



# FlyInside B-206B-3 User Manual

By FlyInside Inc.

Programming - Dan C.

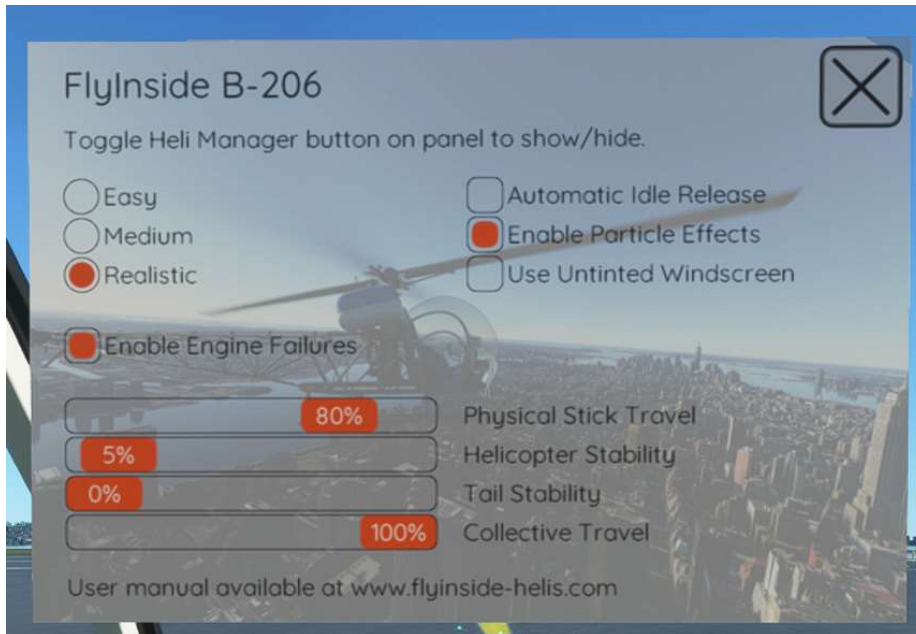
Flight Dynamics - Rick M.

Modeling & Artwork - Tony F., Hunter A.

## Marketplace Version Heli Manager

The website and Marketplace versions of the B-206 are nearly identical. They contain the same artwork, systems, customizability, and flight dynamics. The only difference is the "Heli Manager."

In the marketplace version of the B-206, the Heli Manager is built right into the cockpit, instead of running as a separate program. To dismiss it, click the "X" on the upper right corner.



To open Heli Manager again, simply flip the Heli Manager switch on the upper left of the helicopter panel.



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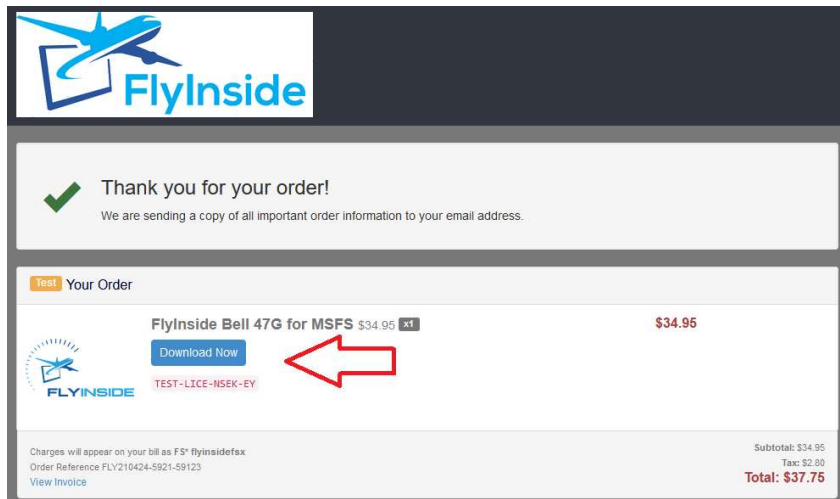
# 1. Introduction

Welcome to the FlyInside B-206. With this aircraft, we've authentically recreated a 1982 B-206B-3 JetRanger with 250-C20B turbine engine for Microsoft Flight Simulator. The 206 ships with highly realistic flight dynamics, accurate systems, and beautiful artwork. We hope that you enjoy this experience!

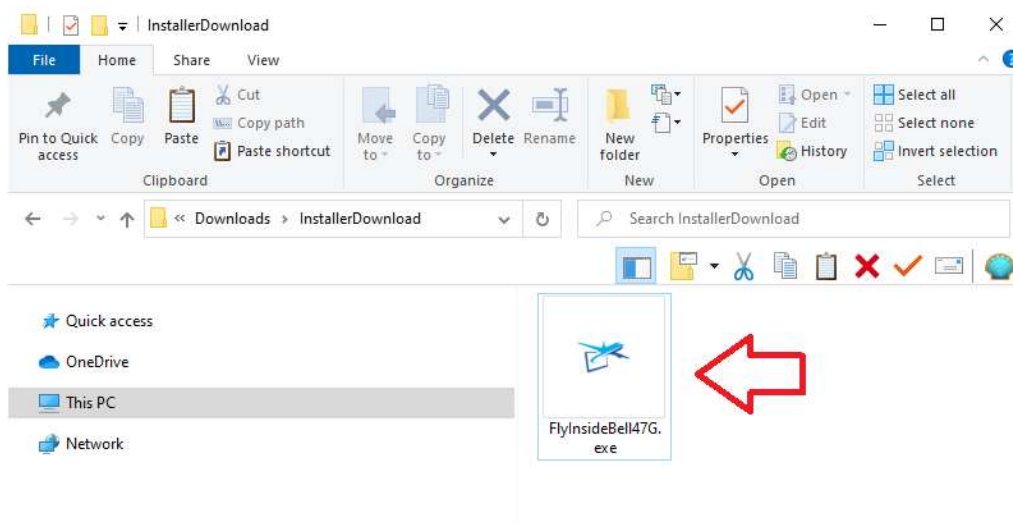
## 2. Installation and Activation

The FlyInside B-206 installs via an easy-to-use setup program. If you encounter any issues, cannot find your installer, or haven't received a license key, please contact [support@flyinside-fsx.com](mailto:support@flyinside-fsx.com)

