turboprop comes at additional cost and following correct procedures and respecting limitations are necessary to avoid very expensive repairs.

Essentially, the PT6A is a small jet engine – by compressing air and mixing it with fuel and igniting the mixture, a jet of hot gas is created that drives the turbine compressor blades, which rotate at very high speeds. These spinning blades are linked to the propeller via a gearbox and other systems to spin the prop (at a much lower RPM), which then provides thrust.

A full description of the functioning of a PT6A-42A engine is beyond the scope of this manual, but there are many excellent resources freely available online if you would like to learn more about how these engines work.

Torque, ITT & Ng

There are three key measures of the engine's performance available to the pilot:

- **Torque** – the amount of power the engine is sending to the prop (measured in pounds-feet or lb-ft);
- **Ng** – the overall capacity of the engine (measured as a percentage of the maximum RPM of the turbine blades). 101.7% = 38,100 rpm. An Ng reading of 90 means you are using 90% of the engines potential power output. The 'g' in Ng stands for gas-generator, which is another name for that part of the engine;
- **ITT** – Inter stage Turbine Temperature. This is the temperature of the combustion chamber and must be carefully monitored.

Engine Systems

Ignition. The Ignition system provides the 'spark' to ignite the fuel at light-off and is controlled using the IGNITION switch on the overhead panel. Manual (MAN) mode will provide continuous ignition and should be selected at engine start, during take-off and landing or when flying in heavy precipitation.

There are two ignitors and there is no time limit on how long the ignitors can be left to run, but leaving them on for extended periods will reduce their life and increase the risk of a failed light-off during engine starts. AUTO mode should therefore be selected in normal flight. When AUTO ignition mode is selected, the ignitors will come on whenever the engine torque drops below 275ft-lbs, helping sustain ignition and avoid an engine 'flame out' (IRL this can occur due to interrupted intake air flow or heavy precipitation). They will turn off automatically should torque rise above 375ft-lbs. Whenever the ignition system is active (MAN or AUTO), the CAS IGNITION Message display.

Engine Accessory systems. The engine has several 'accessory' systems that draw power from it:

- A direct drive Starter/Generator;
- A belt driven Alternator;
- A belt-driven compressor for the air conditioning system.

The Starter/Generator is a single unit – it is used to turn the engine compressor blades during start and then, after start, it is turned by the engine to generate electricity. See Electrical Systems below for more information on these accessory systems.

Inertial separator. The engine has a fixed-position inertial separator. This helps prevent engine damage by preventing foreign objects from entering the engine. This system is not pilot controlled and is always in operation.

Fuel Control Unit. Fuel supply to the engine is controlled through an electronic Honeywell Fuel Control Unit (FCU). This system is not pilot controlled. Fuel pressure can be ensured during engine start and critical phases of flight by turning of the auxiliary fuel pumps by setting the Fuel Pumps switch to MAN.

Oil. The engine has an integral oil lubrication system with a capacity of 12 quarts (11.35 liters). Oil will be consumed over time and, if not replenished in the Maintenance EFB Page, may lead to engine failure. The Engine Information System (EIS – see MFD in Section 7) has oil temperature and pressure gauges. Oil pressure and temperature outside of permitted range may indicate an imminent engine failure and the relevant emergency checklist consulted. The limits on the oil system are:

	Pressure (psi)	Temperature (°C)
Starting	0-200	-40 minimum at start
Take-off/MCP/Cruise	100-135	0-99
Idle	60 minimum	-40 to 99

Engine Controls

The engine is controlled by 3 levers located on the center console/Control Quadrant:

- **Manual Override Lever (MOR)**. This is used to manually control the supply of fuel to the engine in the event of a failure in the FCU or the Throttle linkages. (INOP -planned for future release)

- **Throttle.** This controls the supply of fuel to the engine via the FCU and therefore the power (torque) output of the engine. It has 3 ranges: Normal (Idle to Maximum), Beta and Reverse. Beta and Reverse are accessed by moving the throttle aft of a detent at the idle position. The throttle should never be moved into beta/reverse in the air and a squat switch on the landing gear will prevent this. The correct functioning of the squat switch safety system can be tested on the ground using the Reverse Lock Out switch. See the propeller section below for a description of the Beta and Reverse modes.

- **Condition Lever.** This controls the supply of fuel to the

  FCU and also the prop feathering. It only has two POSITIONS RUN and CUT-OFF/FEATHER. When in RUN,
  fuel-flow is established to the FCU. Placing it in CUT-OFF will cut the supply of the fuel to the engine (shutdown) and simultaneously feather the prop (if the battery is on).

Engine Instruments

There are 5 engine and 1 prop gauges on the EIS display on the MFD:

1. **Torque gauge.** This will show engine torque in 100s of pounds-feet (lb-ft) – a measure of rotational force. The upper limit (red) arc begins at 1580 lb-ft. When applying more torque via the throttle, there is normally some lag between moving the throttle and what is shown on the gauge. This lag is typical for turbine engines and should be accounted for. When in idle on the ground the engine will produce more power and the gauge will read 143lb-ft and in the air will idle at 10lb-ft.

2. **ITT gauge**. The ITT gauge will show the current ITT temp in degrees Celsius. It is a dynamic gauge with different temperature arc for engine start and normal operation. The gauge will automatically switch from Start to Normal arcs after engine start has completed. The temperature range of each arch is:

FIGURE 5-3: ENGINE INSTRUMENTS TABLE 5-2: ITT RANGES

	Start (°C)	**Normal (°C)**
Green	0-800	0-800
Yellow	805-1000	
Red	1005 +	805+

An over-temperature condition (red arc) will be shown with a flashing red CAS symbol on the gauge. Engine damage will result quickly (within seconds).

3. **PROP RPM gauge**. This will show the current rate at which the prop is spinning in revolutions per minute (RPM). The normal operating range is 1200-2000 RPM and in flight the prop governor will maintain a constant speed of 2000 RPM. On the ground at lower power settings, prop RPM will be lower than 2000 RPM. Overspeed of the PROP will trigger a flashing red CAS warning on the gauge. (see the Propellor section below for more information).

4. **Ng gauge**. This will show the operating speed of the gas-generator as a percentage of the maximum RPM of the engine ($101.7\% = 38{,}100$ rpm). Exceeding Ng limits will trigger a flashing red CAS warning on the gauge.

5. **Oil Pressure gauge**. This will show the engine oil pressure in PSI. Any pressure outside of normal range may indicate a failure.

6. **Oil Temperature gauge**. This will show the oil temperature in PSI. Any temperature outside of normal range may indicate a failure.

	Oil Temperature	Oil Pressure (psi)
Green	0-99°C	100-135
Yellow	n/a	136-200
Yellow (lower arc)	-40 to -1°C	60-99 (torque <1100lb-ft) 85-99 (torque > 1100lb-ft)
Red	100°C+	<59 (torque <1100lb-ft) <84 (torque <1100lb-ft)

TABLE 5-3: OIL TEMPERATURE & PRESSURE RANGES

Propeller

The **M600** is equipped with a Hartzell, 5 blade, 82.5", all-metal, variable pitch prop. Each blade has an electric de-ice boot. In normal flight operations, the prop operates at a constant RPM of 2000 via a propeller governor which automatically regulates the prop RPM. The correct functioning of the governor can be tested using the Overspeed Governor Test switch. Prop RPM is not pilot controllable.

Blade pitch angle in normal flight is controlled automatically. On the ground it can be controlled via the throttle to obtain low and negative pitch angles (Beta and Reverse). The prop can be feathered using the Condition lever in the CUT-FEATHER position.

Beta

The props enter beta at a pitch angle of less than approximately 19°and goes down to 0° of pitch angle. As the pitch angle reduces, thrust declines until at 0°, the blades are flat and no effective thrust is produced.

What is Beta Range?

'Beta' range on the **M600** refers to when the throttle is moved aft of the idle detent and allows the prop blades to automatically reduce their pitch angle to produce less forward thrust.

Reverse

Continuing to move the throttle aft then enters the REVERSE range. Here, the blades enter a negative pitch angle up to a maximum of -9.5° to -10.5° and will produce a reverse thrust effect. The further aft the throttle, the greater the negative pitch and the greater the reserve thrust.

Beta is useful when taxiing to control excessive taxi speeds. After landing it should always be engaged to reduce the ground roll. Reserve range can be used to further reduce the ground roll.

Warning!

Reverse thrust may not be used to reverse-taxi the aircraft and should not be used on unsealed surfaces.

Feathering

Feathering the prop places the blades at a pitch of 85°, so they present the least surface area (and therefore drag) to the relative wind. This is important during engine starts or following a loss of engine power, both to aid any attempted restart and to reduce prop drag and increase glide performance.

As the condition lever controls both prop feathering as well as fuel supply, this helps reduce pilot workload, particularly in an emergency.

Note

The Battery must be on to feather the prop. The prop will not feather on Emergency power only.

Electrical

Like most modern aircraft, the **M600** is heavily reliant on its electrical system for many vital functions. The **M600** has a fully modelled electrical system using the new MSFS electrical SDK. This allows the aircraft electrical circuits to be fully mapped, with the correct load and draw – voltage drain on the battery and generator load are all accurately simulated. This section gives a simplified description of the system. Many aspects of what would present in a similar IRL system and have been omitted.

Supply

All electrical systems must have a source of supply to power the aircraft system. The **M600** has 3 onboard method of supply electricity, providing a high level of redundancy.

1. **24v lead-acid battery**. This is used to provide power pre-engine start, to power the starter motor during engine starts and give limited emergency power. The battery has a charge and a total capacity that will degrade over time and will eventually require replacement. Old batteries can result in electrical failures or hot-starts. The battery condition can be seen on the EIS display.
2. **Direct drive starter/generator**. This is the main power source for the aircraft electrical systems. The engine must be on for it to supply power.
3. **A belt-driven alternator**. The alternator works in tandem with the generator and as a back-up. If the generator were to fail, the alternator can supply all necessary electrical power. During normal operations it keeps the battery charged. The engine must be on for it to supply power.

Each system has its own on/off switch on the overhead panel. CAS Messages will show whenever the Generator or Alternator are off/failed. If either the Generator or Alternator trip, follow the emergency procedures set out in Section 11. The system also has an inverter, used to convert DC from the electrical supply to AC for systems that require AC.

WARNING

If you fail to turn on the Generator and/or Alternator after engine start, the aircraft systems will deplete the battery and you will eventually experience a total loss of electrical power with no emergency supply.

Ground Power

As well as the 3 on-board systems, electrical supply can also come from a Ground Power Unit (GPU). This can be requested [ADD IN DESCRIPTION]. When connected it will provide power to all the aircraft systems. The GPU must be disconnected before the generator and alternator are turned on. This is normally immediately after you have started the engine.

Distribution

The power supply must be distributed to the aircraft systems. This is done through a series of electrical 'busses'. Each bus has an associated set of Circuit Breakers (CBs) of different amperage ratings depending on each system. Typically, each bus is located behind its associated CB panel. There are 7 busses:

1. **Tie Bus** (CBs on instrument panel). The tie bus controls the supply to all the other busses except the Emergency and Battery busses which are kept separate. All the CBs for the Battery, Generator and Alternator plus the Main, Non-Essential and Avionics busses are on the tie bus CB panel.
2. **Emergency Bus.** This is connected directly to the battery and not via the tie bus. It can therefore be used to supply essential systems in the event of a total electrical failure.
3. **Main bus** (CBs pilot side, fore & aft). See the CB panel illustration for the systems supplied by the main bus.
4. **Non-essential bus** (CBs co-pilot side). See the CB panel for the systems supplied by the nonessential bus.
5. **#1 Avionics bus** (CBs co-pilot side). See the CB panel illustration for the systems supplied by the
6. **#2 Avionics bus** (CBs co-pilot side).
7. **Battery Bus** (engine compartment). This bus is used to supply courtesy lighting directly from the battery.

Avionics

Both #1 and #2 Avionics Busses will be energized by the Avionics Switch which will turn on the MFD and other avionics. To reduce draw on the battery, the avionics switch is OFF until after engine start.

Gauges

The electrical supply system has two gauges on the EIS:

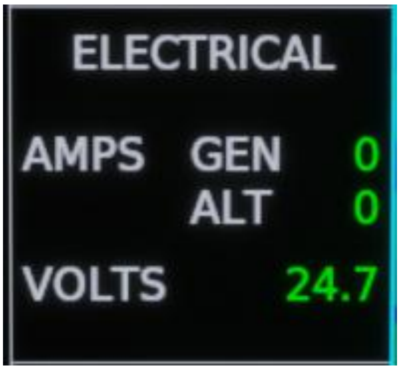


FIGURE 5-4: ELECTRICAL SYSTEM INSTRUMENTS

AMPS = load on the Generator & Alternator

Volts = current bus volts available. When on battery only this will be battery volts. When on generator and/or alternator this will read what they supply (24.7volts).

Emergency Power

The EMER switch can be used to supply power to essential aircraft systems in the event of a total electrical failure. It connects the emergency bus, which is itself connected directly to be battery and not via the Tie Bus. The following systems will be supplied:

- PFD1
- GTC 1
- Standby Instrument
- Comm/Nav/GPS
- #1 AHRS
- #1 ADC
- Landing gear position indicators
- Internal Lighting

The following aircraft systems will NOT be operative in emergency power:

- Flaps
- Rudder trim
- BETA and Reserve range

Some EIS gauges may not function/display invalid:

- Fuel Quantity
- Torque
- Oil Pressure
- Vacuum
- Pressurisation gauges

> **WARNING**
>
> For the Emergency Power supply to operate correctly, the BAT switch must be OFF. If it is ON, a red LED will show on the EMER switch. This is to prevent non-essential systems from drawing from the battery.

Circuit Breakers

Circuit breakers (CBs) are designed to protect electrical systems from damage caused from surges or fluctuations in the electrical supply. There are 4 CB panels:

1. Instrument Panel (tie bus)
2. Pilot side, aft (main bus)
3. Pilot side forward (main bus)
4. Co-pilot side (non-essential buss and avionics 1&2 busses)

With electrical failures enabled in the EFB app, CBs may trip or 'pop' and be in a raised position. It is important to check the CB panel during pre-flight or when a system has failed as it may be the CB. A relevant CAS Message may also be triggered when a CB pops. To reconnect the system, simply push the

CB back down. A CB can trip without it meaning the associated aircraft system has itself failed. If, however the effected system does not reenergize when the CB is pushed back down, then it may have suffered a failure and the affected system might need a repair from within the Maintenance page on the EFB app.

The following screenshots show each CB panel and the individual system that each CB. Each system can be isolated by pulling the CB. Note CBs for systems not implemented will have no effect (e.g. Iridium):

FIGURE 5-5: INSTRUMENT PANEL CBS (TIE BUS)

FIGURE 5-6: PILOT SIDE, AFT CBS (MAIN BUS)

FIGURE 5-7: PILOT SIDE FORWARD CBS (MAIN BUS)

FIGURE 5-8: COPILOT SIDE CBS (NON-ESSENTIAL AND AVIONICS 1&2 BUSSES)

Flight Controls

Primary Flight Controls

The ailerons, elevator and rudder are all conventional and mechanically linked to the control wheels and rudder pedals.

Trim

Pitch (elevator) trim is controlled via the electric trim switches on the control wheels or the trim wheel on the control quadrant. The position of the elevator trim is shown on the gauge to the left of the trim wheel with a blue marker. This should be in the white hatched box for take-off. The trim position including Take-Off position can be viewed on the EIS section of the G3000 avionics.

Rudder trim is controlled by dual electric switches on the instrument panel.
Rudder trim position is shown by the Yaw trim indicator on the EIS screen on the MFD. Before take-off there is a green take-off arc range at 2.5-3 degrees right trim. The absolute value of the trim is shown in cyan numbers to the right of the gauge.

Rudder trim must be in this range for Take Off – if it is not a TO CONFIG CAS advisory/warning message will show. After take-off the green mark is not displayed, although you may find it advisable to keep right rudder trim in place during a maximum continuous power climb.

Aileron trim. The **M600** has no in-flight adjustable aileron trim – a fixed trim tab positioned on the ground assists cruise trim.

Flaps

The **M600** has an electrically operated flaps system. The flaps can be in 3 positions and are controlled by the flap lever. The 3 positions are:

Flap Setting	Maximum Deployment Speed (KIAS)	Typical use
UP	N/A	Normal take-off
T/O	147	Approach and emergency descents
LND	112	Short field take-off/Approach

TABLE 5-4: FLAPS

FIGURE 5-9: Flap Position INDICATOR

Flap position is indicated on the MFD EIS or on the flap selector lever.

Other Systems

Vacuum. The vacuum system is used as part of the de-icing system to keep the pneumatic boots deflated.

Stall Warning. The left wing contains a heated stall warning vane linked to a system for detecting a stall condition. The correct operation of the system is tested with the Stall Warning Test switch on the overhead panel, which will trigger the STALL…STALL aural warning. A failure in the system will trigger the amber STALL WARNING FAIL CAS message.

Emergency Locator Transmitter (ELT). The ELT is used in the event of a forced landing in a remote off field location to allow the emergency services to locate the aircraft. It is a self-contained unit that transmits on the 121.5MHz frequency. It can be set of OFF/ARM or ON. Activating the ELT has no effect in the sim.

Pressurization

The **M600** has a pressurized cabin, allowing operations up to 30’000ft. The **M600** uses custom code to simulate cabin pressurization according to real-world conditions.

The system is highly automated, requiring little pilot input: with the engine running and the main cabin door fully closed and latched, the pilot simply needs to push the bleed air lever to open the supply of conditioned bleed air from the P3 compressor, switch the ECS Cabin Comfort to NORM and make sure the Destination Elevation is set within the GTC unit PERF page and Runway Elevation. The aircraft will then pressurize and depressurize without any further pilot input required other than monitoring the system. It also has warnings and an emergency back-up in case the pilot fails to follow correct procedure. Failure of the pressurization system is an emergency and can lead to hypoxia and loss of control.

System Controls and Instruments

ECS Cabin Comfort. This switch will control the mass of bleed air and the rate at which the cabin will pressurize (and also the rate at which the cabin air will warm). It has 4 positions: OFF, NORM, HIGH and EMERG. To pressurize the cabin, it must be at NORM or above. At very high rates of climb HIGH may be selected or if rapid warming of the cabin is required. Selecting the EMRG will open the emergency bleed valve and the cabin will pressurize at a rapid rate.

