

**DIRECT FROM
MILITARY VISUALIZATIONS INC.**

The Milviz 407



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MINIMUM REQUIRED SPECS:

THIS PRODUCT REQUIRES FSX ACCELERATION AND/OR *P3D V1.4. IT IS ALSO DESIGNED FOR NEWER SYSTEMS. MINIMUM REQUIREMENTS ARE A 2.6 CORE 2 DUO, 4 GIGS OF RAM, 512 MB VIDEO CARD (COCKPIT LIGHTING REQUIRES DX10 OR DX11 GPU) AND 1.2GB OF FREE DISK SPACE. OPTIMAL REQUIREMENTS ARE AN I7 960 CPU, 8 GB RAM, 1 GB VIDEO CARD (W/DX11 OR DX10), OR GREATER.

***NOTE: THIS PRODUCT IS NOT AUTHORIZED FOR USE IN ANY OTHER VERSION OF P3D**

¹ To obtain permission to post in the Milviz forum please send a request to: roadburner440@milviz.com

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The **Milviz 407 User Guide** is designed to cover the basic operation of this product and how it relates to the flight simulators, **FSX** and **Prepar3D v1.4**, as briefly as possible. We know that large, detailed manuals tend to be ignored by most simmers that have a limited amount of time to apply to their hobby and yet need to know the 'slim-skinny' as it were.

Those "*large, detailed manuals*" are critical nonetheless and there are many other simmers who prefer the full coverage of the **407** in detail and for them, **Milviz includes the PDF document "BHT-407-FM-1"**, found in the installer package. If you wish for a more 'certified' instruction/operation procedure of the **407**, please do refer to that document. Thank You, RP

Features included in the Milviz 407

MILVIZ 407 FEATURES INCLUDE:

⇒ **CUSTOMIZABLE 3D COCKPIT!**

⇒ **COMPATIBLE WITH RXP SYSTEM ADD-ONS!**

⇒ **INCREDIBLE SOUND ENGINEERING INSIDE AND OUT!**

⇒ **TRUE-TO-LIFE START-UP & SHUT-DOWN PROCESS, SWITCH FOR SWITCH!**

⇒ **99% CLICKABLE VC COCKPIT**

⇒ **HOTAS ASSIGNABLE FORCE TRIM BUTTON CONTROL!**

⇒ **MANY ADDITIONAL UPGRADES SOON TO COME AS FREE PATCHES**



Crew	1 pilot
Capacity	Typical seating configuration for seven consisting of pilot and passengers with five passengers in main cabin.
Max hook capacity	1200 kg (2645 lb.) ^[2]
Length	41 ft. 8 in (12.7 m)
Rotor diameter	35 ft. 0 in (10.67 m)
Height	11 ft. 8 in (3.56 m)
Disc area	962 ft ² (89 m ²)
Empty weight	2,668 lb. (1,210 kg)
Useful load	2,347 lb. (internal) (1,065 kg (internal))
Max takeoff weight	6,000 lb. (2,722 kg)
Power Plant	1× Allison 250-C47 Turboshaft, 700 shp (520 kW)
Propellers	4 blade rotor

SOME COMPONENT INFORMATION:

- **WSPS:** Wire Strike Protection System - Consists of 3 parts, an upper & lower wire guide/cutter blade and a windscreen deflection brace.
- **Frahm Damper:** A formed steel block housing 8 heavy gage springs – As the main rotors encounter in-flight convective vibrations, the block will begin to counter the vibrations by matching the frequency and effectively reducing them before they can reach the rotor shaft and ultimately, the fuselage. The **Milviz 407's** unusually smooth ride is primarily due to the **Frahm damper**.
- **FADEC Control:** This system monitors the engine and is a considerably more advanced throttle governor found on helicopters like the 206B. It's automatically implemented when the helicopter is started.
- **Force Trim:** Controls Pitch & Roll permitting the pilot a bit more comfort for long flight distances .



Installation and the Milviz ACM



Installing the **Milviz 407** is simple and no different than most other FS installations.

After you have downloaded the **MV 407** to your desktop, right-click it and select "run as administrator". A panel will open, ([figure 1](#)), and offer several options to your installation preferences.