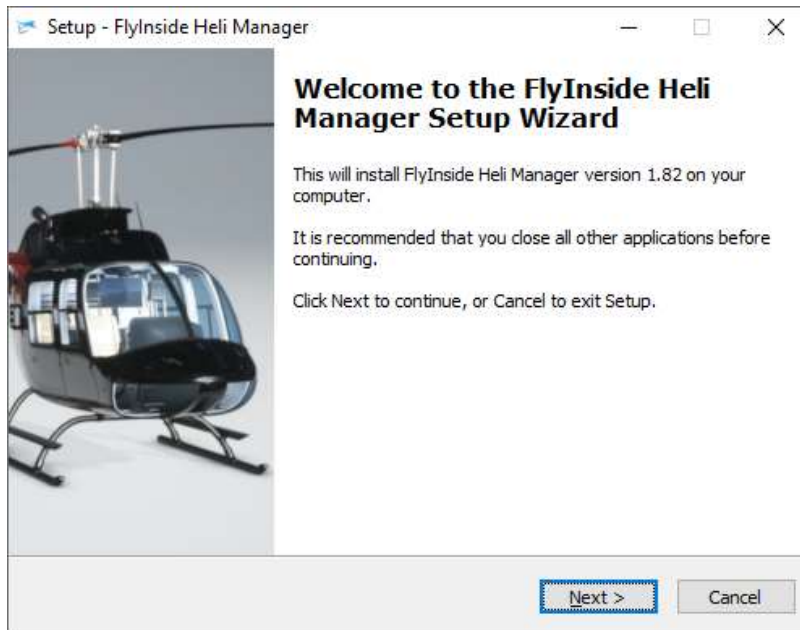
1. Download the installer via the link on your purchase receipt page



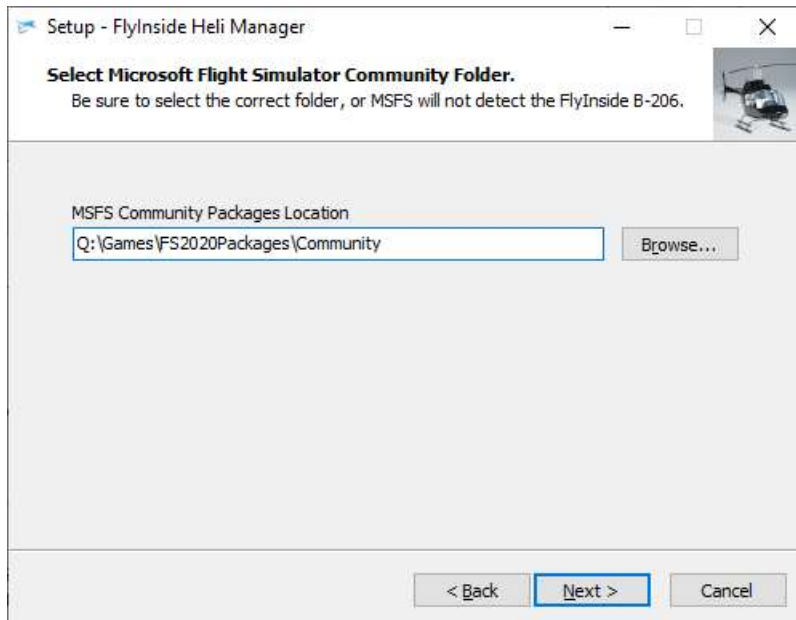
2. Double click the installer to run, and accept any prompts that appear.



3. Click through the installer

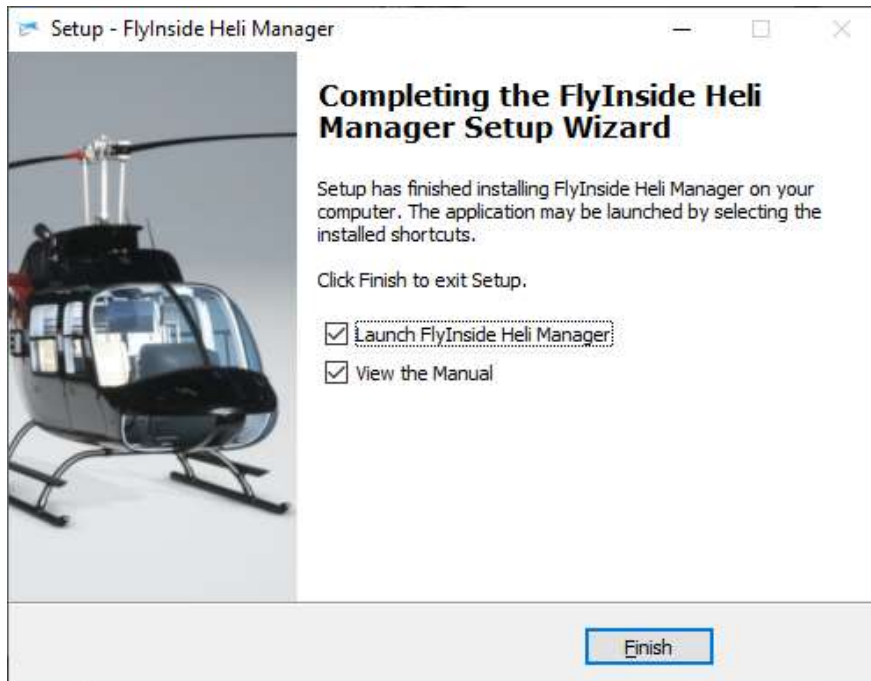


4. Double check that the installer correctly locates your MSFS Community packages folder. If this location is not correct, MSFS will not detect the aircraft.