EIS display. Cabin pressurization information is provided on the EIS on the MFD in the Cabin Press display:

FIGURE 5-10: PRESSURISATION SYSTEM INSTRUMENTS

ALT FT shows the ‘cabin altitude’ i.e. the relative altitude of the cabin. In an unpressurised cabin this will equal the aircraft altitude. In a pressurized cabin, this will only start to rise once the cabin differential PSI reaches 5.2-5.3PSI, after which the pressurization system cannot maintain sea-level pressure. The maximum cabin altitude allowed is 10,000ft. Fly higher than that and the caution CAS Message CABIN ALT will be shown. Above 12,000ft and this will be replaced with the warning CAS Message CABIN ALT 12K and automated emergency pressurization will start.

DEST ELV shows the destination airport elevation. If you created your flight plan via the EFB route page, then this will be set automatically.

RATE FPM shows the rate at which the cabin is pressurizing/depressurizing.

DIFF PSI shows the differential pressure between the cabin and outside. The maximum allowed is 5.6PSI.

CAUTION

This value is linked to the G3000 minimums value used in Instrument Approach Procedures. Altering one will alter the other. As a CAT1 IAP rated aircraft, minimums in the M600 are always higher than the landing field elevation. By how much will vary on the minimums of the selected instrument approach. On landing, if the minimums/dest elevation set is higher than the actual elevation (which it will be if IAP minimums have been set), a squat switch on the gear will trigger a pressure dump/equalization to ensure the cabin pressure matches the ambient pressure.

Cabin Pressure Dump. Protected by a cover. When pressed this will 'dump' pressurized air out of the cabin until it is equalized with the outside air pressure. This is an emergency system. The depressurization will occur rapidly. IRL fogging/icing of the windows would likely occur IRL and the crew and passengers would need to use emergency oxygen to avoid hypoxia.

Note

Emergency Oxygen supply is not presently simulated in the M600

Emergency Pressurization. As a fail-safe, if the cabin altitude exceeds 12,000ft then Emergency Pressurization will be being automatically as soon as the CABIN ALT 12K message is shown. An emergency bleed valve will open and the cabin start to pressurize.

Unpressurised operation

The aircraft can be operated in an unpressurised state: simply do not push the cabin bleed lever in and keep the ECS Cabin Comfort switch in the OFF position. The Bleed Dump switch may also be pressed. If warm bleed air is required to heat the cabin, then use the ECS to supply warm bleed air and the Dump switch to keep the cabin depressurized.

Caution

When operating at very high altitudes, the cabin altitude may exceed 10,000ft in normal operations. The CAS **CABIN ALT 10K** will show, but flight can be continued (IRL, special precautions such as donning oxygen masks in case of loss of pressurization may be taken)

Landing Gear & Hydraulic System

The **M600** has a retractable tricycle landing gear assembly. The gear can be raised and lowered using the landing gear selector lever. This lever is an electric switch and activates the motor-driven hydraulic pump, with hydraulic pressure used to raise and lower the gear. The landing gear is the only aircraft system supplied by the hydraulic pump system.

The gear status is shown on the MFD instrument display (or PFD in reversionary mode).

It can show:

- 3 green: gear down and locked
- 3 hollow white: gear up
- 3 grey: gear in transit
- 3 red: gear fail

Gear Unsafe

To prevent gear-up landings, or unsafe gear operations, a caution CAS CHECK GEAR message will be shown and an aural 'Check Gear' alert given in the following circumstances:

Condition	CAS	Resolution
Throttle >420-lbs in flight, gear not down and locked	CHECK GEAR, aural tone (can be muted)	Lower landing gear, or Increase throttle to above 420ft-lbs; or Mute tone using Alert softkey
Flaps LND, gear not down and locked	CHECK GEAR, aural tone (cannot be muted)	Lower landing gear; or Raise flaps to T/O or UP.
On ground and gear lever UP	CHECK GEAR, aural tone (cannot be muted)	Place gear lever into DOWN position
Above 400AGL, the CHECK GEAR CAS will be a Caution. Below 400AGL, it will be a Warning.		

TABLE 6-5: GEAR UNSAFE CONDITIONS

If you should put the gear lever to UP on the ground, a sensor will detect that there is weight on the wheels and will prevent the gear from being raised. The CHECK GEAR warning will be given.
If the position of the landing gear is unknown, then 3 red will be shown and a master Warning (ground) or Caution (in flight) will sound.

Emergency Gear Operation

If the hydraulic system fails (no 3 green after selecting gear down), the gear can be lowered by using the Emergency Gear Extension lever. This is a gravity-based system. Please refer to Section 11: Emergency Procedures for the full checklist. In the sim:

1. Reduce airspeed to 100KIAS or less;
2. Click to remove the wire guard and then pull the lever;
3. Check for 3 green gear indications;
4. Once the gear is down and locked, pull the HYDRAULIC PUMP circuit breaker and leave the emergency gear extension lever pulled.

Caution

Once the Emergency gear extension lever had been operated, the gear cannot be retracted.

Warning

Operating the Emergency gear extension lever if the gear is already down and locked can cause a gear system failure.

Brakes & Tyres

Each main wheel is equipped with a hydraulic disc brake system. These are operated from the toe brakes that are on the left and right rudder pedals. These can fail as a result of repeated or excessive heavy braking or if not serviced after a long period of normal use.

Tyres can also fail as a result of heavy landings, incorrect inflation and age.

Fuel System

The **M600** is equipped with **one continuous wet-wing integral tank per wing**:

- 132gal (882lb/400) integral wing tank
- 264gal (1764lb/800kg) total fuel capacity.

Fuel Return

The system has fuel-return lines that allow some fuel to be returned from the engine. This is primarily to allow some warmed fuel to be recirculated to the wing tanks, allowing sustained operations at high altitudes down to temperatures as low as -54°C with the use of additives (not implemented). The return lines will open automatically:

- During engine starts; or
- When the fuel temperature indication is 0° or less and the OAT is below -30c with a total fuel quantity over 100lbs minimum.

The minimum operational fuel temperature. The lowest permitted fuel temperature for JET-A1 without additives is -41°C (-54°C with additives – not implemented). As the fuel temperature approaches this limit, ice may form in the fuel lines and low fuel pressure may result.

Fuel Pumps

There are two electric fuel boost pumps in each wing root. These are controlled using the FUEL PUMPS 3-way switch on the overhead panel. The pumps can be set to OFF (middle), MAN (left), AUTO (right).

When in MAN the pumps will run continuously. Fuel pumps are set to MAN at take-off and landing or if sustained low fuel pressure is encountered.

In AUTO the pumps will turn on automatically when:

- Overall fuel pressure drops below 9psig – both pumps will run (the pumps will turn off above 12psig).
- When a fuel imbalance of 40lbs or greater is detected. One pump will run automatically to correct the imbalance.

Fuel imbalances are indicated with a CAS Message.

When a pump is running it will be indicated with a CAS Message for either the left or right pump.

Ice Protection systems

Icing can form in any conditions where the outside air temperature is 5°C or colder and there is visible moisture or during ground operations in wintery conditions. Ice accumulations will be visible on the wing leading edges, the prop spinner and the windshield.

The **M600** is equipped with a suite of ice protection systems to allow Flight into Known Icing (FIKI) conditions up to Light and Moderate icing. Severe icing must be avoided. The ice protection system consists of:

Surface De-ice.

This uses pneumatic de-ice boots on the upper and lower wing and the vertical and horizontal stabilizers. They are inflated with engine bleed air and held down by the vacuum system. The system is turned on with the SURF DE-ICE switch. When active, the boots will then inflate/deflate in a 6 second sequence over a 60 second cycle and will continue to do so whilst the switch is on.

Heated Propeller

Each prop blade has an electrical heating element that will melt accumulated ice when the when the PROP HEAT switch is turned ON. If turned on with the aircraft on the ground, the system will heat the elements for 30 seconds and after 60 seconds turn the prop heat off. It will have to be manually turned on again. In the air, the system will stay on.

Heated Windshield

Windshield heating is provided for the pilot side only and is controlled by the 3 position WINDSHLD HT switch. This can be OFF (center), ANTI-ICE (left) or DEFOG (right). Use the anti-ice position for a more powerful heating effect. Do not operate in either mode for more than 20 seconds on the ground when testing during the run-up checklist. If the windshield temperature exceeds 77°C then the red WDSHLD OVRTMP CAS warning message will be displayed until the temperature is reduced.

Heated Pitot

Both pitot tubes have a heating system controlled by a single PITOT HEAT switch. Pitot heading should be engaged whenever in flight regardless of the conditions. Avoid extended ground operations to prevent overheat damage.

Heated Stall Warning

This will deice the stall warning system and is turned on with the STALL HEAT switch. If it is turned on when the OAT is 5°C or greater, the system will be inhibited to prevent an over-temperature damage and the STALL HT INHIB Case advisory message will display.

Note

MSFS recognizes the stall heat system as a pitot heat. The in-game interactive checklists will highlight both the Pitot and Stall Heat buttons as a result.

Ice Light

This will activate a light that will illuminate the left-hand wing and allow you to see if there has been any accumulation of ice when flying at night.

Windshield defog lever

Located on the co-pilot side of the instrument panel, this can also be used to supply bleed air to the windshield with a flow of air at the temperate set by the A/C system (see the Environmental System section below).

Ground De-icing

The **M600** ice protection systems are not designed to remove ice or snow from a parked aircraft. If you are finding that your aircraft is icing up on the ground whilst you work your way through the pre-flight checklists, wait for fuel etc., you have two options to use:

1) If on PC, go into Dev mode and set the De-ice slider in the Dev Mode menu > Options to 0. This will instantly deice the aircraft.
2) If on Xbox, or on PC and prefer to avoid Dev mode, swap the current weather to a custom or preset warmer condition and let the sun melt it out, then swap back to your original weather setting!

Environmental System

The **M600** has a custom-coded cabin environment, with a fully operating cabin climate control system.

Maintaining a comfortable cabin temperature is managed through using three different systems:

1. Engine Bleed air (heat)
2. Ventilation air (ambient)
3. Air conditioning (cooling)

Engine Bleed

To heat the cabin the Engine must be running, the Bleed Air valve must be closed and the ECS Cabin Comfort dial set to NORM or above. Compressor bleed air will then provide warm air that is fed into the cabin.

Ventilation Air

The aircraft has a system of electrical vent fans. These will circulate air at ambient temperature and can be used with the engine off. Typically, they can be used to provide some comfort in the cabin before the engine is started, but they will not either heat or cool the cabin. They can also be used when in unpressurised flight.

Air Conditioning (AC)

The air conditioning system has an engine belt-fed compressor and the engine must be on for it to provide cool air, although the A/C blowers can be operated without the engine running they will only circulate ambient air.

These three systems are controlled through the Pressurization system (see the Pressurization System entry above for a description of Bleed Air) and the Climate Control Panel, for A/C, vent air and overall temperature management.

Climate Control Panel

The Climate Control Panel has the following switches:

FIGURE 5-11: CLIMATE CONTROL PANEL

1	Aircon ON/OFF	Selecting ON will engage the engine belt-driven compressor and produced cooled air.
2	Aircon HI/LOW	The controls the air conditioning re-circulation blowers. They can be operated with aircon on or off, but to cool the cabin, the AC must be ON.
3	Vent Fan	This will blow ventilation air independently of both the bleed-air from the ECS or the air-conditioner systems. It can be used on the ground or when in unpressurised flight. Not typically used in flight.
4	Climate control cool/warm dial	Automatic COOL/WARM rotary dial set the target cabin temperature when in Automatic mode.
5	Climate control auto/manual	AUTO/MANUAL switch. This sets the temperature management to either an automatic mode, where the target temperature is controlled with the dial (4) or one where the pilot has to manually add cold or warm air as required using the warm/cool switch (6).
6	Climate control (manual) warm/cool switch	When in MANUAL mode, this switch is pulsed to obtain cooler or warmer air.

TABLE 5-6: CLIMATE CONTROL PANEL

Using the system

To obtain comfortable cabin temperatures, you must use a blend of both warm bleed air and cool AC air. In Automatic mode this will be managed for you once you have followed the normal procedure below. If you do not turn on the AC, the cabin will get uncomfortably hot.

Normal operation

1. Select AUTO mode;
2. After engine start, AICR COND = ON;
3. AC blowers = HI/LO as required;

4. Set the target temperature on the COOL/WARM rotary;
5. Bleed air will already be available (unless you are planning an unpressurised flight).

Maximum Ground Cooling

If the cabin is very hot, you can maximize cooling on the ground only by:

1. Start the engine;
2. Pull out (close) the Bleed Air Lever;
3. setting ESC Cabin Comfort dial to OFF; 4. AC on with the AC blowers on HI.

> **Warning**
>
> Ensure to reset the Bleed Air Lever to pushed in and ECS Cabin Comfort to NORM once the cabin has cooled sufficiently.

Maximum Heating (air or ground)

1. Set the ECS Cabin Comfort to HIGH;
2. Set AC to off.

Manual Operation

When in Manual mode, the temperature can be controlled by using the Manual WARM/COOL switch. Press and hold the switch to manually introduce more cool or warm air.

> **Note**
>
> You can use Vent Fans to provide some comfort for the passengers, but the best thing to do is not to delay engine start – try to have completed all pre-flight tasks (walk-round, IFR clearances and taxi/departure briefing) before the passengers arrive. This will keep to a minimum the time they have to spend sitting in an uncomfortable cabin.


0
0.0
FF259
APEXA

6. G3000


25.0
TRIM
PITCH
UP
YAW
R
FLAPS
UP
T/O
LND
QN846
QN745
RQN40
060
QN603
030
QN741
QN849
5NM
RQN25
QN523
QN605
RQNB3
090
DOVMA
QN735
QN
RQN27
QN552
ISVUV
RQN42
RQNT2
QN725
RQNT1
RQN21
QN678
QN682
NZQN
LEMAK
QN864
RQN20
QN602
RQNA5
QN632
D213E
UPTIN
ENKUV
NOLUV
65VOR
RQN29
RQN19

G3000

Avionics systems

The **M600** cockpit is built around a customized version of the advanced Garmin G3000 avionics suite, developed for MSFS 2024 by Working Title (WT G3000). This provides full IFR capability and coupled with the high levels of automation in the **M600** make the aircraft an ideal one for high altitude, single pilot IFR operation. No extra packages are required from the MSFS Marketplace to use the G3000 in the M600.

FSReborn implementation allows the Engine Information and Crew Alert System (EICAS) to be displayed on the MFD and PFD when in reversionary mode as well as implementation of number of other custom features found in the IRL G3000.

Both the IRL and WT G3000 functions are complex, and it is beyond the scope of this manual to describe all (or even many) of these. There are many excellent on-line video tutorials as well as IRL sources freely available from Garmin that describe the detailed functions of the G3000.

Rather than being a complete guide, this section of the manual focuses on helping you navigate all the different panels and buttons – which can be daunting if you are not used to the G3000. It also focuses on core autopilot functions of the GFC-700 AFCS, the custom EICAS and any custom features such as Electronic Stability Protection. It also notes some of the systems that have not been implemented at this time.

> Note
>
> As the G3000 is a wholly integrated system in the **M600**, no other 3rd party avionics are supported as this would mean most of the information from the custom G3000 EICAS would not be available.

The G3000 suite

The G3000 avionics suite consists of the following systems:

- GDU1200W Primary Flight Display (PFD)
- GDU1200W Multi-Function Display (MFD)
- GTC 570 MFD/PFD Touchscreen Controller
- GIA 63W Integrated Avionics Unit
- GEA 71 Engine Airframe Interface
- GRS 77 Attitude and Heading Reference System (AHRS)
- GDC 74A Air Data Computer (ADC)
- GMU 44 Magnetometer

This (incomplete) list illustrates how complex the overall system is. Fortunately, most of these systems work in the background and the main elements of the suite that the pilot will interact with are the PFD, MFD, autopilot control panel and GTC units.

The G3000 PFD/MFD controls ('Bezel')

All three of the G3000 screens (PFD1 & 2 and the MFD) share the same controls on the frame of the screen ('bezel'). This is so the PFD in reversionary mode can provide the same key functions as the MFD and vice versa.

Unlike other popular Garmin avionics such as the G1000NXi the G3000 suite only features a large wide display bezel with only softkeys and gets rid of the various knobs around the frame to instead put those functions into the GTC units below the mainframe instead.

GTC unit

The GTC units below the G3000 avionics is the main computer of the aircraft and handles systems such as flight planning, fuel trip planning and weather forecasting. It also controls the modes and pages displayed on the G3000 such as LIDO charts and exceedances page. Description of each multipage and feature of the GTC unit would be much too complicated for this manual but such information can be found online.

FIGURE 6-1: Garmin Touch Control unit

Primary Flight Display – main instruments

The G3000 PFD combines various flight instruments and information displays. The layout of the main instruments is as shown:

FIGURE 6-2: PFD FLIGHT INSTRUMENTS

	Instrument	Function
1	Commanded Airspeed	Displayed in cyan, shows the commanded airspeed set on the autopilot panel that the AT is targeting
2	Airspeed Indicator (KIAS)	Red = Vso White = Vfe in landing configuration Green = normal operating speed Yellow = approaching Vmo Red/White barber pole = Vne. Current speed is displayed in box and shown by the position of the yellow needle right of the tape. The magenta line is a speed trend indicator.
3	Inset Map	Displays an inset navigation map enabled by the below softkeys under PFD settings.
4	True Airspeed (TAS) & Ground Speed (GS)	The current true airspeed and Ground Speed of the aircraft.
5	Outside Air Temperature (OAT) & International Standard Atmosphere temperature (ISA)	Shows the current outside air temperature based on the sensors on the wings of the aircraft and the atmosphere temperature currently indicated.
6	Wind information	Displays the current receiving wind heading & wind speed.
7	Selected Heading	Displayed in cyan, displays the heading selected on the autopilot panel

8	Current heading	The current heading that the aircraft is flying, displayed in magnetic track
9	Radio Altitude	Shows the planes altitude in feet from the ground using sensors on the aircraft.
10	Desired Track	Shows the desired track that the autopilot is following for the selected NAV source.
11	Horizontal Situational Indicator	Displays an overview compass with a navigation track to either an FMS (Magenta) or a VOR/LOC source (Green) the plane is tracking.
12	Flight Plan progress	Displays the navigation progress of the flight plan with route legs and distance & bearing to the next one.
13	Timer & UTC	A standard timer stopwatch function indicator and the current UTC time (affected by the time set in sim)
14	CAS Messages Alert Box	All CAS Messages will be displayed in this area. Most important will be displayed first. Some messages may be obscured by the inset map when in reversionary mode, or by the flight plan widow.
15	Barometric Pressure	Current selected atmospheric pressure set via the BARO knob on the instrument panel, pressing the knob will active Standard (STD) mode shown in Magenta.
16	Vertical Speed Indicator (VSI)	Displays the current vertical speed the plane is actively doing.
17	Altitude Tape	Current altitude the plane is flying affected by the selected atmospheric pressure set.
18	Selected Altitude	The pre-selected altitude
19	FMS Altitude constraint	Displays in Magenta the current altitude constraint according to the flight plan page. Line below 2000 in this example indicates that 2000 is the minimum floor.
20	COM channels and Flight number	Shows currently tuned VHF1 radio frequency and the flight number.
21	Flight Director cues	Displays either a Single cue or Dual cue flight director indicator.
22	Bank Angle Indicator	Tick marks at 10° spaces and a major tick mark at 30°, 45° and 60° (limit) of bank.
23	Autothrottle Mode	Flight Mode annunciator showing the current auto throttle mode and engagement.
24	Vertical autopilot mode	Shows the current selected vertical flight mode through the autopilot panel. Either displays ALT hold, FLC (Flight Level Change) or VS (Vertical Speed)
25	Autopilot NAV source	Displays what navigation source between Flight Management system or VOR that the autopilot is flying.
26	Autopilot Engaged	Displays if the Autopilot alongside Yaw Damper and Auto throttle modes are engaged or not.

