iniBuilds

Mitsubishi MU-2
MANUAL

Microsoft Flight Simulator

Preface

FOR SIMULATION USE ONLY - DESIGNED FOR SINGLE-PILOT OPERATIONS

This guide is designed to help provide a straightforward set of instructions to aid in operating the MU-2 aircraft. It has been produced using multiple real-world MU-2 operator manuals from various dates and sources with modifications to various procedures to make them more manageable under single-pilot operations.

PHOTOSENTIVE SEIZURE WARNING

A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns that may appear in video games. Even people who have no history of seizures or epilepsy may have an undiagnosed condition that can cause these "photosensitive epileptic seizures" while playing video games.

Immediately stop playing and consult a doctor if you experience any symptoms.

These seizures may have a variety of symptoms, including light-headedness, altered vision, eye or face twitching, jerking, or shaking of arms or legs, disorientation, confusion, or momentary loss of awareness. Seizures may also cause loss of consciousness or convulsions that can lead to injury from falling down or striking nearby objects.

Parents should watch for or ask their children about the above symptoms. Children and teenagers are more likely than adults to experience these seizures.

You may reduce risk of photosensitive epileptic seizures by taking the following precautions:

•   Play in a well-lit room.
•   Do not play if you are drowsy or fatigued.

If you or any of your relatives have a history of seizures or epilepsy, consult a doctor before playing video games.

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About the MU-2

The MU-2 is a twin-turboprop, high-wing utility aircraft developed and produced by Japanese industrial conglomerate Mitsubishi Heavy Industries. The aircraft took its maiden flight on September 14, 1963 and entered full-scale production later that year. A total of 704 airframes were manufactured during a production run that spanned from 1963 to 1986.

The distinctive MU-2 evolved from a clean sheet initiative to develop an airframe that could provide efficient, reliable service for a wide range of utilities, both civil and governmental, including military. Mitsubishi engineers first began work on the project in the mid 1950s, laying the basis for an aircraft to be powered by turboprop engines. At the time, most aircraft manufacturers were simply swapping turboprop powerplants into aircraft initially designed for piston power, which created efficiency, reliability, and sometimes safety problems.

Mitsubishi mated the power capability of turboprop engines available at the time with a meticulously designed wing, fuselage, and empennage combination. The result was an aircraft that could perform exceptionally well at a range of altitudes in terms of speed and efficiency, had great range, and could operate out of all types of facilities, including unimproved short field airstrips. The company designated the aircraft the MU-2 as it was the second design iteration of the Mitsubishi Utility series aircraft.

The utility of the MU-2 is broad ranging. It has successfully proven itself as a business and VIP aircraft, an air ambulance, search and rescue platform, and as a general cargo carrier. It has also served a wide variety of military roles, including liaison and ISR (intelligence, surveillance, and reconnaissance) collections. Through the decades, a number of iterations have been created, including those with extended fuselages, enhanced power variants, and versions for extended range.

The MU-2 measures 39 feet, 5 inches in length, stands 13 feet, 8 inches high, and has a straight main wing with a span of 39 feet, 2 inches. The wing features wingtip fuel tanks and over-wing spoilers for roll control. It also features full-span, double-slotted flaps. The unique wing design allows for slow take-off and landing speeds and high cruise speeds. The MU-2 has a traditional empennage and retractable tricycle landing gear.

The aircraft is powered by two wing-mounted TPE331-6-251 turboprop engines that each produce up to 776 horsepower. Each powerplant turns a 3-blade Hartzell fully feathering, reversible, constant-speed propeller. The MU-2 has a range of 1,450 miles, a service ceiling of 29,590 feet above sea level, and it climbs at 2,360 feet per minute. It cruises at 300 miles per hour, has a top speed of 340 mph, and stalls at 115 mph (flaps down). The aircraft can take-off with 2,170 feet of ground roll and it can land using 1,880 feet of runway.
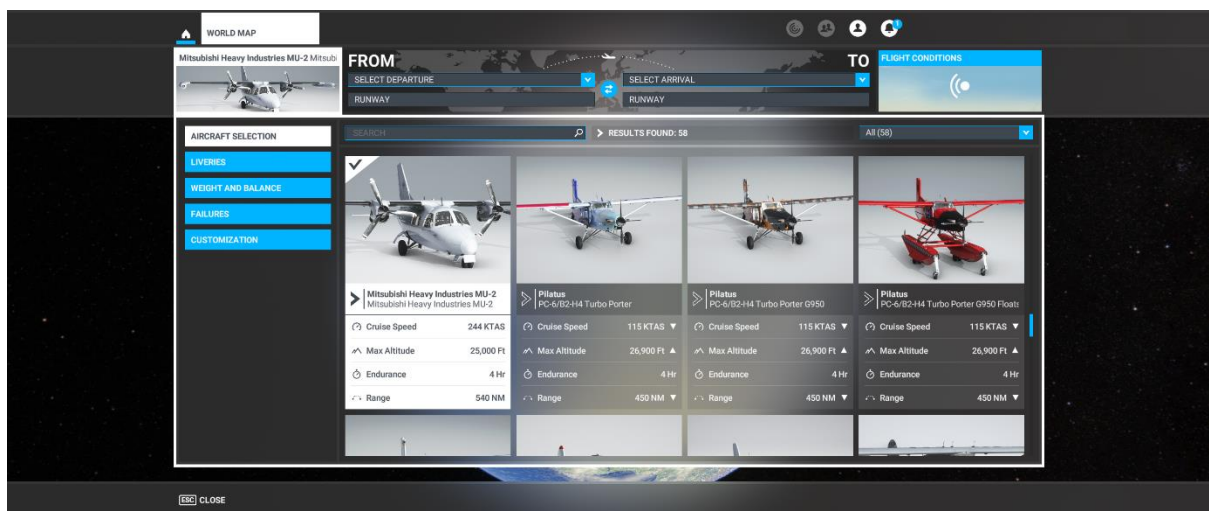
Aircraft Selection and Liveries