5. After the installer completes, allow it to launch FlyInside Heli Manager.



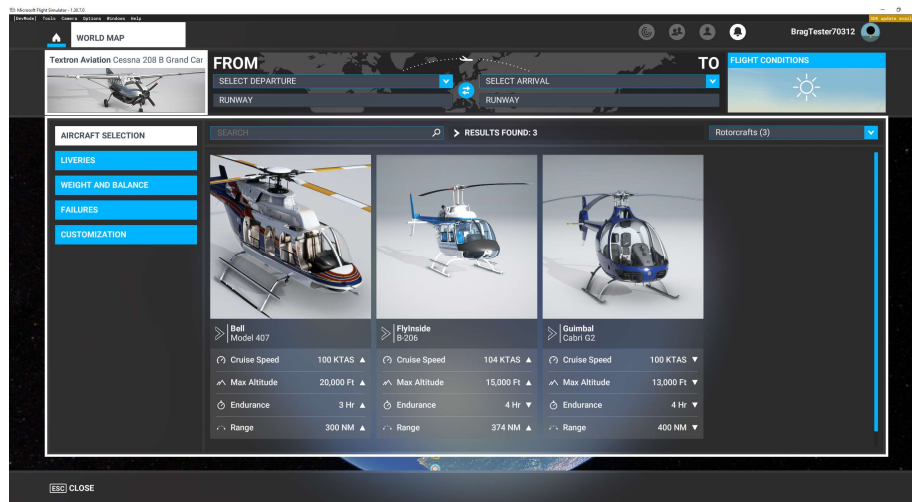
## A Note on FlyInside Heli Manager

FlyInside Heli Manager handles copyright protection for the FlyInside B-206, and allows you to customize the flight model and features as well as matching your joystick hardware to the aircraft. By default, FlyInside Heli Manager will run in the background when you turn on your computer.

FlyInside Heli Manager doesn't log any data, or call home randomly. It will communicate with our servers when you activate a license key, and occasionally to check for new versions. It's also designed to use minimum system resources; it won't affect frame-rates or heat up your CPU while running in the background.

FlyInside Heli Manager runs in the background purely for convenience, so that you won't need to launch it manually when flying our helicopters. If you prefer though, you can turn off the System Start option in Heli Manager, and launch FlyInside Heli Manager manually as needed.

6. Open Microsoft Flight Simulator, and select the FlyInside B-206 as your aircraft. Note that the B-206 will appear in the Helicopters category, choose your livery by clicking on "Liveries" in the left-hand column.

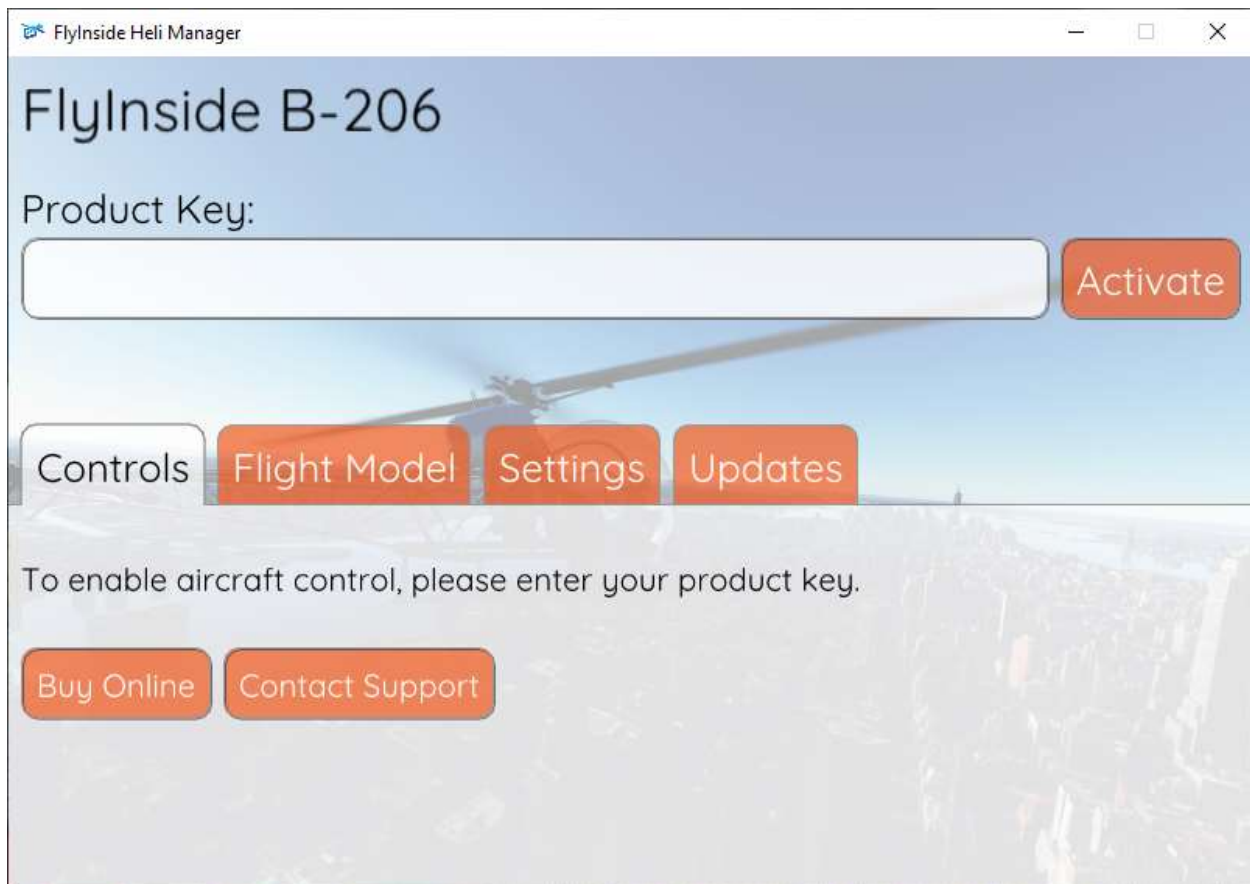


7. Select a departure airport and load a flight. The first time you load the FlyInside B-206 may take several minutes as MSFS compiles our flight-model code for your PC. Once loaded, the B-206 will have an in-cockpit message prompting you to run FlyInside Heli Manager, or to enter an activation key.



8. FlyInside Heli Manager should appear on your desktop. If not, you can click on the system tray icon (if it is running), or run "FlyInside Heli Manager" from your Start Menu.





9. You should have received a product key in your FastSpring email receipt. Enter the product key (you may use Ctrl+V to paste it), and press "Activate."

10. If you started on a runway, the rotors should start spinning up, you're ready to fly! If you selected a parking spot or helipad, you'll be cold and dark, and ready to start up and go fly!