Select the simulator version and choose **DX11** or **DX10**, (which ever one your graphics card contains). The **Milviz 407** cockpit lighting requires one or the other. However, it is completely **independent of FSX "DX10 Preview" mode**. This means you'll experience the **Milviz 407** cockpit lighting even when running FSX in the default DX9 mode!

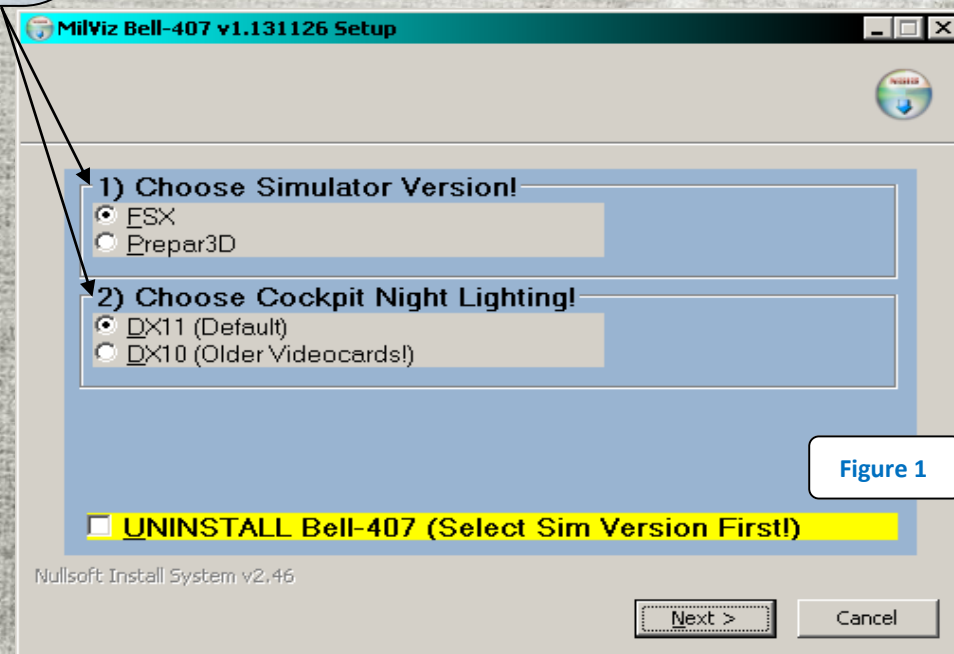


Figure 1

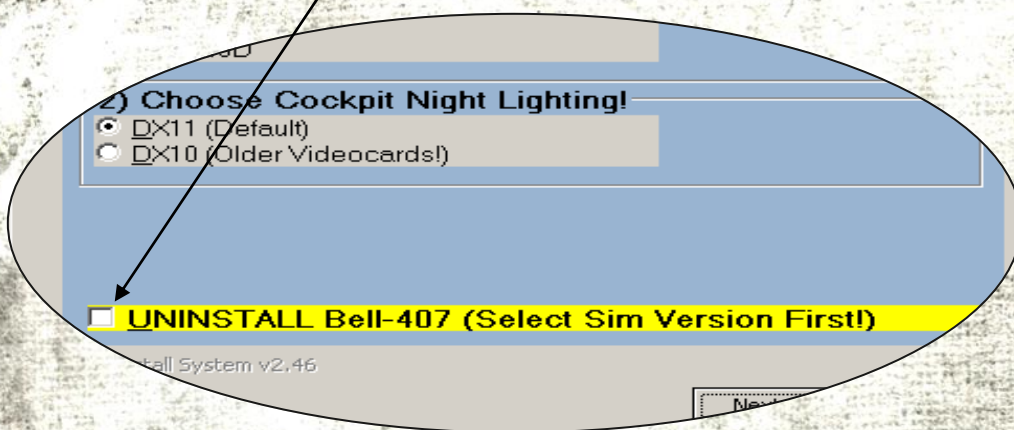
Installation and the Milviz ACM

* If you have previous versions of the 407 in both FSX and P3D, be sure to **run the UNINSTALL option for each Sim before** installing the **Milviz 407**. After receiving a confirmation that the previous versions have been removed, run the installer again, (select the target Sim and DX10/11 application as before), but of course this time, don't put a check in the uninstall option.



After the installation has been completed, you'll find a new icon on your desktop which will open the **Milviz Add-on Manager** (figure 2).

