BOEING C-17 GLOBEMASTER III

FOR MICROSOFT FLIGHT SIMULATOR 2024

MILTECH SIMULATIONS

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CHAPTER 1: PRODUCT DETAILS

1.1 INTRODUCTION

Our team has made every effort to capture the C17 accurately based on the public documentation available. However, some systems have been simplified due to insufficient documentation. Remember that the C17 is in active service, and some areas of the aircraft are classified.

SIMULATION USE ONLY - DO NOT USE THIS DOCUMENTATION ON A REAL AIRCRAFT

Welcome to the user manual for the Miltech Simulations C-17 Globemaster III for Microsoft Flight Simulator 2024. The C-17 Globemaster III is a 4-engine, heavy-lift, military transport aircraft manufactured by American aerospace company Boeing. The prototype C-17 took its maiden flight on September 15, 1991 and serial production airframes entered service on January 17, 1995 with the United States Air Force.

The C-17 is used primarily by the U.S. Air Force, the U.S. Air Force Reserve, and the U.S. Air National Guard. Other countries that operate the airframe include the United Kingdom, Australia, Canada, India, the United Arab Emirates, Kuwait, and Qatar. The C-17 is known for its operational versatility and mission adaptability, and it is renowned for being able to operate out of small and unimproved airfields. It can support military operations at all levels, tactical, operational, and strategic, and it can provide logistics for non-military initiatives including humanitarian assistance and scientific field work. The C-17 has operated on all seven continents and in all types of environments, from desert to polar, and has supported combat missions in Iraq and Afghanistan, among other locations.

The C-17 program traces its history to the 1979 Department of Defense Cargo Experimental (C-X) program. It outlined a request for a jet-powered aircraft that could perform global, strategic heavy-lift missions inclusive of troop transport and aerial delivery of paratroops and materiel. The aircraft needed to be able to accommodate the U.S. military's largest pieces of equipment, including tanks, armored personnel carriers, trucks, and helicopters. It further needed to be able to operate out of short and austere airfields, including dirt strips. Meeting the requirement would prove technically difficult as it sought a functional hybrid of a C-130 Hercules, known for its ability to operate out of short and unimproved airfields, with the C-141 Starlifter, a heavy-lift strategic cargo airplane.

The military awarded the contract to American aviation and defense contractor McDonnell Douglas in August of 1981. The project was named the C-17 Globemaster III, extending a naming lineage that began with the Douglas C-74 Globemaster, a piston-powered cargo aircraft that first flew in 1945, and was continued with the Douglas C-124 Globemaster II, a piston-powered freighter that took its maiden flight in 1949.

In developing the C-17, McDonnell Douglas relied on work it had completed during the 1970s with their YC-15. The YC-15 was a 4-engine, jet-powered, experimental, short take-off and landing (STOL) tactical airlifter intended to replace the C-130 Hercules. The C-17 design, while similar to the YC-15, is much larger and uses a different wing design. Production began in the early 1990s after initial successful test flights; Boeing took over the contract when it acquired McDonnell Douglas in 1997.

The C-17 is crewed by three: two pilots and a single loadmaster. It features a high-mounted, swept main wing with winglets for mitigation of drag-inducing vortex formation. The wing incorporates externally blown flaps for short field performance and uses advanced airfoil designs to maximize aerodynamic efficiency. Its large cargo hold can accommodate over 100 combat-loaded troops, 48 litters for medical transport operations, a single M1 Abrams main battle tank, tracked and wheeled vehicles, and all types of transport containers and pallets. It has an advanced glass cockpit and redundant digital fly-by-wire flight controls.

The aircraft measures 174 feet in length, stands 55 feet, 1 inch tall, and has a wingspan of 169 feet, 10 inches. It is powered by four wing-mounted Pratt & Whitney F117-PW-100 high-bypass turbofan engines that each generate up to 40,440 pounds of thrust.

The aircraft can carry up to 170,900 pounds of payload, has a range of 2,780 miles (extendible by in-flight refueling), and it cruises at 520 miles per hour. It can operate out of airfields as short as 3,000 feet in length, depending on load, and it can execute a 3-point turn within 80 feet due to thrust reversers. We are excited to present this aircraft as our first collaboration with Microsoft and to see it officially released as part of the Microsoft Flight Simulator 2024 Premium Package.

We hope that you enjoy flying the Miltech Simulations C-17 Globemaster III,
Miltech Simulations Team - Gabriel, Dan, Chris, Rhys, Brayan, Max & our Partners at Echo19 and PropAir

1.2 SIMULATED SYSTEMS & ROADMAP

Please refer to the following table for descriptions of aircraft systems and functions modeled on this rendition of the C-17 Globemaster III. Please understand that we must comply with limitations regarding 3rd party add-on support due to this being a Microsoft Flight Simulator stock aircraft.

Item	Simulated	Notes
EFB - to - MSN/FMS Synchronization	Ongoing Implementation	Update 1 - Shortly after Initial Release
Walkaround Items - Pitots, RBF, Tire Pressure	Ongoing Implementation	Update 1 - Shortly after Initial Release. Excluded from initial release due to a core bug.
Tactical Descent, In-Flight Reversers	Ongoing Implementation	MSFS Does not natively support reversers while inflight. Update 2 - System Bypass to enable reversers in-flight.
Flap Index Manual Selection	Ongoing Implementation	Update 2 - System Bypass to enable Flap Index selection.
MFD, Primary Flight Display	Yes	Accurately simulated and functional.
MFD, Navigation Display	Yes	Full Compass, MAP pages supported. MSN (FlightPlan), VOR1, VOR2 supported. TAWS, WX supported. Planned update: TCN1/TCN2.
MFD, PPI	Yes	TCAS, WX, TAWS supported. SKE not supported.
MFD, Engine and Config	Yes	Accurately simulated and functional.
HUD	Yes	Accurately simulated and functional.
FMC	Yes	All 4 screens are independent and functional. Various MSN pages have not been depicted due to military classification of such displays. Performance pages are unavailable due to the lack of publicly available performance tables. PERF will be supported in the future through an update, as we are creating our own through extensive sim testing
Navigation and Communication Displays	Yes	COM1, COM2, NAV1, NAV2, TCN1, TCN2, ADF, IFF supported. Other modes not supported.
STBY Engine Display and LIMIT/RATING	Yes	
Warning and Advisory Panel	Yes	
STBY Radio	Not Modeled	INOP.
Cockpit Clocks	Yes	Elapsed Time and Clock
Bearing, Distance, Heading Indicator	Yes	Full Support for ADF, VOR, TCN.
Terrain Advisory System	Yes	MFD + Audio Calls.
Weather Radar	Yes	
IRS Alignment (All Four IRS Systems)	Yes	Simplified. Alignment time has been reduced, IRS will align with no additional FMC Input.
Electrical System	Yes	Update 2: Improvements to the Elect Buses and XFER.
Circuit Breakers	Not Modeled	Not planned.
Fuel Tanks	Yes	ER System modeled.
Fuel Dumping/XFEED	Not on Initial Release	Update 2: Added support for XFEED and Fuel Dumping.
Hydraulic System	Supported, further improvements to come.	Custom Hydraulic System Simulated. Update 2: Improvements on Native FS24 Hydraulics

Pneumatic/Environmental System	Supported, further improvements to come.	Custom ENVR System simulated. Update 2: FS2024 Full Support of native ENVR System.
Pressurization System/Panel	Yes	Basic implementation. Planned Update: Further expansion of the PRESS system.
RAM Air Turbine	Not Modeled	
Autopilot	Yes, Simplified	Some modes (EPR, SKE, PACAH) excluded.
Lateral Navigation (LNAV), TOD	Yes	Fully implemented.
Vertical Navigation (VNAV), TOD	Excluded from Initial Release	Bugs present. Planned update for full implementation.
Pause on TOD	Not Implemented	
Airdrop	Not on Initial Release	Planned in future update.
Ramp Doors, Paratrooper Doors, Side Door	Yes	Fully modeled.
Flap Index	Not on Initial Release	May come in a future update, to be decided. High complexity/low impact.
Loadmaster Station	Partially Simulated	Some switches non-functional in MSFS. Future updates may add extra functions.
Fly By Wire	Yes	Pitch, Roll, and Yaw.
Threat Detection, Threat Defense	For Display Only	Modeled, but no real function.
Engine/APU Fire	Not Modeled	Will not be modeled due to licensing reasons.
Failures	Not Modeled	Will not be modeled due to licensing reasons.
Navigraph EFB Integration	Not Modeled	Not planned.
CPDLC/SayIntentions Oceanic	Not Modeled	Not planned.
Simbrief FMC Integration	Compatible	

1.3 LIVERIES

A total of 6 Liveries are included with the aircraft. Special thanks to the Royal Canadian Air Force for licensing their iconography to be included with the package upon release.

More liveries will be available at Miltech Simulations website and MS Marketplace.

Livery	Livery	Livery
Default, Base Grey + Registration	177704, 429 Sqn, 8 Wing, Royal Canadian Air Force	177705, 429 Sqn, 8 Wing, Royal Canadian Air Force
Miltech House Livery - Fictional	87-0025, Factory Primer	Boeing House Livery Colours - Fictional

CHAPTER 2: THE AIRCRAFT

2.1 FLIGHT CHARACTERISTICS

2.1.1 FLIGHT BY WIRE

In 1993, the C-17 Globemaster III became the first military transport aircraft to feature a complete Electronic Flight Control System, also known as Flight-by-Wire (FBW) system. The FBW system utilizes force sensors on pitch, roll and yaw axes to provide pilot commands to four separate Flight Control Computers (FCCs). These FCCs combine pilot input and apply appropriate output commands to control surfaces (Elevators, Rudder and Ailerons). The fly-by-wire computers continuously stabilize and trim the aircraft without pilot control input (e.g. the system maintains aircraft attitude). The system also ensures that any pilot input does not cause the aircraft to exceed safe operating parameters. The system will hold a pilot-intended attitude (pitch and roll) within safe parameters (it will not allow the aircraft to enter an aerodynamic stall) through the continuous adjustment of primary control surfaces and trim surfaces. FBW can be deactivated from the Flight Control System panel, overhead of the pilot. Deactivation of the FBW will defer to the aircraft's mechanical backup system and the aircraft will no longer hold attitude automatically.

2.1.2 TACTICAL DESCENTS

The C-17 Globemaster III can execute a rapid tactical descent from FL300 (30,000 feet) to FL50 (5,000 feet) in less than two minutes by utilizing reverse idle thrust, and in some cases, spoilers and flaps to increase drag and increase the descent rate, which can exceed 15,000 feet per minute. This aggressive maneuver, often employed in combat scenarios to avoid detection or threats, involves a steep descent angle and requires precise control by the flight crew to maintain safe airspeeds while shedding altitude quickly.
At this time, the reverse thrust cannot be engaged while inflight due to MSFS limitations, and therefore steep tactical descents are not possible yet. We are working on an alternative, bypass solution to implement in a future update.

2.1.3 BACKSIDE FLYING

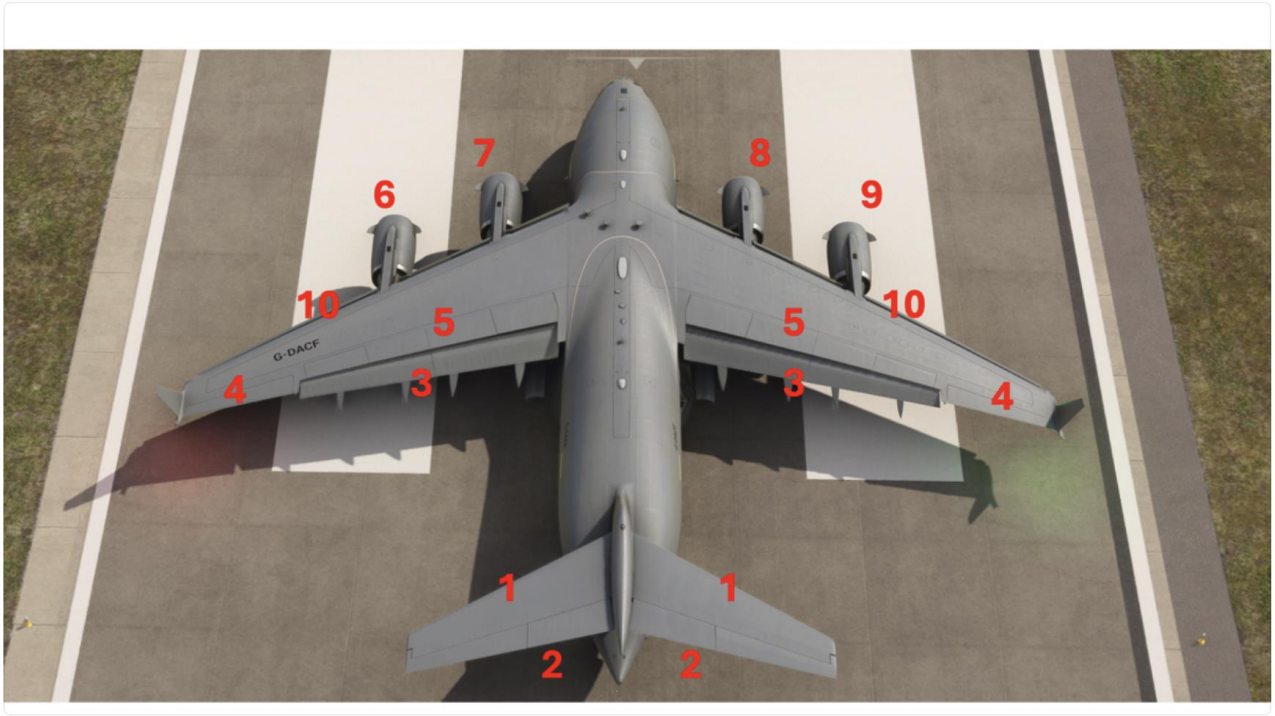
The C-17 is configured to dramatically augment its wing's aerodynamic lift capabilities with a "powered lift" technique where its flaps direct engine exhaust substantially downward, called "externally blown flaps." This converts some of the engine thrust to lift directly, and results in a unique flight path and airspeed response during approach or high flap maneuvers. With powered lift, the thrust will control the flight path angle and vertical speed directly, while the pitch will control the airspeed . This also provides an exceptional landing performance, low approach speeds, and the capacity to fly steep approaches.

2.2 PERFORMANCE CHARACTERISTICS

Please note that the publicly known performance figures for the C17 Globemaster are limited due to the fact that the aircraft is in active military service. Specific performance figures are unavailable.

