Miltech Simulations MV-22B Tiltrotor

Important Need-to-Knows

Aircraft Flight Reality

- It is **REQUIRED** to keep Crash Detection “OFF” due to unique handling characteristics of this aircraft, especially when used with one of our carrier products.
- The aircraft does, however, include its own Flight Assist configuration, which deactivates Vortex Ring State and Engine Limitations to ease flight.
- This option can be located in the CDU/ACFT Init/MENU 3/Flight Reality.
- Please keep in mind that all flights start on the “Hardest” flight reality setting. If you desire to deactivate VRS and Limitations, you must perform this change every time you start a flight.

Proprotor Animations

- The real aircraft has a gearbox and drive shaft system connecting both engines and proprotors. This serves two purposes - the first one is syncing the rotation of both proprotors, and the second is providing thrust to both props with only one engine running. This means that by starting one engine, you will see both props rotate.

Vortex Ring State

- In VTOL config (Nacelles between 80 and 97 degrees) and airspeed < 30 Knots, the aircraft will start to roll/stall uncontrollably when V/S (Vertical Speed) gets over 1500 ft/min.
- This type of stall is common in helicopters and VTOL aircraft and requires special attention from the pilot when descending in VTOL mode. This can easily be avoided by controlling the descent speed and/or airspeed (avoid the “Red area” from the V/S Indicator).



Figure: Vortex Ring State and V/S Indicator

- If you enter a Vortex Ring State at sufficient altitude, throttle up and reduce the nacelles angle to increase airspeed and gain lift. Throttling up without decreasing nacelle angle won’t do much, as the rotors are unable to provide lift when in a Vortex Ring State.
- Vortex Ring State simulation can be deactivated by switching “Flight Reality” to EASY on the CDU.

Engine Start/Stop

- Do not Start/Stop engines using the FS Auto-Start/Auto-Shutdown commands (CTRL+E / CTRL+SHIFT+F1). The complexity of this aircraft requires manual interaction with the overhead panel Starter Levels.

Lights Command "L"

- The “All Lights Toggle” command is disabled for use in this aircraft. Use the light knobs/switches on the overhead panel and CDU to turn on/off the lights. See Aircraft Systems on EICAS and Exterior Lighting.

Engine Limitations

- Engines can afford high RPM (> 98% Ng) for a maximum period of 60 seconds continuously. Any longer and the engines will be damaged and shut down.

- This simulates the real counterpart, which can stand for limited amounts of time at high RPM.
- Engine limitations can be deactivated by switching “Flight Reality” to EASY on the CDU.
- Interm Power on the PFD and FLIR will blink red if the engine is overstressing.
- To reset all failures, see Aircraft Systems on CDU / ACFT INIT Submenu

Flap Controls

- The Osprey features a unique automatic flap system. Flaps are typically in “Auto” at all times. Flaps can be, however, manually operated as well.
- To manually operate Flaps, the user must first set the Flap Lever to 0, then operate the flaps with the regular controls. See Aircraft Systems on Center Console and Flaps.

Use of the Autopilot

- It is recommended that Autopilot and autothrottle be used during APLN mode only (Nacelles at 0 degrees).
- The autopilot does work and can be used during CONV (Conversion from VTOL to APLN), but functions are limited and the behavior can be unexpected.
- The CPLD “ARM” light illuminates when Autopilot is available.

Autohover

- The Osprey features an Autohover function within the Autopilot system. Autohover only functions when radioaltimeter is between 40ft and 300ft and at stable speeds.
- The “ARM” light illuminates when Autohover is available. Autohover disengages with high wind speeds or sudden input on the controls.

Pausing the Sim

- Do not use active pause if nacelles are at a position different to 0 degrees. Active pause (keypess P) only works if the aircraft is in APLN mode.
- Pausing the sim going into the menu (keypress ESC) is fine, regardless of the angle of nacelles.
- VTOL flight requires custom-coded flight dynamics, as it is not natively supported by MSFS. Currently, the simulator pausing system does not work correctly with custom code, allowing variables to continue changing even when the simulator is paused. This ends up in an unrealistic simulator experience after resuming the flight. Note that when nacelles are at zero degrees, the custom code stops executing, and the default MSFS Flight Dynamics take control of the aircraft. Under these conditions, the simulator can be paused without affecting the aircraft behavior.

Controller Settings

- As mentioned above, it is recommended that users of this aircraft create a unique Controller Profile for it. This applies to joysticks, yokes and Xbox Controllers.
- The controller profile shall include allocating two buttons to Cowl Flap 4 Up/Down to operate the nacelles. It is recommended that you map your regular Flaps Up/Down buttons to Cowl Flap 4 Up/Down, since the Flaps of this aircraft operate automatically.
- For those using an Xbox controller, it is recommended that you dampen the input of your controllers to your liking. The aircraft is very sensitive to input, especially during CONV mode, and the Xbox controller lacks the precision required to control the aircraft effectively.

- The Osprey uses a single "throttle" axis to control both engines, which then controls both engines through the aircraft computers. Each engine cannot be controlled independently. Therefore, having a multi-axis throttle quadrant would give you problems when mapping the axis to Throttle 1/Throttle 2. The Osprey shall be controlled with a single throttle lever, which is mapped to the "Throttle" axis on MSFS

Current Limitations

The aircraft presents a few limitations on the depth of systems. Some systems have not been modeled yet or require some further development. Such systems are, for example:

- Anti-Ice and Ice detection are INOP
- AutoNACs are INOP
- Aerial Refueling is INOP, though the probe can be extended.
- Flight Planning is limited to the World Map only. CDU does not support flight planning.