Left click on the **407 icon** and the **Milviz ACM** panel will open (figure 3, page 9 & 3B, page 13).



AT THIS POINT...

Please 'cycle through' each option at least once before opening your selected aircraft in FSX for the first time!

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We hope to reduce confusion and complications by taking a moment to be clear about the following procedure regarding the **ACM**. FSX can be particularly difficult when dealing with add-on software for the first time and especially software that opens in a particular mode that FSX may see as already active.

Simply put, FSX may not complete the preselected options of the newly installed **ACM** as they may indicate in the panel when the panel is opened for the first time after installation. You will note in the **ACM** that each livery has a number of preselected options picked by the developers. Even though these preselected options may indicate as selected, (green-lit options are active), they may not be because of the FSX installation quirks I just mentioned.

So **Milviz** asks that you turn on or turn off, (whichever the case may be), each option for each livery even if that particular option indicates a state that you wanted for that livery at the time. In other words, if the **Frahm Damper** and the **Pilot Figure** indicate as active and the Wire Cutters inactive please click each one to the opposite state and do the same for the remaining selections to that livery.

Then, if you did want the **Frahm Damper** and the **Pilot Figure** as active in that particular livery, simply click on it again to reactivate it and follow the additional instructions for the **ACM** on the following pages.

We ask that you follow this procedure for each livery at least once if it's selected to open in FSX for the first time. There is no need to do this procedure again unless of course you uninstall the **Milviz 407** from your computer and then reinstall it later.

Thanks! Now let's get on with it!



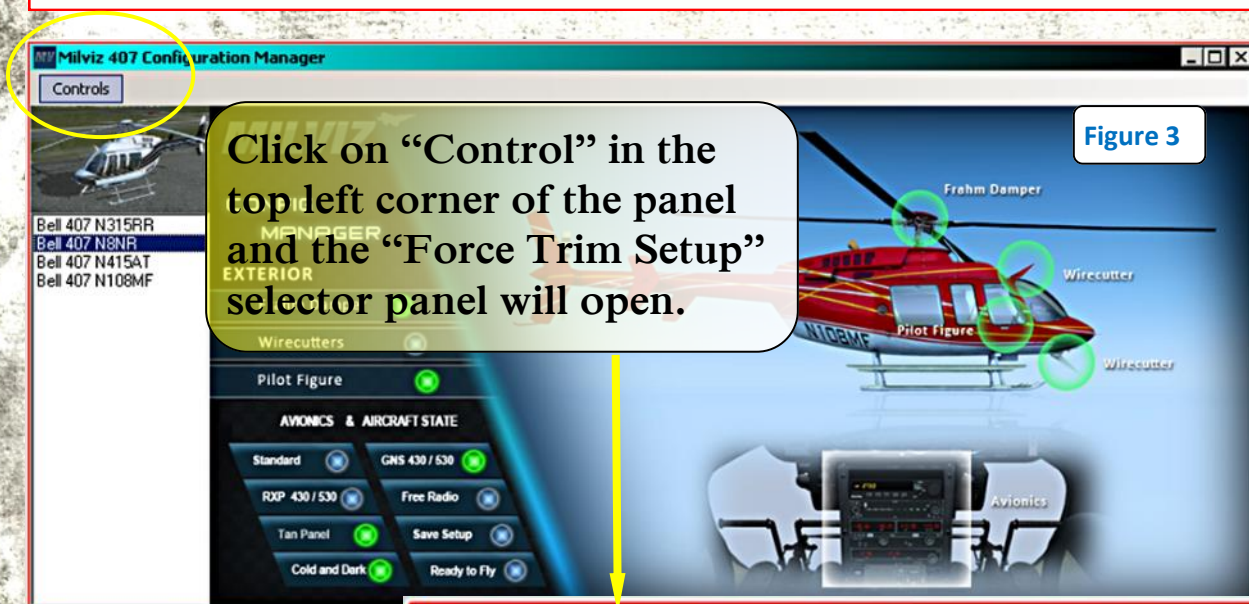
Force Trim Assignment Selection

There's a quick rundown defining and summarizing the application of **Force Trim** in the 407 on **page 12**, ("*About Force Trim*"), take a look.

The **Milviz** development team has given you the ability to assign a button on your joystick or throttle to the **Force Trim** function button on the cyclic of the **Milviz 407**, (without need to install FSUIPC, often required for special assignments).