To fly the MU-2, you will need to select it from the Aircraft Selection menu.
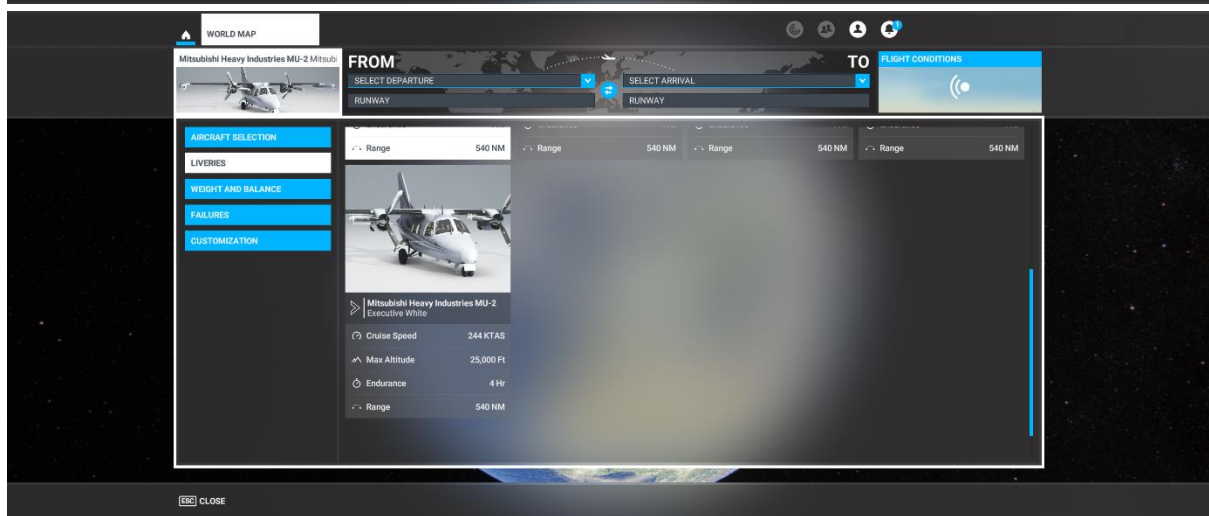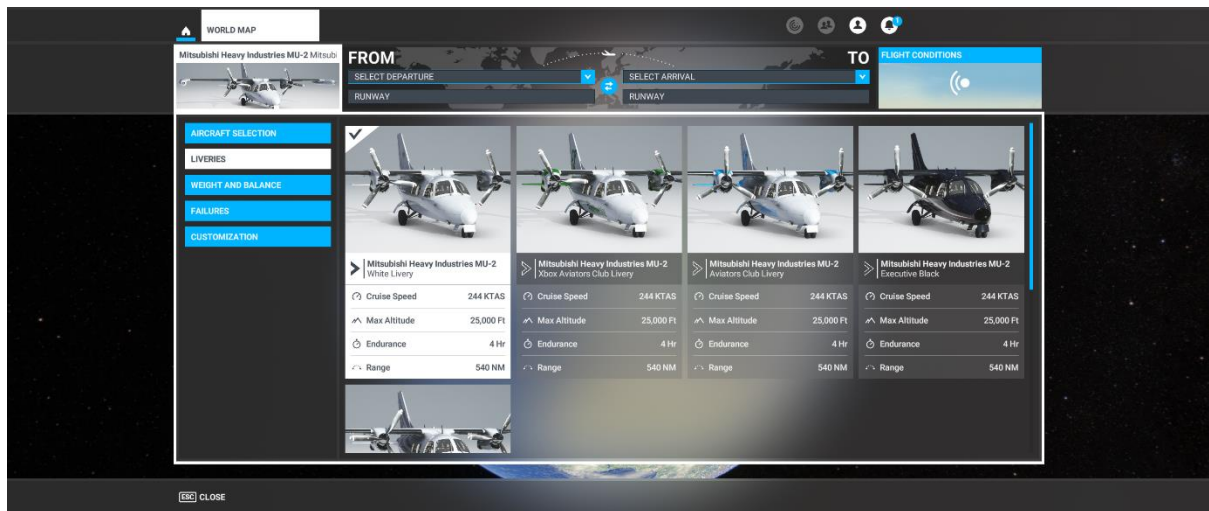Click on WORLD MAP in the Main Menu and click the AIRCRAFT SELECTION icon on the top left.