External Dimensions	Wingspan to Winglet Tip	169.8 ft (51.74 m)
	Length	174 ft (53.04 m)
	Height at Tail	55.1 ft (16.79 m)
	Fuselage Diameter	22.5 ft (6.86 m)
Engines	Number of Engines	Four (4)
	Engine Type	F117-PW-100
	Thrust per Engine	40,440 lbs Each
Wing	Area	3,800 sq. ft. (353 sq. m)
	Aspect Ratio	7.165
	Sweep Angle	25 degrees
	Airfoil Type	Supercritical
	Flaps	Fixed-vane, double-slotted, simple-hinged
Horizontal Tail	Area	845 sq. ft. (78.50 sq. m)
	Span	65 feet (19.81 m)
	Aspect Ratio	5.0
	Sweep	27 degrees
Weights	Maximum Zero Fuel Weight (MZFW)	282,500 lb (128,140 kg)
	Max Takeoff Weight (MTOW)	585,000 lb (265,352 kg)
	Max Landing Weight, Full Flaps	502,100 lb (227,748 kg)
	Fuel Capacity	35,546 US gal
Cargo Capacity	Capacity	170,900 lb (77,519 kg)
	Capacity, in Pallets	18 463L Master Pallets
	Capacity, in Troops	134 Troops, seated
	Capacity, in Paratroopers	102 Paratroopers, seated
	Capacity, in Vehicles	One M1 Abrahams heavy tank, or Three Stryker Armored Vehicles, or 10 Humvees
	Capacity, in Aircraft	One CH47 Helicopter Fuselage, or two H60 Helicopter Fuselages
Performance	Cruise Speed	450 kn (Mach 0.74-0.79)
	Range	2,420 nmi with 157,000 lb payload
	Ferry Range	6,230 nmi
	Service Ceiling	45,000 ft
	Takeoff Run at MTOW	8,200 ft
	Takeoff Run at 395,000 lbs	3,000 ft
	Landing Distance	3,500 ft

2.3 OVERVIEW, EXTERIOR



Aircraft Exterior, Top View

1. **Horizontal Stabilizer**
2. **Elevators**
3. **Trailing-Edge Flaps**
4. **Ailerons**
5. **Spoilers**
6. **Engine 1**
7. **Engine 2**
8. **Engine 3**
9. **Engine 4**
10. **Leading-Edge Flaps (Slats)**

Aircraft Exterior, Side View

1. **Front Landing Gear**
2. **Side Crew Door**
3. **Main Landing Gear**
4. **Paratrooper Doors**
5. **Rudder**

Aircraft Exteiror, Front View

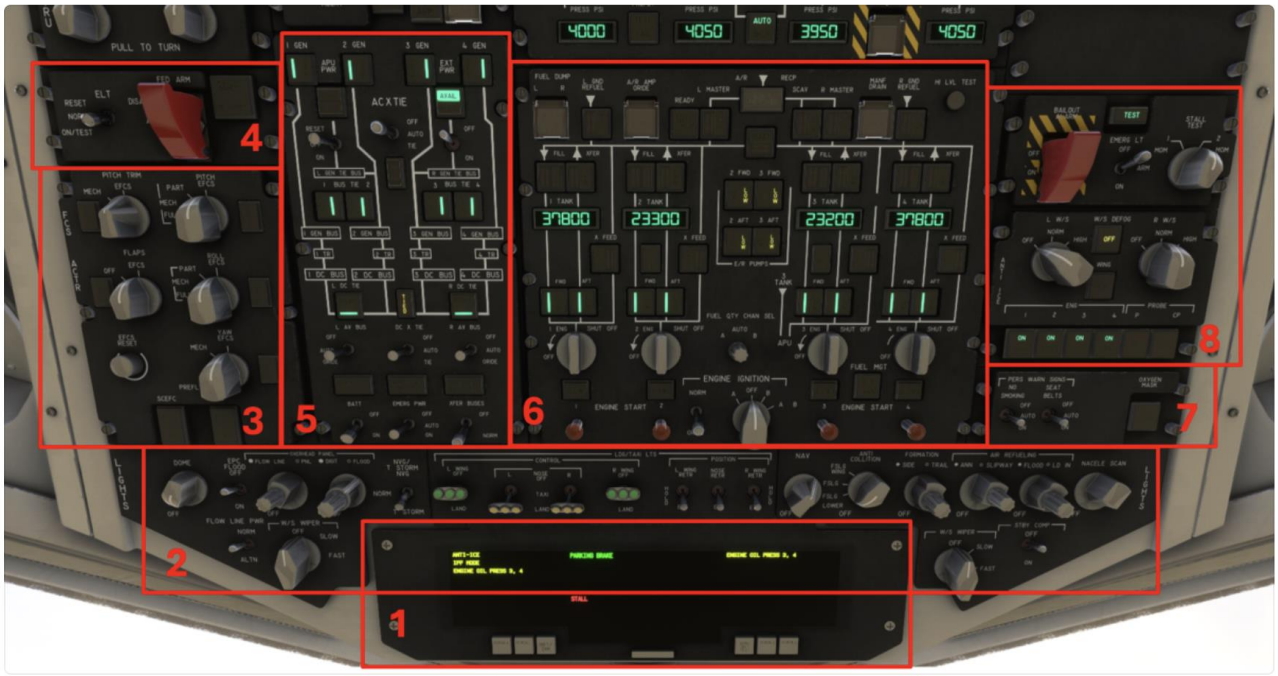
1. **Front Landing Gear**
2. **Aerial Refueling Port**

Aircraft Exterior, Cargo Ramp Closeup

1. **Cargo Ramp**
2. **Cargo Ramp Slide**
3. **Supporting Hydraulic Legs**
4. **Paratrooper Doors**

2.4 OVERVIEW, INTERIOR

2.4.1 OVERHEAD PANEL OVERVIEW



Lower Overhead Panel

1. **Warnings and Caution Annunciation Panel (WAP) Display**
2. **Lights and Windsield Wipers Panel**
3. **Electronic Flight Control Surfaces Panel**
4. **ELT/FED Arm Panel:** Functions are INOP
5. **Electrical System Panel**
6. **Fuel and Propulsion System Panel**
7. **Personal Warning Signs/Oxy Mask Panel**
8. **Anti Ice and Misc Panel**

Upper Overhead Panel

1. **Ground COMM and AR RECP Switches Panel:** Functions are INOP
2. **Inertial Reference Units 1 and 2 Selector Knobs:** All four IRUs need to be ON for the MFDs to be started correctly. Losing one or more (Up to 3 max) will not affect the capacity of completing a successful flight, however, the MFDs and other avionics will not be initialized with less than all four IRUs aligned.
3. **Backup Radio System:** INOP
4. **On Board Inert Gas Generating System (OBBIGS) Panel:** INOP
5. **Auxiliary Power Unit (APU) Panel**
6. **Hydraulic System Panel**
7. **Environmental System Panel**
8. **Fire Detection System Panel**
9. **Inertial Reference Units 3 and 4 Selector Knobs:** All four IRUs need to be ON for the MFDs to be started correctly. Losing one or more (Up to 3 max) will not affect the capacity of completing a successful flight, however, the MFDs and other avionics will not be initialized with less than all four IRUs aligned.

2.4.2 MAIN GLARESHIELD PANEL OVERVIEW

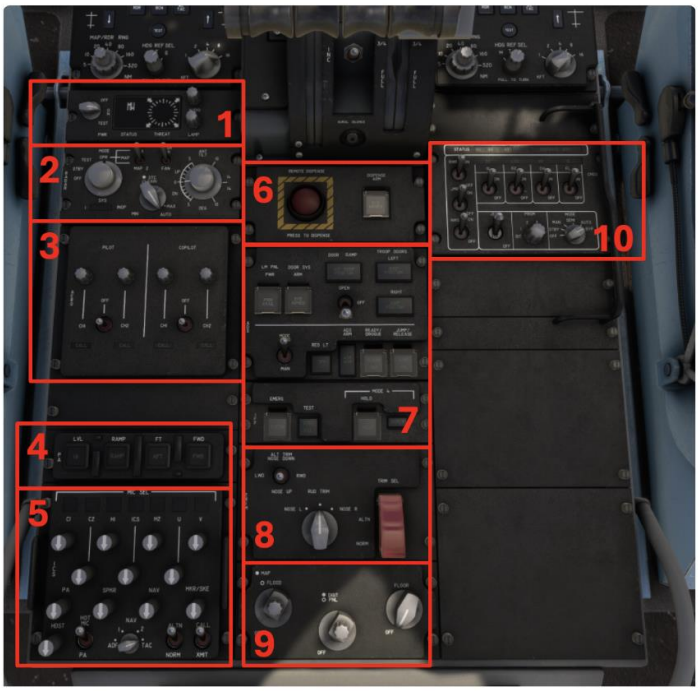
Main Glareshield

1. Multi-Function Head-Up Display (HUD) Display, Pilot side
2. Master Caution/Master Warning/Other Alarms
3. Pilot Side COMNAV Panel
4. Autopilot Panel/Nav Controls
5. Fire Pull Handles
6. Copilot Side COMNAV Panel
7. Master Caution / Master Warning / Other Alarms
8. Copilot Side COMNAV Panel
9. Clock / Bearing, Distance and Heading Indicator (BDHI) / Misc Nav Switches
10. Multi Function Display
11. Backup Attitude Instrument / Backup Airspeed / Altitude Indicator
12. Total Fuel Display
13. Landing Gear Handle / Landing Gear Status Lights / Brake Pressure Gauge
14. Backup Engine Display / Flaps Indicator Gauge / Spoiler Status Gauge / Trim (Yaw, Pitch, Roll) Gauges

2.4.3 CENTRE CONSOLE PANEL OVERVIEW

Upper Centre Console

1. **Multi-Function Pilot Side Mission Computer Displays (2x) and Mission Computer Keyboard**
2. **Copilot Side Mission Computer Displays (2x) and Mission Computer Keyboard**
3. **Cabin Pressurization System Panel**
4. **Multi-Function Controls Units (MFCs)**



Lower Centre Console

1. **Defensive System Controls, AAR-47: For display only**

2. **Radar: Knobs INOP.**
3. **Aero-I Control Panel: INOP**
4. **Public Address (PA) Panel: INOP**
5. **Inter-comm System Panel**
6. **Defensive System Controls, Remote Defences: For display only**
7. **Aerial Delivery System, IFF Panel: INOP**
8. **Trims Panel**
9. **Centre Console Lighting**
10. **Defensive System Controls: ALE-47**

2.5 OVERVIEW, CARGO BAY

The C-17 is one of the most versatile and flexible military cargo aircraft in history. It can be quickly adapted for several mission sets. The cargo bay is equipped with foldable seats on both sides of the aircraft. The cargo bay has enough capacity for 102 Paratroopers, or 134 troops, or One heavy tank, or Three Armored Vehicles, or 10 HWMVVs, or one CH47 Fuselage or two UH60 fuselages.

Cargo Bay Overview

- **Loadmaster Station:** Located on the Front of the cargo bay, to the right side of the cockpit stairs. The loadmaster typically manages cargo operations. This station is equipped with controls and monitoring systems for the loading and unloading process, ensuring cargo is distributed properly and safely. It usually includes displays or instruments for weight distribution, cargo restraint systems, and communication tools to stay in contact with the flight crew and ground personnel. The loadmaster ensures that cargo is properly secured, balanced for the flight, and that it adheres to aircraft limitations for safe operation. Here you will find a laptop computer that can be used to load cargo and fuel into the aircraft.
- **Cargo Ramp and Cargo Door:** The cargo door and ramp system consists of the cargo door, cargo ramp and ramp toes. The system is used with the ramp in the horizontal position for straight-in loading/offloading or during airdrop operations. The ramp toes can also be lowered to ground level for on/offloading rolling stock and personnel. The system requires electrical power and hydraulic pressure from No.2. Doors can be operated from the EFB/Loadmaster Laptop. or from the Doors Loadmaster Panel
- **Side Paratrooper Door:** Two side Paratrooper Sliding doors are located in the rear side of the cargo bay. Each door features an external wind deflector that deploys automatically upon opening. Doors do not require hyd. or electrical power to be operated. Doors can be opened by clicking on the door handles or through the EFB/Loadmaster Laptop.
- **Side Crew Door**: The side crew door is located in the front, left side of the aircraft, opposite to the Loadmaster Station. Features a staircase for direct access into the cargo bay. Door do not require hyd or electrical power to be operated. Door can be opened by clicking on the door handles or through the EFB/Loadmaster laptop.

- **Lavatory and Galley:** The lavatory is found in the front side of the cargo bay. Lavatory is accessible and flushable on this rendition of the aircraft. A small galley is located under the cockpit stairs.
- **Loadout Options and EFB:** Various loadout options, including presidential motorcades, pallets, helicopter fuselages and military vehicles are included. These can be selected and toggled on/off from the EFB in the cockpit, or the loadmaster laptop.

CHAPTER 3: AIRCRAFT SYSTEMS

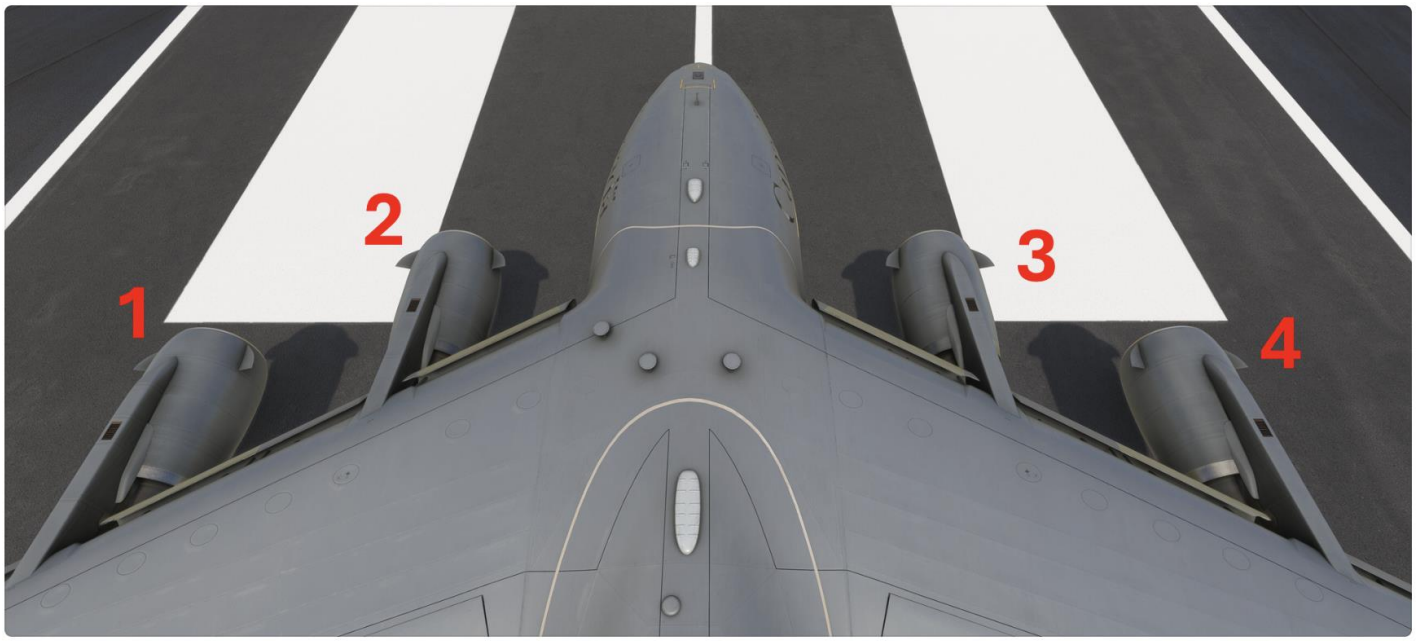
3.1 PROPULSION SYSTEM

> Tactical In-Flight Reversers are not supported on initial release of this aircraft due to MSFS Limitations. We are working on an alternative, bypass solution to implement in a future update.