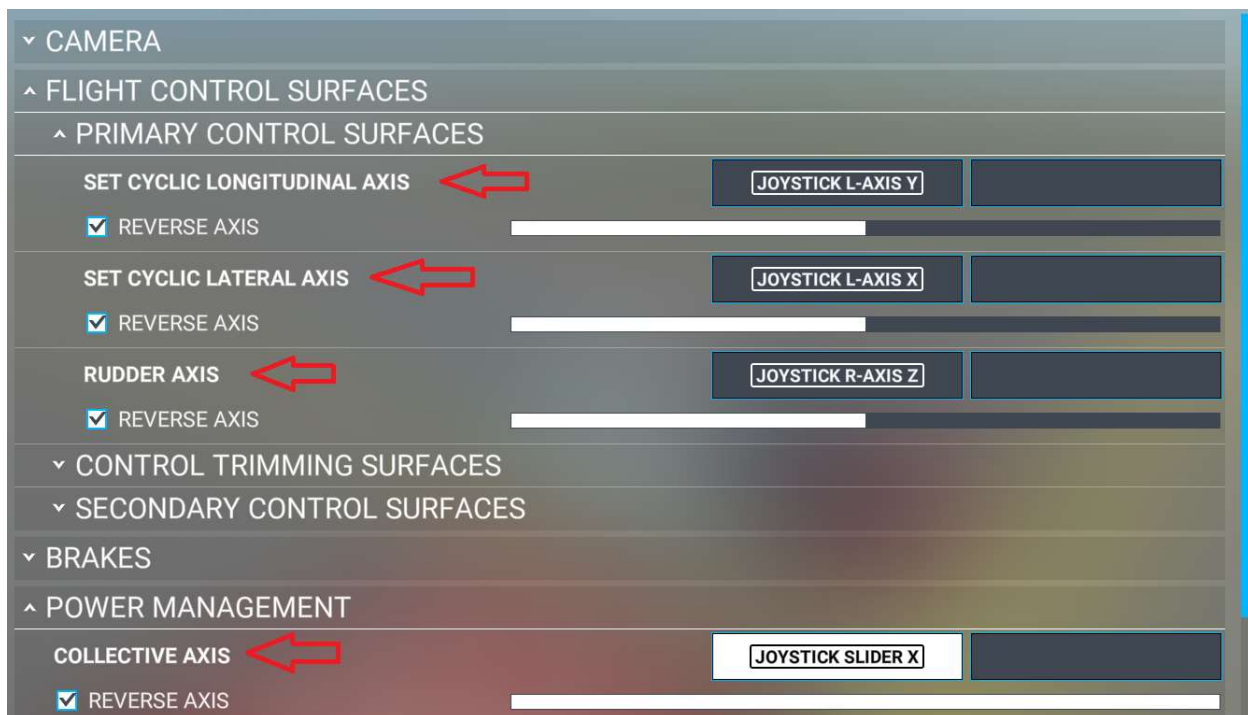
For startup, follow your checklist (in the in-game tab menu).

\*\*NOTE: See Section 6 for a complete Startup Walkthrough

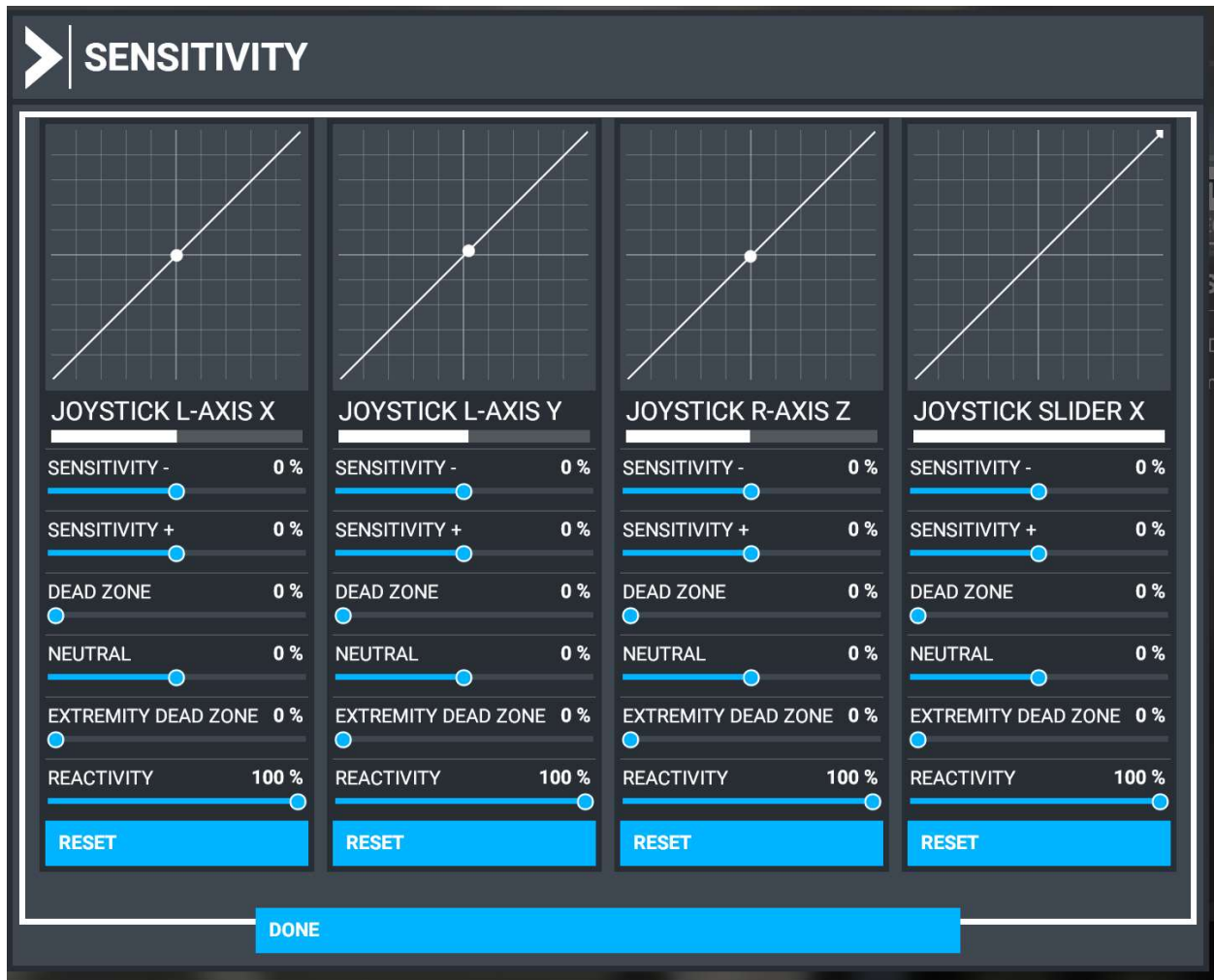
### 3. Flight Controls Setup

The FlyInside B-206 should work with your standard Microsoft Flight Simulator control bindings. At a minimum you'll need the following controls