Scroll until you see the MU-2 or type "MU-2" in the search bar, and it will appear.

Click on Liveries to select any of the various designs available for the MU-2.

Cockpit Interaction

Some knobs within the cockpit have interaction where you can push, pull, or scroll them for their functionality.

This functionality will vary depending on your simulator's specific settings under GENERAL OPTIONS > ACCESSIBILITY.

If a control is set to "Lock," left click (and hold the left mouse button) the knob and push the mouse for "push" interaction and pull the mouse for "pull" interaction. Some functions also may have middle-mouse button "scroll" or "push" and right-mouse click "set" functions.

If it set to "Legacy," you will see an icon appear to the left, right, above, or below, which you use the middle-mouse wheel to scroll as if a circular arrow, and left click to "set" as if an up or down arrow icon.

On the Xbox, press **A** to interact with the knob and use **A** to "push," **X** to "pull," Right Stick to "scroll," and **B** to finish the control input.

Checklists

While this guide offers comprehensive operational instructions that are functionally complemented by the Quick Reference Card (QRC), iniBuilds has incorporated expedient procedural checklists within the simulator. These can be accessed via the top-of-screen drop-down menu by selecting the Checklist option.

Clicking the blue eye icon to the right of the checklist item will switch your view to the requisite panel where the button/switch/dial/gauge is located. You can use the AUTO COMPLETE option to expediently tick off the item from the checklist.

Important Notes and Substitutions

The aircraft uses the new Computational Fluid Dynamics (CFD) flight model along with new fuel system and propeller physics. Care should be taken while flying the aircraft not to stress the airframe beyond its intended limitations as the aircraft, including all of its internal structural elements, reacts realistically in the system under these new simulation mechanisms.

By design, this aircraft could be susceptible to crosswind components and care should be taken when flying beyond typical and / or suggested operational limits.

You can enable two options within OPTIONS > ASSISTANCE OPTIONS: "Auto-Rudder" and "Assisted Takeoff" which are designed to help fly in these conditions.
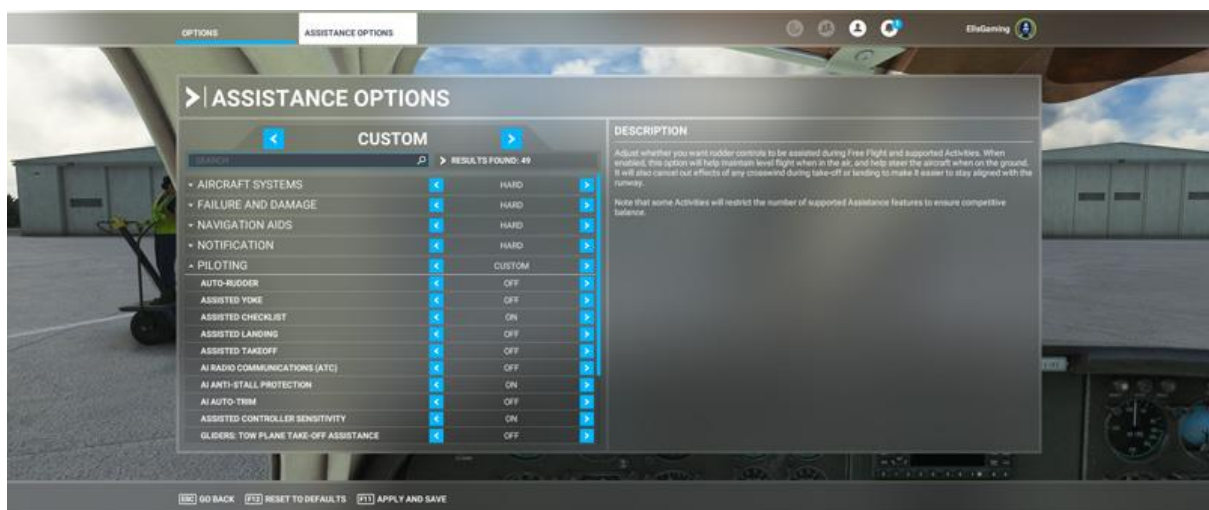
"Adjust whether you want rudder controls to be assisted during Free Flight and supported activities. When enabled, this option will help maintain level flight when in the air, and help steer the aircraft when on the ground.
It will also cancel out effects of any crosswind during takeoff or landing to make it easier to stay aligned with the runway."

MU-2 Specifications

Cruise Speed: 205 KTAS
Max Altitude: 25,000 FT
Max Weight: 10,520 Lbs
Range: 540 NM
Fuel Capacity: 375 Gal
Length: 34.00 Ft
Wingspan: 37.00 Ft

Electronic Flight Bag (EFB)

Within the cockpit is an EFB which allows for some key functions of the aircraft to be accessed.
There is a moving VFR Map, which will show your route if set within the World Map.
The Home page allows you to view the METAR of your departure and arrival airfield.
The settings page allows you to switch the gauges between Classic and Modern cockpit. There is also an option to switch between passenger (PAX) and Cargo in the rear cabin.