3.1.1 THE ENGINE

The aircraft is powered by four F117-PW-100 Fly-By-Wire Turbofan Engines. (Four F117-PW-100 high-bypass turbofan engines with full-authority digital engine control (FADEC)). The F117-PW-100 is a dual spool, single-stage fan, high-bypass ratio (6:1) turbofan with a maximum flat-rated thrust of 40,440 pounds at sea level.

Engines are numbered 1-4; Engine #1 being the leftmost engine and #4 the rightmost engine. All four engines have thrust reversers, which can currently only be used while the aircraft is on the ground. Tactical in-flight reversers will be supported in the near future through an update.



Engine Numbering

3.1.2 ENGINE CONTROLS, IGNITION, STARTING

The engine propulsion is controlled by the four Engine Throttle levers located in the centre console. You may keybind each axis individually to ENGINE THROTTLE 1 through ENGINE THROTTLE 4; or use a single ENGINE THROTTLE axis to control all four at the same time.

The Engine Control panel is located in the Overhead Panel, just under the Fuel System Panel.

Engine Control Panel, Overhead

1. **Engine 1/2/3/4 Shutoff Valve:** Control fuel to the respective engine. Closing the valve will shut down the engine due to fuel starvation.
2. **Fuel Qty Fuel Selector:** INOP
3. **Engine Starter 1/2/3/4:** Opens the starter control valve to start the engines. Requires SHUTOFF VALVE of the respective engine to be in the opened position.
4. **Engine Ignition Override:** INOP
5. **Engine Ignition Selector:** Ignition System Selector.
    a. OFF: Both systems are turned off, engines cannot be ignited.
    b. A: Left side Ignition armed, engines 1 and 2 can be started.
    c. B: Right side Ignition armed. engines 3 and 4 can be started.
    d. A&B: Both ignition systems are armed

3.1.3 ENGINE BACKUP/STBY DISPLAY

Engine information (N1, N2, EPR, EGT, FF, Oil, etc.) Is generally available on the MFD Engine Pages. For more details, look at the MFD Section of this manual. However, the aircraft is equipped with a low-consumption LCD Display to allow monitoring of the engines in the case of an electrical failure, or any other situation that renders the MFDs unusable. The Engine Backup Display is located just under the two center MFDs, and along with the Display you will find an array of buttons and knobs to control the Engine Thrust Ratings.

Engine Standby Display

1. **EPR Rating Knob:** The knob is engaged when EPR MODE is set to MAN. You may then rotate the node to increase or decrease EPR Selection.
2. **Mode Selector:** Provides power to the Standby Engine Instrument and selects either N2 or EPR Digital Indications
3. **RTG Value Selected:** Displays Rating selected for the engines. The selected value only engages when Mode selected is MAN, otherwise it remains standby.
4. **Mode Selected Display:** Displays mode selected among those selectable on the right side of the STBY Display.
5. **N2/ERP Display:** Displays engine N2 or EPR Rating. These cannot be viewed at the same time.
6. **EGT Display:** Displays Engine Gas Temperature for all four engines.
7. **N1 Display:** Displays N1 for all four engines.
8. **Mode Options:** Selects engine mode from the five available – MAX, INT, MCT, DRT and MAN.

3.1.4 ENGINE THRUST RATINGS

Different Thrust Rating Modes can be selected through the buttons on the left side of the STBY Engine Display. This will effectively set a RATING LIMIT BAR on the MFD Eng Page, and limit the performance of the engines to reduce wear and tear.

Engine Thrust Ratings

- **MAXIMUM (MAX):** The maximum thrust approved for the engine. This rating is limited to five minutes for takeoff. Shall only be used for takeoff and go around.
- **INTERMEDIATE (INT):** The maximum thrust certified for continuous use. Shall be used at pilot's discretion.
- **MAXIMUM CONTINUOUS THRUST (MCT):** The maximum thrust recommended for normal climb operations. Recommended setting for cruise.
- **DERATED THRUST (DRT):** The minimum thrust required to perform a takeoff safely.

3.1.5 THRUST REVERSAL SYSTEM

Engine Thrust Reversal is available on all four engines, and can be engaged through the regular keybinds (TOGGLE REVERSE THRUST). At this time, Thrust reversers are only available on the ground. Tactical In-Flight reversers will be supported in the near future through an update.

Yellow UNLK Icons will show up on the MFD Display to signal the reversers are unlocked. These turn blue "REV" when full reverse thrust is set.

Yellow UNLK Icons

Blue REV Icons

3.1.6 ENGINE INSTRUMENTS

- Refer to Cockpit Displays Section, MFD ENG Page
- Refer to Above Section, STBY ENGINE

3.1.7 FIRE DETECTION SYSTEM

Engine Fire, fire detection and fire suppression is not supported on this simulation. However, the four Fire Extinguishing handles are functional. Pulling any of the four Extinguishing Handles will cut fuel to the engine, shutting it down immediately. **This action cannot be reversed -** flight must be restarted.

Fire Extinguisher Handles

Fire detection tests for systems A and B are fully modeled, as smoke detection lights. Aural warnings will be heard during fire tests. The aircraft also requires all fire detection systems to be enabled as part of the cockpit pre-start procedures.

Fire Detection System

3.2 FUEL SYSTEM

The C-17's Fuel Supply System is designed to provide an uninterrupted flow of fuel under all conditions, attitudes, and altitudes encountered in normal operations. The system consists of four Main Wing tanks, one Extended Range Tank (ER Variant modeled), eight + four boost pumps, four tank transfer pumps, a jettison system, Aerial Refueling valves and all associated indicators.

3.2.1 FUEL TANKS

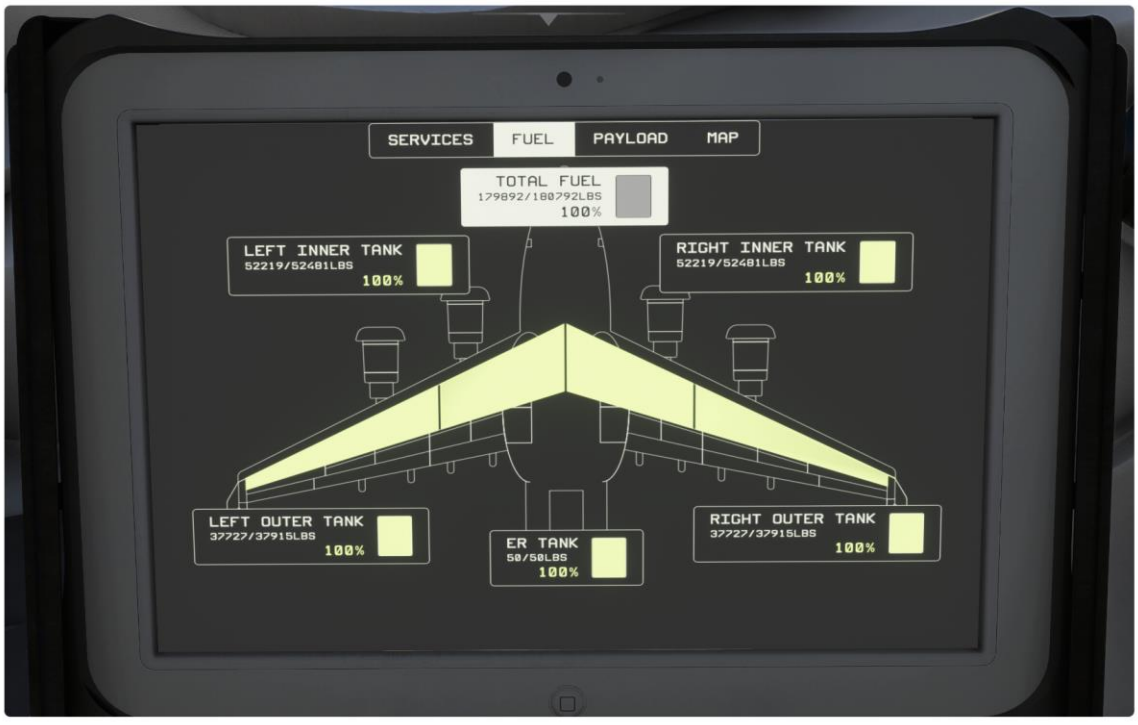
This rendition of the C-17 (ER Variant) Features a total of five fuel tanks:

- Two Outboard wing fuel tanks (No. 1 and No. 4), with a capacity of 37,915 lbs each.
- Two Inboard wing fuel tanks (No. 2 and No. 3), with a capacity of 52,481 lbs each.
- One Extended Range fuel Bladder, with a capacity of 64,433 lbs
  Total fuel capacity is therefore 245,226lbs

Fuel is automatically transferred from the ER Tank into the Inboard tanks, and then to the engines. The ER tank has four electrical boost pumps to increase fuel flow outboard from the tank.

After ER tank is depleted completely, fuel will flow out from all four tanks and into the engines, each aided by its boost pump. However, the engines can operate normally without any fuel pumps by a combination of gravity feed and suction feed from the engines.

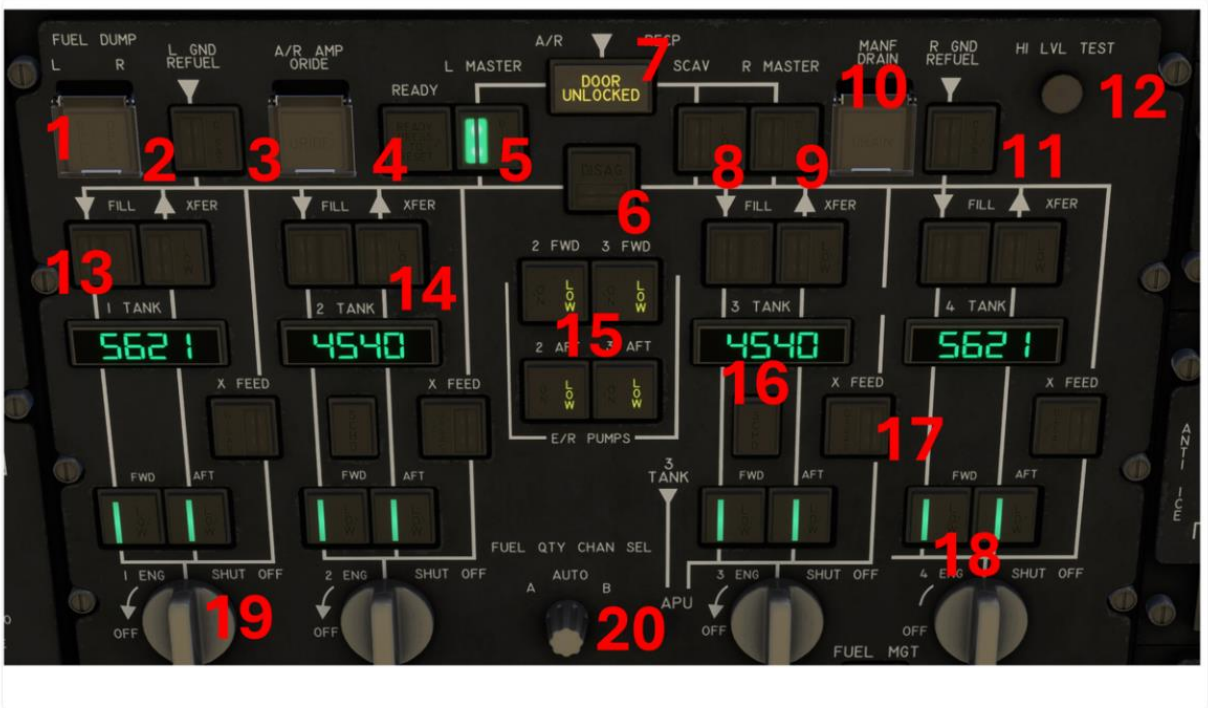
Fuel capacities and system overview can be seen on the Electronic Flight Bag, Fuel Page.



Fuel Page, EFB

3.2.2 FUEL PANEL

The fuel panel is located on the overhead panel of the aircraft, direclty above the Engine Panel and adjacent to the Electrical Panel



Fuel Panel, Overhead

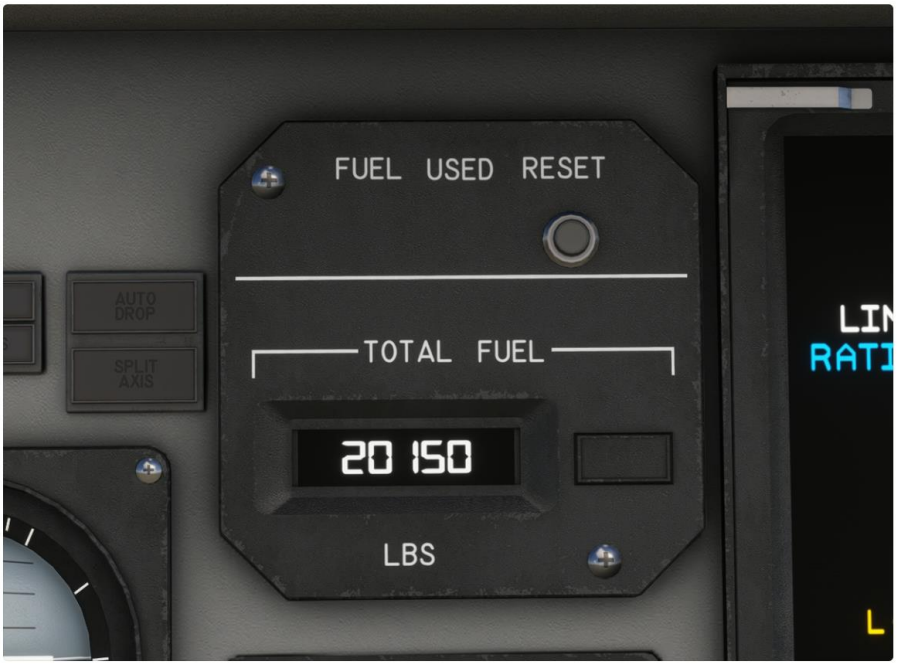
1. **Fuel Dump Valves, L and R:** Used for Fuel Dumping, INOP on initial release, see notes below.
2. **L Ground Refuel:** INOP. These valves are used to pump fuel from ground to the tanks given the elevation of the wings during single-point refueling, resulting in the "Moose sounds". This is not necessary on MSFS.
3. **A/R AMP ORIDE:** INOP
4. **A/R READY:** INOP
5. **A/R Left Master:** Master Left Aerial Refueling Pump. Opens the AR Slipway and turns on flow of fuel towards the fuel tanks during AAR Operations.
6. **Separation Var:** INOP
7. **A/R Door Status Light:** Turns on if Aerial Refueling door is unlocked/opened.
8. **Scavange Pump Switch:** INOP
9. **A/R Right Master:** Master Right Aerial Refueling Pump. Opens the AR Slipway and turns on flow of fuel towards the fuel tanks during AAR Operations.
10. **Main Drain:** INOP
11. **R Ground Refuel:** INOP. These valves are used to pump fuel from ground to the tanks given the elevation of the wings during single-point refueling, resulting in the "Moose sounds". This is not necessary on MSFS.
12. **HI LVL TEST:** INOP
13. **Fill Valves (x4):** Provide pressure into fuel tanks for Crossfeed and Refueling operations. INOP on initial release, see notes below.
14. **XFER Valves (x4):** Provide pressure out from fuel tanks for Crossfeed and Refueling operations. INOP on initial release, see notes below.
15. **ER Pumps (x4):** Provide additional pressure to fuel flowing outwards from the ER Tank. If pumps are off, the fuel will continue flowing due to gravity.