1. Bind the joystick axis you'd like to use for cyclic roll (left/right) control to either the MSFS "Cyclic Lateral Axis" or the "Ailerons Axis"
2. Bind your cyclic pitch (fore/aft) control to the MSFS "Cyclic Longitudinal Axis" or "Elevator Axis"
3. Bind your pedals or yaw control to the MSFS "Rudder Axis"
4. Bind your collective control (or throttle paddle) to the MSFS "Collective Axis"
5. You may have to reverse some axes depending upon your hardware.



For realistic control response, you'll want to ensure that MSFS "Sensitivity" is set to 0%, 'Dead Zone' 0%, 'Neutral' 0%, 'Extremity Dead Zone' 0%, and 'Reactivity' 100%, for all axis.



## Throttle Control

For realistic startups, you'll want to bind a throttle control. The helicopter must be started with zero throttle, and then have fuel fed in when the Gas Producer (N1) reaches 15%. If you have a collective with twist grip (or another free joystick axis), you can bind the twist grip to the "Set Helicopter Throttle Axis." Otherwise, you can use keyboard/button bindings on "Increase Helicopter Throttle" and "Decrease Helicopter Throttle."

## **Misc. Bindings**

For startups, the "Set Starter 1" binding is recommended, or you may also click on the virtual starter button within the cockpit.

Bind "DECREASE COWL FLAP 3" to control the Idle Release switch when using manual Idle Release mode (see Flight Model Options for more detail).

CYCLIC LATERAL/LONGITUDINAL Force Trim bindings are supported. Though the real helicopter does not have force trim.

"INCREASE COWL FLAP 4" and "DECREASE COWL FLAP 4" – May be used to adjust the beep governor. This allows the engine to be adjusted in small increments to compensate for Density Altitude.

Most stock MSFS bindings are supported for lights, avionics, etc.

## **Mouse Click Spots**

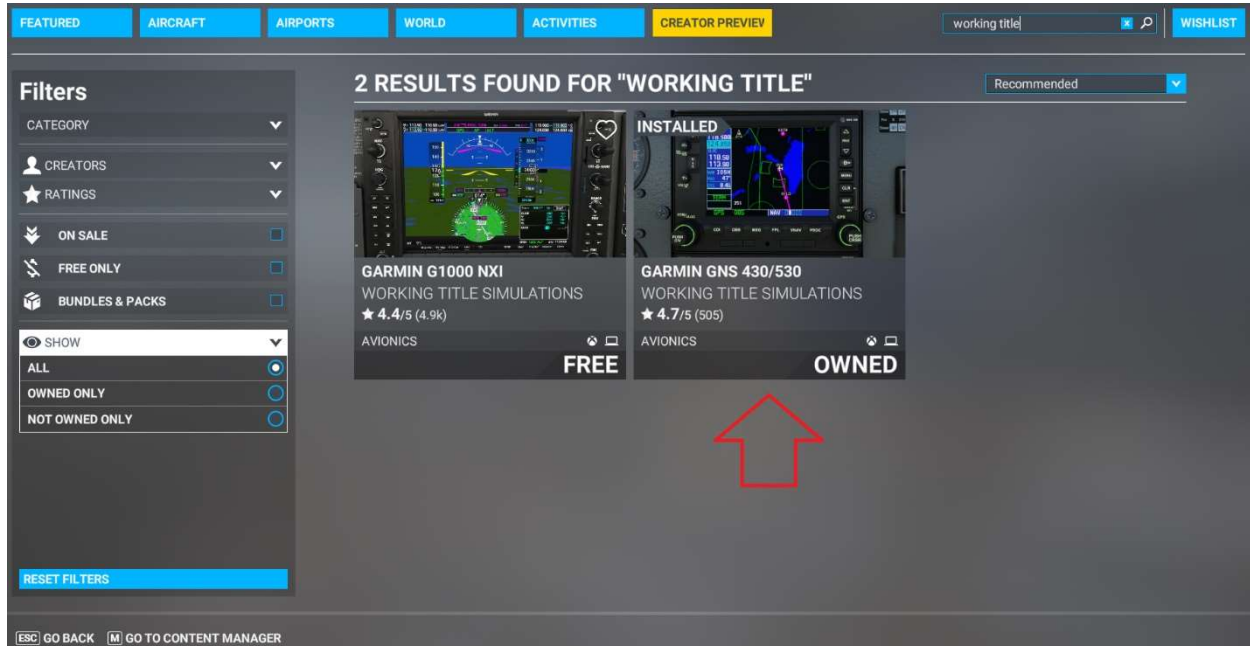
Many locations both inside and outside the aircraft are "click-able" The sliding vent windows on the cockpit crew doors open and close. The center post light is able to be turned on and off. The Headphones (individually) can be clicked to put them on and reduce cockpit noise. Doors can be opened and closed by clicking on the handles. Once outside, you can open every inspection door and cover on the aircraft. See the Engine, Transmission, Hydraulic control servos even the Oil tank. Check out the battery hatch in the nose. Open the baggage door and, of course, all the aircraft passenger doors.

## **Mechanical Animations**

Every control system is faithfully reproduced. Go ahead and move your cyclic and collective. Watch the Swashplate, Main Rotor Head and Blades react correctly. Move your pedals, watch the Tail Rotor and Delta hinge move the right way! It's all there. Even your Rotor Brake works.