Home page
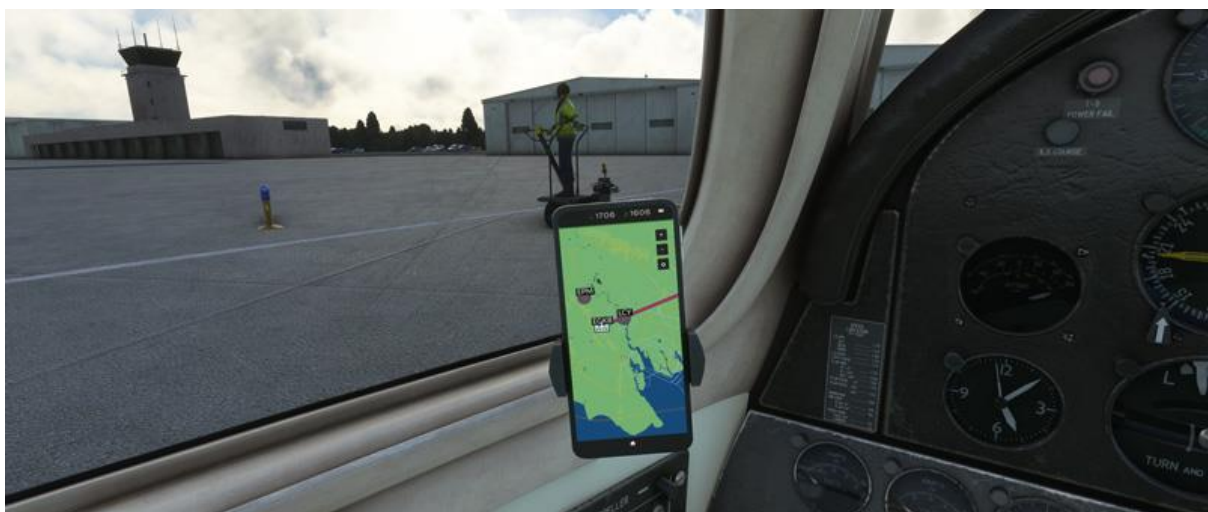
Map page

Settings page

See below for details about setting Modern/Classic cockpit and PAX/Cargo options.

Classic / Modern Cockpit

We have included an option to have classic or modern radio and transponder units to provide a unique classic cockpit experience.

Go to the Settings page and Toggle Classic or Modern which will switch the units.

Note: for the modern instruments, the two Radio switches and Invertor switch must be set to ON.

Classic Cockpit

Modern Cockpit

Radio Switches and Invertor Switch must be ON for Modern instruments to work properly.

Passenger (PAX) / Cargo

You can also switch the rear cabin area between passenger seats or cargo option, whilst still having access to the interactive elements such as the cabin door and light switch.
For the PAX option, you can also open/close the side table by clicking on the handle.

Passenger

Cargo

Test Light Functionality

On the main instrument panel, and associated panels, there are various lights that have Push-to-Test functionality.

Simply mouse click or use the controller **A** button to interact with the light to test it.

The light will illuminate for a short period and then go back to its original state.

Testing is available for the following lights:

Outer, Middle and Inner radio marker beacon lights, Captain and FO side

Gear indicators

Flap indicators

Engine Starter Indicators

Radio and Transponder Functions

There are options on the EFB Settings page for Classic or Modern cockpit which switches the radio and transponder units installed in the aircraft on the main front instrument panel. Both panels have been adapted for use in Microsoft Flight Simulator using the default ATC system.

You can either use the in-sim ATC window to change radio frequencies and SQUAWK code for the transponder automatically, or manually tune them based on instructions given by in-sim ATC or an external provider such at VATSIM or IVAO.

The navigation radios for ADF, VOR and ILS are fully functional using the gauges on the Captain and First Officer panels.

Classic Cockpit

Modern Cockpit

Please see below on how each individual unit works in-sim.

Classic Radio Panel

If using the in-sim ATC menu functions to change frequency, the radio will automatically change to the selected frequency, there is no need for interaction with the unit.

1. COM1 Frequency
2. COM2 Frequency
3. COM3 Frequency
4. NAV1 Frequency
5. COM1 Frequency Change
6. COM2 Frequency Change
7. COM3 Frequency Change

8. NAV1 Frequency Change
9. TX1/TX2 Mode
10. Audio Selection Switches
11. Volume Knob
12. NAV2 Frequency
13. Speaker On/Off Switch
14. NAV2 Frequency Change

Classic Transponder

If using the in-sim ATC menu functions to change squawk code, the transponder will automatically change to the selected code, there is no need for interaction with the unit.

1. Transponder Frequency
2. IDENT Button
3. XPDR Frequency Change Digits 1 & 2
4. XPDR Frequency Change Digits 3 & 4
5. XPDR Mode STBY / ON / ALT
6. XPDR Mode 1 / OFF / 2

WX Radar

The MU-2 features a weather radar located on the Classic Cockpit comms panel.
This will detect any anomalous weather ahead of the aircraft.

1. Gain Knob
2. INT Knob
3. OM UP / DOWN
4. Tilt Knob
5. Tilt Degrees Indicator

Modern Radio Panel

If using the in-sim ATC menu functions to change frequency, the radio will automatically change to the selected frequency, there is no need for interaction with the unit.