TABLE 6-1: PFD FLIGHT INSTRUMENTS

Multi-Function Display (MFD)

The MFD is the primary source for engine and other systems information via the Engine Information System (EIS) bar on the left. It also provides a configurable moving map display which includes information from the terrain warning and avoidance system (TAWS).

FIGURE 6-3: MFD LAYOUT

	MFD Information	Description
1	Map/Main screen	This part of the MFD will display the map, traffic screen or weather radar (Select from the Map Page Group). Windows for Flight Plan and Procedures can also be displayed using the GTC Unit. LIDO charts can also be displayed from the GTC charts page.
2	Engine Information	Custom engine information and aircraft system status display.
3	Bearing Information Windows	Heading & Range arc.
4	Current Aircraft Position	This shows the current aircraft position. This will always be centered unless in pan mode.
5	Map Information	Depending on the level of detail selected and other configurable options, the map will display airports (blue = towered, magenta = un-towered. Hollow = soft runway surface).
6	Flight Plan Route	Displays current loaded and activated route.
7	Navigation data bar	Supplementary navigation data. These fields are configurable within the GTC unit.
8	North pointer and map mode indicator	The map can either display with the top always fixed with north at the top (North UP) or so that the map will rotate with the heading of the aircraft (Heading UP). The N arrow shows where North is.

TABLE 6-2: PFD FLIGHT INSTRUMENTS

The MFD Map

The main part of the MFD displays a moving map that can be zoomed by turning the left-most joystick knob on the GTC unit. Pressing the joystick knob will activate a touch mode that then allows the map to be panned using by pressing and dragging on the GTC screen. The map can be configured to show either absolute or relative terrain, be ‘North Up’ or ‘Heading Up’. Options include displaying NEXRAD and having a cyan ‘Track Vector’ which will show you predicted track based on the time parameter selected, and a cyan ‘Select ALT arc’ – this will show at what point on your lateral track you will reach the selected ALTS. It will move as your rate of descent changes. These options can be set inside the Map Settings page when Map is the current selected mode on the GTC unit.

The EICAS system

The **M600** is fitted with a custom-coded Engine Information and Crew Alerting System (EICAS) that displays information on the PFDs and MFD and has a number of custom aural alerts.

Engine Information display

Engine and other key aircraft system information is displayed on a dedicated display on the left-hand side of the MFD as shown in the red box above.

Please see Section 6: Aircraft Systems section for a description of the function of each gauge.

Crew Alerting System

The crew alerting system consists of several elements, including warnings and cautions built into the various flight instrument displays, aural tones or messages and CAS messages. The CAS messages are detailed in Section 11 – Failures and Emergency Procedures.

GWX-70 Airborne Color Weather Radar

The **M600** has a GWX-70 airborne color weather radar. This can be viewed on the MFD by turning on Context radar within the Map settings page and then Sensor page on the GTC unit. In addition, you can activate the dedicated weather page on the GTC unit to display it in Fullscreen instead of overlaying on the map.

The radar draws data from the MSFS weather engine to represent precipitation with green/amber/red indicating the degree of intensity. The radar will be placed into standby automatically on landing to protect ground personnel.

Reversionary Mode

If the MFD should fail for any reason, the system will place the PFDs into 'reversionary mode'. This is a back-up mode that allows important information from the EIS to still be displayed.
The PFD in Reversionary mode can be seen whenever the battery is turned on but before the avionics switch is also turned on. It is normal to start the engine with the PFD in reversionary mode as this helps reduce load on the battery. The PFD will enter Reversionary mode automatically whenever the MFD is not operating.

The two Display Backup buttons on the instrument panel are used to manually put the PFD into reversionary mode should it fail to switch automatically. Even if the automatic switch has occurred, a button should be pressed in any case.

When in reversionary mode, critical information from the EIS is prioritized for display and some information is not shown. Map and navigation information is limited to the inset map. This may obscure some CAS Messages and the outside air temperature information.

IRL it is possible to also place the MFD into a reversionary mode if the PFDs should fail, so it will display the flight instruments.

The GFC 700 Auto flight control system (AFCS)

The GFC-700 Auto flight control system (AFCS) uses a series of systems to direct and control the aircraft in the pitch, roll and yaw axes.

The system is complex and powerful, with many features, particularly when linked to the G3000 navigation and instrument procedure functions to allow IFR flight. This section only gives an overview of the key features of the autopilot system.

The GFC-700 system has Four main elements:

- Flight Directors
- Yaw Damper
- Autopilot
- Autothrottle

Flight Directors (FD)

When engaged the Flight Directors (one each on PFD1 and 2) provides direction to the pilot to maintain a desired attitude when hand-flying the aircraft via a magenta 'command bar' on the Attitude Indicator. The command bar will give combined lateral and vertical direction. When the autopilot is engaged, it provides the guidance to the control surface servos/actuators.

The Flight Directors in the WT G3000 are fully synchronized and both pilot and co-pilot side will always display the same FD guidance.

The Flight directors are engaged and disengaged by pressing the FD button on the autopilot controller pane. This will activate the FD in default ROLL & PIT modes.

The Flight Directors can also be engaged by pressing any of the lateral and vertical mode buttons. If activated this way, the FD will give guidance from the mode used to active it, plus the default mode for the other axis – e.g., if you press the HDG button, the FD will come on in HDG & PIT. If you pressed VS, it would come on in VS and ROLL modes. If you want to clear a mode and revert to the default ROLL & PIT, press the active mode button again – e.g., in the first example above, press the HDG button again: the FD will remain on but the lateral mode will revert to the default ROLL.

Any activation of the autopilot will also turn the FD on.

To use the FD, simply fly the aircraft with the appropriate power, pitch and roll to maintain the attitude indicated by the command bars, staying coordinated with the rudder if necessary. What they command will depend on the autopilot modes and associated target values set. A description of all the lateral and vertical modes is given below.

The Flight Directors can be disengaged by pressing the FD button. All autopilot modes will be cleared from the scoreboard. Any selected altitude will remain in the ALT SEL box.

Yaw Damper

When engaged**,** the Yaw Damper provides stability on the yaw axis, helps counteract Dutch Roll and helps coordinate turns requiring less pilot rudder input. The Yaw Damper is engaged by pressing the YD button.

‘YD’ in green will be indicated in the center of the AFCS status bar. It will also engage automatically whenever the autopilot is engaged (see below).
The yaw damper should be disengaged for Take Off and Landing and be active during all other phases of flight. The yaw damper will disengage when:

- pressing the YD button when active;
- disengaging the Autopilot; or
- whenever below 100ftAGL

When disconnected, the YD indication on the AFCS status bar will flash yellow for 5 seconds before clearing.

Autopilot

When engaged, the autopilot will take direction from the active autopilot mode. Engaging the autopilot will engage the flight director at the same time if it is not already on. Servo motors on the ailerons and elevator will then respond to the commands from the active mode to maintain the aircraft in the correct attitude to follow those commands as shown by the command bar.

The autopilot can be engaged in three ways:

1. Pressing the AP button on the autopilot control panel
2. Pressing one of the LVL buttons on the instrument panel
3. The ECS system has been active for 10 seconds out of the last 20 seconds, the autopilot will engage in LVL mode.

Engaging the autopilot will also engage the Yaw Damper if it has not already been engaged separately.

Once engaged the AP will take direction from the active mode and will fly the aircraft without the pilot needing to operate the controls.

> **Note**
> The autopilot should only be engaged when the aircraft is in trimmed and stable flight, with no pilot pressure on the control wheel.

To disengage the AP:

- Press the AP button when AP is active;
- Press the Autopilot Disconnect/Trim Interrupt button on the control wheel;
- Operate the electric pitch trim on the control wheel;

Disengagement may also occur with:

- Strong inputs by the pilot on the control wheel;
- Excessive pitch or roll;
- When unable to maintain the commanded attitude;
- A fuel imbalance of 125lbs or greater.

When disconnected, the AP indication on the PFD will flash yellow for 5 seconds before clearing, accompanied by a distinctive aural tone.

Auto throttle

When engaged the autopilot module of the aircraft will follow the commanded speed selected either on the autopilot panel with MAN mode set on the Speed knob or in FMS mode it will follow the speed set via constraints or performance pages of the GTC unit.

The mode can be activated by pressing the AT button on the GMC-710 panel and a green AT indicator will be displayed on the PFDs upper box to indicate that the system is active, press the button again to disengage the system.

The system will handle throttle during all autopilot vertical modes including: Flight Level Change, Vertical Speed and Altitude hold modes.

Emergency Autoland (EAL)

The Emergency Autoland (EAL) system, when fully functional, is designed to automatically guide the airplane to an appropriate approach, configure the airplane for landing, perform a safe landing, decelerate and steer the airplane to a full stop, and shutdown the engine. This system is for emergency use only. Do not allow the presence of this system to influence your operational decision making, such as attempting a flight into weather that you would not otherwise attempt if the EAL system were not installed.

Emergency Autoland can be activated by the following manual or automatic methods:

1. Manually pressing the EMERGENCY AUTOLAND guarded switch on the instrument panel.
2. Automatic engagement after being in Autopilot Level Mode for 2 minutes.
3. Automatic engagement after reaching 14,100 feet in Hypoxia Alert - Emergency Descent Mode.

Upon activation of Emergency Autoland, the autopilot will roll the airplane to wings level and zero vertical speed and the Garmin displays will change immediately to the Emergency Autoland User Interface. The EAL system will automatically broadcast emergency information to the appropriate air traffic control facilities in the form of radio transmission and transponder code (7700). And the system will determine the most favorable route and approach to conduct considering weather, terrain features, fuel quantity, wind conditions, runway length and width and various other factors. Upon landing the system will automatically attempt to keep the plane on the centerline and will smoothly apply brakes to come to a full stop.

When the system is engaged there will be a white CAS EAL IN 1 MIN message to indicate the system is engaged and will later show a yellow EAL IN 30 SEC CAS message in the final countdown to activation and once the system is fully in place to take over it will display a red AUTO DESCENT CAS message

The GMC-710 autopilot controller Panel

The primary means of controlling the AFCS is through the GMC-710 autopilot controller panel, located in the center of the instrument panel above the MFD. The following illustration sets out the function of each control key or dial. The lateral modes are grouped on the left, the main modes in the center and the vertical modes on the right on the panel.

FIGURE 6-4: GMC-710 AUTOPILOT CONTROLLER PANEL

1	HDG key	Selects/deselects Heading Select Mode.
2	APR key	Selects/deselects Approach Mode.
3	NAV key	Selects/deselects Navigation Mode.
4 & 7	CRS1 & 2 knob	Adjust the Selected Course (while in VOR, LOC, or OBS Mode) in 1° increments on the Horizontal Situation Indicator (HSI) of the corresponding PFD Press to re-center the Course Deviation Indicator (CDI) and return course pointer directly TO the bearing of the active waypoint/station.
5	BC key	Selects/deselects Backcourse Mode.
6	HDG knob	Adjusts the Selected Heading and bug in 1° increments on the HSI (both PFDs) Press to synchronize the Selected Heading to the current heading on the pilot-side PFD.
8	FD key	Activates/deactivates the flight director only. Pressing once turns on the selected flight director in the default vertical and lateral modes (PIT & ROLL). Pressing again deactivates the flight director and removes the Command Bars. If the autopilot is engaged, the key is disabled.
9	BANK key	Manually selects/deselects Low Bank Mode.
10	XFR key	Transfers between the pilot and copilot flight directors and controls which flight director the autopilot is tracking. This is currently inoperable.
11	AP key	Engages/disengages the autopilot.
12	YD key	Engages/disengages the yaw damper.
13	ALT key	Selects/deselects Altitude Hold Mode.
14	VS key	Selects/deselects Vertical Speed Mode.
15	UP/DN wheel	Adjusts the reference/target value in Pitch Hold, Vertical Speed, and Flight Level Change modes.
16	FLC key	Selects/deselects Flight Level Change Mode.
17	SPD key	Adjusts the selected speed with the auto throttle system & between manual mode or Flight Management System mode.
18	VNV key	Selects/deselects Vertical Path Tracking Mode for Vertical Navigation flight

19	ALT SEL knob	Controls the Selected Altitude in 100-ft increments.
20	LVL key	Activates Level (LVL) mode.
21	AT key	Activates the autothrottle.

TABLE 6-3: AUTOPILOT CONTROLLER PANEL

Flight Director/Autopilot modes

The buttons on the AP controller panel control different autopilot modes. There are four types of mode:

1. Lateral.
2. Vertical.
3. Combined (Approach mode).
4. Level.

The lateral modes (Roll, Heading, Navigation) are used to navigate the aircraft and direct or control the ailerons. The vertical modes (Pitch, Vertical Speed, Flight Level Change) are used climb or descend the aircraft and direct or control the elevator and electric pitch trim. Approach mode is used when flying an approach procedure and will provide combined lateral and vertical direction to maintain both the localizer and glideslope (for ILS approaches) or the final approach course and glidepath (for GPS/RNAV approaches with vertical guidance). Level (LVL) is a special mode that will bring the aircraft to a wings level, 0° pitch when active (see below).

The following table describes the function of each control key and if active or armed, what will be indicated in the AFCS status bar.

Control Mode Function AFCS Status Indication

AP or FD	**Pitch Hold**. This is the default vertical mode and will be engaged if no other vertical mode has been selected. The FD command bars will indicate a pitch (whatever pitch the aircraft was at then AP or FD was pressed). Use the UP/DN wheel to change the pitch.	PIT
AP or FD	**Roll Mode**. This is the default lateral mode and will be engaged if no other lateral mode has been selected. The amount of ROLL will be synchronized with the roll present when the mode was engaged. The command bars will indicate a bank angle to maintain.	ROL
ALT key	**Altitude Hold**. Pressing this sets the command bars to maintain the current aircraft altitude. When reaching a pre-selected altitude (ALTS)once within 200ft, it will be captured and ALT mode activated automatically to maintain the selected altitude	ALT
VS Key	**Vertical Speed**. Pressing this will allow you to select a rate of climb or descent. Once active, use the UP/DN wheel to set the rate of VS. The selected rate will be displayed on the VSI gauge on the PFD in feet per minute.	VS

FLC Key	**Flight Level Change**. Maintains the current aircraft airspeed (in IAS) while the aircraft is climbing/descending to the Selected Altitude. The target speed can be changed using the SPD knob and is shown in cyan above the Airspeed Indicator. The ability of the aircraft to maintain the selected FLC speed, -and the resulting rate of climb or descent- is determined by the throttle power setting. When climbing apply power and lower the target speed to gain a higher vertical speed. When descending do the opposite: reduce power and increase the target speed to descend faster.	FLC
VNV key	**Vertical Navigation (VNAV)**. Pressing VNV will arm/capture the calculated vertical path (VPATH). This is a descent path calculated by the G3000 which will give a nominal descent. VNAV can only be used in descent. With VNAV mode active, when the aircraft reaches the calculated top of descent (TOD), and a with a lower altitude selected in ALTS, VPATH will become the active mode and will command the aircraft into a descent, pitching to follow the calculated path. The aircraft will descend to either the preselected altitude or a Vertical Path constraint in the flight plan, stopping at whichever is higher. See the VNAV section below for more information on using this mode.	VPATH
HDG key	**Heading hold**. Captures and tracks the heading selected with the HDG knob. The selected HDG can be changed whilst the mode is active, allowing the pilot to steer the aircraft with the HDG knob to follow ATC vectors etc.	HDG
NAV key	**Navigation mode**. Captures and tracks selected navigation source (GPS, VOR1 & 2, LOC). The active nav source is shown on the HSI on the PDF and is changed using the 'CDI' softkey on the bezel. Note NAV will only become active until the aircraft is within a certain distance of the navigation source track and within a certain angle of intercept. Use other lateral modes (HDG, ROLL) to steer the aircraft towards the desired track. When within capture parameters, NAV will become the active mode.	GPS VOR LOC
APR key	**Approach mode.** This will capture and track an approach procedure loaded into the flight plan or another suitable navigation source (ILS) that has been tuned and set as the active navigation source.	LOC / GS NAV GP GS
	APR mode behaves depends on the type of procedure loaded or current navigation source in use. For ILS approaches lateral (LOC) and vertical (GS - Glideslope) guidance will be provided. For GPS approaches lateral (GPS) will be provided and vertical guidance for precision (LPV) procedures (GP – glidepath). For visual approaches lateral (GPS) and vertical (GP) guidance will be provided, although visual approaches cannot be used in IMC conditions. (note: there are several different types of GPS/RNAV approach. Please consult other resources for more detail on this point).	
BC key	**Backcourse mode**. Captures and tracks a localizer signal for back course approaches.	BC

Bank Key	**Low Bank Mode**. Limits maximum commanded roll angle to 15 degrees. Note: Bank mode is engaged automatically at high altitudes to prevent sudden maneuvering.	Green arc on bank angle indicator
Alt Sel knob	**Select Altitude**. Used to pre-select a target Altitude, shown in cyan above the Altimeter.	ATLS
Level	**Level mode.** This is activated by pressing either of the Level buttons on the main instrument panel. It should only be engaged when the autopilot is not activated. Level mode is a safety system and used to bring the aircraft to straight and level light should the pilot experience disorientation. It will also activate automatically if the aircraft is kept in an unusual attitude for an extended time.	LVL

TABLE 6-4: AFCS MODES

AFCS limitations

The autopilot and yaw damper have the following operational limitations:

Maximum engagement limits:

- **Pitch**: -20°/+25°
- **Roll**: +/-45°

Minimum engagement heights:

- 400ft AGL during takeoff and climb out
- 1000ft AGL during cruise and descent
- 200ft AGL during approach operations

Control Wheel Steering (CWS)

On each control wheel (yoke) there is a CWS button. When pressed and held, this allows the pilot to temporarily interrupt any AFCS commands to the servo motors to take manual control. On releasing the CWS button, the autopilot will resume, although in what way depends on what AP modes were engaged when the CWS button was pressed.