The entire **Force Trim** button assignment **process is independent of any other actions in the ACM** panel. In other words, you can assign a button to your control and simply close the panel. The assignment will apply to each livery of the **407** automatically.

NOTE! The **Force Trim Assignment** is **NOT** a mandatory option. You can easily operate the **FT** button from within the **VC Cockpit** with a mouse click as well!



Force Trim Setup

Devices

Master Combined

Button

1

You can complete the **Force Trim** button assignment process before or after going on to setting up the additional helicopter options within the **ACM** panel.

It's the **ONLY** process where you needn't click "**Save Setup**" after making your selection and before closing the panel. However, you must click "**Save Setup**" for all other selections you make within the **ACM** panel regarding your **407** options as discussed in the **ACM** section that follows.

As shown in **figure 4**, (next page), there are 2 drop-down lists to select your controller and the buttons pertaining to that controller **providing it's connected to a USB Port**.

Force Trim Assignment Selection

The FT Panel will only reflect the **controllers connected to a USB port**. Of course, if you're not using a profiler software tool and you have many individual controller components, (throttle quadrants, rudder pedals, MFD panels, etc.), they'll likely all be reflected individually in the "Devices" drop-down list, (**figure 4**). I found the MV ACM FT button assignment tool the easiest and simplest method to use even though I always run the TARGET profiler for the Warthog controllers when I run FSX. With or without a profiler, the assignment procedure is easy and quick to use!

Note: Assigning the **Force Trim** to your controller button requires that you know your controller button ID numbers, (sometimes referred to as "DX 10 button assignments"). If you don't know or are uncertain of your controller's button ID numbers, **please see page 14** which goes over the 3 step process to easily get that information, (**very quick and simple**).

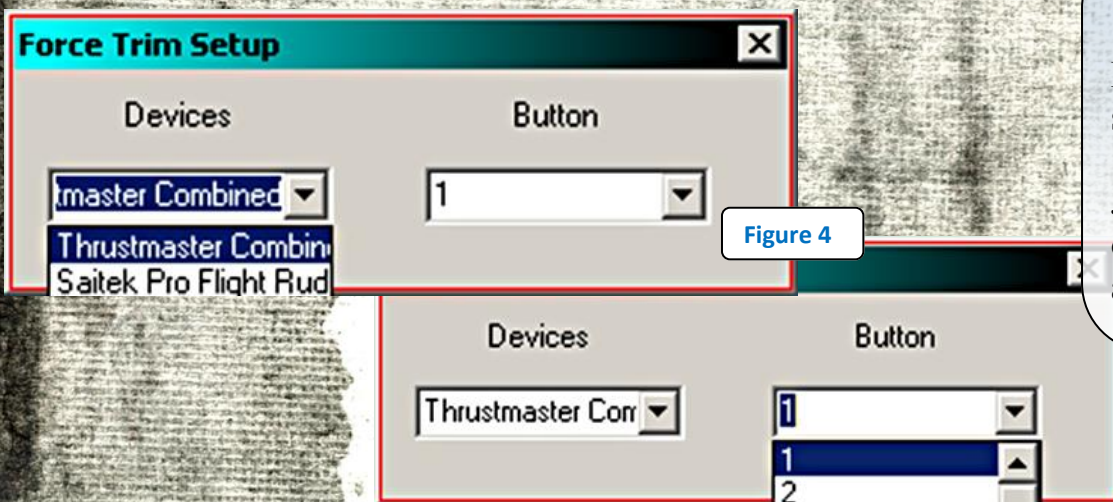
1st
Select your HOTAS controller from the "Devices" drop-down list and the controller's button number you want assigned to the Force Trim operation from the "Button" drop-down list.



2nd

Close the boxes, (no 'save' to click), and that's it! You're done and your controller will operate the Force Trim reset in the 407 each time you press the selected button.

Just be careful to assign the operation to a 'clean' button on your controller. If you already have that button assigned to something, you may get unwanted reactions.



Fine tuning Force Trim with your Controller

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Once you've pressed & released the Force Trim button your new 'cyclic position' will reset to that moment. But as it's been pointed out on **page 12**, (*About Force Trim*), the helicopter is prone to change its pitch & roll and gradually change the pitch & roll you had initially set.