16. **Tank Quantity Indicator (x4):** Provides a continuous digital reading to the nearest 100 pounds of fuel of each associated tank. This is, other than the EFB, the only display of fuel quantity per tank on the aircraft.
17. **Crossfeed Valve (x4):** Controls the associated crossfeed valve for fuel transfer operations.
18. **Forward/Aft Fuel Boost Pumps (x4 of each):** Provide additional fuel pressure to each associated tank. If pumps are off, the fuel will continue flowing due to gravity feed and suction feed.
19. **Engine 1/2/3/4 Shutoff Valve:** Control fuel to the respective engine. Closing the valve will shut down the engine due to fuel starvation.
20. **Fuel Qty Fuel Selector:** INOP

3.2.3 TOTAL FUEL INDICATOR

Additional to the overhead displays, a Total Fuel Indicator is located in between the two pilot MFDs. It provides a continuous display of total fuel quantity, equal to the sum of fuel available on all tanks, including the ER Tanks in pounds.

The LOW amber alert lights up when fuel quantity is under 16,000 pounds. Additionally, Master Caution and Low Fuel WAP will illuminate.



Total Fuel Indicator

3.2.4 CROSSFEEDING, DUMPING AND AERIAL REFUELING

Fuel Crossfeeding and Dumping are not supported on initial release. However, this will be added shortly in an update. This will also add functionality to Fuel Dump, Fill, XFER and XFEED valves on the overhead panel.

Aerial Refueling will be supported by 3rd party addons such as the upcoming Aerial Refueling Pro by Miltech Simulations. The AR Slipway door can be opened by pressing the A/R MASTER Button (L or R), or through the EFB Services tab.

3.3 ELECTRICAL SYSTEM

The C-17 Electrical system provides and distributes power to various components and systems onboard, ensuring the proper functioning of essential and non-essential equipment. It powers avionics, lighting, navigation systems, communication devices, cockpit displays, and control surfaces. Additionally, the system supports critical operations such as engine starting, deicing, cabin pressurization, and fuel management.

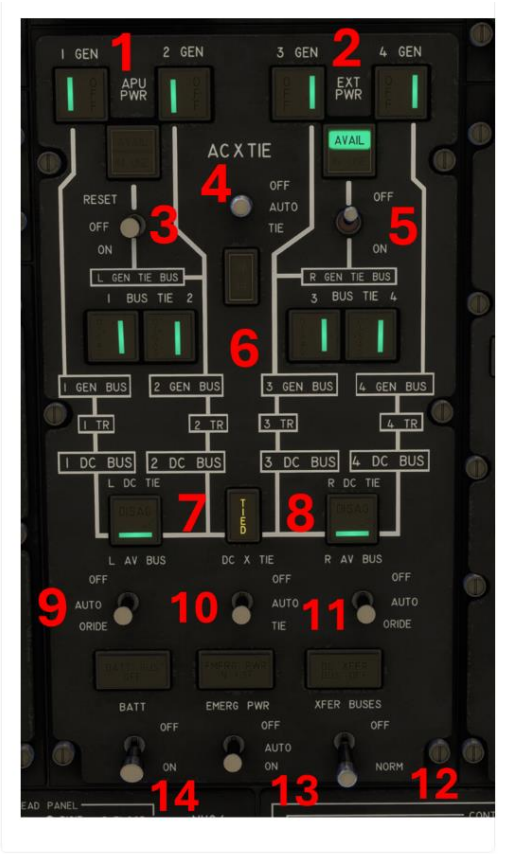
The electrical system on the Globemaster III consists of:

- Four generators, one for each engine.
- An Auxiliary Power Unit
- An array of batteries
- A connecting port for ground power units

Additionally, AC Convertors, Buses and Circuit panels guarantee the correct distribution of power in the aircraft.

3.3.1 ELECTRICAL PANEL

The electrical panel is located on the overhead panel of the aircraft, adjacent to the fuel and engine panels.



Electrical Panel (Overhead)

1. **Engine Generators 1 and 2:** Provide the aircraft AC Current from the engine 1 and 2 generators. The flow bar indicates switch position only. The yellow OFF light lights up if generator is not providing current.
2. **Engine Generators 3 and 4:** Provide the aircraft AC Current from engine 3 and 4 generators.
3. **APU Generator:** Provide the aircraft AC Current from the Auxiliary Power Unit, provided that the APU is on. The two leds above will display if APU is available or in use.
4. **AC X Tie:** Closes/opens AC Cross Tie circuit. AUTO is its normal position.
5. **External Power Toggle:** Connects/Disconnects External Power/Ground Power Unit, provided GPU is available.
6. **1-4 Bus Ties Switches:** Opens/closes pass of current through bus ties.
7. **L DC Tie:** Opens/Closes Left DC Tie Circuit.
8. **R DC Tie:** Opens/Closes Right DC Tie Circuit.
9. **Left Avionics Bus:** Opens/Closes flow of electricity to the Left Avionics Bus. AUTO is its normal position.
10. **DC X Tie:** Closes/opens DC Cross Tie circuit. AUTO is its normal position.
11. **Right Avionics Bus:** Opens/Closes flow of electricity to the Right Avionics Bus. AUTO is its normal position.
12. **XFER Buses Toggle Switch:** Switches behavior of transfer busses in case of de-energizing.
13. **Emergency Power Toggle:** Switches operation mode of emergency power. AUTO is its normal position.
14. **Master Battery Switch:** Switches battery on/off.

3.3.2 THE AUXILIARY POWER UNIT (APU)

> The APU may take up to one minute to start. This is normal and accurate to the real aircraft.

The auxiliary power unit is a gas turbine engine that is located in the forward section of the right main landing gear pod. The APU provides auxiliary electric, hydraulic, and pneumatic power to the aircraft when the engines are turned off.

The APU Feeds from Fuel Tank #3. Fuel may be fed by gravity, however, it is recommended to have at least one boost pump on to provide sufficient pressure. The APU is unable to feed from any other fuel tank, unless XFEED of fuel is occurring towards Tank 3.

The APU Panel is located directly above the Electrical panel.

APU Panel

1. **APU Display:** Displays APU RPM and Engine Gas Temperature.
2. **APU Starter/Control Switch:** OFF/RUN/START, used to start and stop the APU turbine.
3. **Auto Shutdown Override:** INOP
4. **Mode Selector:** INOP
5. **Fuel Press Indicator:** The amber light will turn on if fuel pressure to the APU is low. Will extinguish if either Tank 3 Boost Pump is enabled.
6. **APU Fire Alarm**
7. **APU Fire Agent Discharge:** INOP

The Auxiliary Power Unit not only provides electricity (Provided that the APU Generator Switch is on), but it also provides hydraulic pressure through the AUX Pumps. The APU can pressurize all four lines to aproximately 3800 PSI (slightly under their normal pressure of 4000 PSI) by using the AUX Hydraulic Pumps on any of the systems. This means that ramps and doors, as well as control surfaces, can be fully operated on APU Power alone. Auxiliary Pumps are entirely electric (AC), so these can also function with Ground Power.

Additionally, the APU provides Pneumatic pressure through the APU Bleed to the R Pack (Directly) and L Pack through the Bleed XFEED Valve. This provides environmental control (AC) and de-ice/anti-ice systems.

3.4 PNEUMATIC / ENVIRONMENTAL SYSTEM

The Environmental/Pneumatic System comprises several sub-systems that all use pressurized air and include environmental or ice protection for the crew and passengers. These subsystems are:

- Bleed Air Supply
- Air Conditioning
- Cargo Compartment Ventilation
- Pressurization

3.4.1 BLEED AIR SUPPLY AND AIR CONDITIONING

The Bleed Air Supply is the main source of pneumatic supply on the aircraft. Airflow is supplied from the APU or Engines, and enters a crosswing manifold that ducts the air to the engine start, air conditioning, avionics cooling or ice protection system.

The system consists of four main engine bleeds, one for each engine, and one APU Bleed. All bleeds are connected by a Bleed XFEED Valve. Two separate and independent air conditioning packs thermoregulate the bleed air and distribute it into three distinct temperature sections - Cockpit, Crew Rest and Cargo.

Bleed Air Supply / Air Con Panel

1. **Engine 1-2 Bleeds:** Provides means of selecting the engine bleed air source for the pneumatic system (ENGs 1/2). Pressing the switchlight opens the engine pressure valve and illuminates the flow line.
2. **APU Bleed:** Provides means of selecting the APU bleed air for pneumatic pressure.
3. **Engine 3-4 Bleeds:** Provides means of selecting the engine bleed air source for the pneumatic system (ENGs 3/4). Pressing the switchlight opens the engine pressure valve and illuminates the flow line.
4. **Supply Press Indicator, PSI:** Digital displays indicate the bleed air pressure available at each wing manifold. Normal operating pressure is 44 +- 4 PSI.
5. **High Flow:** INOP
6. **Left Pack:** Controls the bleed air to the left air conditioning packs.
7. **Ram Air Knob:** INOP
8. **Right Pack:** Controls the bleed air to the right air conditioning packs.
9. **Avionics Cool Override:** INOP
10. **Trim Air:** INOP
11. **Discharge Temperature Indicator:** Displays the pack discharge temperature

12. **Compartment Air Flow:** INOP
13. **Remote Temperature Controller:** INOP
14. **Supply Temperature:** Provides methods to monitor and control the temperatures on the Flight Compartment, Crew Rest and Cargo Compartment respectively. Supply Temperature is the temperature at the entrance to each compartment.
15. **Compartment Temperature:** Provides methods to monitor and control the temperatures on the Flight Compartment, Crew Rest and Cargo Compartment respectively. Compartment Temperature is the actual temperature of the associated compartment.
16. **Temperature Selector:** Provides means to select and control the actual temperature of any of the compartments.

3.5 HYDRAULIC SYSTEM

> Hydraulic Pressure in systems 2 and/or 3 is required for ramps to be operated. Hyd system can be pressurized using AC Power and auxiliary electrical pumps.

The C-17 has four fully independent, continuously operating hydraulic systems that provide approximately 4000psi of Hydraulic Pressure under normal conditions (3800 Approx. under AUX Electrical Pump) to power all flight control surfaces and hydraulically dependent utility systems.

The primary flight control surfaces (ailerons, elevators, rudder) and secondary (stabilizer, flaps, slats) are all powered by at least two systems at any given time. They can continue to function at a reduced capacity after the loss of a system.

Each system has a primary, a secondary, and an auxiliary pump, and associated reservoirs. The AUX Pumps are electrically driven. No. 4 system has a ram air turbine as well, which is not currently modeled, but may be added in a future update. Systems 2 and 3 also share a XFER pump.

3.5.1 HYDRAULIC PANEL

The Hydraulic panel is located on the overhead panel of the aircraft, right above to the fuel and engine panels.

Hydraulic System Panel

1. **Reservoir Temperature Display,** in degrees Celcius, for the associated system.
2. **Reservoir Quantity Display,** in gallons, for the associated system.
3. **Primary Engine Driven Pump (x4):** Provides on/off control of the associated pump.
4. **Secondary Engine Driven Pump (x4):** Provides on/off control of the associated pump.
5. **Auxiliary Driven Pump (x4):** Provides on/off control of the associated pump. Aux Pumps are electric.
6. **Pressure Display:** Provides hydraulic pressure for the associated system, rounded to the nearest 50 psi. Any pressure less than 100psi is reported as zero. Normal range is 3800 - 4100 PSI

7. **Preflight System Test:** INOP
8. **XFER Pump:** Transfer Hydraulic Press between systems 2 and 3.
9. **RAT Switch:** Ram Air Turbine deploy switch, INOP.

The hydraulic system may be pressurized by the auxiliary pumps using electric power from the APU or Ground Power. The APU or GPU can pressurize all four lines to aproximately 3800 PSI (slightly under their normal pressure of 4000 PSI) by using the AUX Hydraulic Pumps on any of the systems. This means that ramps and doors, as well as control surfaces, can be fully operated solely on AC power.

3.6 FLIGHT CONTROL SYSTEM

3.6.1 COCKPIT CONTROLS

The aircraft is equipped with two control stick assemblies that are interconnected and move in unison. The stick features various buttons for Autopilot and Microphone switches;, however, these buttons are inoperative for ease of simulated operation.

Both sets of rudder pedals are interconnected. The top of each rudder pedal tilts forward to apply brakes.

A flaps lever is located just under the throttle levers. A spoiler deploy/retract rocket switch is located on the sides of the handles of the throttle levers.

3.6.2 ELECTRONIC FLIGHT CONTROL SYSTEM PANEL

In 1993, the C-17 Globemaster III became the first military aircraft to feature a complete Electronic Flight Control System, also known as flight by wire (FBW) system. The FBW system utilizes force sensors on pitch, roll and yaw axes to provide pilot commands to four separate Flight Control Computers. These FCCs combine the commands and apply the output commands to the control surfaces (Elevators, Rudder and Ailerons). The fly-by-wire computers act to stabilize the aircraft and adjust the flying characteristics without the pilot's involvement (eg. aircraft holds the attitude), and to prevent the pilot from operating outside of the aircraft's safe performance envelope.

The EFCS System can be disabled by switching the corresponding axis from EFCS to "MECH". This engages the backup Mechanical linkages.