Overspeed Protection

While Pitch Hold, Vertical Speed, Flight Level Change, Vertical Path Tracking, or an altitude capture mode is active, airspeed is monitored by the flight director. Overspeed protection is provided to limit the flight director's pitch command in situations where the flight director cannot follow the active autopilot commands without exceeding Vmo.

When Overspeed Protection is active, the flight director will reduce the pitch down angle and an aural 'AIRSPEED' warning given. Engine power should be reduced and/or the pitch reference adjusted to slow the aircraft.

Electronic Stability and Protection (ESP)

ESP provides feedback to the pilot to prevent them from exceeding normal flight parameters (pitch, roll, Vmo). It only functions when the autopilot is OFF. It will engage if the following parameters are met:

Parameter	Activation
Pitch	20° nose-up & 17° nose-down
Roll	45° or above
Speed	188KIAS (Vmo)

TABLE 6-5 : AFCS LIMITATIONS

When active IRL, the pilot will receive force-feedback control inputs nudging them away from the exceeded parameter. In the **M600** this will be felt as a movement by the aircraft to reduce the excessive pith or roll. This movement can still be overcome by the pilot with more forceful inputs to the control wheel.

When active, a caution CAS Message ESP ACTIVE will display. If the ESP condition continues for more and 10 seconds in any 20 second period, the autopilot will engage automatically in LVL mode.

Changing Nav source

When using NAV mode, the G3000 will navigate to and track whatever source is active. The **M600** will start on GPS (magenta) as the NAV source by default, which will follow any entered flight plan. It can also be used to track radio navigation aids such a VOR's, ILS and ADF systems (green).

You can change the nav source using the PFD CDI softkey, from GPS to NAV1 or NAV2. The color of the Course Deviation Indicator needle will change on the HSI and the mode data in the center of the HSI will also change.

Bearing Pointers.

There are two additional bearing pointers that you can set to show information from different sources. Pointer 1 has a single line. Point 2 is double. You can select what the source for each pointer will be using the softkeys. As well as the needle, more information for each source will be shown in information boxes just below the HSI compass (if selected from the softkeys).

VOR navigation

To track a VOR radial:

1. Tune and make active the VOR frequency in NAV1 or NAV2,
2. Select VOR1 or VOR2 as the navigation source using the CDI softkey. The CDI needle on the HSI will change color to green.
3. Use the CRS knob on the GMC 710 panel to select the desired radial to track. To track directly towards the VOR press the CRS button.
4. Select NAV autopilot source. If you are close enough to capture, VOR will be indicated on the AFCS status bar in green and the autopilot will track the radial.
5. If not close enough to capture immediately, VOR will arm in white. Use another lateral mode such as Heading (HDG) to fly closer to the desired track. Once the CDI needle on the HSI starts to move ('deflect') then the VOR mode should turn from white to green on the AFCS status and the selected VOR radial will be tracked.

Flying Instrument Approaches

The set up an Instrument landing System (ILS) approach:

1. Load an appropriate ILS approach procedure via the PROC page on the GTC– Set the correct minimums (CAT1). You can then either load or activate the procedures. Use ‘load’ if you still have some legs in your course to fly. If you are on vectors, then select ‘activate’. This will clear your current leg – if you are not on an intercept course you may need to use another lateral mode to control the aircraft until you are close enough.
2. If you selected ‘load’. when close enough on an ILS approach, the active nav source will ‘auto switch’ to LOC (green) and the correct ILS frequency and course will be set on NAV1 and NAV2 radios. If auto switch fails to occur, use the CDI softkey to manually switch to LOC.
3. Once on an intercept course to the Localizer, press the APP key on the autopilot controller. GS will appear in white on the right-hand side of the AFCS status bar.
4. If you are at the correct height (either at or below the correct height at the final approach fix), glideslope (GS) capture when the green diamond on the vertical course deviation indicator (left of altimeter) reaches the center position. The aircraft will now begin to descend on the glideslope. Monitor and configure the aircraft for landing.
5. At the Decision Height or Altitude - and no lower than 200ft above ground level in all cases - disengage the Autopilot (yaw damper will disengage at the same time) and land the aircraft.

The procedure for RNAV approaches is similar, but with some important differences – particularly that not all RNAV approaches are precision and also that some will have vertical guidance and some will not. This can be a complex area and beyond the scope of this manual.

7. Flying the M600

Flying the M600

The Flight Model

The **M600** uses the native MSFS SDK to provide its flight model. This allows the aircraft to be available to all users of MSFS regardless of the platform they use to sim on.

The model uses CFD ('computational fluid dynamics') physics provided by Asobo. This is a powerful new means of modelling flight aircraft behavior based on the geometry of the aircraft and the air mass it is interacting with. Although CFD is a powerful tool, to get best results, it requires careful testing and tuning.

Developing any aircraft flight model is a complex process requiring collaboration between developers who understand the software, pilots with relevant real-world experience and simulator test pilots able to test in a range of conditions and scenarios and provide effective feedback. The **M600** flight model is a product of just such teamwork and testing and the model has been tested against real-world benchmarks and known performance parameters in a wide range of weight and weather conditions.

We are very happy with the flight handling achieved, with realistic and stable behavior. You will feel the torque of the powerful PT6-42A engine pull you to the left as you begin the take-off roll, smoothly easing with increasing airspeed. Controlled crosswind take-off and landings up to the maximum demonstrated (and beyond) are possible with a little practice and without the need for any high-end hardware. Precise and stable trimming make hand-flying a joy. High-power climbs will require P-factor to be catered for. Adverse yaw in turns and increased drag in slips are present to the correct degree and you will need to hone your foot-work during turns and slips. Flap and gear drag have been precisely modelled against real-world approach profiles.

Enhanced procedures

This part sets out some further details of normal operations.

Engine Starts

There are two methods of starting the engine:

1) Battery Power, Auto mode
2) Battery Power, Manual mode

Battery Power vs Ground Power

Battery powered starts are the normal method, if there is concern that the battery may not have sufficient voltage to ensure a good start, check that the generators are fully operational and not damaged from within the EFB App.

Automatic Starts

The normal way of starting the engine is in Automatic mode and the in-cockpit checklists show this method. In automatic start mode, a momentary press of the starter button will initiate the starter motor which will then cut out automatically once Ng rises above 56%. Automatic mode is enabled when the Start Mode switch is not pressed (LED extinguished). This is the default position.

Manual Starts

A manual start requires the starter button to be pressed and held until ignition has occurred. It should not be held for longer than 10 seconds after the Condition Lever has been moved into the RUN position as damage to the starter motor may occur. If ignition has not occurred, release the starter button, wait 30 seconds and follow the DRY MOTOR checklist before attempting another engine start. Manual starter mode is enabled by pressing the Start Mode switch (LED on).

A Manual Start is usually selected either to either:

- Stop a failed automatic start sequence; or
- When it is necessary to 'dry motor' the engine either to vent excess fuel or help dissipate residual ITT.

Automatic starts are preferred to manual starts as there is less chance of damage to the starter.

The in-game Checklists are for a Battery powered automatic start.

The Starting Sequence

You should always carefully follow the starting sequence for the type of engine start you have decided to perform using the Starting Engine Checklist (Section 10: Normal Procedures). All start methods, however, follow the same essential sequence:

1. Ignition and fuel supply ensured by placing Ignition and Fuel Pump switches to manual. (IGNITION and FUEL PUMPS L & R will be indicated on the CAS).
2. The three control quadrant levers are all in the correct position: MOR in Normal, Throttle in IDLE and Condition Lever in CUT-OFF/FEATHER.
3. Starter motor turned on. This starts to spin the engine compressor blades and create the cooling airflow in the combustion STARTER chamber. (will be indicated on the CAS).
4. Ng will accelerate to a maximum of ~20%. Fuel can be introduced once Ng is stabilized and greater than 13%. A slow rise in Ng may indicate a risk of a hot start.
5. The Condition Lever is now placed from CUT-OFF/FEATHER to the RUN position and the Fuel Control Unit will introduce fuel into the combustion chamber.
6. Ignition of the fuel will now occur ('light-off'). ITT will rise fairly rapidly – the rate will depend on the environmental conditions (density altitude) and the condition of the engine. Very rapid rise means the risk of an over-temperature condition (hot start) and you should immediately pull the Condition lever to the CUT OFF position.
7. Engine oil temperature and pressure will rise to normal operating ranges (green arc)
8. The ITT will 'peak' – the exact point will vary – and then stabilize at an idle ITT and Ng of ~60%. During a start ITT should not exceed 1005°C for more than 5 seconds.
9. The starter motor will cut out automatically once Ng > 56% to prevent damage to the starter motor. If using Manual start mode, the pilot should release the Starter switch no more than 10 seconds after putting the condition lever into the RUN position.
10. The prop will gain RPM and achieve a minimum of Np > 1200RPM by the time ITT and Ng have stabilized.
11. The engine will now have completed a normal start.

It is possible that the engine may not start normally – see the 'risks and malfunctions' section below for a description of the main problems that can occur.

Dry Motoring

This is a process where the starter is turned on, but no fuel introduced. It is used to clear the engine of excess fuel or help dissipate residual ITT. The procedure is as follows:

Allow minimum of 30 seconds fuel draining period, then:

POWER Lever .... IDLE
CONDITION Lever .... CUT-OFF/FEATHER
FUEL PUMPS Switch .... MAN
IGNITION Switch .... OFF
BATTERY Switch .... ON
START MODE Switch .... MAN (Switch Light Illuminated)
PUSH START Switch .... PUSH and HOLD (15 SEC.)
PUSH START Switch .... RELEASE

Flying into Known Icing

The M600 is capable of flying into known icing conditions where the icing is expected to be mild or moderate. The various ice protection systems described in Section 6 can be used. Flaps are restricted to 20° in icing. The following checklist should be used when expecting to enter icing conditions:

FLIGHT INTO KNOWN ICING CHECKLIST

PRIOR to entering icing conditions, the following ice protection systems MUST be activated.

1. SURF DE-ICE .... SELECT ON
2. STALL HEAT .... SELECT ON
3. PITOT HEAT ....VERIFY ON
4. PROP HEAT .... SELECT ON
5. WINDSHLD HT.. ..SELECT ANTI ICE
6. Wing Inspection Light (ICE LIGHT) .... AS REQUIRED
7. IGNITION .... MAN
8. Windshield Defog (DEFROST) .... PULL ON
9. ECS CABIN COMFORT .... HIGH

During Icing Conditions:

10. Wing Leading Edge .... MONITOR
(for continual shedding of ice)
11. EIS Indications and CAS Window .. .. MONITOR
(for correct function of ice protection systems (no system failures)

After departure from icing conditions with remaining residual/airframe ice:

1. SURF DE-ICE .... MAINTAIN ON
2. STALL HEAT .... MAINTAIN ON
3. PROP HEAT .... MAINTAIN ON

4. PITOT HEAT .... MAINTAIN ON
5. WINDSHLD HT .... DE-FOG or ANTI ICE as required
6. IGNITION .... AUTO
7. Flaps .... DO NOT EXTEND BEYOND T/O

After removal of residual ice:

1. SURF DE-ICE .... OFF
2. STALL HEAT .... OFF
3. PROP HEAT .... OFF
4. PITOT HEAT .... MAINTAIN ON
5. WINDSHLD HT .... DE-FOG or ANTI ICE as required

Risks & Malfunctions

There are various risks when starting the engine. All of these can be mitigated by keeping the aircraft well maintained and following checklists carefully:

"Hot Start". This is when combustion temperatures in the ignition chamber exceed limitations, resulting in an over-temperature condition, damaging the turbine blades. A hot start can develop very quickly and requires the aircraft to be grounded and a full engine overhaul, usually resulting in a very expensive repair IRL.

The root cause of a hot start is not enough cooling air flowing through the combustion chamber when the fuel is introduced, allowing excessive temperatures to develop. This cooling airflow is created by the turbine/compressor blades spinning at an RPM fast enough to provide sufficient cooling effect. Anything which inhibits this may lead to a hot start developing.

As explained above, the 'Ng' gauge indicates how fast the turbine blades are spinning as a percentage of maximum RPM and is therefore an indication of the cooling air-flow available.

This is why in an engine start; the electrical starter motor is engaged first before any fuel is introduced – it spins the compressor blades up to an RPM to provide sufficient cooling. A minimum Ng of 13% is required to avoid a hot start and fuel should not be introduced until this has been reached.

As well as introducing fuel too soon, there are several other factors that may contribute to the risk of a hot start:

- **Throttle not in idle position.** This will result in excessive fuel being introduced when the condition lever is placed into RUN and the available air flow, even with a good battery, will provide insufficient cooling.
- **Low battery voltage**. A degraded battery or low ambient temperature may result in insufficient voltage. The low voltage does not allow the starter motor to get the turbine blades spinning fast enough. A minimum of 24v is required for a battery start. If insufficient voltage is suspected, you should use a GPU to provide power for the start, or have the generator serviced *via* the EFB Maintenance page.
- **High residual engine temperature/ITT** following an earlier period of operation. ITT should be allowed to cool to <150°C before attempting a new engine start. This cooling can be

accelerated/achieved using the ‘dry motoring’ technique (see above), although care must be taken to avoid damaging the starter motor by limiting each period of dry motoring as per the checklist. Note: there is a known issue with residual ITT remaining too high after an aborted engine start.

- **Excess pooled fuel** in the ignition chamber following a previously failed start attempt.

You can observe a hot-start developing with the ITT gauge accelerating to the upper limit more rapidly than usual. You must take immediate action to pull the Condition Lever back to the CUT-OFF/FEATHER position. As This may happen in just 1 or 2 seconds, you should:

- Know what a normal rate of temperature increase on the ITT dial looks like and be ready to respond the instant you suspect something is not normal;
- During the engine start process focus only on the engine gauges (particularly Ng and then ITT) and keep your hand on the condition lever (however you control it in the sim), ready to pull it to CUT-OFF. Do not be distracted by other tasks.
- As soon as you have cut the fuel, shut down the starter motor to prevent damage to it. If starting in Auto mode, press the ‘Start Mode’ switch on the overhead panel – this will put it into manual mode and will stop the auto start sequence, which would otherwise continue to run. If starting in Manual mode, simply release the starter button.

Caution

If you hot-start the **M600**, you will not be able to start the engine until it has been serviced via the EFB Maintenance page. **Hot Starts can be disabled in EFB>Realism page and ITT will be capped to 800°C.**

No Ignition. If, once the fuel is introduced, the ITT does not rise then ignition may not have occurred (no ‘light off’). This can be caused by a faulty ignition system or inadequate fuel pressure. If ITT does not rise, then stop the starter by pressing the START MODE switch and follow the dry-motoring process. This will clear any excess fuel that may have pooled and could, if not vented, lead to a hot start. If you fail to get light off, the ignition system may be faulty and need repair.

Hung Start. A hung-start is when engine ignition occurs, but for some reason it does not accelerate to idle RPM. This can be seen by the Ng failing to reach 60%. In this case, the engine start should be aborted. DO NOT advance the throttle in an effort to obtain idle RPM.

Exhaust pipe Fire. This is caused when excess fuel has accumulated in the exhaust pipes and will be seen as a very visible jet of flame coming from the exhausts. In this case, proceed with the engine start – do not cut the fuel/abort as that may create negative pressure in the engine, sucking the flame back in and damaging the engine. Proceed with the start and once stabilized, shut the engine down in the normal procedure and conduct maintenance checks for damage.

Other engine failures may occur during flight due to exceeding engine limitations as set out above and in Performance section, lack of maintenance/wear and tear.

Taxi

Use Beta range to limit taxi speeds. You should not exceed 20knots ground speed on taxiways, reduced to 10knots in turns.

You will need to use right rudder during taxi to counter the effects of engine torque and propwash.

Take Off

TO Config. Before starting your take off roll, make sure the CAS TO CONFIG advisory is extinguished before starting the take-off roll. This requires you to have:

- Set flaps to T/O.
- Rudder trim set to 2-3° (green mark)
- Ignition and Fuels pumps to manual
- Autopilot and Yaw Damper disengaged.

If you do not, then a Master Warning chime will sound and TO CONFIG will be indicated.

TO Roll. Apply power smoothly to reduce the torque effect – there will be a noticeable pull to the left when you first apply power, with the left-pull reducing as speed increases and control surface authority is gained. Above 65KIAs little rudder should be needed in calm wind conditions.

Maintain center line with active use of the rudder pedals. In strong right crosswinds you may need to use left rudder input.

Crosswind technique. The maximum demonstrated component of crosswind velocity is 16knots. Taking off in strong crosswinds will require plenty of rudder input to counter weathervane effect. You should position the ailerons into the wind. The M600 does not experience much in the way of rolling effect from crosswinds, but correct positioning of the ailerons will mean you are configured to enter a crab to maintain centerline after take-off.

Rotation should be smooth at 85KIA – a reasonable degree of elevator input is needed in a normal (flapless) take off – about 30-50% of your normal axis range. But you should not need to pitch up more than 10-15°. Be careful not to let the nose to dip after rotation.

Climb-out

Once positive rate of climb is seen and there is no more usable runway beneath you, retract the gear (but before your speed exceeds 130 KIAS) and engage the Yaw Damper. You can engage the autopilot once above 400ft AGL and the aircraft fully trimmed (no control wheel pressure applied).

At high power settings and high angle of attack, significant P-factor and torque/propwash will be felt. This can be countered with rudder trim and it is often possible to leave the rudder trim in the take-off position during the entire climb to cruising altitude.

The **M600** pitch trims well and is stable enough to allow hands free flying in smooth air without requiring use of the autopilot.

Cruise

Make sure to take out any right rudder trim you have applied – if you do not the aircraft will fly uncoordinated (the slip/skid indicator bar will not be centered) . The M600 has no aileron trim, but is configured to fly wings-level at cruise speeds. If you encounter a gentle roll, compensate with rudder trim.

Maneuvering

Turns should be limited to 45° of bank. You will experience moderate adverse yaw and should use the rudder to remain coordinated. The M600 is not rated for acrobatic maneuvers, and you will quickly over-stress the airframe, which has the following load limits:

Positive Load Factor (Maximum)

Flaps Up	**3.6 g**
Flaps T/O/LND	**2.0 g**
Negative Load Factor (Maximum)	**-1.4 g**

Although not rated for Spins, you should practice spin recovery as they are a feature of how the M600 will stall.