That's where the Hat switch on the 407's Cyclic grip comes in; the pilot can make small input changes to the pitch & roll without having to continuously press & release the F T button. A short 'bump' of the Hat switch every so often can avoid disturbing the cyclic center established with the Force Trim button.

You can operate that function from within the **VC Cockpit** by hovering your mouse over or near the **Cyclic's Hat switch**. By rolling the mouse's center wheel forward or back the same action would be applied to the switch. Left or Right clicking the switch will do the same in the left or right direction.



However, the **Milviz developers** also give you the ability to assign the **FSX Aileron & Elevator** default keyboard commands to operate the **407's Hat switch** for fine tuning the **Force Trim** and again, without the need for **FSUIPC** to be installed*.

“Pitch Down or Up” (Elevator), -Num Pad 2 & 8 respectively-. “Bank Left or Right” (Ailerons), -Num Pad 4 & 6 respectively-. These are the FSX keyboard commands specifically tied to the **MV 407's Hat switch**. **Num Pad 5** is the centering command. Remember that it can cause problems if your Joystick's Hat switch is tied to the **View** direction commands so you may want to assign different switch/switches for handling one or the other.

*“**FSUIPC**” is a great freeware, (unregistered, base version), and important application to many Flight Sim hobbyists but not everyone has it as an add-on. As a result, they may often find themselves unable to apply a key command to their controller buttons in order to initiate an action or move a switch. Instead, they have to use their mouse and this can greatly reduce the immersion quality of the experience.

Milviz recognizes this and wanted all their customers to have the ability to 'tie' certain switches in the VC to their controller buttons making it a more convenient and immersive experience for even the most casual of FS hobbyists to enjoy. It's just one more reason to own **Milviz** products!

The Milviz 407's Force Trim isn't as advanced as say, the AFCS found in some helicopters such as the CH 53, but it does give pilots the ability to relax a bit on some of the longer flights they may encounter.

You can bet that you'll have a bad day, (or night), if you're counting on it to hold a particular preference in altitude and course because there is no feedback to the 407's systems to tell it to pitch up/down left or right should something like the winds, (among many other variables), change in any way.

Michael Baker, (one of several experienced consultants on the

Milviz 407 team), has logged many hours in various helicopters including the 407. Though his experience with **Force Trim** comes from several other models like the 204 and 205, their systems are alike and in the following excerpts, he explains the **Force Trim** of the 407 this way:

*“There is no trim adjustment or forced trim on the anti-torque system ... un-like the stick in a fixed wing airplane, the cyclic, (in helicopters like the Bell 204, 205, & 407), have no dynamic feedback. Bell's version of trim is “**Forced Trim**” and it does its job by magnetic force along the push-pull*

tubes of the cyclic controls. Once centered, (pilot chosen), any force applied feels like pushing against a spring. (The force), becomes stronger the further the stick is moved from the pre-determined center.”

He went on to explain a typical scenario in using the **Force Trim** button:

*“...most pilots don't ‘press and move’ to a new location, (they're), generally already holding the stick in the position, (they), want the new center to be. So one just momentarily presses the button to re-set the center...” – **MG Baker***



Installation and the Milviz ACM



The **Milviz 407 ACM** is a very simple and straightforward selection application. If you want your helicopter to open with a **Pilot, Frahm damper**, (vibration reduction system), **WSPS**, (Wire Strike Protection System), as well as a specific **Radio and GPS** system configuration, then all you need do is select the livery that you want these changes made to, (located in the white field on the left side), and then activate each option you want applied, (Green light means ACTIVE). Click “**Save Setup**” before moving on to the next livery!