## 4. GPS Installation

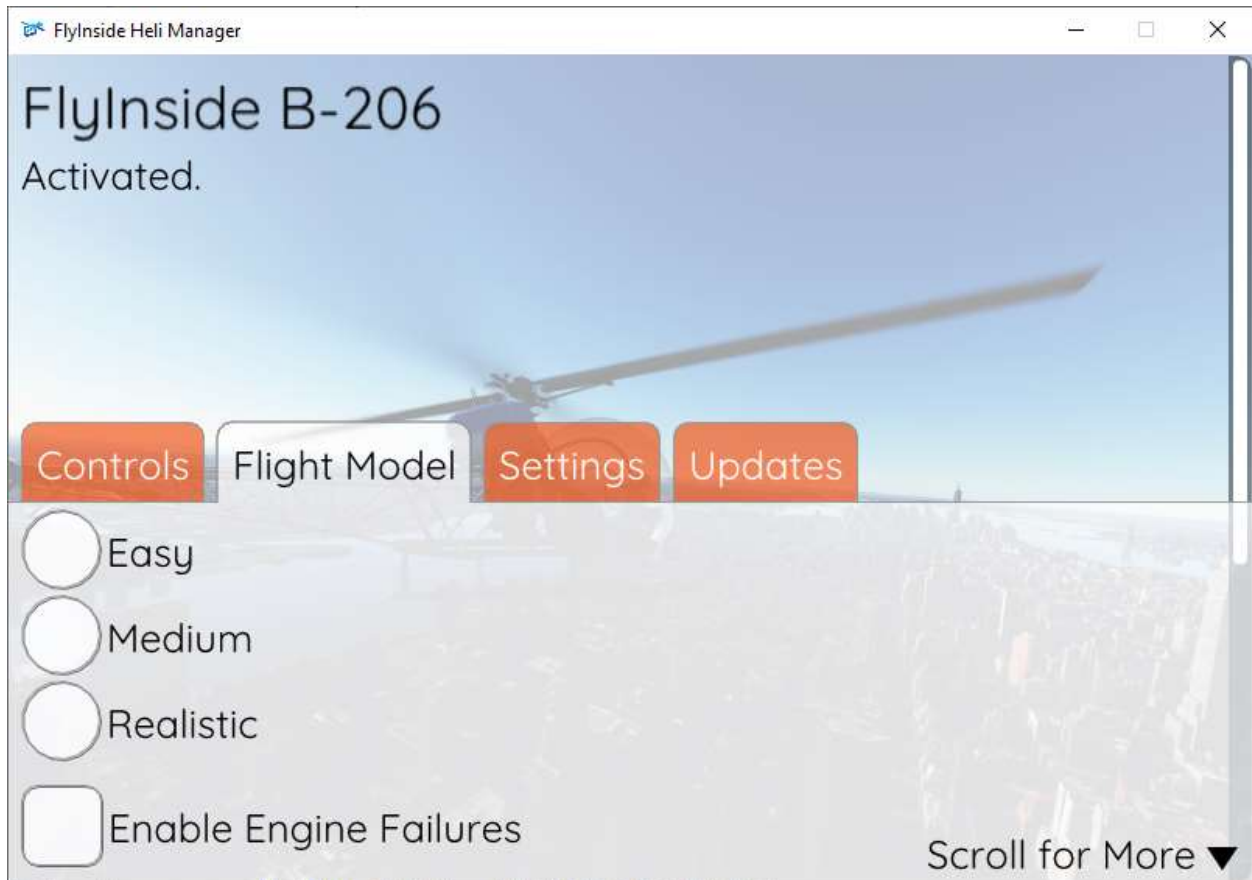
The FlyInside B-206 uses the Working Title GNS 430 to provide navigation. In order for the GPS to work, the battery must be on, the GPS circuit breaker must be in, and the Working Title 430 must be installed. If the GPS remains black when power is applied, you'll need to install the Working Title 430.



To do so, open MSFS and navigate to Marketplace. Search for Working Title, and install the free "Garmin GNS 430/530" by "Working Title Simulations"

## 5. Flight Model Options

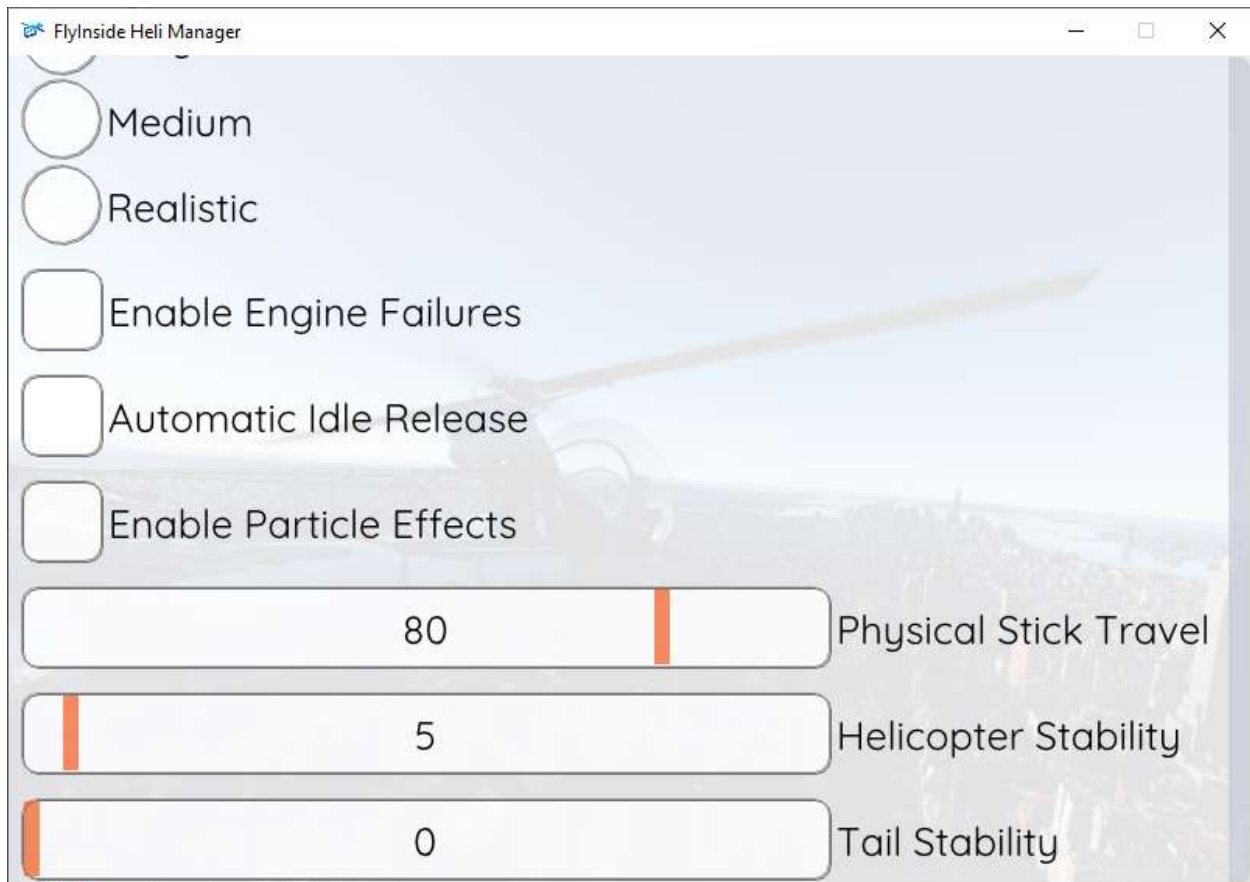
The FlyInside B-206 supports multiple realism levels and options to suit your control setup and skill level. To configure these, run FlyInside Heli Manager, and go to the Flight Model tab.