Approach and Landing

The M600 has reasonably low drag when in clean configuration and will not decelerate as rapidly as a fixed gear aircraft. Use flaps to slow to approach speeds. Also, as the gear can be extended at 168KIAS, you can use this also to help you slow down relatively early in the approach.

Use the following power and configuration schedule to achieve a stabilized 3° approach:

Power setting	Configuration	Speed
420lb-ft	Clean	160KIAS
420lb-ft	Flaps T/O	148KIAS
420lb-ft	Flaps LND	112KIAS

TABLE 7-1: APPROACH SPEED SCHEDULE

Vref (landing speed) is 85KIAS which you should target on short final.

Make use to include a gust factor in you approach speed calculations. This is Vref + half of the gust speed, to a maximum of 10 KIAS. So, if the METAR or ATIS was giving 140@20G30, you would add 5KIAS to Vref, so 85+5 = 90KIAS.

In strong crosswind or gusty headwind conditions, consider landing with reduced or no flaps. You will land faster as Vso will be higher but will be less prone to buffeting. $V_{REF\ (NO\ FLAPS)}$ = 100KIAS.

Landing. For Landing, smoothly reduce power to idle as you cross the threshold. Flare to ensure the main wheels touch first but be careful not to flare too much – the **M600** lands pretty flat.

Roll-out. Once all three wheels are down, you can engage BETA range, apply the BRAKES and put BACK PRESSURE on the control wheel to help keep weight off the nose-gear. Be careful to do it in that order – putting back pressure on too soon may lead to an unwanted rotation!

Stalls & Spins

The **M600** is a hard plane to stall! This is primarily because the ESP system will prevent you from getting into a stall situation.

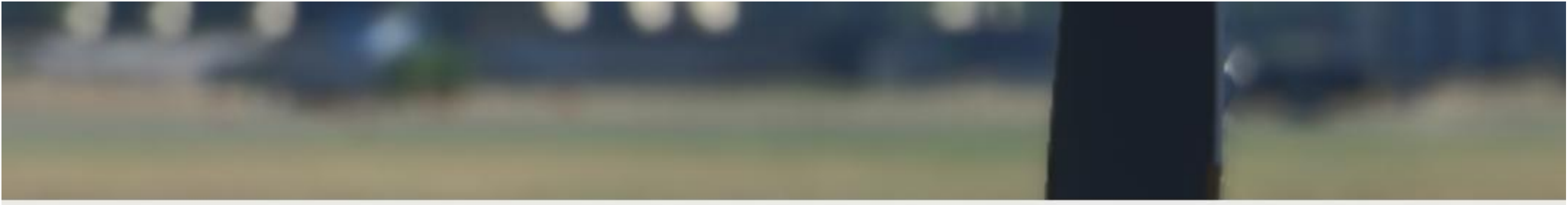
Flight testing has indicated that a typical no power, level flight stall occurs in two clear phases:

- **Wing level stall**. At Vso and lower, the wing will get 'tired' and cease to generate enough lift to keep the aircraft at the desired attitude/altitude. No stall warning will sound, although stall buffeting will be present. The effect can be countered with increasing amounts of pitch up, allowing the aircraft to 'mush' along in a high AOA at speeds below 70KIAS.

- **Full Stall**. At a critical point, the aircraft will stall, usually at around 73KIAS in a clean configuration at max weight. The stall warning CAS will sound 'STALL…STALL' immediately prior to the stall. There will be very noticeable stall buffeting. When the stall does occur, it will be with a pronounced wing drop, usually to the left. If no immediate recovery action is taken (lowering the pitch/AOA, then increasing the power), a spin will rapidly develop. This can be safely recovered from by allowing the controls to center and then applying full rudder opposite to the direction of the spin (see Spin Recovery checklist below). But spin recovery must be prompt otherwise g-loading (particularly then pulling out of the resulting dive) will overstress the airframe. Full Stalls less than 1000ft AGL are usually not recoverable. If practicing stalls, make sure to do so from at least 3000AGL and de-activate the ESP. To get a sense of what is possible, also make sure to turn on aircraft stress damage in the MSFS Assistance > Realism options.

Spin Recovery Checklist

Rudder .... FULL OPPOSITE TO DIRECTION OF ROTATION
Control Wheel .... FULL FORWARD WHILE NEUTRALIZING AILERONS
POWER Lever... CLOSED
Rudder (when rotation stops) .... NEUTRAL
Control Wheel .... AS REQUIRED TO SMOOTHLY
REGAIN LEVEL FLIGHT ATTITUDE



8. Normal Procedures

Normal Procedures

This section contains the normal checklists for the M600. You should use these checklists to ensure a safe and efficient flight.

There are fully interactive checklists in the sim. If the Assisted Checklist is selected, each control will be highlighted and the co-pilot will confirm when a checklist item has been verified.

If you prefer to use paper copies of checklists, then the following pages have been designed to allow you to print them out. Paper checklists can be easier to work though for experienced pilots than the in-sim ones. These have been designed to fit onto two sides of A4 paper.

Items not currently simulated have generally been omitted from the checklists. Note, there may be some minor differences between the checklists provided here and those in the SIM.

Normal Procedures Checklists

N-1 BEFORE STARTING ENGINE

Passengers .... BOARD
Door .... CLOSE and LATCH
All Electrical Switches........ OFF
Cabin climate controls .... OFF
Circuit Breakers ....All Pushed
ECS CABIN COMFORT .... OFF
PARKING BRAKE .... ON
Bleed Air Lever .... PULL OFF (closed)
Power Lever .... IDLE
Condition Lever .... CUT-OFF/FEATHER
EMER Switch .... ON – check PFD – OFF
Nav light .... ON
Battery switch .... ON
Flaps .... RETRACT
Fuel Gauges .... CHECK QUANTITY & IMBALANCE
OAT/Fuel/Oil temps .... VERIFY & CHECK
FIRE DET/ANN TEST........PRESS and HOLD, verify
ENGINE FIRE CAS, RELEASE
CAS........CONSIDER ANY ILLUMINATED

N-2 AUTO ENGINE START – USING BATTERY

Battery Voltage .... 24-26 VOLTS
Fuel Pumps .... MANUAL
L & R Fuel Pump ON CAS message .... ILLUMINATED
Ignition Switch .... MANUAL
Ignition ON CAS message .... ILLUMINATED
Prop area .... CLEAR
Start Mode Switch .... AUTO (Light in Switch Extinguished)
PUSH START switch .... Lift Cover. PUSH
Oil pressure .... Check
Rising
Ng (min. 13%) .... Stabilized
Condition Lever ....
RUN ITT .... Max 1000°C, limited
to 5s Starter @ 56% Ng .... Verify STARTER off
(CAS)
If not Press MAN/STOP
Ng .... Stable above 63%
Np .... Verify 1200RPM Minimum
GEN Switch .... ON. Check Positive Amps & 28 Volts
ALT Switch .... ON
Fuel Pumps Switch .... AUTO
Ignition Switch .... OFF
Oil Pressure .... CHECK (Minimum 60 PSI)

N-3 BEFORE TAXI

AVIONICS Switch........ON
MFD .... ON (Press ENT)
CAS Messages........CONSIDER ANY ILLUMINATED
Autopilot........Pre-flight test
PITOT Switch........ON, Check Operation
PITOT Switch........OFF
TAXI/REC LT Switch .... ON
Cabin Climate Controls .... As required
Radios/Avionics .... CHECK
Flaps .... VERIFY RETRACTED
Elevator Trim .... SET TAKE-OFF RANGE
Rudder Trim .... SET 2-3 Right Trim (Green mark)
Bleed Air Lever .... PUSH IN (ON)
Cabin Pressure DUMP Switch........ Verify Position
ECS CABIN COMFORT Switch .... NORMAL
DEST ELV (LFE in TMR/REF window) .... SET
STALL WARN Test Switch .... Press to Test
Standby flight instrument .... VERIFY ON
Altimeters .... SET
Parking Brake .... RELEASE

N-4 TAXIING

Taxi area .... CLEAR
POWER Lever .... ADVANCE SLOWLY
Prop RPM .... Minimum 1200RPM
Brakes .... CHECK
Steering .... CHECK

NO REVERSE ON UNPAVED SURFACES

N-5 ENGINE RUN UP

Parking Brake .... SET
Power Lever 1900RPM
OVERSPEED GOV TEST Switch .... Push and HOLD
Observe approx. Np drop 60RPM. RELEASE
Power Lever .... IDLE
REVERSE LOCK OUT Switch .... HOLD (min 5s)
POWER LEVER .... RETARD
Confirm beta & reverse not available
GEN Switch .... OFF. Confirm Alternator takes load
GEN Switch .... ON

N-6 BEFORE TAKEOFF

Seats, Armrests & Belts .... ADJUSTED & LOCKED
GEN Switch .... ON
ALT Switch .... ON
BLEED AIR Lever .... IN
ECS CABIN COMFORT .... NORM
Fuel Temperature .... CHECK WITHIN LIMITS
FUEL PUMPS Switch .... MAN
IGNITION Switch .... MAN
PITOT HEAT .... ON
Ice Protection .... AS REQUIRED
TAXI/REC LT Switch .... AS REQUIRED
LANDING LIGHT .... ON
NAV LIGHT .... ON
STROBE LIGHT Switch .... ON
Flight Instruments .... CHECK
CAS/PFD .... CONSIDER
Engine Instruments .... CHECK
Radios/Avionics/Transponder .... SET AS REQUIRED

Flaps .... T/O
Elevator & Rudder Trim .... SET
Flight Controls .... FREE & CORRECT
TO/GA .... Press if desired
Timer & HDG bug .... START & SYNCH

TURN TO BACK

FOR SIMULATION USE ONLY

N-7 NORMAL TAKEOFF (T/O FLAPS)

Brakes .... APPLY
POWER Lever .... SET TO TAKEOFF
Brakes .... RELEASE
Engine Instruments .... MONITOR
Indicated airspeed .... CALL 'AIRSPEED ALIVE' & '60 knots'
Rotation & Liftoff (Vx) ....85 KIAS
Obstacle Clearance Speed (OCS) ....95 KIAS
Positive Rate of climb
Landing Gear .... UP, confirm no lights.
Yaw Damper .... ON
Autopilot .... AS REQUIRED

N-8 SHORT FIELD/UNPAVED

SHORT FIELD: FLAPS T/O, Maintain Vs 85 KIAS & Obstacle Clearance Speed = 95KIAS.

UNPAVED FIELD: FLAPS T/O & elevator back. Vs 85 KIAS & OCS 95KIAS. Consider rolling takeoff if LFL permits.

N-9 MAXIMUM CONTINUOUS POWER

POWER Lever .... MCP
FUEL PUMPS... AUTO
IGNITION .... AUTO
LANDING LIGHT .... OFF
TAXI/REC LIGHT .... AS REQUIRED
Ice Protection .... AS REQUIRED
Engine Instruments
Torque......................... MONITOR (1575 ft-lbs max)
ITT .... MONITOR (800°C max)
Ng .... MONITOR (101.7% max)
Climb speed (best rate) ....122 KIAS
Transponder .... Verify ALT mode

For CRUISE CLIMB use 145KIAS to 20,000ft and 122KIAS to 30,000ft.

N-10 CRUISE

Cruise Power .... Set as per power tables in Annex A
Engine/Fuel indication .... MONITOR
Fuel Temperature/OAT .... MONITOR
Cabin climate controls .... AS DESIRED

N-11 DESCENT

WINDSHLD Heat switch .... DEFOG (if required)
Ice Protection Equipment .... AS REQUIRED
POWER lever .... SET TO DESIRED TORQUE
Altimeters .... SET & CROSS CHECK
DEST ELV .... CHECK
Cabin Climate Controls .... AS REQUIRED

N-12 BEFORE LANDING

Approach Check

Autopilot .... DISENGAGE below 100 KIAS
FUEL PUMPS .... MAN
IGNITION .... MAN
LANDING LIGHT .... ON
Fuel quantity & Balance .... CHECK
Seats, Armrests & Belts .... ADJUSTED & LOCKED
Landing Gear .... DOWN (below 170KIAS)
Flaps .... T/O (below 147 KIAS)

Landing Check

Gear indication .... 3 GREEN
Brakes.. CHECK
Flaps .... LND (below 112 KIAS max)
Airspeed 85KIAS
Autopilot .... OFF
Yaw damper .... OFF

N-13 LANDING

POWER lever .... IDLE
Brakes...................................MODERATE (or as required)
POWER Lever...BETA
(or REVERSE as required)

N-14 AFTER LANDING

Timer .... STOP
FUEL PUMPS .... AUTO
IGNITION .... OFF
PITOT HEAT .... OFF
Ice Protection Equipment .... OFF
Landing/Taxi lights .... AS REQUIRED
Strobe Light .... AS REQUIRED
WX Radar .... STBY

Flaps .... RETRACT
Transponder .... AS REQUIRED

N-15SHUTDOWN

PARK BRAKE .... SET
ECS CABIN COMFORT .... OFF
POWER lever .... IDLE
Cabin Climate Controls .... OFF
FUEL PUMPS Switch .... OFF
AVIONICS Switch .... OFF
GEN Switch .... OFF
ALT Switch .... OFF
ITT.. Stabilize for 2 mins @ idle
CONDITION Lever .... CUT-OFF/FEATHER
"FEATHER" CASE Message .... CHECK ON
BLEED AIR .... OUT
Exterior lighting switches .... OFF
Fuel Remaining .... NOTE
BATTERY Switch .... OFF
Wheel Chocks, tie downs and covers .... AS REQUIRED

FOR SIMULATION USE ONLY

9. Emergency Procedures

Emergency Procedures

The M600 failure engine

The M600 has a custom failure engine that will allow a wide range of aircraft systems to fail under two different conditions:

1. After a component has degraded over time due to a lack of maintenance;
2. Pilot behavior stresses the aircraft systems causing components to fail.

The Maintenance EFB page has information on what systems will fail. These include:

- Engine failures caused by overstressing the engine either on start-up or during flight or lack of maintenance to the oil system. Note -to get engine failures you need to have the MSFS Engine stress MSFS Assistance > Realism turned on in .
- Electrical System failures can be related to any part of the system, from the battery, generator and alternator through to a simple circuit breaker trip. These can cause a myriad of other failures in the electrical systems of the aircraft.
- Hydraulics system failures. This will result in the main gear becoming inoperable
- Flaps wear and tear when overstressing the surfaces or improper maintenance.

We don't provide a list of failures as they are condition dependent and with all the electrical systems in particular there are simply too many possible combinations to list.

Managing Failures

There are several steps in successfully managing a failure:

1. **Maintain Airplane control** – above all keep flying the plane!
2. **Analyze the problem**. Try to identify the possible failure through EICAS information and aircraft behavior/state;
3. **Take action**. Use the correct emergency checklist procedure/s or other steps to manage the problem.

Given the myriad of possible failures, pilots who fly with failures enabled are advised to be familiar with the CAS Messages in the following section and have ready access to this manual and the emergency checklists. Knowledge of the aircraft systems will help – it's much easier to appreciate the various alarms and warnings on the CAS if you understand the system it relates to. Pilots should also practice failure scenarios in a controlled manner when possible – this can be a lot of fun!

If you do get a failure in flight then work to remedy it – treat it like it was the real thing, don't just quit in frustration. If you dislike your flights being disrupted, then turn off some or all of the failures in the Realism EFP page.

Persistence and Acceleration

All failures are persistent! They will not go away by restarting the flight – you need to perform the necessary maintenance via the EFB app.

These systems are very reliable (so long as you don't abuse the aircraft) IRL and you could rack up many hundreds of hours without experiencing a problem.

Crew Alert System (CAS)

The Crew Alert System (CAS) is used to display messages and information to the pilot *via* the PFD and MFD. The CAS system includes warning information embedded in PFD & EIS gauges or dials – e.g. excessive temperatures on the EIS ITT gauge, or overspeed on the PFD IAS tape, as well as the aural tones, but the main element of the CAS System that you will see are the 'CAS messages' shown on the right side of the PFD.

CAS Messages

CAS messages convey important information about the state of the aircraft and can be of three types:

- Warning (red)
- Caution (amber)
- Advisory (white)

The following tables sets out each type of CAS message implemented in the **M600** with a brief description of what it indicates.

Warning CAS Messages

CAS MESSAGE (WARNING)	**MEANING**
FUEL PRESS LOW	Fuel pressure is below 10 psi
FUEL QTY	Total FUEL QTY is equal to or less than 100 pounds
FUEL IMBALANCE	Fuel quantity imbalance greater than 125 pounds.
ENGINE FIRE	Overtemperature condition in the engine compartment due to fire
CABIN ALT 12K	Cabin altitude is 12,000 or above
CHECK GEAR	Landing gear is not down and locked when aircraft is less than 400 ft AGL with engine torque less than 420ft-lb (mutable aural); or flaps greater than LND (nonmutable aural). Landing gear is selected UP while on the ground.
T/O CONFIG	Engine torque greater then 800ft-lb. Flaps greater than T/O. Rudder trim less than 1° right or greater than 4° right
DOOR AJAR	Cabin door is not properly closed and latched with the engine running
SURF DEICE FAIL	Surface de-ice system has failed in flight
ALTERNATOR FAIL	Alternator switch selected ON and alternator control unit detects a failure of the alternator
GENERATOR FAIL	Generator selected ON and no output
FLAP FAIL	Wing flap system failure due to an overcurrent condition in the flap motor/actuator circuit
PITOT HT FAIL	Both left and right pitot heat have failed
PROP HEAT FAIL	A fault has developed in the propeller heat system in flight

TABLE 9-1: CAS WARNING MESSAGES

Caution CAS Messages

CAS MESSAGE (CAUTION)	MEANING
CABIN ALT 10K	Cabin altitude is 10,000 feet or above
CHECK GEAR	Landing gear is not down and locked when aircraft is greater than 400 ft AGL with engine torque less than 420 ft-lb (mutable aural) or flaps set to LND (non-mutable aural)
FEATHER	With engine operating, indicates a failure in the propeller feathering electrical system. An uncommented propeller feathering could occur if additional electrical failures occur in the system
FUEL IMBALANCE	Fuel quantity imbalance greater than 40 pounds
FUEL QTY	Total FUEL QTY is between 180 and 100 lbs
L PITOT HT FAIL	Left pitot heat has failed
R PITOT HT FAIL	Right pitot heat has failed
PITOT HEAT OFF	Pitot heat has not been selected ON (no chime accompanies this CAS message)
PROP HEAT FAIL	A fault has developed in the propeller heat system while the aircraft is on the ground
STALL HEAT FAIL	Stall Warning Heat has failed
SURF DEICE FAIL	Surface de-ice system has failed while the aircraft is on the ground
STALL WARN FAIL	The lift computer and/or lift transducer has failed
ESP ACTIVE	The electronic stability protection system is active

TABLE 9-2: CAS CAUTION MESSAGES

Advisory CAS messages

CAS MESSAGE (ADVISORY)	MEANING
ALTERNATOR OFF	The alternator switch is selected OFF
AV1 FAN FAIL	The Avionics 1 cooling fan has Failed
AV2 FAN FAIL	The Avionics 2 cooling fan has Failed
AV3 FAN FAIL	The Avionics 3 cooling fan has Failed
BETA	Propeller is in Beta range while the aircraft is on the ground
DOOR	Cabin door is not properly closed and latched while the aircraft is on the ground with the engine not running
EMER BLEED ON	Emergency bleed system has been activated either automatically at a cabin altitude in excess of 12,000 feet
GENERATOR OFF	The generator switch is selected OFF
FEATHER	Propeller is in feather position while the aircraft is on the ground
L FUEL PUMP ON	Left fuel pump is operating
R FUEL PUMP ON	Right fuel pump is operating
FUEL TEMP	Fuel temperature is equal to or less than -34°C
IGNITION ON	Ignition switch is selected to MANUAL or engine torque is below 450 ft-lbs when ignition switch is selected to AUTO.
INVERTER FAULT	The inverter has failed
MFD FAN FAIL	The MFD cooling fan has failed
PFD1 FAN FAIL	The PFD 1 cooling fan has failed
PFD2 FAN FAIL	The PFD 2 cooling fan has failed
AT	Emergency auto throttle control failure

STARTER ENGAGED	The starter is engaged normally
T/O CONFIG	Flaps greater than T/O. Rudder trim less than 1° right or greater than 4° right. Ignition not on. Fuel pumps not in manual. Autopilot or Yaw Damper on

TABLE 9-3: CAS ADVISORY MESSAGES

Emergency Procedure Checklists

The following 4 pages provide emergency procedure checklists for the M600. They are formatted in a way to allow them to be printed out for quick reference. Each checklist is referenced with 'E-' Some checklists require other checklists to be performed. Other items have been included for immersion purposes such as passenger briefing, or evacuation items.