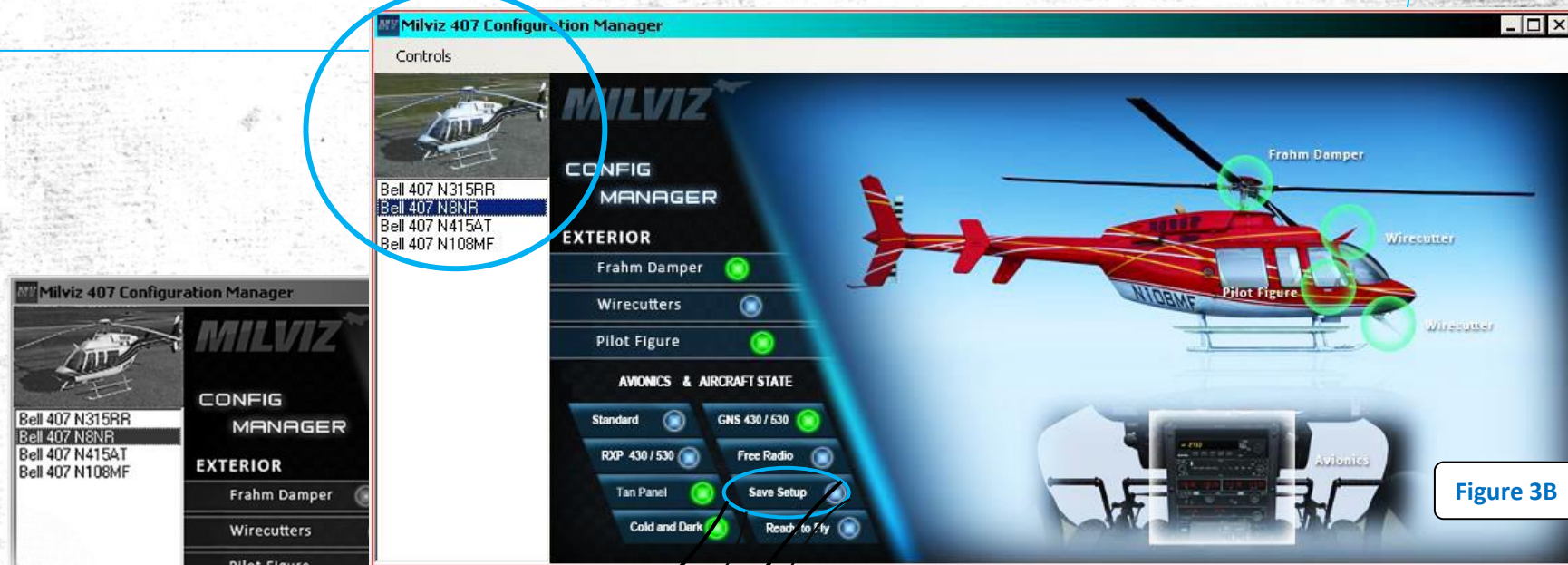


Figure 3B

Remember
click
"Save Setup"

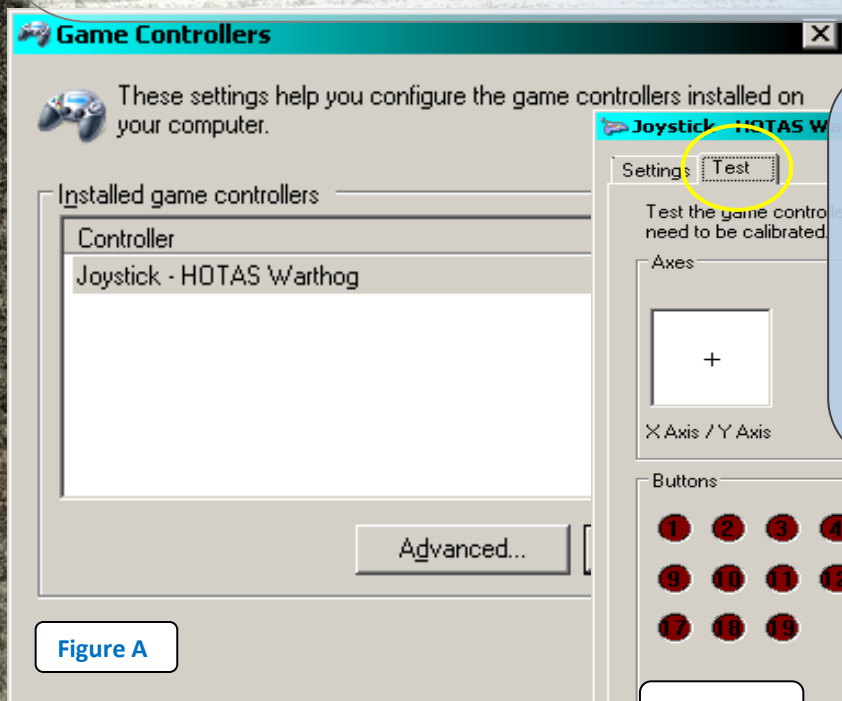
Remember to click the “**Save Setup**” when you’re done making your selections for the livery you chose. You can then continue on to a different livery to prepare or you can close the **ACM** by clicking the “**X**” on the top, right, corner which will close the entire panel and apply all your changes simultaneously. the next time the Sim is opened.