Easy, Medium, and Realistic allow you to change the flight difficulty. Realistic flies just like the real thing, requiring minute control inputs and a gentle touch. Easy is self-stabilizing, has little torque effect, and offers a gentle introduction to helicopter flight. Medium of course falls in-between.



In addition, you can scroll down to customize several settings, as well as the difficulty level.



## Failures

If you start the helicopter incorrectly (hot-start), try to pull too much torque, or over-temp the engine, it can fail. Turning off “Enable Engine Failures” will allow you to climb using your full control range without risking engine failure.

## Throttle Idle Release

The 206 throttle has an idle release switch to prevent you from accidentally shutting down the engine when moving the throttle. By default, the FlyInside 206 automates this process by popping out the idle release when you open your throttle, and popping it back in when you close the throttle.

You can also turn off “Automatic Idle Release.” In manual mode, you’ll need to manage the idle release button yourself. When you open the throttle, the idle release will pop out. If you try to close your throttle, it

will stop in the idle position. You'll need to click on the Idle Release button to then fully close the throttle and shut down the engine. You may also bind "DECREASE COWL FLAP 3" in MSFS to trigger the Idle Release button.

## **Detailed Flight Model Options**

Physical Stick Travel adjusts your Joystick hardware to match the Artwork (and the Flight Model) in the aircraft. For the most realistic control feel and accuracy, use the slider so that the virtual aircraft cyclic travel matches your physical joystick's travel. You can then tweak it up or down to your liking.

Helicopter Stability causes the helicopter to return to an upright hover on its own. In real life, (and on Realistic mode), a helicopter is not self-stable. If you don't constantly correct, it can eventually tip over in any direction. Stability prevents this, meaning you'll need to hold the joystick forward to keep the helicopter tilted forwards.

Tail Stability determines whether the helicopter is at the mercy of torque effects. In Realistic, if you pull in more collective, your helicopter will spin opposite the direction of rotation, and you'll need to compensate for this with the anti-torque pedals. As you turn up tail stability, this becomes less and less prominent.

Collective Travel allows you to adjust how far the in-game collective moves in relation to your physical collective control. Note that this isn't a difficulty setting, and should normally be left at 100%. The main use is for when you have an especially sensitive collective control that you need to tone down.

If you'd like to enter a value outside of the 0-100 range (for a more sensitive cyclic, for example), you can hold the CTRL key and click on any of the sliders. The slider will then let you type any value you'd like into it. Note that excessive values will cause poor flight behavior.

## 6. Helicopter Flight

If you've only flown helicopters in video games before, you'll find the FlyInside B-206 a real challenge. You may want to start on Easy or Medium, and work your way up as you become more comfortable and experienced. You may also start on realistic, and adjust the stability sliders to your liking.

Although the 206 has a powerful turbine engine, pulling too much collective/torque can still damage it. Helicopters can hover, however, they don't normally climb vertically, except close to the ground during take-off and landing. You'll almost never see them climb straight up.

When pulling up into a hover, pay close attention to the attitude of the helicopter. Correct for any tilt or yaw with cyclic and pedals before lift-off. Depending upon your current weight and balance, the helicopter will become "light on the skids" before liftoff. Use that to level the aircraft before you leave the ground.

As such, be gentle on the collective, and once in a hover, in order to take off, gain a little forward speed. As you gain speed the efficiency of the rotor disk increases, and you'll be able to climb out more quickly.

Keep an eye on the torque gauge and the TOT gauge. There are redlines, the maximum engine power you can safely operate at. If you're pulling more power than this, you can cook the engine and experience in-flight engine failure! At lower altitudes you'll find yourself torque limited (even if the engine can make the power, you could break or damage parts). At higher altitudes you'll instead be temperature limited.

The 250-C20B turbine in the 206 is limited to 85% maximum continuous torque. Be very careful exceeding these limits.

At high power settings, the torque may start to override pedal authority in a hover. If you want to turn left, and the helicopter won't let you, just lower the collective to reduce the power needed.

The last thing to keep in mind, is that helicopters aren't stable. If you tip the nose forward, it won't come back on its own. You'll need to pull back on the stick to pull the nose back up. In fact, different flight forces will tilt the helicopter in different directions as you speed up and slow down. You'll need to constantly correct for this. Unlike an airplane, a helicopter doesn't want to stay in place on its own. You need to keep it there.