Electronic Flight Control System Panel

1. **Pitch Trim EFCS Selector:** INOP
2. **Pitch EFCS Selector:** Three-way switch that determines the behavior of the Electronic Flight Control System (Fly-By-Wire). “EFCS” is the regular mode, and it provides normal operation of the system. MECH (Mechanical, PART or FULL) Disables all EFCS and reverts to the mechanical backup system. The aircraft will no longer hold attitude as expected on a FBW system.
3. **Flaps EFCS Selector:** INOP
4. **Roll EFCS Selector:** Three-way switch that determines the behavior of the Electronic Flight Control System (Fly-By-Wire). “EFCS” is the regular mode, and it provides normal operation of the system. MECH (Mechanical, PART or FULL) Disables all EFCS and reverts to the mechanical backup system. The aircraft will no longer hold attitude as expected on a FBW system.
5. **EFCS Reset Pushbutton:** INOP
6. **Yaw EFCS Selector:** INOP, the Yaw EFCS mode is always engaged by the Flight Model configuration.
7. **SCEFC Switch:** INOP
8. **FCC Switch:** INOP

3.6.3 FLAPS AND SLATS

Extension and Retraction of Flaps, Slats and Spoilers are controlled by two FCC Computers. The Flaps slide has Five detent positions. First position is SLATS + FLAPS 0deg. Second position is 0/EXT (Slats Extended, Flaps Zero). Third position is 1/2 Flaps, slats extended. Fourth position is 3/4 Flaps. Final position is full Flaps. Granular Flap Index control is unavailable on this rendition of the C-17

The Speedbrake is controlled by a single rocker switch. Only two positions (deployed and retracted) are selectable, however, the aircraft will automatically manage all the individual spoielr surfaces.

Flaps and Slats Indicators

3.7 LANDING GEAR SYSTEM

The C-17 Globemaster III has a unique Landing Gear assembly configuration. The aircraft is equipped with a forward, steerable gear with two wheels; and a main gear assembly with two struts; three wheels on each strut. All wheels on the main gear assembly have braking mechanisms. The front wheels do not have brakes.

Main Gear Mechanism

A complex and unique set of linkages and rotatory axles fold the gear into the reduced space in which they are retracted. The C-17 has a gear design like no other aircraft.

On the physical aircraft, Hydraulic Pressure from systems 2 or 3 is required to retract the gear.

3.7.1 RETRACTION/EXTENSION AND ANTI-SKID

A gear retraction and extension handle is located near the First Officer MFDs, and feature indicator lights displaying the gear status. Additionally, the handle lights up Red when the gear is moving. Gear status is also displayed on the MFD, Config page.

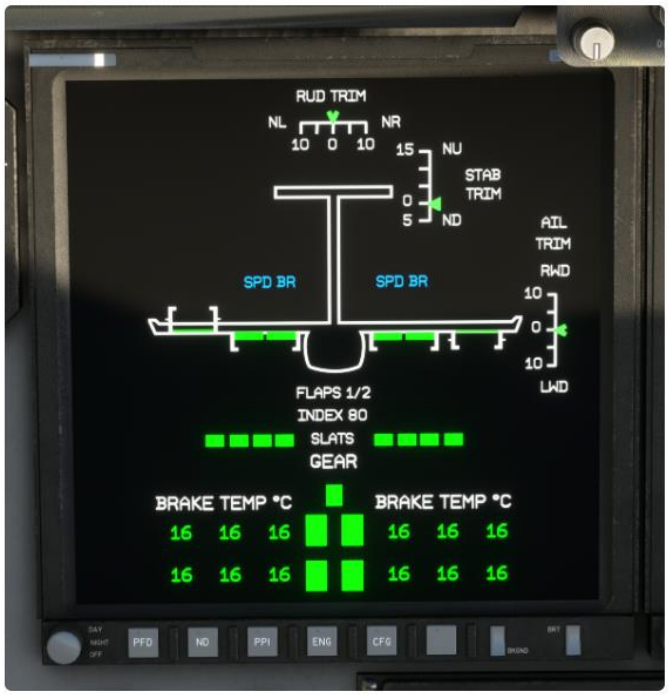
A test button lights up all the status lights to certify them being functional. Anti-skid system and auto Brake Temp monitoring is available to control the aircraft in aggressive braking conditions.

Gear Lever, Anti Skid Switch

3.7.2 BRAKE SYSTEM

All 12 wheels on the main gear assembly feature individual braking. The brakes have active monitoring of their temperatures, that can be checked from the cockpit's MFD Config Page.

Autobraking is not available on the C-17.



Brake Temperature

A brake pressure gauge accurately represents and monitors Braking Pressure in PSIx1000. This pressure is affected by the supply of Hydraulic Pressure on Hydraulic System #3, and decreases/increases slightly with braking action.

Brake Press

3.8 AUTOMATIC FLIGHT SYSTEM

The Automatic Flight Control System (AFCS) on the physical C-17 Globemaster III is highly complex, and supports various modes for engine-managed speed control, stationkeeping, and formation flying.

The system has been adapted and simplified, while maintaining the most important modes in regular operations.

Autopilot Panel/MCP

1. **NAV Source Selector, Pilot:** Selects source of navigation data for the Pilot MFDs, Navigation Display pages. Currently supports
    1. VOR/ILS 1 and 2: Available on ND, currently unavailable for LNAV.
    2. MSN: Flightplan as active on FMC, available for LNAV.
    3. SKE: Stationkeeping, INOP
    4. ETAC: INOP
    5. TAC: TACAN, currently unavailable for ND and LNAV. Functional on BDHI.
2. **F/D:** Toggle Pilot/Copilot Flight Director On/Off
3. **CAGE:** INOP
4. **APPR:** Toggle APPROACH autopilot mode
5. **RA/BA:** Switch altitude reference source from Barometric altimeter to Radio Altimeter, on Pilot/Copilot PFD.
6. **DCLT:** Declutter HUD (Pilot/Copilot), cycle through three Decluttered states.
7. **A/D:** Airdrop, currently unavailable.
8. **CAT1/CAT2 Selector:** INOP
9. **EPR Speed Mode:** Unavailable
10. **SPEED HOLD Mode:** Manages and holds selected MACH/IAS Speed as displayed on #20. Autothrottle must be engaged for this mode to function.
11. **SPDNAV Speed Mode:** Unavailable
12. **HDG HOLD Mode:** Holds selected heading as displayed on #21. Autopilot Master must be engaged for this mode to function. Engaging this mode will deactivate LNAV.
13. **LNAV:** Lateral Navigation. Follows the nav source selected. Currently only MSN is supported - support for VOR and TCN coming soon. Autopilot Master must be engaged for this mode to function. Engaging this mode will deactivate HDG HOLD.

14. **Ground Spoiler Arm Selector Switch:** 3-Way Switch - ARM (Arms ground spoilers), OFF (Disarm ground spoiler) and LAPES (Disarm Spoilers).
15. **Approach Path Selector Angle:** Selects Approach Path angle. Regardless of angle selected, the aircraft will always follow the glideslope as provided by airport ILS systems.
16. **APPR Path Display:** Displays selected Approach Path.
17. **MACH/IAS:** Switches between SPD HOLD in MACH or in IAS. Switches automatically to MACH at 18,000ft.
19. **MACH/IAS Selector:** Increase or Decrease selected airspeed. Note that rotating the knobs increases/decreases the selected airspeed, but such change will NOT be made effective until the knob is pushed to acknowledge the change.
20. **THR/PITCH:** Switches between THR and PITCH modes. Currently only THR is supported.
20. **MACH/IAS Display:** Displays selected airspeed.
21. **HDG Display:** Displays selected heading.
22. **Maximum Bank Selector:** Selects Bank Angle (Standard/Normal/20)
23. **HDG Selector:** Increase or Decrease selected heading. Note that rotating the knobs increases/decreases the selected airspeed, but such change will NOT be made effective until the knob is pushed to acknowledge the change.
24. **Pilot ID:** INOP
25. **ATS:** Autothrottle Master Switch. Required for IAS/MACH to function.
26. **Roll Rate:** INOP
27. **AP:** Autopilot Master Switch, required for all Autopilot modes to function. Spring loaded if Autopilot is force-disconnected. This switch also engages Yaw Damper automatically.
28. **ALT HOLD:** Upon selecting, aircraft will climb to/descend to/hold selected altitude as selected on #33. Manages Vertical Speed hold automatically. Requires Autopilot Master to be engaged.
29. **VNAV Mode:** Temporarily unsupported. To be added in a future update due to outstanding bugs.
30. **TURB Mode:** Unsupported.
31. **SPLIT AXIS:** Overrides Altitude Hold, and manages Vertical Speed independently as selected on #32. Requires Autopilot Master to be engaged.
32. **Vertical Speed selector and Display:** Select and display Vertical Speed.
33. **Altitude selector and Display:** Select and display Altitude (always BARO). Note that rotating the knobs increases/decreases the selected airspeed, but such change will NOT be made effective until the knob is pushed to acknowledge the change.
34. **Alert Reset:** INOP
35. **NAV Source Selector, First Officer:** Selects source of navigation data for the First Officer MFDs, Navigation Display pages. Refer to #1 for all the modes available.

3.8.1 UNDERSTANDING THE AFCS SYSTEM

The AFCS system manages the aircraft in three axes: Speed, Altitude/Pitch and Heading/Roll.

Speed Modes:

- Autothrottle Engaged:
    - IAS HOLD MODE: Holds selected IAS
    - MACH HOLD MODE: Holds selected MACH

Other modes (EPR, SPD NAV, etc.) are not modeled.

Altitude/Pitch Modes:

- Autopilot Master Engaged:
    - ALT HOLD: Increases/Decreases/Holds altitude as selected.
    - VERT SPD (Split Axis): Overrides ALT HOLD and holds selected VS.
    - APPR: Follows Glideslope

Other modes (Turb) are not modeled.

Heading/Roll Modes:

- Autopilot Master Engaged:
    - HDG HOLD: Turns to and holds selected heading.
    - LNAV: Follows navigation source selected on NAV Source Selector. Currently only MSN is available, but VOR and TAC will be soon supported.
    - APPR: Follows localizer.

Other modes (SKE, ETAC, etc.) are not supported.

3.8.2 AUTOPILOT STATE DISPLAYS

Unlike other aircraft, the autopilot pushbuttons on the C-17 are not backlit, nor are any indicator lights available on the cockpit. Instead, the engaged modes can be validated on the Primary Flight Display and HUD. Additionally, indicator lights will turn on when Autothrottle or Autopilot are engaged.

Aural alarms, MASTER CAUTION warnings, and WAP Display messages show up when autopilot or autothrottle are disconnected, either manually or by force.

Primary Flight Display showing active modes - IAS, ALT, HDG. Notice AP and ATS lights are active, indicating the system is engaged.

3.8.3 PERFORMING ILS CATII/III LANDINGS

ILS Landings are fully supported on the aircraft, however, they require systems to be correctly setup for the aircraft to follow the automated landing procedure.

1. **Program the approach on the FMS/MSN Systems.** An approach procedure, including selecting the active runway, type of approach and Standard Arrival must be inputted and activated on the aircraft FMS/MSN System. There shall be no flight plan discontinuities from the current position of the aircraft to the destination airport.
2. **Follow the procedure using LNAV:** Autopilot must be engaged, and LNAV mode must be active. The aircraft will follow the standard arrival procedure.
3. **Tune in the ILS Frequency on the NAV1 Radio:** Make sure the frequency is correctly selected on NAV1. When the aircraft has entered the localizer range, distance and bearing to LOC will display on the BDHI Indicator.
4. **Intercept the Approach:** Most airports have ILS intercepts of 30 degrees or less. You may either follow the LNAV through the intercept, or engage APPR mode shortly before the aircraft intercepts the localizer.
5. **Engage APPROACH (APPR) Mode:** Engage APPR Mode and verify the lateral mode automatically switches from LNAV to APPR (verify on PFD bottom left corner). You will see the deviation diamonds on both the horizontal and glideslope bars.
6. **Fly the Glideslope:** The aircraft will automatically intercept the Glideslope, and the ALT Mode (upper right corner) will display GLIDESLOPE once intercepted. Monitor the instruments throughout the approach.

Bear in mind that the aircraft will be unable to fly the ILS if the approach and runway selection is not performed on the MSN system.

3.9 NAVIGATION AND COMMUNICATION SYSTEMS

3.9.1 NAVCOM CONTROL PANEL

The NAVCOM Control panel comprises the primary radio controls for all tunable communications and navigation equipment.

- Tunes all the communication radios.
- Tunes the VOR/ILS, TACAN and ADF Navigation Radios.
- Tunes IFF and Transponder
- Activates the IFF IDENT Feature

Navigation and Communications Display

1. **Left Side Pushbuttons:** Cycle through the communication options:
    1. COM1/COM2: Selects COMM1/2 Frequencies by using the FREQ knobs. Press once for COMM1, a second time for COMM2.
    2. UHF: Unsupported by the simulator.
    3. VHF: Unsupported by the simulator.
    4. HF: Unsupported by the simulator.
2. **Right Side Pushbuttons:** Cycle through the navigation options:
    1. NAV1/NAV2: Selects NAV1/2 Frequencies by using the FREQ Knob. Select Course with the CRS Knob. Press once for NAV1, a second time for NAV2. NAV supports VORs and ILS Frequencies.
    2. TAC1/TAC2: Same as above. TACAN frequencies can be used on the BDHI Bearing Distance and Heading Indicator.
    3. ADF: Same as above. ADF can be used on the BDHI.
    4. IFF: Transponder
3. **OFF/BRT Button**
4. **Lower Side Pushbuttons:** Their functionality changes from page to page. Particularly important to change IFF mode from GRD to T/A
5. **Upper Side Pushbuttons:** Generally INOP
6. **IDENT Button**

7. **XFER Button:** Transfers frequency from STBY to ACTIVE
8. **CRS Knob:** Selects course. Outer knob selects by 10s, inner knob selects by units.
9. **FREQ Knob:** Selects frequency. Outer knob selects integer parts, inner knob selects decimal parts.

3.9.2 STANDBY RADIO

The standby radio located in the overhead panel is not simulated and INOP.

3.9.3 ICS/RADIO VOLUME/MIC SELECT MODULES

The various ICS/Radio Volume/Mic Select modules located around the cockpit are fully animated, but do not have any real functionality in the simulation. You may find them across the entire aircraft - in the centre console, on the pilot/copilot sidepanels, in the loadmaster station, etc.

ICS/Radio Volume/Mic Select Modules

3.9.4 MULTI-FUNCTION CONTROLS UNIT

Located on the Centre Console (two of them, for the pilot and first officer respectively), the MFC Unit provides control over the Primary Flight Display and Navigation Displays of the aircraft.