How to ID your Controller's Button Numbers

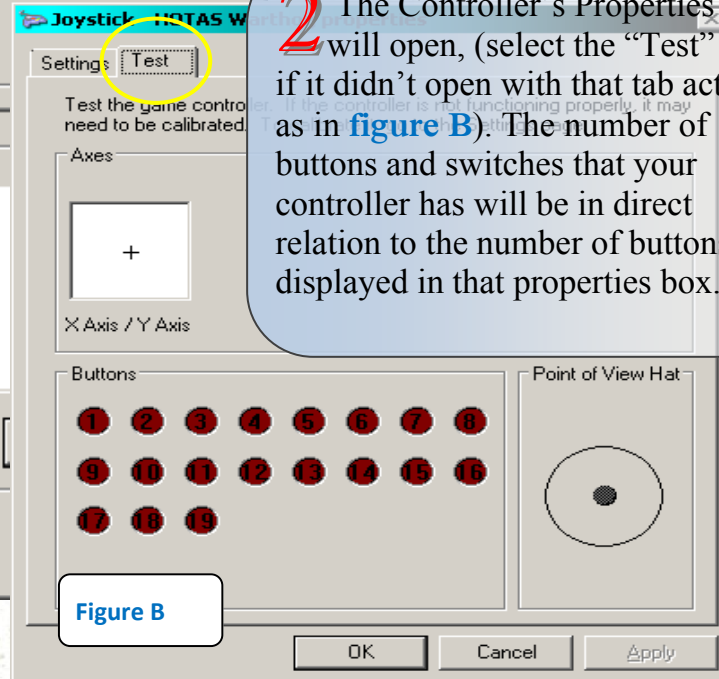
Most operating systems offer a quick way to get to your flight simulator controls for purposes like calibration and testing. They're typically found in the same location as your other devices such as printers and external hard drives.

The device will only appear when it's connected to a USB port. In Windows, you would click on "Start", select "Devices and Printers", (similar location for Mac), and then right-click on the icon of your controller.

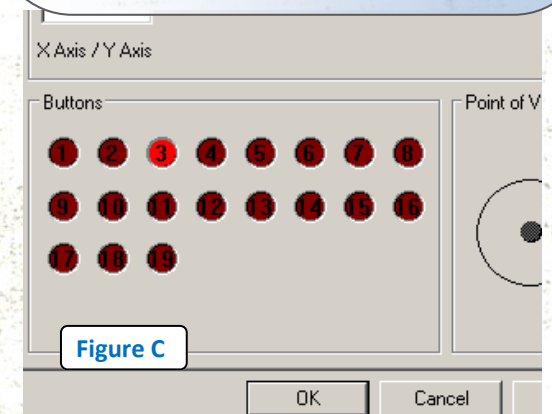
1 A box will open and from that selection click on "Game Controller Settings". If you have more than one controller connected to the computer, (such as Throttle and/or Pedals), select the controller for your assignment and then click "OK", (figure A).



2 The Controller's Properties box will open, (select the "Test" tab if it didn't open with that tab active as in figure B). The number of buttons and switches that your controller has will be in direct relation to the number of buttons displayed in that properties box.



3 Push the button or switch on your controller that you wish to Identify and the number of that button will light up on the Test box display as shown, (figure C). That number will correspond to the number in the ACM's Force Trim assignment drop-down list.



As you've seen, one of the options offered for each livery in the ACM is the selection to open the aircraft "**Ready to Fly**" or "**Cold and Dark**". Ready to Fly means exactly that and when the aircraft opens in **FSX** the rotors will be spinning. You'll likely hear a few seconds of the low RPM horn sounding off as the engine winds up, but your lighting and various engine condition applications, (Pitot, radios, etc.), are pretty much all you're left with.

A real-life startup procedure involves a series of very important checks and rechecks and even the shutdown demands focus and patients. The actual number of switches to move in order for the rotors of the 407 to begin turning are surprisingly few. Of course, no experienced pilot would start the 407 that way unless he was

in a huge hurry, (like being shot at, or at the base of a volcano about to blow... things like that).