The modern cockpit radio panel consists of a standard GMA audio selection unit, GTX Transponder Unit and GNS radio/navigation unit.

Modern GMA345 Unit

The MU-2 features a Garmin GMA345 Audio Panel.

To select the audio mode to hear in the cockpit, select either COM1, COM2, COM3, NAV1 or NAV2.

The master volume for the radios is controlled using the left-hand volume knob.

The green light within the button indicates which audio mode is selected.

1. COM1
2. COM2
3. COM3
4. NAV1
5. NAV2

6. COM1 MIC
7. COM2 MIC
8. COM3 MIC
9. Volume Knob
All other buttons and functions are INOP.

Modern GTX Transponder Unit

The aircraft has a functional modern Transponder unit that is linked into the in-sim Air Traffic Control (ATC) that can be operated in two modes.

Automatically using the in-sim ATC window whereby the transponder will auto-tune to the frequency set by ATC, or manually tuned by the pilot which is still functional with ATC.
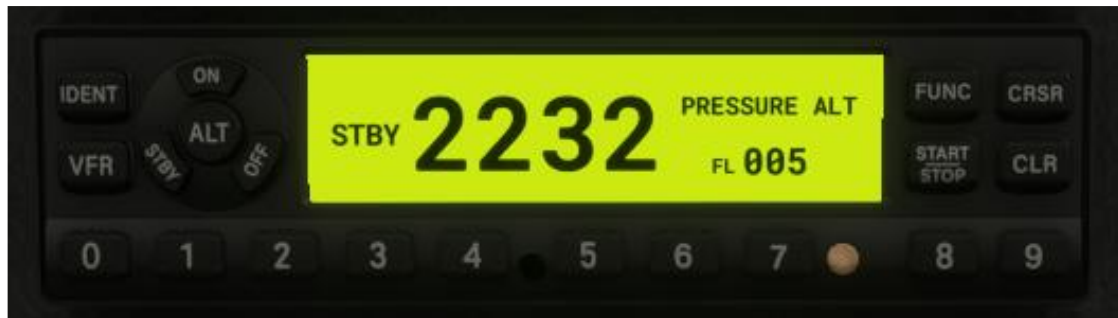
Transponder Button Functions:

IDENT: Activates IDENT for 18 seconds then shuts off

VFR : Swap between VFR code and current code

ON : Set XPDR to On Mode

STBY : Set XPDR to Standby Mode

ALT : Set XPDR to ALT Mode

OFF : Set XPDR to Off

FUNC : Changes the function section page on the right of the code characters with the following available pages:
- Current flight time
- Altitude Monitor
- Outside Air Temperature (OAT) reading and DALT level
- Flight ID
- Count up timer (start/stop/clear)
- 3 minute count down timer (start/stop/clear)

START/STOP: Starts/Stops Altitude Monitor, Count Up, Count Down and Flight timers

CRSR : Initiates starting time entry for Count Down timer and cancels code entry

CLR : Resets/Cancels data entry

0-9 buttons: Starts XPDR code entry

Both the radio and transponder are fully tied into the in-sim ATC functionality.

Either manual tuning on the units themselves or auto-tuning from the ATC panel or in-sim AI Radio Communications (ATC) works.

Modern GNS530 Audio/Nav Unit

The MU-2 has a functional GNS audio/nav unit using the standard Working Title GNS530 system.

1. COM Flip-flop
2. COM Power/Volume
3. VLOC Flip-flop
4. VLOC Volume
5. Small left knob
6. Large left knob
7. RNG (map range)
8. Direct-To
9. MENU
10. CLR (clear)
11. ENT (enter)
12. Small right knob
13. Large right knob
14. CDI
15. OBS
16. MSG (message)
17. FPL (flight plan)
18. VNAV
19. PROC (procedures)

Autopilot Control Panel

The MU-2 has a fully working autopilot system whereby the panel is located on the centre console under the trim lever.

For Track mode to work a valid route must be set in the Main Menu > World Map > Airport depart from and Arrive to.

1. AP Master Switch ON / OFF
2. INOP
3. AP Rudder Trim Indicator
4. Engage Light

5. HDG Mode (as set on the CPT HSI)
6. CAPTURE Mode (arm LOC capture mode)
7. TRACK Mode (NAV hold)

8. GS Mode (Glideslope capture)
9. ALT Mode (hold current altitude)
10. Power Indicator ON / OFF
11. Turn Knob (changes bank angle +/- 15 degrees)
12. AP Elevator Trim Indicator
13. VS selector Up / Down

The master switch toggles the autopilot on/off.

HDG button enables the HDG hold mode which is ruled by the HDG knob selector located in the CPT HSI (left knob)

CAPTURE button will arm the LOC capture mode and will capture it if available.

TRACK button toggles the nav hold mode when a VOR frequency is available and it's ruled by the CRS selector located on the CPT HSI (right knob).

GS button toggles the glideslope capture mode when an ILS frequency is available.

ALT button toggles the altitude hold mode, it will hold the current altitude when pressed.

TURN selector changes the turning bank angle to -15deg or +15deg. If centre it will level the wings.