MFC Unit

1. **Altitude Reference Selector:** Selects the altitude reference to be used with the Central Aural Warnings System (CAWS) and the alert displayed on PFD. Options are:
    1. MDA: Minimum Descent Altitude – If the aircraft goes below the selected altitude, MDA message will be displayed on PFD
    2. MKR: Marker – If the aircraft goes below the selected altitude, TOO LOW message will be displayed on the PFD.
    3. DH: Decision Height – When the aircraft crosses Decision Height, DH Message displays on the PFD, followed by the respective aural alarm.
2. **Altitude Selected Display:** Displays selected altitude as per ALT REF Mode (1) and MIN SELECT (3)
3. **Minimum Altitude Selector Knobs:** The outer knob selects the reference source for generation of PFD Altitude Alerts (BARO for Barometric, and RA for radar altitude). The inner knob selects the altitude on the display window.
4. **MFC Buttons:** Enable/Disable various of the MFCs Functions:
    1. CDI: Course Deviation Indicator
    2. 1CRS: INOP
    3. 2CRS: INOP

    4. PFP: INOP
    5. TAC CRS: INOP
    6. FLT PLN: Display MSN Flight Plan
    7. PPI PLN: INOP
    8. DATA: INOP
    9. NVAD: Display Navigation Aids on Navigation Display - VORs, NDBs and TACANs
    10. ARPT: Display Airports on Navigation Display
    11. GRP: INOP
    12. TACT: INOP
    13. SEC PLN: Secondary Plan, INOP
    14. DCLT: INOP
    15. RDR: Cycle through Radar Modes - OFF/Terrain Radar (TAWS)/Weather Radar (WX)
    16. BCN: INOP
    17. RZ TAC: INOP
5. **Aircraft Reference Symbol Position Selector, move Backward:** Enables the aircraft reference symbol to be moved Backward. This will affect both MFDs on the corresponding MFC Side.
6. **Display Test Mode:** Pressing the TEST Pushbutton enables a HUD and MFD Test Format.
7. **Aircraft Reference Symbol Position Selector, move Forward:** Enables the aircraft reference symbol to be moved Forward. This will affect both MFDs on the corresponding MFC Side.
8. **SKE/TCAS Ring Interval:** INOP
9. **Heading Reference Selector Switch:** INOP. All headings on the aircraft are set to Magnetic
10. **Map/Radar Range Selectors:** Increases/Decreases range for the MAP, ND Compass and PPI

3.9.5 BEARING, HEADING, DIRECTION INDICATOR (BDHI)

The BDHIs. located outboard of the outside MFDs at each pilot station, provide magnetic heading, and magnetic bearing and/or digital readouts of distance to VOR, DMEs or TACANs, and relative bearing to radio stations supplied to ADF.

BDHI Imdicator

TACAN Stations may display correct distance to station but incorrect bearing. We are investigating the issue.

VORTAC Stations will function correctly with DIST and BEA.

1. **Mode 1 Selector:** Select between VOR1, TACAN1 and ADF1. The instrument will use the frequencies as selected on the COMNAV display. Assuming the frequency is valid, and aircraft is within range of the radio station, the bearing to the station will display on Needle #4 and the distance on #6.
2. **Mode 2 Selector:** Select between VOR2, TACAN2 and ADF2. The instrument will use the frequencies as selected on the COMNAV display. Assuming the frequency is valid, and aircraft is within range of the radio station, the bearing to the station will display on Needle #5 and the distance on #7.
3. **Magnetic Heading Indicator:** The rotating plate will function as a backup compass, displaying the current magnetic heading of the aircraft.
4. **FREQ1 Bearing Indicator:** Displays the bearing to the station as selected on Mode 1 Selector. Eg. assuming Mode 1 selector is set to VOR1, and a valid VOR Frequency has been entered on the COMNAV display, the needle will point towards the bearing of the selected VOR station.
5. **FREQ2 Bearing Indicator:** Displays the bearing to the station as selected on Mode 2 Selector. Eg. assuming Mode 2 selector is set to ADF1, and a valid ADF Frequency has been entered on the COMNAV display, the needle will point towards the bearing of the selected ADF station.
6. **FREQ1 Distance Indicator:** Displays the distance, in Nautical Miles, to the station as selected on Mode 1 Selector, assuming the station can provide distance information.
7. **FREQ2 Distance Indicator:** Displays the distance, in Nautical Miles, to the station as selected on Mode 2 Selector, assuming the station can provide distance information.

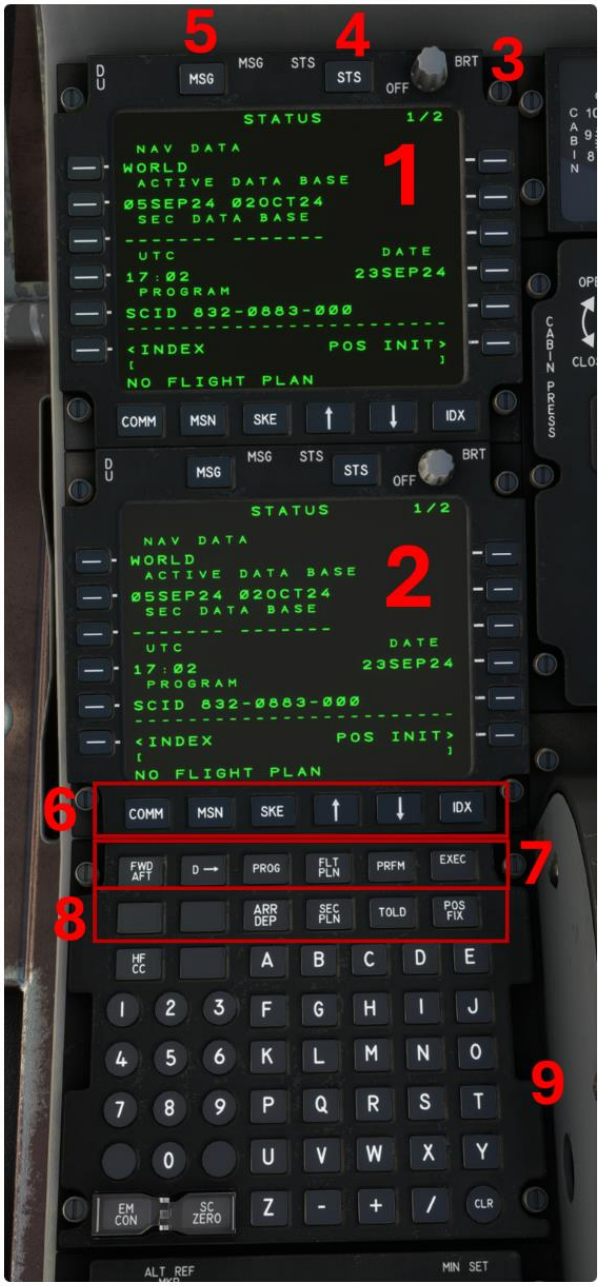
3.10 MISSION/FLIGHT PLANNING SYSTEM

> Please note that the publicly known performance figures for the C17 Globemaster are limited since the aircraft is in active military service. This system may not match perfectly the displays found in the real aircraft.
>
> The performance section on this MSN system is unavailable on the initial version due to a lack of public performance figures.

The MSN (Mission) System, also known as Mission Computer Display/Keyboard system.

This system enables aircrew or operators to input and manage critical mission parameters, providing an interface for real-time updates and control over navigation and operational tasks. The system mainly functions as flight plan input and modification device, from where the crew can input the flight route, waypoints, target locations, and other critical navigation data, as well as modify them in real-time based on mission needs. Other functions on the real counterpart include stationkeeping and aircraft performance calculations.

The C-17 features a unique setup, consisting of four displays and two keyboards - two displays and one keyboard located on the captain-side, and two displays+keyboard on the first officer side. This setup provides the crew more flexibility and efficiency when performing actions while in flight.



MSN/Mission Computer Display System

1. **Forward Mission Computer Display,** with 12 softkey pushbuttons, 6 on each side.
2. **Aft Mission Computer Display,** with 12 softkey pushbuttons, 6 on each side.
3. **Brightness Knob** (x2)
4. **STS Button:** INOP
5. **Messages Button (MSG):** Display Messages Page. Each screen has an individual MSG Button, and as such it allows for control of each display individually.
6. **Mission Computer Keyboard, row 1:** Each screen has an individual copy of these buttons, which allows for control of each display individually. From left to right:
    1. Communications (COMM): Displays the Frequency Search/Communications Page
    2. Mission (MSN): The Mission Page (also known as Route Legs) will display all the waypoints, navaids, and fixes comprising the flightplan. This page is used to evaluate and modify the planned route of flight during the climb and to add or delete waypoint.
    3. Stationkeeping (SKE): INOP

4. Arrow Up: Moves up through the list/page
5. Arrow Down: Moves down through the list/page
6. Index (IDX): Displays index menu linking to all the different pages.

7. **Mission Computer Keyboard, row 2:** From left to right:
    1. Forward/Aft (FWD AFT): Switches active display between Forward/Aft
    2. Direct To (D->): Displays the Direct To / Nearest Airports Page
    3. Progress (PROG): Displays the Progress Page
    4. Flight Plan (FLT PLN): Displays the Active Flightplan Page
    5. Performance (PRFM): INOP
    6. Execute (EXEC): Execute Button
8. **Mission Computer Keyboard, row 3:**
    1. Empty Button
    2. Empty Button
    3. Departure/Arrivals (DEP ARR): Display Departure/Arrivals Page
    4. Secondary Flight Plan (SEC PLN): INOP
    5. Takeoff and Landing Distance (TOLD): INOP
    6. Position Fix (POX FIX): Display Fix Information/Create Reference Points to display on ND
9. **Mission Computer Keyboard:** The keyboard will type on the active display only. To switch active displays, press the FWD AFT button.

3.10.1 MISSION COMPUTER DISPLAY DESIGN LOGIC

Mission Computer Display Design

The system's design logic uses pages with options either highlighted in green or unhighlighted. Green-highlighted options indicate features that are not simulated or unavailable, while unhighlighted options are clickable and interactive. This closely resembles the real counterpart.

3.10.2 CREATING A NEW FLIGHT PLAN

1. Aircraft must have a source of power (Battery, APU, Generators or Ground Power) switched on.
2. Turn on the MSN Displays by using the rotary switch in the upper right corner.
3. Verify which screen is active. This can be easily done by typing with the keyboard - the active display text on the latest row. You may switch active displays by pressing FWD AFT.
4. Press FLT PLN. Insert departure and arrival airports.
5. Press DEP ARR. Insert the departure runways and SIDs, as well as arrival runway, approach and STARS. Press Execute to validate the departure/arrival procedures.
6. Press MSN to review flightplan. Delete any discontinuities or add any route waypoints. Press Execute to validate the flightplan.
7. The aircraft will follow the flight plan by selecting LNAV Mode on the Autopilot panel. VNAV mode will soon be integrated as well.

3.11 DEICING/ANTI-ICING SYSTEM

3.11.1 DEICING, ANTI-ICING AND MISC PANEL

Deicing, Anti-Icing and Misc Panel

1. **Bailout Alarm Switch:** Upon switching on, the Bailout alarm sounds.
2. **Emergency Lighting Switch:** Three way switch OFF/ARM/ON. Off turns off all associated emergency lighting, incuding the EXIT signs. ARM sets the state of emergency lighting to the ARMED mode. On illuminates all components of the system.
3. **Stall Test Switch:** Three-way spring-loaded switch to test the stall prevention system. Center mode is OFF, 1MOM and 2MOM can be selected to test the corresponding stall alarms, displayed messages and stick shaker.
4. **Left Windshield Anti-Ice:** Provides controls for the windshield anti-icing system. OFF De-energizes the system, NORM energizes the system at a moderate temperature, HIGH energizes at a higher temperature.
5. **Windshield Defog Switch:** Provides control of Windshield Defog system. System is normally on for the flight. When selected off, the amber OFF lights illuminates.
6. **Wing Anti-Icing Switch:** Provides control for opening and closing the shutoff valves to both wings. Normally off for flight operations. When pressed on, the switch lights up green.
7. **Right Windshield Anti-Ice:** Provides controls for the windshield anti-icing system. OFF De-energizes the system, NORM energizes the system at a moderate temperature, HIGH energizes at a higher temperature.
8. **Engine Deicing Switches:** Provides control for opening and closing the associated engine cowl anti-icing valve. The switch lights up green to signify the system has been commended on.
9. **Probe Heat Switches:** Provides heat control for pitot-static probes, for the Pilot (P) and Copilot (CP). The system is normally on for the flight. When selected off, the amber OFF lights illuminates.

3.12 LIGHTING SYSTEMS

3.12.1 LIGHTING SYSTEM PANEL

Lighting Panel

1. **Dome Lights**
2. **EPC Flood**
3. **Flow Line Power:** INOP
4. **W/S Wiper, Captain:** Three Positions - OFF, SLOW and FAST
5. **Overhead Panel Flow Line/Panel:** The small knob controls the lighting flow lines on the overhead panel. The large knob controls the brightness of the backlit panel text.
6. **Overhead Panel Digit/Flood:** The small knob controls the brightness on all the small LCD displays in the overhead panel. The large knob controls the flood lighting illuminating the overhead completely.
7. **Navigation/Storm Lights:** Controls the Green NVG Lighting, as well as the thunderstorm dome lights.
8. **Left Wing Landing Lights:** Controls the extensible landing lights located on the left wing. These lights are generally in the FOLDED position. Use the Landing Lights Position switches (#11) to move the lights into the extended position for operations.
9. **Nose Landing Lights:** Controls the two extensible landing lights located on both sides of the fuselage, as well as the Runway Turnoff lights. Three way switch - LAND, TAXI, OFF. The LAND position sets maximum brightness to the extensible landing lights, and turns the Runway Turnoffs off. The TAXI position makes use of the Runway Turnoff lights, while setting the Landing Lights to medium intensity. OFF de-energizes the entire system. These lights are generally in the FOLDED position. Use the Landing Lights Position switches (#11) to move the lights into the extended position for operations.
10. **Right Wing Landing Lights:** Controls the extensible landing lights located on the right wing. These lights are generally in the FOLDED position. Use the Landing Lights Position switches (#11) to move the lights into the extended position for operations.
11. **Landing Light Position Switch:** This switch controls the position of foldable landing lights. All three are 3-way switches EXTEND-HOLD-RETRACT. The Extend position will fully move the corresponding extendable light to the fully deployed position. The HOLD position will hold the position and de-energize the folding mechanism. The RETRACT position will return the lights to fully retracted. Keep in mind that extension and retraction of lights works completely independently from the light circuits themselves, and as such configuring lights for landing is a two-step process: First extending lights, and then turning them on. Finally, we'd like to remind that lights shall be retracted for cruise flight, and only extended under 250 KIAS.
12. **Navigation Lights:** Modeled as an ON/OFF Switch
13. **Anti Collision Lights:** Four-position switch - OFF, Lower Beacon, Both Beacons, Beacon + Strobe
14. **W/S Wiper, First Officer:** Three Positions - OFF, SLOW and FAST
15. **Standby Comp:** INOP
16. **Formation Lights, Side and Trail:** Controls the formation lights brightness.
17. **Air Refueling Lights:** Controls the slip way and lead in lighting.
18. **Nacelle Scan Lights:** Illuminates the Engine Nacelles and Front Leading Flap for inspection.