The checklists use the following two terms:

Land as soon as possible

A landing should be accomplished at the nearest suitable airfield considering the severity of the emergency, weather conditions, field facilities, and ambient lighting.

Land as soon as practical

Emergency conditions are less urgent, and although the flight should be terminated, the emergency is such that an immediate landing at the nearest suitable airfield may not be necessary.

This table provides an index of the emergency procedure checklists.

Ref	Checklist	Ref	Checklist
E-1	**ENGINE FAILURE BEFORE ROTATION**	E-14	**LANDING GEAR FAILURE**
E-2	**ENGINE IMMEDIATELY AFTER TAKE-OFF**	E-15	**EMERGENCY LANDING GEAR EXTENSION**
E-3	**ENGINE FAILURE IN FLIGHT**	E-16	**GEAR UP LANDING**
E-4	**OIL TEMPERATURE**	E-17	**FUEL QUANTITY**
E-5	**OIL PRESSURE**	E-18	**LOW FUEL PRESSURE**
E-6	**AIR START – STARTER ASSIST**	E-19	**FUEL IMBALANCE**
E-7	**ENGINE FIRE ON GROUND**	E-20	**GENERATOR FAILURE**
E-8	**ENGINE FIRE IN FLIGHT**	E-21	**ALTERNATOR FAILURE**
E-9	**EMERGENCY DESCENT, MAXIMUM RATE**	E-22	**COMPLETE ELECTRICAL FAILURE**
E-10	**CABIN ALTITUDE ABOVE 12,000FT**	E-23	**FLAPS SYSTEM MALFUNTION**
E-11	**POWER-OFF LANDING (ENGINE CUT-OFF/FEATHER)**	E-24	**DUAL FAILURE ON BOTH GENERATOR & ALTERNATOR**
E-12	**OVER PRESSURIZATION**	E-25	**PROPELLOR SPEED**
E-13	**HYDRAULIC FAILURE**	E-26	**EMERGENCY AUTOLAND**

TABLE 9-4: EMERGENCY CHECKLISTS

E-1 ENGINE FAILURE BEFORE ROTATION

POWER Lever .... **IDLE**
Braking .... **AS REQUIRED**
Stop straight ahead.
If insufficient runway remains for a safe stop:
CONDITION Lever .... **CUT-OFF/FEATHER**
BATTERY Switch .... **OFF**
Firewall FUEL SHUTOFF Valve .... **LIFT COVER - PULL OFF**

E-2 ENGINE FAILURE IMMEDIATELY AFTER TAKE-OFF

Airspeed .... **95 KIAS**
Landing Gear .... **DOWN**
POWER Lever. .... **IDLE**
CONDITION Lever. .... **CUT-OFF/FEATHER**
When landing gear is down and time permits:
Flaps .... **LND**
Airspeed .... **85 KIAS**
BATTERY Switch .... **OFF**
Firewall FUEL SHUTOFF Valve .... **LIFT COVER - PULL OFF**

E-3 ENGINE FAILURE IN FLIGHT

Oxygen .... **AS REQUIRED**
MIC SEL Switch .... **MSK**
Airspeed .... **115 KIAS**
POWER Lever. .... **IDLE**
CONDITION Lever .... **CUT-OFF/FEATHER**
Propeller .... **VERIFY FEATHERED**

CAUTION

The battery switch must be ON to feather the propeller.

Remaining Fuel .... **CHECK**
Air Start. .... **Refer to Air Start procedure in this section.**

E-4 OIL TEMPERATURE

Indication: Master Warning, Triple Chime, Flashing Red Oil Temperature Indication
POWER Lever. .... **REDUCE POWER**

If temperature remains high, continue flight at reduced power and *land as soon as possible.*

E-5 OIL PRESSURE

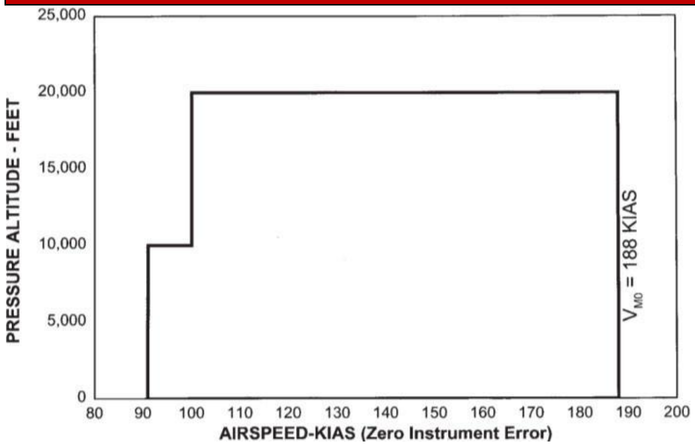
Indication: Master Warning, Triple Chime, Flashing Red Oil Pressure Indication Engine Torque at or above 1100 ft-lb:
Low Oil Pressure, Below 85 PSI

POWER Lever. .... **REDUCE TO A MAX. OF 1100 FT - LB OF TORQUE**
Land as soon as practical.
High Oil Pressure, Above 200 PSI:
Land as soon as practical.

Engine Torque below 1100 ft-lb:
Low Oil Pressure, Below 60 PSI
Power.................... **REDUCE TO MINIMUM TORQUE REQUIRED TO COMPLETE FLIGHT** ***Land as soon as possible.***

High Oil Pressure, Above 200 PSI *Land as soon as possible.*

E-6 AIR START – STARTER ASSIST



Oxygen .... **AS REQUIRED**
MIC SEL Switch .... **MSK**
Autopilot .... **DISENGAGE**
CONDITION Lever .... **CUT-OFF/FEATHER**
Altitude & Airspeed.............. **WITHIN THE AIR START ENVELOPE**
POWER Lever. .... **IDLE**
GEN Switch .... **OFF**
ALT Switch .... **OFF**
Electrical Load .... **REDUCE**
ECS CABIN COMFORT Switch .... **OFF**
BLEED AIR Lever. .... **PULL OUT (closed)**
EMERGENCY PRESSURE Circuit Breaker. .... **PULL**
(Located on pilot's aft circuit breaker panel, row B, position 6)
FUEL PUMPS Switch .... **MAN**
IGNITION Switch .... **MAN**

CAUTION

To obtain an AUTO air start, the START MODE MAN/STOP switch must not be selected. If the switch is selected to MAN (switch light illuminated), the PUSH START switch must be held ON to keep the starter engaged during the start.

START MODE Switch .... **AUTO**
PUSH START Switch .... **ENGAGE (Verify START ENGAGED message Illuminated)**
CONDITION Lever (Ng min. 13%) .... **RUN**
ITT and Ng .... **MONITOR**
After Engine Relight - Ng ≥ 63%:
GEN Switch .... **ON**
ALT Switch. .... **ON**
FUEL PUMPS Switch .... **AUTO**
IGNITION Switch .... **AUTO**
EMERGENCY PRESSURE Circuit Breaker .... **RESET**
(Located on the pilot's aft circuit breaker panel, row B, position 6)
BLEED AIR Lever. .... **PUSH IN (open)**
ECS CABIN COMFORT Switch .... **NORM**
Electrical Equipment. .... **AS REQUIRED**
POWER Lever .... **IDLE**
CONDITION Lever .... **CUT-OFF/FEATHER**

Brakes..AS REQUIRED
Firewall FUEL SHUTOFF Valve................. **LIFT COVER - PULL OFF**
BLEED AIR Lever. .... **PULL OUT (closed)**
ECS CABIN COMFORT Switch .... **OFF**
FUEL PUMPS Switch .... **OFF**
IGNITION Switch..**OFF**
Radio...**EMERGENCYCALL**
BATTERYSwitch...**OFF**
Aircraft..**EVACUATE**
Fire .... **EXTINGUISH**

E-8 ENGINE FIRE IN FLIGHT

Engine Power .... **REDUCE TO MINIMUM ACCEPTABLE ACCORDING TO FLIGHT SITUATION**
Oxygen .... **AS REQUIRED (all aircraft occupants)**
MIC SEL Switch .... **MSK**

Confirm that fire exists then:

CONDITIONLever..**CUT-OFF/FEATHER**
Firewall FUEL SHUTOFF Valve.................**LIFT COVER - PULL OFF**
ECS CABIN COMFORT Switch...**OFF**
BLEED AIR Lever..**PULL OUT (closed)**

Conduct a Normal Descent, or Emergency Descent (E-9)-as appropriate and Power Off Landing, (E-11)

CAUTION

If pressurized, this procedure will result in an immediate loss of pressurization and cabin altitude will rise at an uncontrolled rate.

E-9 EMERGENCY DESCENT, MAXIMUM RATE

Autopilot..**OFF**
POWER Lever..**IDLE**
Landing Gear ....**Below 170 KIAS, DOWN**
WINDSHLD HT Switch...**DEFOG**
Airspeed after Landing Gear is Fully Extended.............**153 KIAS**
Airspeed .... **121 KIAS.**

E-10 CABIN ALTITUDE ABOVE 12,000FT

Master Warning, Triple Chime, CABIN ALT 12K, Red cabin altitude indication.

Oxygen Mask...**ON**
MIC SEL Switch...**MSK**
ECS CABIN COMFORT Switch......................**Verify NORM or HIGH**
BLEED AIR Lever...**Verify IN (open)**

If cabin altitude exceeds 14,000 feet:

Emergency Descent..................... **ACCOMPLISH PER SECTION E-9**

Descend as soon as practical.

E-11 POWER-OFF LANDING (ENGINE CUT-OFF/FEATHER)

Best Gliding Airspeed is 115 KIAS

POWER Lever..**IDLE**
CONDITION Lever...**CUT-OFF/FEATHER**
Propeller...**VERIFYFEATHERED**
FUEL PUMPS Switch..**OFF**
IGNITIONSwitch..**OFF**
Firewall FUEL SHUTOFF Valve................**LIFT COVER - PULL OFF**
Electrical Load...**REDUCE**
ECS CABIN COMFORT Switch...**OFF**
CABIN PRESSURE DUMP Switch..**DUMP**
Seats and Seat Backs.........**UPRIGHT & LOCKED IN POSITION**
Seat Belts and Harness...............**FASTEN/TIGHT CHECK INERTIA REEL**
Passengers.........................**BRIEF When committed to landing:**
Landing Gear...**DOWN; 3 GREEN**
Flaps..**AS REQUIRED**

If landing site is not suitable for gear down landing:

Landing Gear..**MAINTAIN UP**
Flaps..**FULL DOWN**
Final Approach Speed..**85 KIAS**

After Touchdown:

BATTERY Switch..**OFF**
After the aircraft has stopped.......................................**EVACUATE.**

E-12 OVER PRESSURIZATION

Indication: Master Warning, Triple Chime, Red cabin differential pressure indication.

If cabin differential pressure is above 5.8 psi (or 5.6 psi for greater than 30 sec.):

Oxygen Mask...**ON**
MIC SEL Switch...**MSK**
ECS CABIN COMFORT Switch
....**OFF** BLEED AIR
Lever...**PULL OUT (closed) If over pressurization continues:**
CABIN PRESSURE DUMP Switch.......................................**DUMP**
Emergency Descent..................**ACCOMPLISH PER SECTION E-9**

E-13 HYDRAULIC FAILURE

On Ground:

Indication: Master Warning , Triple Chime, HYDR PUMP ON

LANDING GEAR Selector.....................................**Verify DOWN In Flight:**

Indication: Master Caution , Double Chime, HYDR PUMP ON

HYDRAULIC PUMP POWER Circuit Breaker
.... **PULL** (Located on pilot's forward circuit breaker panel, row C, position 4)

Land as soon as practical and investigate the cause.

Prior to landing, the HYDRAULIC PUMP POWER circuit breaker must be reset to extend the landing gear. If the pump continues to run after the gear is locked down, pull the HYDRAULIC PUMP POWER circuit breaker. If the gear fails to extend, refer to the **Emergency Landing Gear Extension Procedure E-15**

E-14 LANDING GEAR FAILURE

Indication: Master Caution, Double Chime, GEAR SYS

HYDRAULIC PUMP POWER Circuit Breaker..................**Verify IN**
(Located on pilot's forward circuit breaker panel, row C, position 4)
BATTERY Switch...**Verify ON**
GEN Switch...**Verify ON**
ALT Switch...**Verify ON**
LANDING GEAR Selector..**CYCLE**
If issue not resolved......................**Perform Emergency Landing Gear Extension (E-15)**

E-15 EMERGENCY LANDING GEAR EXTENSION

Indication: One or more of the green gear indications not illuminated.

Airspeed..**100 KIAS**
HYDRAULIC PUMP POWER Circuit Breaker (25 amp)..........**PULL**
(Located on pilot's forward circuit breaker panel, row C, position 4)
LANDING GEAR Selector...**DOWN**
Emergency Gear Extension Control....................................**PULL**
If 3 green gear indications are still not present:
Yaw the aircraft left and right to lock the main landing gear.
Reduce airspeed to minimum safe speed to improve nose gear locking.
If 3 green gear indications are present:............................Land If not successful, refer to **Gear Up Landing (E-16)**.

E-16 GEAR UP LANDING

ECS CABIN COMFORT Switch..**OFF**
Cabin Pressure DUMP Switch..**DUMP**
Passengers...**BRIEF**
Flaps..**FULL DOWN**
Final Approach Speed...**85 KIAS**

When Runway is Assured
POWER Lever...**IDLE**
CONDITION Lever..**CUT-OFF/FEATHER**
Firewall FUEL SHUTOFF Valve................**LIFT COVER – PULL OFF**
After Touchdown
BATTERY Switch..**OFF**
After the aircraft has stopped......................................**EVACUATE**

E-17 FUEL QUANTITY

Indication: Master Warning, Triple Chime, FUEL QTY
Total fuel quantity is less than 100lbs. ***Land as soon as possible***.
Reduce power/fuel flow if possible.
Indication: Master Caution, Double Chime, FUEL QTY
Total fuel quantity is less than 180lbs, ***Land as soon as practical***. Reduce power/fuel flow if possible.

E-18 LOW FUEL PRESSURE

Indication: Master Warning, Triple Chime, FUEL PRESS LOW
Power...**REDUCE**
FUEL PUMPS Switch..**MAN**
Fuel Quantity and Balance..**MONITOR** If fuel pressure annunciator remains illuminated, ***land as soon as possible.***
If fuel pressure annunciator remains illuminated**, *land as soon as possible.***

E-19 FUEL IMBALANCE

Indication: Master Warning, Triple Chime, FUEL IMBALANCE ,
Red fuel imbalance indication (>125lbs imbalance)

FUEL PUMPS Switch ....**MAN**
If either white **"L FUEL PUMP ON"** or **"R FUEL PUMP ON"** message is <u>NOT</u> illuminated, turn the **FUEL PUMPS Switch to OFF.**
In all cases, Land as soon as possible.

FUEL IMBALANCE 40 pounds
Indication: Master Warning, Triple Chime, , FUEL IMBALANCE
Ambar fuel imbalance indication.

FUEL PUMPS Switch...**Verify AUTO**
Fuel Pump..........................**Verify white L or R FUEL PUMP ON (High Fuel Side) message on MFD**
Fuel Quantity...**MONITOR**

E-20 GENERATOR FAILURE

Indication: Master Warning, Triple Chime, GENERATOR FAIL
Zero generator amps indication.
Electrical Load...........................**REDUCE UNTIL TOTAL LOAD IS BELOW 130 AMPS & VOLTS ANNUNCIATOR IS EXTINGUISHED**
AIR COND Switch...**OFF**
GEN Switch...**OFF then ON**
If generator fails to reset:
GEN Switch..**OFF**
GENERATOR CONTROL Circuit Breaker.............................**RESET**
(Located on the lower left instrument panel.)
GEN Switch..**ON**
If circuit breaker opens again or annunciator stays illuminated with zero amps indicated:
GEN Switch...**OFF**
GENERATOR CONTROL Circuit Breaker......................... PULL/ DO NOT RESET *Land as soon as practical.*

E-21 ALTERNATOR FAILURE

Indication: Master Warning, Triple Chime, ALTERNATOR FAIL
Zero alternator amps indication.
ALT Switch...**OFF then ON**
If alternator fails to reset:
ALT Switch..**OFF**

ALTERNATOR FIELD Circuit Breaker. ....RESET
(Located on pilot's forward circuit breaker panel, row D, position 7)
ALT Switch.. ON
If circuit breaker opens again or annunciator stays illuminated with zero amps indicated:
ALT Switch...OFF
ALTERNATOR FIELD Circuit Breaker............................ PULL/ DO NOT RESET If generator has assumed the load, limit load to under 200 amps and continue flight while avoiding icing conditions.
Repair alternator as soon as possible.