VERTICAL SPEED selector will increase or decrease the vertical speed value, it will be active until ALT mode is activated, the pilot selects 0 ft/m or the autopilot is disengaged.

Cockpit Layout
Captain Instrument Panel

1. Airspeed Indicator
2. Attitude Direction Indicator (ADI)
3. Altimeter
4. Automatic Direction Finding (ADF)
5. Horizontal Situation Indicator (HSI)
6. Vertical Speed Indicator (VSI)
7. Outside Air Temperature (OAT)
8. Clock
9. Turn and Slip Indicators

10. Radar Altitude (RADALT)
11. Torque Pressure ENG1 &2
12. Exhaust Temp ENG1 &2
13. Fuel Flow ENG1 &2
14. RPM Percent ENG1&2
15. Oil Temp ENG1&2
16. Airway/Outer/Middle Marker Lights
17. Show/Hide Yoke

Captain Electrical and Fuel Panel
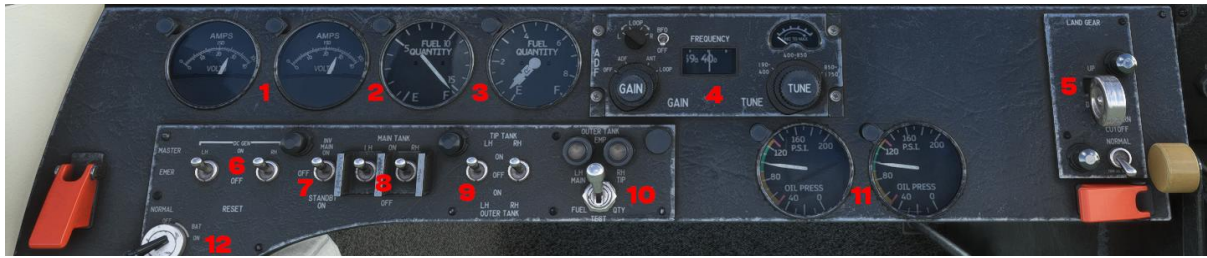
1. Amp/Volt Meters
2. Centre Tank Fuel Quantity
3. Wingtip Tanks Fuel Quantity
4. ADF Tuning Panel
5. Landing Gear Lever
6. DC Generator Switches

7. Main Invertor Switch
8. LH and RH Fuel Tank Switches
9. LH and RH Tip Tank Fuel Transfer Switches
10. Fuel Lamps Test Switch
11. Oil Pressure ENG1&2
12. Main Battery Key

Captain Radio Master Switches and EFB

1. Radio Master Switches
2. Electronic Flight Bag (EFB)

First Officer Instrument Panel

1. Airspeed Indicator
2. Attitude Direction Indicator (ADI)
3. Altimeter
4. Automatic Direction Finding (ADF)
5. Horizontal Situation Indicator (HSI)
6. Vertical Speed Indicator (VSI)
7. Hobbs Meter
8. Clock
9. Turn and Slip Indicators
10. Suction Gauge
11. Airway/Outer/Middle Marker Lights
12. Show/Hide Yoke

First Officer Air Conditioning and Cabin Pressure Panel

1. Air Conditioning Panel
2. Cabin Pressure Altitude Control
3. Cabin Differential Pressure
4. Cabin Vertical Speed Indicator (VSI)

Overhead Panel

Anti–Ice Panel (left)

1. Prop De-Icer
2. LH Engine Intake De-Icer
3. RH Engine Intake De-Icer
4. LH Pitot Heat
5. RH Pitot Heat
6. Stall Vane Heat

7. Anti-Ice Cycle Control
8. Windshield Anti-Ice
9. Windshield Wipers
10. Wing Ice-Light
11. Wing De-Icer
12. Prop De-Icer Current Load

Lighting Panel (right)

13. Pilot Flight Instrument Lights Control
14. Engine Instruments Lights Control
15. Co-Pilot Flight Instrument Lights Control
16. Panel Lights Control
17. Radio Panel Lights Control