Various other lighting panels are located throughout the aircraft - in the centre console, glareshield, loadmaster bay, etc. These control "local lights" (eg. Cargo Bay lights from the Loadmaster Panel), as well as smaller panels that feature backlighting. For practical reasons, we decided not to picture all of them on the manual, but the decal titles are self-explanatory and these are all tooltipped as well.

TOP LEFT: Under Autopilot Module, TOP RIGHT: Next to the HUD, BOTTOM: Centre Console

CHAPTER 4: COCKPIT DISPLAYS

4.1 PRIMARY FLIGHT DISPLAY

Primary Flight Display

1. **Airspeed Autopilot Mode:** Displays the selected Autopilot Airspeed mode (ATHR ACT, IAS, MACH, etc). The white box displays when Autothrottle is engaged. The active mode will display in the upper box.
2. **Vertical Autopilot Mode:** Displays the selected Autopilot Vertical mode (ALT, VV, etc.). The white box displays when Autopilot is engaged. The active mode will display in the upper box.
3. **Lateral Autopilot Mode:** Displays the selected Autopilot Lateral mode (HDG, ROLL, LNAV, etc.). The white box displays when Autopilot is engaged. The active mode will display in the upper box.
4. **Airspeed Tape:** Displays the indicated Airspeed in Knots. Contrary to most commercial aircraft, the airspeed tape increases moving downwards.
5. **Selected Airspeed:** Displays the selected airspeed in Knots or MACH, as selected on the Autopilot panel.
6. **Heading Indicator/Selected Heading Bug:** Displays the current heading, as well as the selected heading as on the autopilot panel.
7. **Vertical Speed/Radio Altimeter/Decision Height Indicators:** Displays the current vertical speed. Decision Height is displayed as well in blue, as selected in the MCP Panel. Radio Altimeter is displayed, unless BA/RA Mode is switched, in which case Baro altimeter will be displayed.
8. **Altitude Tape:** Displays the current Baro Altitude. If BA/RA is engaged, the tape will display Radio Altitude.
9. **Selected Altitude:** Displays the current Altitude selected as per the autopilot panel. Always in Baro Altitude.
10. **Roll Indicator:** Displays the current aircraft roll attitude, as well as the roll limitations for the current speed/altitude.
11. **ADI:** Displays the current Attitude of the aircraft with reference to the horizon.
12. **Flight Path Vector indicator/Flight Director/Attitude Reference:** Displays the aircraft attitude and direction of travel.
13. **Screen Brightness Selector:** Cycles through display OFF/Night (Low Brightness Mode) and Day (High Brightness Mode).
14. **Multi-Function Display Selector:** Cycles through the different pages available on the MFD.

15. **Localizer/Glideslope/Flight Path indicators:** Display the aircraft position in reference to the glideslope, localizer, selected navaid or flightplan entered.

4.2 NAVIGATION DISPLAY

Navigation Display, Compass Format

1. **Heading Indicator**
2. **Aircraft Position Indicator**
3. **Selected Range Indicator:** Displays range as selected on the MCP Range Knob
4. **Wind Direction Information**
5. **Selected NAVAID Information**
6. **Selected Heading Bug**
7. **Screen Brightness Selector:** Cycles through display OFF/Night (Low Brightness Mode) and Day (High Brightness Mode).
8. **Multi-Function Display Selector:** Cycles through the different pages available on the MFD. First click on ND button will set MFD to the ND Compass page. A second click will set to Map Page format.

Navigation Display, Map Format

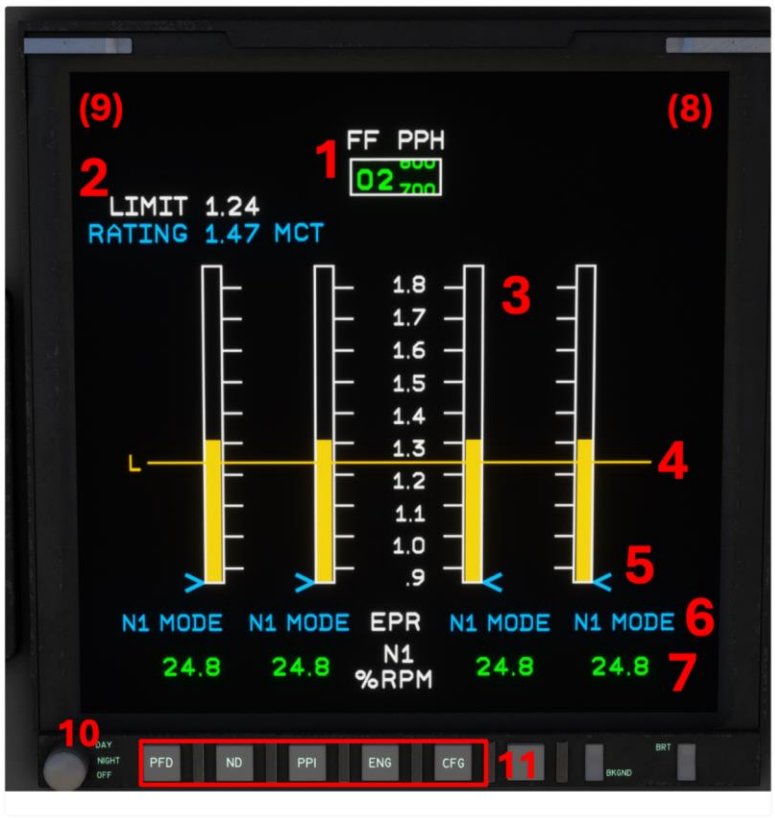
1. **Heading Indicator**
2. **TAWS/WX/TCAS Mode Indicator:** TAWS/WX Can be Enabled/Disabled on the MCP, RDR Button. TCAS is by default disabled on ND, and always enabled on PPI
3. **Aircraft Position Indicator:** Position indicator can be moved up/down using the two arrow buttons on the MCP.
4. **Selected Range Indicator:** Displays range as selected on the MCP Range Knob
5. **Map Display:** Displays WX or Terrain information, airport positions, NAVAIDs, etc. as selected on the aircraft MCP.
6. **Wind Direction Information**
7. **Selected NAVAID Information**
8. **Screen Brightness Selector:** Cycles through display OFF/Night (Low Brightness Mode) and Day (High Brightness Mode).
9. **Multi-Function Display Selector:** Cycles through the different pages available on the MFD. First click on ND button will set MFD to the ND Compass page. A second click will set to Map Page format.

4.3 PLAN POSITION INDICATOR DISPLAY

PPI Page

1. **Heading indicator**
2. **TAWS/WX/TCAS Indicator:** TAWS is controlled by the RDR button on the MCP. TCAS is by default always TA/RA
3. **Aircraft Position Indicator:** The position of traffic will be displayed in reference to the position of the Aircraft Indicator
4. **Range Lever:** As per selected on the MCP
5. **Navigation/Waypoint Information**
6. **Screen Brightness Selector:** Cycles through display OFF/Night (Low Brightness Mode) and Day (High Brightness Mode).
7. **Multi-Function Display Selector:** Cycles through the different pages available on the MFD.

4.4 ENGINE DISPLAY



Engine Display, EPR Page

1. **Fuel Flow:** in Pounds per Hour
2. **Thrust Rating and Limit Display:** Reflects the selected EPR Rating as selected on the Standby Engine instrument panel (MAX, INT, MCT, DRT, MAN). Displays the respective Limit and Rating values.
3. **EPR Vertical Tapes:** Displays green when the engine EPR is within the limits. Displays yellow when EPR exceeds the EPR Limit
4. **EPR Limit/Rating Line:** Displays the engine max EPR Rating (Yellow). Displays the selected EPR Rating (Cyan),
5. **EPR Predictor:** Cyan chevron commanded by the throttle levers and corresponds to the set throttle lever angle.
6. **EPR Engine Mode annunciator:** Displays engine operating mode (N1 or N2)
7. **N1 RPM Digital Display:** When engine is operating in N1 mode, displays the N1 RPM for each engine.
8. **(Not Pictured) Brake Temperature Indicator**
9. **(Not Pictured) MAX Thrust Time, Reverser Status**
10. **Screen Brightness Selector:** Cycles through display OFF/Night (Low Brightness Mode) and Day (High Brightness Mode).
11. **Multi-Function Display Selector:** Cycles through the different pages available on the MFD. First click on ENG will open the EPR Page, second click the extended Engine page and third the Engine Oil page.

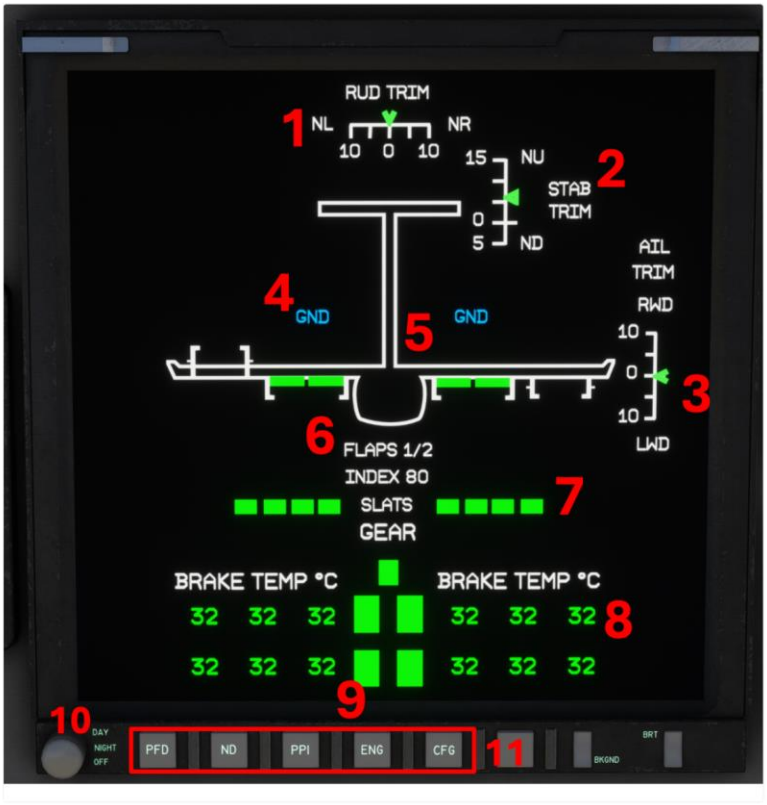
Engine Display, Extended Page

1. **Thrust Rating and Limit Display:** Reflects the selected EPR Rating as selected on the Standby Engine instrument panel (MAX, INT, MCT, DRT, MAN). Displays the respective Limit and Rating values.
2. **N1 RPM Indicator:** Arc displays the N1 RPM% For all four engines. Generally green, turns yellow when N1 is below the low limit, and red when its above the high limit.
3. **N2 Indicator:** The arc displays the N2 RPM% for all four engines. Generally green, turns yellow when N2 is below the low limit, and red when its above the high limit.
4. **EGT:** Displays the exhaust gas temperature, in degrees Celsius, in the linear arc.
5. **FF PPH:** Displays the fuel flow, in pounds per hour, to each individual engine.
6. **(Not Pictured) MAX Thrust Time, Reverser Status**
7. **Screen Brightness Selector:** Cycles through display OFF/Night (Low Brightness Mode) and Day (High Brightness Mode).
8. **Multi-Function Display Selector:** Cycles through the different pages available on the MFD. First click on ENG will open the EPR Page, second click the extended Engine page and third the Engine Oil page.

Engine Display, Engine Oil Page

1. **Engine Oil Pressure:** Displays engine oil pressure, in PSI
2. **Engine Oil Temperature:** in degrees Celsius
3. **Engine Oil Quantity:** In Quarts
4. **Fuel Used:** Shows the total fuel used per engine since the latest reset.
5. **Screen Brightness Selector:** Cycles through display OFF/Night (Low Brightness Mode) and Day (High Brightness Mode).
6. **Multi-Function Display Selector:** Cycles through the different pages available on the MFD. First click on ENG will open the EPR Page, second click the extended Engine page and third the Engine Oil page.

4.5 CONFIGURATION DISPLAY



Configuration Display

1. **Rudder Trim Indicator**
2. **Stabilizer Trim Indicator**
3. **Aileron Trim Indicator**
4. **Spoiler Mode Indicator:** DLC Appears when spoilers are being used in the lift control mode during approach (Spoilers deployed and Flaps >1/2). SPD BR appears when spoilers are used in speed brake mode (Spoilers deployed and Flaps <1/2). GND Appears when spoilers are used on the ground for full stop landings or touch and gos.
5. **Aircraft Control Panel:** Displays the position and deflection of all control surfaces against the aircraft outline.
6. **Flap Status Indicators:** Display flap readouts according to the flaps lever: UP, ½, ¾ and FULL
7. **Slat Status Indicator:** Indicates if Slats are extended or retracted.
8. **Brake Temperature Indicator:** in degrees Celsius
9. **Landing Gear Status Indicator**
10. **Screen Brightness Selector:** Cycles through display OFF/Night (Low Brightness Mode) and Day (High Brightness Mode).
11. **Multi-Function Display Selector:** Cycles through the different pages available on the MFD. First click on ENG will open the EPR Page, second click the extended Engine page and third the Engine Oil page.

4.6 HEAD-UP DISPLAY

Heads Up Display

1. **Airspeed Autopilot Mode:** Displays the selected Autopilot Airspeed mode (ATHR ACT, IAS, MACH, etc). The white box displays when Autothrottle is engaged. The active mode will display in the upper box.
2. **Roll Indicator:** Displays the current aircraft roll attitude, as well as the roll limitations for the current speed/altitude.
3. **Vertical Autopilot Mode:** Displays the selected Autopilot Vertical mode (ALT, VV, etc.). The white box displays when Autopilot is engaged. The active mode will display in the upper box.
4. **Airspeed Tape:** Displays the indicated Airspeed in Knots. Contrary to most commercial aircraft, the airspeed tape increases moving downwards.
5. **Altitude Tape:** Displays the current Baro Altitude. If BA/RA is engaged, the tape will display Radio Altitude.
6. **Altitude/Vertical Speed Indicator**
7. **Flight Path Vector indicator/Attitude Reference:** Displays the aircraft attitude and direction of travel.
8. **Lateral Autopilot Mode:** Displays the selected Autopilot Lateral mode (HDG, ROLL, LNAV, etc.). The white box displays when Autopilot is engaged. The active mode will display in the upper box.
9. **Heading Indicator/Selected Heading Bug:** Displays the current heading, as well as the selected heading as on the autopilot panel.
10. **HUD Brightness Mode Switch:** OFF/NIGHT/AUTO/DAY
11. **HUD Manual Brightness Selector**
12. **HUD Declutter Pushbutton:** Cycles through the declutter states, removing redundant information for ease of visibility during sorties.