E-22 COMPLETE ELECTRICAL FAILURE

Indication: PFDs, MFD and all equipment, excluding the Standby Instrument, will be unpowered.
Standby Flight Instrument..................**Verify OPERATIONAL**
Aircraft Control..............................**Use Standby Instrument**
EMER Switch ....**ON**
BATTERY Switch..**OFF**
GEN Switch..**OFF**
ALT Switch..**OFF**
AVIONICS Switch..**OFF**
CABIN PRESSURE DUMP Switch (prior to landing)......**DUMP**

Land as soon as possible.

The aircraft will now be on emergency bus power only. Please refer to section 5, 'Emergency Power' for a description of what systems will be powered.

NOTE

With a complete electrical failure, emergency landing gear extension and landing without flaps will be required. Refer to Emergency Landing Gear Extension () and Landing Without Flaps ().

CAUTION

Torque indication will not be available, therefore engine power should be set using throttle lever position, engine sound, airspeed, and the remaining powerplant indications.

CAUTION

During operations on the emergency bus, BETA and reverse are not available.

E-23 FLAPS SYSTEM MALFUNTION

Indication: Master Warning, Triple Chime, FLAP FAIL

FLAP WARN Circuit Breaker .... **PULL AND RESET VERIFY NORMAL FLAP OPERATION**
(Located on pilot's side forward panel, row B, position 4)

If FLAP FAIL remains indicated:
FLAP MOTOR Circuit Breaker .... **PULL AND RESET VERIFY NORMAL FLAP OPERATION**
(Located on pilot's side forward panel, row B, position 3)

TO LAND WITHOUT FLAPS, FOLLOW NORMAL PROCEDURES BUT USE Vref = 100KIAS

E-25 DUAL FAILURE ON BOTH GENERATOR & ALTERNATOR

Indication: Master Warning, Triple Chine ALTERNATOR FAIL
And Zero Amps indicated on both ammeters.

NOTE

Any time total tie bus voltage is below 25 Vdc while Any time total tie bus voltage is below 25 Vdc while illuminate.

GEN Switch...**OFF**
ALT Switch...**OFF**
GENERATOR CONTROL Circuit Breaker.................................**RESET**
(Located on the lower left instrument panel.)
ALTERNATOR FIELD Circuit Breaker.....................................**RESET**
(Located on pilot's forward circuit breaker panel, row D, position 7)
GEN Switch (after OFF at least one second)............................
ON ALT Switch (after OFF at least one second)
.............................**ON If only the generator resets:**
ALT Switch...**OFF**
Continue flight while avoiding icing conditions. If only the alternator resets:
GEN Switch...**OFF**
Electrical Load..........................**MAINTAIN LESS THAN 130 AMPS**
Ammeter...**MONITOR**
Land as soon as practical.
If neither the generator nor alternator resets:
GEN Switch..**OFF**
ALT Switch...**OFF**
EMER Switch..**Verify OFF**
BATTERY Switch... **Verify ON**
Electrical Load.....................**REDUCE TO MINIMUM**
Load-shed procedure (for 30-minutes of battery life)

E-26 EMERGENCY AUTOLAND

NOTE

The Emergency Autoland switch should be pressed and held until the EAL system activates, as indicated by the PFDs and MFD changing to the EAL display mode.

EMERGENCY AUTOLAND Switch.................**LIFT COVER/ PRESS & HOLD**

POWER Lever...**REDUCE POWER**
Airspeed..**REDUCE**

Land as soon as practical.

CAUTION

The flight controls, throttle, landing gear and flap levers should not be manipulated during the Emergency Autoland Sequence. Doing so could interrupt the autonomous nature of the system.

CAUTION

Emergency Autoland will automatically activate after 2 continuous minutes in Level Mode.

NOTE

Emergency Autoland will automatically activate at 14,100 feet during a descent in Emergency Descent Mode.

Annex A: Performance Tables

Take-off performance: Take-Off Field Required

TEMP(C)	TAKEOFF DISTANCE - WEIGHT 6000LBS					
	SEA LEVEL	2000	6000	8000	10000	
35	**2390ft**	**2681ft**	**3268ft**	**4202ft**	**-**	**FLAPS T/O**
20	**2183ft**	**2446ft**	**3086ft**	**3614ft**	**4233ft**	
10	**2051ft**	**2296ft**	**2891ft**	**3382ft**	**3958ft**	
0	**1922t**	**2150ft**	**2702ft**	**3158ft**	**3693ft**	
-10	**1797t**	**2008t**	**2519ft**	**2942ft**	**3436ft**	

TEMP(C)	TAKEOFF DISTANCE - WEIGHT 5000LBS					
	SEA LEVEL	2000	6000	8000	10000	
35	**2008ft**	**2252ft**	**2745ft**	**3530ft**	**4284ft**	**FLAPS T/O**
20	**1834ft**	**2055ft**	**2592ft**	**3036ft**	**3556ft**	
10	**1723ft**	**1929ft**	**2429ft**	**2841ft**	**3325ft**	
0	**1615ft**	**1806ft**	**2270ft**	**2653ft**	**3102ft**	
-10	**1510ft**	**1687ft**	**2116ft**	**2471ft**	**2886ft**	

TEMP(C)	TAKEOFF DISTANCE - WEIGHT 4000LBS					
	SEA LEVEL	2000	6000	8000	10000	FLAPS T/O
35	1622ft	1819ft	2218ft	2852ft	3461ft	
20	1482ft	1660ft	2094ft	2453ft	2873ft	
10	1392ft	1558ft	1962ft	2296ft	2687ft	
0	1304ft	1459ft	1834ft	2144ft	2506ft	
-10	1220ft	1363ft	1710ft	1996ft	2332ft	

Table A-1: Normal take-off – distance required (ft) (no flaps)

SUBTRACT 200ft TO LANDING ROLL DISTANCE PER 10KT OF HEADWIND
ADD 450ft TO LANDING ROLL DISTANCE PER 10KT OF TAILWIND
MULTIPLY LANDING ROLL DISTANCE BY:

x1.2 FOR GRASS; x1.3 FOR WET GRASS

TEMP(C)	TAKEOFF DISTANCE - WEIGHT 6000LBS					
	SEA LEVEL	2000	6000	8000	10000	FLAPS T/O 50ft Obstacle
35	3276ft	3675ft	4486ft	5780ft	-	
20	2993ft	3354ft	4231ft	4954ft	5803ft	
10	2811ft	3147ft	3963ft	4637ft	5427ft	
0	2635ft	2947ft	3708ft	4330ft	5062ft	
-10	2464ft	2753ft	3050ft	4033ft	4710ft	

TEMP(C)	TAKEOFF DISTANCE - WEIGHT 5000LBS					
	SEA LEVEL	2000	6000	8000	10000	FLAPS T/O 50ft Obstacle
35	2709ft	3039ft	3710ft	4779ft	5812ft	
20	2475ft	2773ft	3499ft	4097ft	4799ft	
10	2325ft	2603ft	3278ft	3835ft	4488ft	
0	2179ft	2437ft	3064ft	3581ft	4187ft	
-10	2038ft	2277ft	2856ft	3335ft	3895ft	

TEMP(C)	TAKEOFF DISTANCE - WEIGHT 4000LBS	

	SEA LEVEL	2000	6000	8000	10000	FLAPS T/O 50ft Obstacle
35	**2149ft**	**2411ft**	**2943ft**	**3791ft**	**4609ft**	
20	**1964ft**	**2200ft**	**2775ft**	**3250ft**	**3807ft**	
10	**1844ft**	**2065ft**	**2600ft**	**3042ft**	**3560ft**	
0	**1729ft**	**1933ft**	**2430ft**	**2841ft**	**3321ft**	
-10	**1616ft**	**1806ft**	**2260ft**	**2646ft**	**3090ft**	

FLAPS T/O

SUBTRACT 200ft TO LANDING ROLL DISTANCE PER 10KT OF HEADWIND •

ADD 450ft TO LANDING ROLL DISTANCE PER 10KT OF TAILWIND

MULTIPLY LANDING ROLL DISTANCE BY:

x1.2 FOR GRASS; x1.3 FOR WET GRASS

Cruise Performance – Normal Recommended Cruise Speed

	-54	-52	-50	-48	-46	-44	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24
15000											**1575**	**1575**	**1575**	**1575**	**1575**	**1575**
16000										**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**
17000									**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**
18000								**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**
19000							**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**
20000						**1575**	**1575**	**1575**	**1575**	**1575**	**1574**	**1568**	**1562**	**1556**	**1550**	**1542**
21000					**1575**	**1575**	**1575**	**1575**	**1575**	**1572**	**1560**	**1547**	**1534**	**1522**	**1509**	**1496**
22000				**1575**	**1566**	**1558**	**1550**	**1542**	**1534**	**1522**	**1510**	**1498**	**1486**	**1474**	**1462**	**1450**
23000	**1560**	**1555**	**1549**	**1538**	**1527**	**1516**	**1505**	**1494**	**1483**	**1471**	**1460**	**1449**	**1438**	**1426**	**1414**	**1402**
24000	**1505**	**1497**	**1485**	**1474**	**1463**	**1451**	**1440**	**1429**	**1418**	**1408**	**1397**	**1386**	**1374**	**1363**	**1351**	**1339**
25000	**1447**	**1437**	**1426**	**1415**	**1405**	**1394**	**1383**	**1372**	**1360**	**1349**	**1338**	**1327**	**1315**	**1304**	**1292**	**1281**
26000	**1387**	**1378**	**1369**	**1360**	**1350**	**1340**	**1330**	**1319**	**1309**	**1298**	**1287**	**1276**	**1265**	**1254**	**1243**	**1232**
27000	**1331**	**1323**	**1316**	**1308**	**1297**	**1287**	**1277**	**1267**	**1257**	**1247**	**1237**	**1227**	**1217**	**1206**	**1195**	**1184**
28000	**1275**	**1270**	**1264**	**1254**	**1244**	**1234**	**1224**	**1214**	**1204**	**1194**	**1184**	**1174**	**1164**	**1154**	**1143**	**1132**
29000	**1215**	**1211**	**1202**	**1192**	**1183**	**1174**	**1165**	**1155**	**1145**	**1135**	**1126**	**1116**	**1106**	**1096**	**1086**	**1077**
30000	**1160**	**1152**	**1143**	**1135**	**1127**	**1118**	**1109**	**1099**	**1090**	**1080**	**1071**	**1061**	**1052**	**1042**	**1032**	**1023**

Table A-4: Normal Speed Cruise – Power Setting (OAT -54 to -24)

	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0	2	4	6	8
15000	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1573**	**1565**	**1558**	**1550**	**1542**	**1529**	**1507**
16000	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1573**	**1570**
17000	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1575**	**1570**	**1554**	**1538**	**1522**	**1506**	**1489**	**1468**	**1448**
18000	**1575**	**1573**	**1563**	**1553**	**1543**	**1534**	**1522**	**1505**	**1489**	**1472**	**1456**	**1439**	**1421**	**1403**	**1385**	**1367**
19000	**1570**	**1556**	**1541**	**1527**	**1512**	**1497**	**1483**	**1469**	**1454**	**1440**	**1424**	**1407**	**1390**	**1372**	**1355**	**1338**
20000	**1527**	**1513**	**1499**	**1485**	**1471**	**1457**	**1444**	**1430**	**1416**	**1402**	**1386**	**1370**	**1354**	**1339**	**1323**	**1307**
21000	**1482**	**1469**	**1455**	**1442**	**1429**	**1416**	**1402**	**1389**	**1376**	**1362**	**1348**	**1334**	**1320**	**1306**	**1292**	**1278**
22000	**1437**	**1425**	**1412**	**1399**	**1387**	**1374**	**1361**	**1348**	**1336**	**1323**	**1311**	**1298**	**1286**	**1273**	**1261**	**1246**
23000	**1390**	**1377**	**1365**	**1352**	**1340**	**1327**	**1315**	**1302**	**1290**	**1278**	**1266**	**1254**	**1242**	**1230**	**1215**	**1200**
24000	**1328**	**1315**	**1303**	**1291**	**1279**	**1267**	**1255**	**1244**	**1232**	**1221**	**1210**	**1198**	**1187**	**1173**	**1159**	**1145**
25000	**1269**	**1257**	**1245**	**1234**	**1222**	**1211**	**1199**	**1188**	**1177**	**1165**	**1154**	**1143**	**1130**	**1117**	**1104**	**1091**
26000	**1220**	**1209**	**1197**	**1186**	**1175**	**1163**	**1152**	**1141**	**1129**	**1118**	**1107**	**1095**	**1083**	**1071**	**1059**	**1047**

27000	1173	1162	1151	1140	1129	1119	1108	1097	1086	1075	1064	1054	1043	1033	1023	
28000	11121	1110	1100	1089	1078	1068	1057	1046	1036	1025	1015	1005	994	984		
29000	1067	1056	1045	1035	1024	1013	1003	992	982	972	963	953	944			
30000	1013	1003	992	982	972	962	952	942	932	922	913	903				

Table A-5: Normal Speed Cruise – Power Setting (OAT -22 to +8)

Cruise Performance – Normal Cruise Speed

	10	12	14	16	18	20
15000	1485	1463	1440	1418	1396	1374
16000	1427	1407	1386	1366	1345	1326
17000	1382	1363	1344	1325	1307	1289
18000	1349	1331	1313	1296	1279	1261
19000	1320	1303	1287	1271	1254	1238
20000	1291	1275	1260	1244	1229	1213
21000	1263	1247	1232	1216	1201	
22000	1231	1217	1202	1187		
23000	1185	1170	1155			
24000	1130	1116				
25000	1078					
26000						
27000						
28000						
29000						
30000						

Table A-6: Normal Speed Cruise – Power Setting (OAT +10 to +20)

Cruise Performance

ISA	-20				-10				ISA			
Altude	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**
0	-5	1575	457	209	5	1575	459	212	15	1575	461	214
2000	-9	1575	442	213	1	1575	443	216	11	1575	445	219
4000	-13	1575	426	218	-3	1575	427	220	7	1575	429	223
6000	-17	1575	411	222	-7	1575	413	224	3	1575	414	227
8000	-21	1575	399	226	-11	1575	400	229	-1	1575	401	232
10000	-25	1575	386	230	-15	1575	387	233	-5	1575	388	236
12000	-29	1575	374	235	-19	1575	375	238	-9	1575	375	241
14000	-33	1575	365	239	-23	1575	365	243	-13	1575	366	245
16000	-37	1575	357	244	-27	1575	357	247	-17	1575	358	250
18000	-41	1575	352	249	-31	1575	352	252	-21	1575	352	255
20000	-45	1575	346	254	-35	1575	346	257	-25	1546	341	259
22000	-49	1575	343	259	-39	1537	335	260	-29	1478	324	260
24000	-53	1500	325	260	-43	1443	313	260	-33	1389	302	259
26000	-57	1399	302	258	-47	1353	292	259	-37	1301	281	258
28000	-60	1291	277	256	-50	1266	272	257	-40	1216	262	257
30000	-64	1157	249	250	-54	1161	250	254	-44	1120	242	253

Table A-7: M600 NORMAL CRUISE PERFORMANCE (ISA -20 to ISA)

- **Altitude = ft**
- **IAS = degrees Celsius**
- **OAT = Outside Air Temperature**
- **TQ = Torque, lb-ft**
- **Fuel Flow = Pounds Per Hour**
- **TAS = True Air Speed, in Knots**

ISA	**+10**				**+20**				**+35**			
Altitude	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**
0	25	1575	462	217	35	1575	464	219	50	1575	468	222
2000	21	1575	447	221	31	1575	449	223	46	1575	452	227
4000	17	1575	431	225	27	1575	433	228	42	1575	436	231
6000	13	1575	416	230	23	1575	418	232	38	1575	421	236
8000	9	1575	402	234	19	1575	403	237	34	1575	406	240
10000	5	1575	389	239	15	1575	390	241	30	1536	384	243
12000	1	1575	376	243	11	1575	377	246	26	1472	360	244
14000	-3	1575	367	248	7	1573	367	251	22	1406	339	245
16000	-7	1575	358	253	3	1496	345	251	18	1342	320	246
18000	-11	1575	342	256	-1	1445	328	253	14	1310	306	248
20000	-15	1475	328	257	-5	1407	315	256	10	1288	295	252
22000	-19	1416	312	259	-9	1352	301	257	6	1258	284	254
24000	-23	1331	292	258	-13	1270	281	257	2	1184	264	254
26000	-27	1246	271	257	-17	1189	261	255	-2	1104	245	252
28000	-30	1167	252	255	-20	1113	243	253	-5	1033	228	249
30000	-34	1073	232	252	-24	1025	224	250	-9	949	210	245

Table A-8: M600 NORMAL CRUISE PERFORMANCE (ISA +5 to +25)

- **Altitude = ft**
- **IAS = degrees Celsius**
- **OAT = Outside Air Temperature**
- **TQ = Torque, lb-ft**
- **Fuel Flow = Pounds Per Hour**
- **TAS = True Air Speed, in Knots**

ISA	-20				-10				ISA				+10				+20			
Altitude	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**
0	-5		430	201	5		431	203	15		433	205	25		435	208	35		437	210
5000	-15		391	211	-5		393	214	5		394	216	15		395	219	25		397	221
10000	-25		354	221	-15		355	224	-5		357	227	5		358	229	15		360	232
15000	-35	1400	330	232	-25	1400	331	235	-15	1400	331	238	-5	1400	332	241	5	1400	333	244
20000	-45		314	244	-35		314	247	-25		314	250	-15		314	253	-5		314	256
25000	-55		303	256	-45		303	260	-35		291	259	-25		280	258	-15		269	256
30000	-64		249	251	-54		250	254	-44		242	254	-34		232	252	-24		224	250

Table A-9: M600 1400 lb-ft CRUISE PERFORMANCE (ISA -20 to +20)

ISA	-20				-10				ISA				+10				+20			
Altitude	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**
0	-5		400	189	5		401	192	15		403	194	25		404	196	35		406	198
5000	-15		360	199	-5		361	202	5		363	204	15		364	206	25		365	209
10000	-25		323	209	-15		324	212	-5		325	214	5		326	217	15		327	219
15000	-35	1200	295	220	-25	1200	296	222	-15	1200	297	225	-5	1200	297	228	5	1200	298	230
20000	-45		277	231	-35		278	234	-25		278	236	-15		279	239	-5		279	242
25000	-55		265	242	-45		265	245	-35		265	248	-25		265	251	-15		265	254
30000	-64		249	251	-54		250	254	-44		242	254	-34		232	252	-24		224	250

Table A-10: M600 1200 lb-ft CRUISE PERFORMANCE (ISA -20 to +20)

- **Altitude = ft**
- **IAS = degrees Celsius**
- **OAT = Outside Air Temperature**
- **TQ = Torque, lb-ft**
- **Fuel Flow = Pounds Per Hour**
- **TAS = True Air Speed, in Knots**

ISA	-20				-10				ISA				+10				+20			
Altitude	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**
0	-5	1000	371	176	5	1000	373	178	15	1000	374	180	25	1000	375	182	35	1000	376	184
5000	-15		330	185	-5		331	188	5		332	190	15		333	192	25		335	194
10000	-25		292	195	-15		293	197	-5		294	200	5		295	202	15		296	204
15000	-35		263	205	-25		264	207	-15		265	210	-5		265	212	5		266	215
20000	-45		243	215	-35		243	218	-25		244	220	-15		245	223	-5		245	225
25000	-55		227	226	-45		228	228	-35		228	231	-25		229	234	-15		229	236
30000	-64		219	237	-54		219	240	-44		218	242	-34		219	245	-24		219	248

Table A-11: M600 1000 lb-ft CRUISE PERFORMANCE (ISA -20 to +20)

ISA	-20				-10				ISA				+10				+20			
Altitude	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**	**OAT**	**TQ**	**Fuel Flow**	**TAS**
0	-5	600	317	137	5	600	318	139	15	600	319	141	25	600	320	143	35	600	321	145
5000	-15		275	146	-5		275	148	5		276	150	15		277	152	25		278	154
10000	-25		236	154	-15		236	156	-5		236	158	5		236	160	15		237	162
15000	-35		205	162	-25		205	164	-15		206	166	-5		206	168	5		207	169
20000	-45		182	170	-35		182	172	-25		182	174	-15		183	175	-5		183	177
25000	-55		162	177	-45		163	179	-35		163	181	-25		164	182	-15		164	183
30000	-64		149	183	-54		149	185	-44		149	186	-34		149	187	-24		150	188

Table A-12: M600 600lb-ft CRUISE PERFORMANCE (ISA -20 to +20)

- **Altitude = ft**

- IAS = degrees Celsius
- OAT = Outside Air Temperature
- TQ = Torque, lb-ft
- Fuel Flow = Pounds Per Hour
- TAS = True Air Speed, in Knots

Annex B: Controller bindings & events

This annex provides some examples of different ways of configuring a throttle axis in SPAD.next to take advantage of the functioning Beta range. It also provides a list of the main simevents and L:VARS used in the M600 cockpit controls (there are many other custom L:VARS related to aircraft systems).