## 7. Startup Procedure

To start the helicopter, you need air, fuel and a spark. From cold and dark you'll want to do the following:

1. Turn on the BATT switch on the overhead panel
2. Ensure the Generator switch is in the START position. The generator doubles as a starter motor, so it can either be used to spin up the engine, or generate electricity, but not do both at once.
3. Ensure that the throttle is fully closed.
4. Push both fuel pump circuit breakers in.
5. Press and **hold** the Starter button on your collective.
6. When the Gas Producer (N1) turbine reaches 15%, introduce fuel. Turn your throttle up until the idle release button on your virtual collective pops up (approximately 30%), then stop. Continue to hold the Starter Button! You'll hear light-off occur, and see temperatures (TOT) climb. Note that introducing fuel too early can lead to a hot-start and cook the engine.
7. Allow the gas producer to increase to 58% N1, at which point it will be self-sustaining. Release the starter button. Wait 1 minute to stabilize temperatures.
8. Slowly Increase throttle until gas producer (N1) reaches 70%, while keeping torque below 40%.
9. At 70% N1, set the Generator switch to the GEN position.
10. On the overhead panel, be sure that all breakers are pushed in, switches for gyros, lights, etc. are turned on.
11. Align DG to compass heading.
12. While keeping torque below 40%, slowly advance the throttle to 100%.
13. Go fly!

Note\* that this 206 does not have a dedicated avionics switch, but all avionics are wired to the GPS circuit breaker.

## **Engine Shutdown:**

1. Roll your throttle down to Ground Idle (Idle Rel Button still up)
2. Wait 2 Minutes (Use the Timer on the Clock)
3. Turn off non-essential electrical systems.
4. Watch all Gauges for Temperature reduction.
5. Press Idle Release. Rotate throttle to Cutoff.
6. Keep Cyclic Centered until Blades stop.
7. OPTIONAL: at Between 38 and 35% Rotor RPM Engage Rotor Brake.
8. Turn off any remaining systems and shut off BATT switch.





1. Clock
2. Outside Air Temperature
3. Engine Oil Press/Temp
4. Transmission Oil Press/Temp
5. Fuel Quantity
6. Electrical Load/Fuel Pressure
7. Torque
8. Turbine Outlet Temperature (TOT)
9. Gas Producer/N1
10. Radar Altimeter
11. Airspeed Indicator
12. Rotor RPM/N2
13. Secondary Nav CDI
14. Low-Rotor Alarm Silence Button
15. Attitude Indicator
16. Directional Gyro
17. Primary Nav HSI
18. Altimeter
19. Vertical Speed Indicator
20. Turn Coordinator
21. Fuel Valve Switch

\*\*Note: Below and to the right of the OAT Gauge is a small button. Use this to open Heli Manager **in the Marketplace** version.



1. COM1
2. NAV1
3. GPS
4. COM2
5. NAV2
6. Transponder
7. Caution Lights Dimmer Switch
8. Engine Anti-Ice Switch
9. Hydraulic System Switch

## 9. Failures

### 1. Engine:

The 250-C20B turbine, as installed in the 206 is a very robust and reliable powerplant, as long as you mind its' limitations. Watch the Gauges! Pulling too much power and exceeding torque/temp limits will cause failures!

Max. Continuous Torque is 85% on the Gauge. You can go Higher for short periods. 85% to 99%! Take off only 100% < 5 Minutes.

Max TOT (Turbine Outlet Temperature) 100C-738C Continuous. 738C-810C Take Off and 810C Five Minute Limit. During Startup or Shutdown MAXIMUM Limit is 927C. The "Tattletale LED" will light up if temperature is 812C-927C for 10 seconds, or above 927C for 1 second.

### 2. Airframe

The 206 airframe has some limitations to be mindful of.

Airspeed Limits - 0-130 Knots (0-150MPH) Normal Range, 130Kts (150MPH) Redline. Go much above that and you will begin to experience severe buffeting and eventually Retreating Blade Stall.

Keep some forward Airspeed during descents. If you Must do a vertical descent keep your rate below 300FPM. Failing to do that may result in VRS (Vortex Ring State) which is when you descend into your own turbulent downwash, killing your lift and entering an uncontrolled Rapid descent. You can Recover. Just decrease your Collective Pitch while moving your Cyclic either forward or laterally to get out of the disturbed column of air. It takes a fair bit of practice to do this without losing too much altitude.

Autorotations - In order to make a safe landing with an engine failure and some Tail Rotor Failures an Autorotation is necessary. The BLUE Line (100 Knots) on your Airspeed Indicator is the Max. Speed for an Autorotative Descent.

1. Reduce Collective to maintain in the Green on the RRPM Gauge (90-107%)

2. Adjust Speed for conditions (100Kts or below). Slowest Descent Rate is 52 Knots (60 MPH) Maximum Glide Range 69 Knots (80 Mph)
3. At approximately 75 feet begin flare (Rotor RPM will increase) to arrest forward motion. Simultaneously slightly raise collective, to begin slowing your descent rate.
4. Level aircraft to horizontal
5. Pull Collective pitch to cushion landing (prior to 70% RRPM)
6. Reduce Collective

This takes practice. You may "run on" or slide a bit on touchdown. This is OK.

## 10. Common Issues

### 1. My engine quit in flight

The engine will unexpectedly quit in flight for two main reasons. First, if you are pulling too much power and exceeding torque/temp limits. Secondly, if you run out of fuel (check your fuel gauge), the engine will quit.

### 2. I was descending and suddenly fell out of the sky

You most likely encountered vortex ring state, also known as settling with power. VRS occurs when you descend quickly into the turbulence created by your own downwash. To avoid this, either keep some forward airspeed in descents, or vertically descend at less than 300 fpm. You can recover from VRS if you have enough altitude by lowering the collective and going either forwards or sideways to gain airspeed.

### 3. I got a "Hot Start" pop-up

Be sure that you have the throttle rolled to cut-off (0%) when engaging the starter. Smoothly roll in fuel when N1 reaches 15%. If you add fuel at the wrong time a hot start will occur. At 15%, turn your throttle until the idle release button on your virtual collective pops up. Releasing the starter too early with fuel added will also melt the engine.

#### **4. I got a “Rotor Overspeed” pop-up**

Autorotations, as well as excessive descent rates can cause the Rotor RPM to climb above 100%. If it goes too far above the redline, a rotor failure can result.

To prevent this, avoid descents with a fully bottomed out collective. If you see RRPM climbing excessively or above the redline, raise your collective as necessary to return it to the green.

# Thank You

Thank you for reading, we hope you enjoy the FlyInside B-206!

For questions you can contact us directly at [support@flyinside-fsx.com](mailto:support@flyinside-fsx.com)

Be sure to check out our forums at <https://forum.flyinside-helis.com/>