18. Landing and Taxi Lights
19. Strobe Lights
20. NAV Lights
21. IND Lits Control
22. Beacon / Wing Taxi Lights

Throttle / Trim Panel
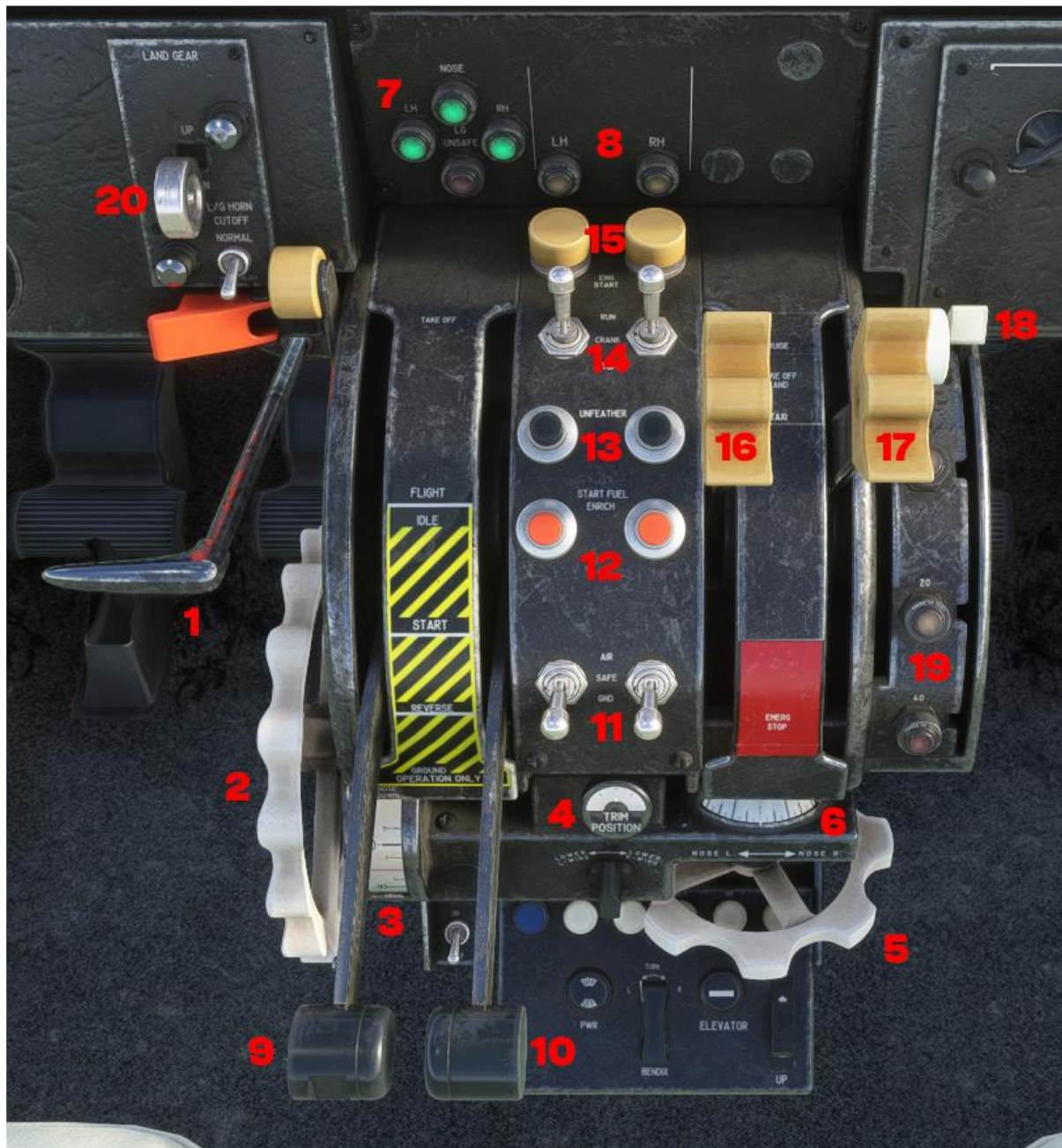
1. Parking Brake
2. Elevator Trim Wheel
3. Elevator Trim Indicator
4. Roll Trim Indicator and Switch
5. Rudder Trim Wheel
6. Rudder Trim Indicator
7. Landing Gear Indicator Lights
8. LH and RH Engine Starter Lights
9. Left Throttle Lever
10. Right Throttle Lever
11. Gearing Switches
12. Fuel Enrich Buttons
13. Unfeather Buttons
14. Engine Crank Switches
15. Engine Start Buttons
16. Left Prop Lever
17. Right Prop Lever
18. Flaps Lever
19. Flaps Indicator Lights
20. Landing Gear Lever

Rear Cabin Interaction

1. Table Open/Close
2. Cabin Light Switch
3. Cabin Door Open/Close

Operations and Techniques

This Section outlines the procedures and techniques required to operate the MU-2 safely and efficiently through all phases of flight.
Some procedures have been simplified and streamlined for single-pilot operation in a typical multi-crew aircraft.

Simplified Procedures

Preliminary Cockpit Preparation	
Captain Electrical & Fuel Panel	
BATTERY	OFF
GENERATOR SWITCHES	OFF
INVERTOR	OFF
FUEL TANK SWTICHES	OFF
Throttle / Trim Panel	
THROTTLES	OFF
PROP LEVERS	EMERG STOP
GEARING SWITCHES	OFF
CRANK SWITCHES	OFF
FLAP LEVER	0 DEGREES
GEAR LEVER	DOWN
PARKING BRAKE	SET

INIBUILDS

ENG Start Procedure

Captain Electrical & Fuel Panel	
When clear for start:	
BATTERY	ON
PARKING BRAKE	ON
Lighting Panel	
BEACON LIGHT	BEACON
Throttle / Trim Panel	
LEFT PROP LEVER	TAXI
LEFT THROTTLE LEVER	START
LEFT GEARING SWTICH	GND
ENG1 FUEL ENRICHMENT SWITCH	PRESS
ENG1 CRANK SWITCH	CRANK
ENG1 STARTER SWITCH	PRESS
Captain Electrical & Fuel Panel	
OIL PRESSURE	MONITOR >40 psi
LH MAIN FUEL TANK SWITCH	ON
Captain Instrument Panel	
FUEL FLOW	MONITOR INCREASE
RPM	MONITOR INCREASE
PROP ROTATION	CHECK FOR GOOD ROTATION
Captain Electrical & Fuel Panel	
LH GENERATOR	ON
INVERTOR	ON
Throttle / Trim Panel	
RIGHT PROP LEVER	SET UP (Upper position)
RIGHT THROTTLE LEVER	START
RIGHT GEARING SWTICH	GND

