Miltech Simulations MV-22B Tiltrotor

Normal Procedures

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

Sim Operation Remarks

1. MSFS Sets the starting flight mode based on the type of starting location for the flight:
2. Hangar: Cold and Dark/Blades Folded
3. Parking: Cold and Dark
4. Taxiway: Ready to Fly
5. Runway: Ready to Fly
6. Flying: Ready to Fly
7. Flights starting from Miltech's Carrier products (LHA-6 America, USS George Bush CVN-77 or LPD-22 San Diego) may have the option to start on the "Runway" (ready to fly) or on the "Parking" (Cold and Dark). This must be selected at the time of starting the flight.
8. All flight plans are to be created using the built-in MSFS Flight Map before starting the flight. CDU Input is not available.
9. Fuel and payloads are to be changed through the built-in MSFS Menu. Range and Endurance are calculated automatically based on these numbers.
10. By default, the aircraft always starts in "Hard" Flight Mode. Under this mode, the aircraft is prone to Vertex Ring State and Engine Limitations that the pilot must take care of for a successful flight. Flight mode can be switched to "Easy" through the CDU to deactivate VRS and Limitations.

Pre-Start

1. Landing Gear - Down
2. Flaps - AUTO
3. Displays - OFF
4. Fire Suppression T Handle - Both NORM
5. Rotor Brake - OFF
6. Engine Control Levers - Both OFF
7. APU - STOP
8. Primary Cockpit Lights - OFF
9. Emergency Egress - OFF
10. Secondary Cockpit Lighting - OFF
11. Cargo Hook Hoist Mode - OFF
12. Fuel Dump - OFF
13. Emergency Oxygen - OFF

14. Blade Unfold and Wing Unstow Procedure - As required, see Blade Fold/Unfold and Wing Stow (BFWS) Procedures

Power Startup

1. Battery - ON
2. APU - RUN/ENG check APU display is RUN
3. Turn ON ALL PFD/MFD/CDU Displays
4. Exterior Lights as required
5. Interior Lights as required

Engine Startup

Start Engines:

1. Set CDU on EICAS display or set MFD on STAT-ENG display
2. Parking brake - ON
3. Rotor Brake - OFF
4. Rotor Lock - OFF
5. Fuel Quantity - CHECK
6. Nacelles - 90 Degrees
7. Check aircraft is clear from obstacles
8. Move ENG2 Control Lever to START position.
9. Proprotor - ROTATE
10. EICAS-NG - gaining % RPM after 30 sec
11. ENG2 - Wait for Np stabilize at 70-72 %
12. Switch respective Engine Control Lever - FLY
13. ENG1 - Lever to START position
14. ENG1 - Wait for Np stabilize at 70-72%
15. Switch respective Engine Control Lever - FLY

Taxi

1. Disengage APU - STOP Position
2. Engine Control Levers - Check both FLY
3. Parking Brake - OFF
4. Nacelles and Throttle as Required (minimum 60 Deg)
5. Speed under 20 Knots

Before Takeoff

1. Flaps - AUTO

2. Fuel Quantity - CHECK
3. Doors and Ramp - CLOSED
4. Decide if takeoff will be VTOL or STOL
5. VTOL - Maximum Takeoff Weight: 52.000 lbs
6. STOL - Maximum Takeoff Weight 60.000 lbs
7. Contact tower for Takeoff Clearance. Radios freqs are inputted in CDU

Takeoff - VTOL

1. Check MTOW for VTOL
2. Check take off Area- CLEAR from obstacles
3. Nacelles 87 - 92 Degrees
4. Check windspeed and direction - headwind / into the wind
5. Increase Thrust slowly and Take off VTOL - observe NG indication to avoid engine stress.
6. Establish hover at 20ft AGL

Takeoff - STOL

1. Check MTOW for STOL
2. Taxi to runway (Take-off position) and check area is CLEAR from obstacles
3. Nacelles: as required, depending on available runway. Normally: 60 to 75 degrees
4. Take off STOL - observe NG indication to avoid engine stress.

Airborne and Conversion

1. Observe aircraft attitude - LEVEL
2. Observe engine RPM% - GREEN
3. Landing Gear - UP
4. Gain speed and gradually rotate nacelles forward - observe conversion corridor indication in the PFD (Conversion)
5. Gain altitude as required
6. Above 130 knots nacelles can rotate to 0 degrees (APLN)
7. Set and activate Autopilot after CPLD turns green to ARM

Climb, Cruise and Descent

Climb

1. Navigation Course - SET
2. Default Climb Rate - 1000 Feet/min

Cruise

1. Ideal Cruise Altitude - 17,000ft

2. Ideal Cruising Indicated Airspeed - 180 KIAS

Descent

1. Default Descent Rate - 1000 Feet/min
2. Keep Indicated Airspeed under 200 KIAS

Conversion

1. Max Speed for Conversion: 200 KCAS (see the Conversion Corridor Figure Performance and Limits)
2. Ideal Conversion: 150-170 KCAS at 5000ft (Radio Altimeter)
3. **Limit Nacelles to <75 Degrees until 40 KCAS is reached (follow Conversion Corridor)**
4. **At Nacelle Angle >75 Degrees, beware of rate of descent is NO MORE than 1500ft/min.** Otherwise, the risk of Vortex Ring State is high.
5. If VRS occurs, move nacelles down and gain airspeed to retain lift, if altitude permits.

NOTE: From 180 KCAS to 0 KCAS/Hover, conversion requires around 1800 meters in length. Distance requires varies depending on windspeed and thrust.

Landing - VTOL

1. Observe Landing Spot is CLEAR
2. Observe wind speed and direction - head INTO the wind and avoid crosswind conditions
3. Adjust speed and Nacelle Angle
4. **Limit Nacelle Angle >75 Degrees for speeds under 40 KCAS**
5. **At Nacelle Angle >75 Degrees, beware of rate of descent is no more than 1500ft/min**
6. Landing Gear - EXTENDED
7. Flaps - AUTO
8. At 300ft AGL, level fuselage altitude and start turning Final
9. **Under 200ft AGL, descent rate must be no more than 400ft/min**
10. Move nacelles to 90deg (±5 Deg) and establish a stable a 30-40ft hover over the landing area
11. Reduce throttle slowly to lower the aircraft
12. Cut the throttle and apply breaks upon touchdown to avoid aircraft movement on the ground

Landing - STOL

1. Approach the runway as a conventional aircraft - Speed and nacelle angles as required (follow the Conversion Corridor Figure Performance and Limits)
2. Observe landing path
3. Landing Gear - EXTENDED
4. Flaps - AUTO or MANUAL as Required
5. On Final Approach
6. **Nacelles at 60 Degrees**

7. **Maintain speed between 50-80 Knots**, as required according to weight
8. **Vertical Speed as Required**
9. Land with Main Landing Gear first
10. Cut throttle, apply braking as Required
11. Increase Nacelle Angle as Required

Taxi

1. Nacelles and Throttle as Required (minimum 60 Deg)
2. Speed under 20 Knots
3. APU - As Required, RUN/ENG

Engine Shutoff

1. Throttle Control Lever - Closed/IDLE
2. Nacelles - 90 Degree
3. Parking Brake - SET
4. ENG1 and ENG2 Engine Control Levers - OFF
5. Blade Fold and Wing Stow Procedure - As Required, see Blade Fold/Unfold and Wing Stow (BFWS) Procedures

Cockpit Switchoff

1. External Lights - OFF
2. MFDs / CDU / EICAS - OFF
3. RFIS / Standby Instruments - Min Brightness
4. Cockpit Lighting - OFF
5. APU - STOP
6. BATTERY - OFF