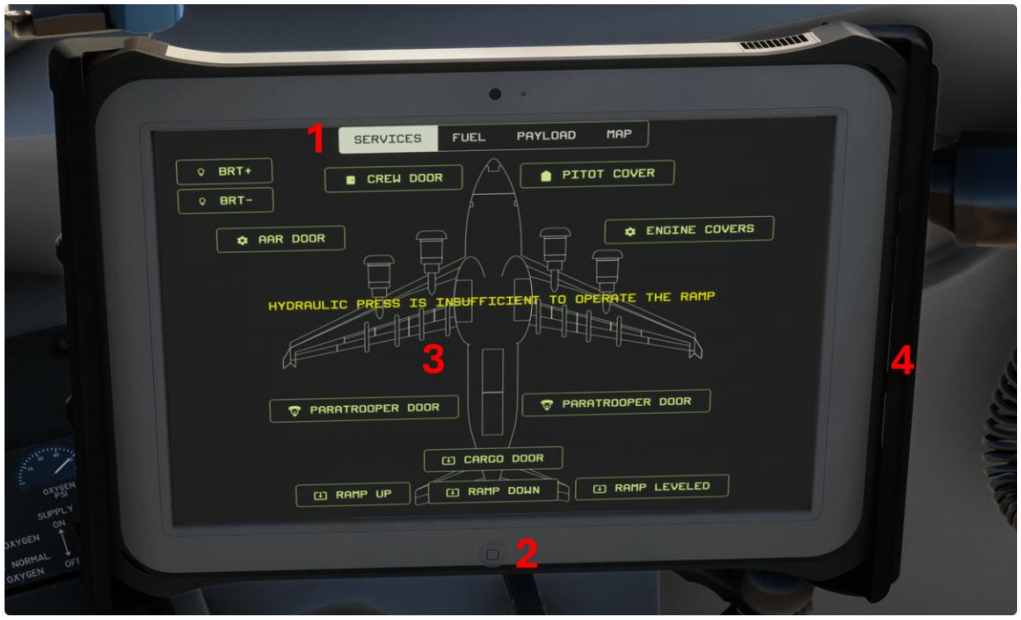
4.7 WARNINGS AND ANNUNCIATORS PANEL

Warnings and Annunciators Panel

1. **Left Side Caution Messages**
2. **Right Side Caution Messages**
3. **Annunciation Messages**
4. **Warning Messages**
5. **Left Scroll Buttons**
6. **Brightness Increase/Decrease Button:** Cycle through display brightness levels
7. **Annunciations/Lights Test Switch:** INOP
8. **Right Scroll Buttons**

CHAPTER 5: ELECTRONIC FLIGHT BAG

The Electronic Flight Bag provides an easy-to-use interface to interact with the aircraft attachments, doors and payloads. The EFB is located in the left side wall of the pilot seat, near the window. The EFB can also be accessed from the Loadmaster Station, though displayed as a laptop instead of a tablet.



EFB, Services Page

1. **EFB Menu:** Switch tabs between Services, Fuel, Payload and Map
2. **EFB On/Off Power Button**
3. **Services Page:** Select doors to open/close, external attachments, etc.
4. **Hide EFB Tablet Clickspot**

EFB, Fuel Page

1. **EFB Menu:** Switch tabs between Services, Fuel, Payload and Map
2. **EFB On/Off Power Button**
3. **Fuel Page:** For visualization only, displays the fuel quantity per tank, as well as total fuel loaded on the aircraft.

EFB, Payload Page

1. **EFB Menu:** Switch tabs between Services, Fuel, Payload and Map
2. **EFB On/Off Power Button**
3. **Payload Selection**
4. **Aircraft Weights:** Monitor aircraft weights to ensure the takeoff weight is under MTOW
5. **Center of Gravity Calculation Diagram**

CHAPTER 6: CARGO AND LOADMASTER

The loadmaster station is located on the forward cargo bay to the right side of the cockpit stairs. The Loadmaster typically manages cargo operations. This station is equipped with controls and monitoring systems for the loading and unloading process, ensuring cargo is distributed properly and safely. It usually includes displays or instruments for weight distribution, cargo restraint systems, and communications tools to maintain contact with the flight crew and ground personnel. The Loadmaster ensures that cargo is properly secured and balanced for the flight, and that it adheres to aircraft limitations for safe operation. Here you will find a laptop computer that can be used to onload cargo and fuel.

Loadmaster Station Panel

1. **Loadmaster Lights:** Controls Cargo Bay flood lights, LM Panel lights, LM Desktop Lamp, etc. Some Lighting Knobs/switches may be INOP as they do not apply to simulation.
2. **Chute/Rails Control Switches:** INOP, not simulated.
3. **System Status Lights:** Display the status of Hyd 2 and Hyd 3 systems, as well as Electrical Power system. These are important for door and ramp operation, as the ramp and cargo door cannot operate without Hydraulic Pressure or Electrical Power,
4. **Cargo Door and Cargo Ramp Pushbuttons**
5. **Aerial Delivery System Panel:** INOP, not simulated
6. **Ramp Blowdown / Drogue Panel:** INOP, not simulated
7. **PA/Communications Panel**
8. **FED/Smoke Detection Panel:** INOP, not simulated
9. **Environment Panel:** Control Exhaust Fans and Cargo Bay Heater. Cargo Compt temperature selector and temperature displays INOP.

10. **Door Status Lights**

Additionally, the Loadmaster Station has access to the Electronic Flight Bag displayed as a laptop. The touchscreen provides an easy-to-use interface to interact with the aircraft attachments, doors and payloads. We have also added a little homage to our early days in Flight Simulation ;)

For more information, read the EFB Section of this manual.

Loadmaster EFB

CHECKLISTS

EXTERNAL PREFLIGHT SAFETY INSPECTION	
Engine Covers	*Removed*
Pitot Covers	*Removed*
Wheel Pins	*Removed*
Front Gear Tire Pressure	*Check*
Main Gear Tire Pressure	*Check*

PREFLIGHT SAFETY INSPECTION	
Gear Handle	*Down*
ENGINE IGNITION NORM/ORIDE Switch	*NORM*
ENGINE IGNITION Selector Switch	*OFF*
ENG SHUT OFF Switches 1, 2, 3, 4	*OFF*
GND OPS PWR Switch	*OFF*
BATT Switch	*ON/Locked*
DC X TIE Switch	*AUTO*
EMERG PWR Switch	*AUTO*
XFER BUSES Switch	*NORM*
L/R AV BUS Switches	*AUTO*
WAP (Warning/Caution Displays)	*RESET MASTER CAUTION, Check WAP MSG*
Fire Detection System	*Tested*
Smoke Detection System	*Tested*
EXT PWR Switch	*ON if Available*
AC X TIE Switch	*AUTO*
BAILOUT Alarm	*TESTED*
EMERG Lights	*ARM*
STALL Test	*Complete, Verify WAP Messages and Sounds*

PREFLIGHT CHECKLIST	
Parking Brakes	*ON*
WAP (Warning/Caution Displays)	*Checked*
Interior/Exterior Lights	*As Required*
Cockpit and Instrument Illumination	*As Required*
IRU Switches 1, 2, 3, 4	*ON*
HUD, MCD, MFDs	*ON and Adjusted*
COMM/NAV Radios	*Set*
Pilot STBY Instruments	*Checked*
ELT Switch	*NORM*
FED ARM Switch	*Disarm*
OBIGGS L&R Switchlights	*ON*
COMPT AIR FLOW	*ON*
TRIM AIR	*ON*
AVIONICS COOL ORIDE	*OFF*
W/S DEFOG	*ON*
L and R W/S Anti-Ice	*OFF*

ENG Anti-Ice	*OFF*
Probe Heat	*OFF*
No Smoking, Fasten Seatbelts Signs	*ON*
Anti-Skid/Brake Temp Switch	*ARM*
Mission Computer (FMC)	*Initialized*
FCS Actuator Panel	*EFCS*
Mission Computer Data / FMC	*Setup Flight Plan and Verified*
Fuel Pumps #3	*ON*
APU Starter	*START, wait RPM >95%*
APU Bleed	*ON*
APU Generator	*ON*
HYD2 and HYD3 AUX Pumps	*ON, verify PRESS PSI >3000*

LOADMASTER CHECKLIST Now move the camera to the Loadmaster Station (recommended, can also perform these steps from Cockpit EFB)	
Loadmaster Computer	*On*
Open Cargo Ramp/Door	*As Required*
Cargo Selected and Loaded	*Check*
Takeoff Weight is under Safe Limits	*Verify*
CG is under Safe Limits	*Verify, crosscheck with Charts*

BEFORE START ENGINES CHECKLIST Return to Cockpit Pilot Seat	
COMM Radios	*Set*
APU and External Equipment	*As Required*
Parking Brake	*On*
WAP Displays	*Checked*
Fuel QTY	*Checked*

ENGINE START CHECKLIST	
MFD 2, 3	*Set for Engine Start*
NAV Lights	*ON*
ANTICOL Lights	*FSLG/WING*
ENGINE IGNITION Selector Switch	*A or B, or A&B*
Throttles	*IDLE*
Bleed Air Supply	*Checked*
Engine Shutoff Valve 1	*ON*
Start Engine 1	*Start*
Monitor N2 and Engine Parameters, Engine 1	*Monitor*
Engine Shutoff Valve 4	*ON*
Start Engine 4	*Start*
Monitor N2 and Engine Parameters, Engine 4	*Monitor*
Start Engines 2, 3	*Follow Procedure Above, Start & Monitor*
APU Bleed	*OFF*

Engine Bleeds	*ON, All Four*
Wing De-Ice	*As Required*
ENG Anti-Ice	*As Required*
Probe Heat Switchlights	*As Required (ON Below 6 Deg C)*
Packs L and R	*ON*
Hyd Pumps	*PRI/SEC/AUX ON, All Four*

BEFORE TAXI CHECKLIST	
DC X TIE Switch	*AUTO*
Hydraulic XFER Pump	*AUTO*
Flaps/Slats	*Checked for Full Movement*
Flight Controls	*Checked for Full Deflection*
Flight Controls	*Checked In MECH Law*
APU Generator	*OFF*
APU	*OFF*
External Power	*OFF*
STBY ENG SEL	*EPR*
Thrust Rating	*SET MAX, DRT or MAN as Required*
Flaps	*Set*
Stabilizer, Rudder Trim, Aileron Trim	*Set, 0 and 0*
Altimeters	*Set*
Doors	*Closed*
Hydraulic Temps	*Checked*
WAP Display	*Checked*

TAXI CHECKLIST	
Taxi	*40% N1 Max*
Taxi Lights	*On, Extended*
Brakes	*Minimize Use*
Thrust Reversers	*Avoid Repeated Cycle of use to Slow Down*

BEFORE TAKEOFF CHECKLIST	
Brakes, Steering and Stick	*Checked*
Flight Instruments	*Checked*
Probe Heat Switchlights	*ON*
Fuel Boost Pumps	*ON*
WAP Display	*Checked*

LINEUP CHECKLIST	
Slats/Flaps	*Extended, Flaps ½, Index Confirmed*
Hydraulic Temps	*Checked*
Exterior Lights	*As Required*

Landing Lights	*ON, Extended*

TAKEOFF CHECKLIST	
Brakes	*Hold*
Takeoff Thrust	*MAX EPR or DRT EPR*
Engines	*Stabilize at 1.15 EPR*
Brakes	*Released*
Rotate	*12 Degrees*

AFTER TAKEOFF CHECKLIST	
Landing Gear	*UP, Lights Out*
Flaps/Slats	*UP/RET*
Anti-Ice	*As Required*
Pressurization/Air Conditioning Packs	*Checked and ON*

CRUISE	
Altimeters	*Set*
Anti-Ice	*As Required*
Pressurization	*Checked*
Exterior Lights	*As Required*
Pers Warning Signs	*As Required*

DESCENT	
Engine Ignition Selector Switch	*A or B or A&B*
Anti-Ice	*As Required*
Pers Warning Signs	*ON*
Enroute Descent	*Lowest of Mach 0.74 / 310 KIAS*
Tactical Descent	*Lowest of Mach 0.80 / 320 KIAS*

APPROACH	
Passing 10,000 Feet	*250 KIAS Max*
Exterior Lights	*ON*
Altimeters	*Set*
Flaps	*Set*
Thrust Rating	*As Required (Normally MAX)*
WAP Display	*Checked*

BEFORE LANDING	
Slats/Flaps	*Extended, Flaps on Index*
Landing Gear	*Down*
Spoiler Switch	*ARM*

LANDING	
Normal Landing (3/4 to FULL Flaps)	*FPV set to -1.0 TO -1.5 degrees, 240FPM*
Assault Landing (FULL Flaps)	*FPV set to -1.5 TO -2.0 degrees, 360 FPM*
Reversers	*Four REV, Reverse IDLE at 70 kts*

AFTER LANDING	
Flaps/Slats	*UP/RET*
Spoiler Switch	*Dearmed*
Exterior Lights	*As Required*
Cargo Door and Ramp	*As Required*
Engines	*Operate at 1.05 EPR or less for 5 Minutes*
Engine 1 and 4 HYD PRI, SEC, AUX Pumps	*OFF*
APU	*Start*
APU Generator	*ON*
Engine 1 and 4 Boost Pumps	*OFF*
Probe Heat	*OFF*

COCKPIT SWITCHOFF	
Parking Brake	*ON*
Engine Shut Off Switches	*OFF*
Anti-Ice	*OFF*
Hyd Pumps	*OFF*
Interior and Exterior Lights	*As Required*
Pers Warning Signs	*OFF*
IRU Switches 1, 2, 3, 4	*OFF*
OBIGGS L&R Swithlights	*OFF*
EMERG LT Switch	*OFF*
DC X TIE Switch	*AUTO*
EMERG PWR Switch	*ON*
XFER Buses	*OFF*
APU	*OFF*
APU GEN	*OFF*
BATT Switch	*OFF*

GLOSSARY

- A/D: Airdrop
- A/R: Air Refueling
- AAR: Air Refueling
- AFCS: Automatic Flight Control System, autopilot.
- BA: Barometric Altimeter
- BDHI: Bearing Distance and Heading Indicator
- CONFIG: Configuration Display, page on the MFD
- CPT: Captain, Pilot
- DCLT: Declutter (HUD)
- EFB: Electronic Flight Bag, cockpit tablet.
- ENG: Engine Display, page on MFD
- FO: First Officer, Copilot
- IAS: Indicated Air Speed
- MFD: Multi-function Display
- MSN: Mission, Flightplan as active on FMC
- ND: Navigation DIsplay, page on the MFD
- PFD: Primary Flight Display, page on the MFD
- RA: Radio Altimeter
- RDR: Radar
- SKE: Stationkeeping
- TACAN: Tactical Navigation
- VS: Vertical Speed