ENG2 FUEL ENRICHMENT SWITCH	PRESS
ENG2 CRANK SWITCH	CRANK
ENG2 STARTER SWITCH	PRESS
Captain Electrical & Fuel Panel	
OIL PRESSURE	MONITOR >40 psi
RH MAIN FUEL TANK SWITCH	ON
Captain Instrument Panel	
FUEL FLOW	MONITOR INCREASE
RPM	MONITOR INCREASE
PROP ROTATION	CHECK FOR GOOD ROTATION
Captain Electrical & Fuel Panel	
RH GENERATOR	ON

After ENG Start Procedure

Captain Electrical & Fuel Panel	
OIL PRESSURES	MONITOR >40 psi
Captain Instrument Panel	
OIL TEMPERATURES	CHECK WITHIN GREEN
FUEL FLOWS	CHECK WITHIN GREEN
EGT'S	CHECK WITHIN GREEN
TORQUE PRESSURES	CHECK WITHIN GREEN
Throttle / Trim Panel	
ENG1 CRANK SWITCH	AUTO-SWITCHED TO RUN
ENG1 CRANK SWITCH	AUTO-SWITCHED TO RUN
GEARING SWITCHES	AUTO-SWITCHED TO SAFE

Taxi Out Procedure	
Lighting Panel	
BEACON LIGHT	BEACON/TAXI (DOWN)
COCKPIT LIGHTS	AS REQUIRED
Throttle / Trim Panel	
PROP LEVERS	SET TO TAXI
TOE BRAKES	HOLD
PARKING BRAKE	RELEASE
THROTTLE LEVERS	BACK
TAXI	SLOWLY
USE RUDDE TO STEER	SLOWLY

Take Off Procedure	
Lighting Panel	
STROBE LIGHT	ON
NAV LIGHTS	ON
LANDING LIGHTS	ON
De-Ice Panel	
DE-ICE SWITCHES	AS REQUIRED
Throttle / Trim Panel	
TRIM	SET TO 2 DEGREES NOSE UP
FLAPS LEVER	20 DEGREES
PROP LEVERS	SET TO TAKE OFF
PARKING BRAKE	RELEASE
THROTTLE LEVERS	SET TO TAKE OFF
ROTATE SPEED	115 KNOTS
PULL BACK YOKE	SLOWLY

Climb Procedure	
Throttle / Trim Panel	
GEAR LEVER	UP
FLAPS LEVER	UP
Captain Instrument Panel	
TORQUE PRESSURE	MAINTAIN 45-50 PSI
BEST CLIMB SPEED	150 KNOTS
Lighting Panel	
BEACON LIGHT	BEACON (UP)
LANDING LIGHTS	OFF AND RETRACTED AS REQUIRED

Cruise Procedure	
Throttle / Trim Panel	
PROP LEVERS	SET TO CRUISE
THROTTLE	AS REQUIRED
Lighting Panel	
LANDING LIGHTS	OFF AS REQUIRED
General	
TRIM	AS REQUIRED
BEST CRUISE SPEED	205 KNOTS

Landing Procedure	
Lighting Panel	
LANDING LIGHTS	ON
BEACON	BEACON/TAXI (DOWN)
Throttle / Trim Panel	
PROP LEVERS	SET TO TAKE OFF
FLAPS	40 FULLY DOWN
THROTTLE LEVERS	AS REQUIRED
LANDING GEAR	DOWN
SPEED – APPROACH	MAINTAIN 150 KNOTS
TRIM	SET NOSE UP 4 DEGREES
SPEED - TOUCH DOWN	125 KNOTS
THRUST REVERSERS	AS REQUIRED
BRAKE	GENTLY

After Landing & Taxi Back Procedure	
Lighting Panel	
LANDING LIGHTS	OFF
BEACON LIGHT	BEACON/TAXI (DOWN)
NAV LIGHTS	OFF
STROBE LIGHT	OFF
Throttle / Trim Panel	
FLAPS	UP
PROP LEVERS	SET TO TAXI
THROTTLE LEVERS	BACK
TAXI	SLOWLY
USE RUDDER TO STEER	SLOWLY
MANAGE THROTTLES	AS REQUIRED SLOWLY

Parking Procedure

Lighting Panel	
BEACON LIGHT	BEACON (UP)
Throttle / Trim Panel	
PARKING BRAKE	ON
PROP LEVERS	SET TO TAKE OFF
THROTTLE LEVERS	SET TO START
FUEL TANK SWITCHES	BOTH TO OFF
CRANK SWITCHES	SET TO STOP
GEARING SWITCHES	SET TO SAFE
PROPS	CHECK ROTATION HAS STOPPED
Lighting Panel	
COCKPIT LIGHTS	OFF AS REQUIRED
Captain Electrical & Fuel Panel	
INVERTOR	OFF
GENERATOR SWITCHES	OFF
BATTERY	OFF