Throttle configuration in SPAD.next

The following screenshots show two examples of the throttle configured to an axis using SPAD.next. The first example shows the axis configured to give Normal & Beta, with reverse mapped to a button below the hardware detent (a Honeycomb Bravo in example 1) and the second shows the axis mapped to give Normal, Beta and Reverse on one normal Axis on a Logitech FlightPro Throttle Quadrant.

The first example allows the upper part of the normal axis to command forward thrust, the lower part of the axis to command beta. Full Reverse is commanded by dropping the throttle through the detent to 'press' the button below to give maximum reverse thrust. The second has the advantage of being able to control the amount or reverse thrust, but the disadvantage of a shorter normal range as a result. Which to use is a matter of personal preference and the controller you are using.

The downside to both methods is that there is no hardware/physical detent at the Idle stop. Setting small dead zones will help. Fortunately, the **M600** will not allow Beta or Reverse to be engaged in flight!

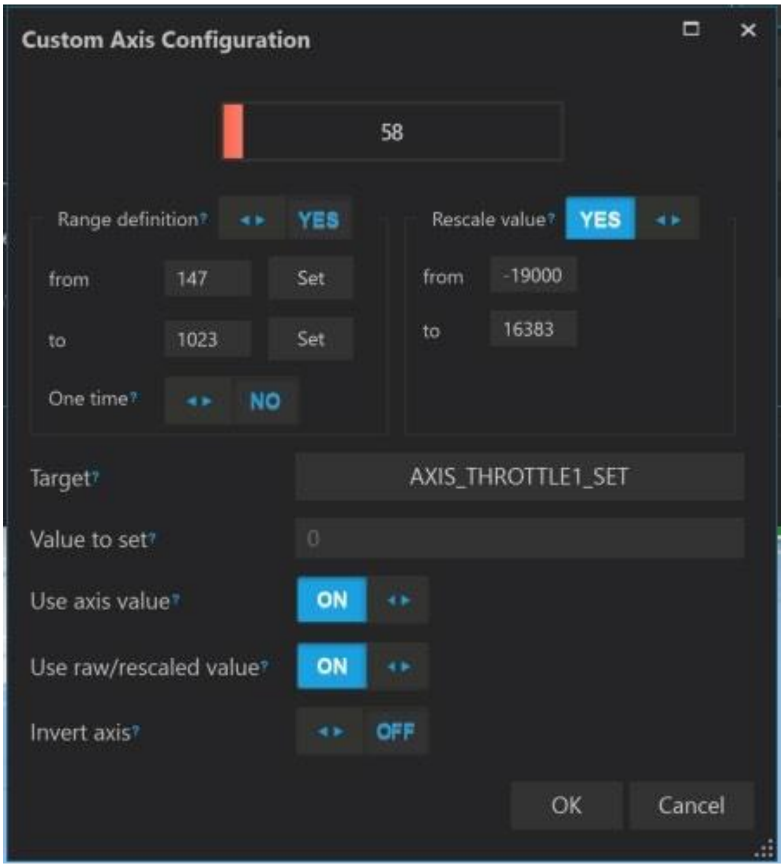


Figure B-2: Example 1: Axis with normal & beta

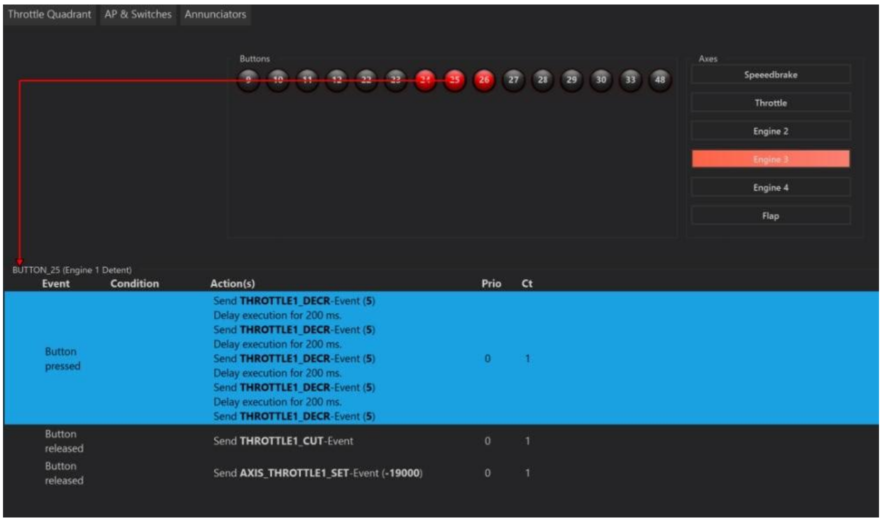


Figure B-2: Example 1: reverse thrust on button

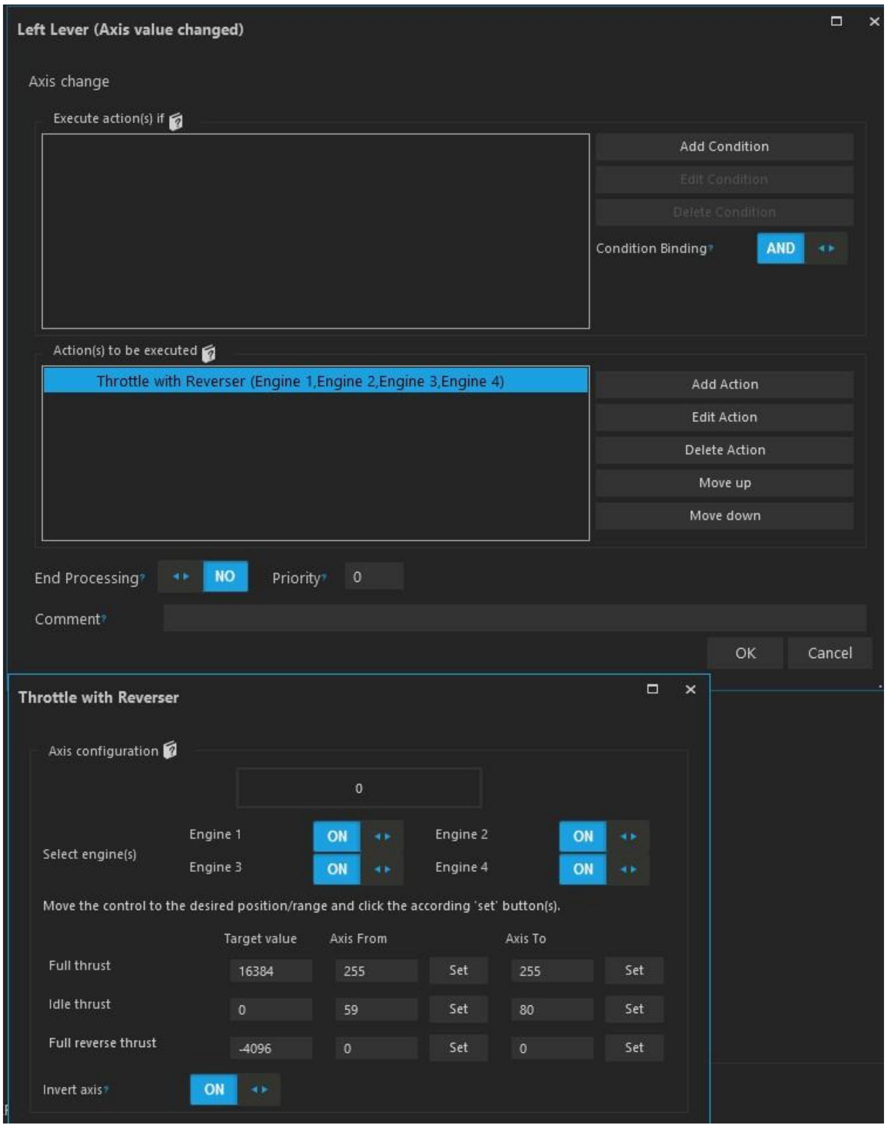


Figure B-3: Example 2: Axis with Normal, Beta and reverse

Condition lever

The condition lever is controlled using MIXTURE events. This is an example of a custom axis that will allow full range. Normal MSFS actions will work equally well.

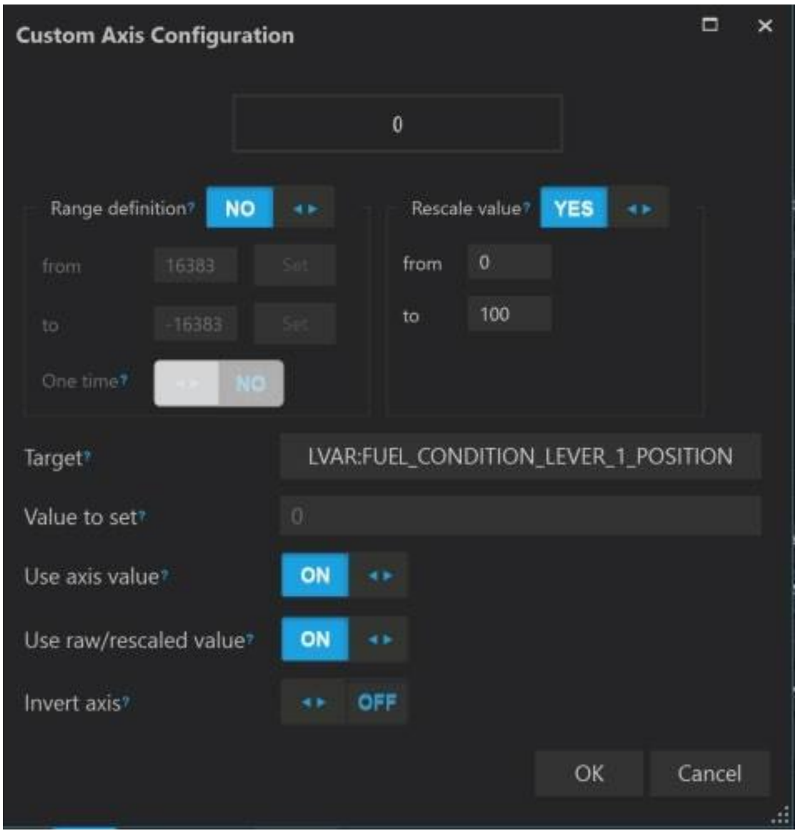


Table of Events and Variables

The following table sets out many of the most useful events and variables used by the **M600.** They are a mix of standard simevents and custom local variables (L:VARS). All of the custom L:VARS begin with FSR_M600. If not indicated otherwise, 1=ON and 0=OFF.

Note – there are L:VARS for the switch covers but these may not bind well, so have not been included. It's possible to use the STARTER1_SET event to activate the starter without lifting the cover.

Switch/Control	Event/Variable
Flight Controls	
Rudder trim switch	RUDDER_TRIM_LEFT/_RIGHT
Flaps lever	FLAPS_INCR /FLAPS_DECR
Overhead Electrical Panel - pilot side	
Battery	FSR_M600_BATTERY_SWITCH_ON FSR_M600_BATTERY_CIRCUIT_ON
Avionics	AVIONICS MASTER SWITCH CIRCUIT AVIONICS ON
Generator (GEN)	GENERAL ENG MASTER ALTERNATOR:1
Push Start	STARTER1_SET
Fuel Pumps rocker switch	ELECT_FUEL_PUMP1_SET (0=OFF, 1=ON, 2=AUTO)
Ignition	FSR_M600_ENGINE_IGNITION_1 (0=OFF, 1=AUTO, 2=ON,
Start Mode	FSR_M600_STARTERSTOPBUTTON
Alternator (ALT)	GENERAL ENG MASTER ALTERNATOR:2
Emergency Switch (EMER)	FSR_M600_EMERGENCY_POWER
Stall Warn Test	FSR_M600_ELECTRICAL_SWITCH_STALL_TEST
Reverse Lock Out	FSR_M600_ELECTRICAL_SWITCH_REVERSE_LOCK
Overspeed Gov Test	FSR_M600_ELECTRICAL_SWITCH_GOV_TEST
Overhead Electrical Panel - dimming	
Switch	FSR_M600_LIGHTING_SWITCH_DIMMER_SWITCHES (0-100)
Panel	FSR_M600_LIGHTING_SWITCH_DIMMER_PANEL (0-100)
Avionics	FSR_M600_LIGHTING_SWITCH_DIMMER_AVIONICS (0-100)
Panel Flood	FSR_M600_LIGHTING_SWITCH_DIMMER_PANEL_FLOOD (0-100)
Day/Night	FSR_M600_LIGHTING_SWITCH_DIMMER_DAYNIGHT (0-100)
Dome Light (left)	FSR_M600_LIGHTING_knob_pilot (0-100)
Dome Light (right)	FSR_M600_LIGHTING_knob_copilot (0-100)

Overhead Electrical Panel - co-pilot side	
Windshield Heat	FSR_M600_DEICE_SWITCH_WINDSHIELD (ON=2, OFF=1)
Pitot Heat	PITOT HEAT ON/OFF
Prop Heat	PROP DEICE SWITCH

Stall Heat	PITOT HEAT ON/OFF
Surf de-ice	FSR_M600_DEICE_SWITCH_AIRFRAME
Taxi/Rec Light	LIGHT TAXI
Landing Light	LANDING_LIGHTS
Nav Light	LIGHT NAV (note – REC lights presently not configurable)
Strobe Light	STROBES ON/OFF
Ice Light	[---]
Fire Det/Ann Test	FSR_M600_ELECTRICAL_SWITCH_FIRE_TEST
Instrument Panel	
Autopilot Level mode	AUTOPILOT WING LEVELER
Parking Brake	PARKING_BRAKES
Bleed Air ON (PUSHED)	FSR_M600_BLEED_LEVER =0 BLEED AIR SURCE CONTROL =3
Bleed Air OFF (PULLED)	FSR_M600_BLEED_LEVER =100 BLEED AIR SURCE CONTROL =1
Landing Gear	GEAR_UP/DOWN
Emergency Gear Extension	1.FSR_M600_HANDLING_EMERGENCY_GEAR_LEVER_COVER 2. EMERGENCY_GEAR_LEVER (0-100)
ECS cabin comfort	FSR_M600_PRESSURIZATION_ECS_KNOB (OFF=0, NORM =1, HI=2, EMERG=3)
Cabin Pressure dump	PRESSURIZATION DUMP SWITCH
Cabin Pressure dump cover	[---]
Aircon on/off	FSR_M600_AIRCON_SWITCH_MASTER
Aircon hi/low	FSR_M600_AIRCON_SWITCH_MASTER_SPEED (hi = 2 off = 0) FSR_M600_AIRCON_SWITCH_MASTER_SPEED_ON (LO = 1 off = 0)
Vent Fan	FSR_M600_AIRCON_SWITCH_VENT
Climate control cool/warm dial	FSR_M600_CLIMATECONTROL_KNOB_TEMP
Climate control auto/manual	FSR_M600_CLIMATECONTROL_SWITCH_MASTER
Climate control (manual) warm/cool switch	FSR_M600_ClimateControl_Switch_Temp
Defrost	FSR_M600_ClimateControl_Defrost_Lever

Control Quadrant	
Manual Override Lever (INOP)	N/A
Throttle	See entry on throttle axis
Condition Lever	LVAR:FUELCONDITION_LEVER_1_POSITION
Elevator Trim Wheel	ELEV_TRIM_UP/_DN
Fuel Shut-off cover/lever (INOP)	N/A
Yoke - pilot side	
Electric Elevator Trim switch	ELEV_TRIM_UP/_DN
CWS (INOP)	N/A
Autopilot Disconnect	AUTOPILOT_OFF
Ident (INOP)	N/A

Yoke - copilot side	
Electric Elevator Trim switch	ELEV_TRIM_UP/_DN
CWS (INOP)	N/A
Autopilot Disconnect	AUTOPILOT_OFF
Ident	N/A
Cabin	
Main cabin door	TOGGLE_AIRCRAFT_EXIT_FAST
Folding table	FSR_M600__FOLDING_TABLE