An experienced pilot could take 10 minutes or more to get to 'lift-off status' if he's starting a chopper that hasn't been running for the last 24 hours. In fact, it's actually considerably longer if you include the mandatory, and equally important exterior pre-flight 'walk-around' procedures!

The PDF manual, "**BHT-407-FM-1**" included with the **Milviz 407** installer package, covers the startup procedure every step of the way beginning on **PDF page 43**, "**Normal Procedures**". It's actually very interesting and you immediately get a sense of just how complex of a machine this helicopter is and can see

where years of experience play a huge part.

The following startup and shutdown procedure of the **Milviz 407** is the "*real-life process*" but strictly focuses only on the steps needed to accomplish either one. It continues through the sequence without calling attention to the many important checks and re-checks, (mentioned earlier), that helicopter pilots would typically follow.

The startup procedure begins with the assumption that the helicopter was shut down properly. The only switch that *may* be set to "ON" is in the overhead panel; the Hydraulic Switch. Typically, that's a personal preference decision and can just as easily have been in the off position if the previous pilot preferred it that way at the end of the shutdown process they had completed.

Helicopter in Cold and Dark setting:

Startup Procedure

1. **Anti-collision light** switch Check/ **On** (if not on already)
2. **Hydraulic switch** Check/**On** (typically, this switch should be in the **ON** position at all times)
3. **Check the throttle is at cut off position** (click on the release button)
4. **Battery switch to On**
5. **Horn Mute button** (as needed to turn off sound alerts)
6. **Boost/XFR switches to On** (left and right)
7. **Fuel Valve Switch to On** and cover closed
8. **Collective full down**
9. **Cyclic & Pedals Centered** (cyclic centering light extinguished)
10. **Throttle to Idle** position
11. **Press and Hold Start switch** (left Click) for **approximately 1 second** and observe that the **Start and Auto Relight** annunciator lights are **illuminated**. **NOTE:** if the switch doesn't flip back to center, **LEFT click it one more time** to get it back
12. **Generator Switch to ON**
13. **Flight Instruments Switches to ON** (all 3) **NOTE:** switch the "**Dim/Bright**" toggle to the **Bright** position if you want rheostat control of the Caution Light intensity. If the Rheostat is on while the toggle is in the Dim setting, the lights will stay at the low intensity.
14. **External/Internal Lights as needed** (also Engine Anti- Ice, Pitot, etc. Switched **On** as desired)
15. **BEFORE LIFT OFF: Check that Throttle is open to the fly detent position** and that your **NR/NP gauges read 99 to 100%**. Also, confirm engine transmission and electrical instruments all within limits. Flight navigation instruments & fuel quantity are checked.



Startup & Shut Down Procedure

Many of you who have had experience with some of the latest aircraft technology, (wide-body commercial planes particularly come to mind), have heard of "Black Panel Technology". Although technically, the makers behind the 407's development don't refer to their instrument panel system as BPT, the logic behind it is the same.

You'll note that after you've started the 407 following the steps on the previous page, every light on your panel should be off if you did it right. The image on this page, (figure 5), displays exactly what you should see after your helicopter is up and running. -Of course, the 407 was in flight for that screenshot so using over 13 years of experience, I expertly covered the gages in an inconspicuous manner, (please don't ask me for the technique, it's guarded)-.

{ F.A.D.E.C. }

The 407 has a sophisticated throttle governor that's quite advanced compared to the 205 and 206 throttle governors for instance. This system is called FADEC, ("Full Authority Digital Engine Control"), and it automatically takes over during the startup procedure. From its typically automatic state, it's brought to its manual state by pressing the "FADEC Mode" button on the lower right corner of the panel.

Of course, this isn't recommended unless you're going through a special procedure that requires this mode to be changed but my point is that if the FADEC Mode light is On, the system is in a manual mode and that's typically not what you want. That goes pretty much for all the other buttons that light when their mode is changed. So remember, under typical conditions, if it's off, it's a good thing.

Some other lights may turn on during the course of your flight to indicate that a particular function is active. Most of these will illuminate on the annunciator panel in white light. You can see what these 6 particular lights refer to when you push the annunciator **Panel Light Test** button. On the other hand, if a light comes on which is not in a white illumination, give it the attention it deserves.

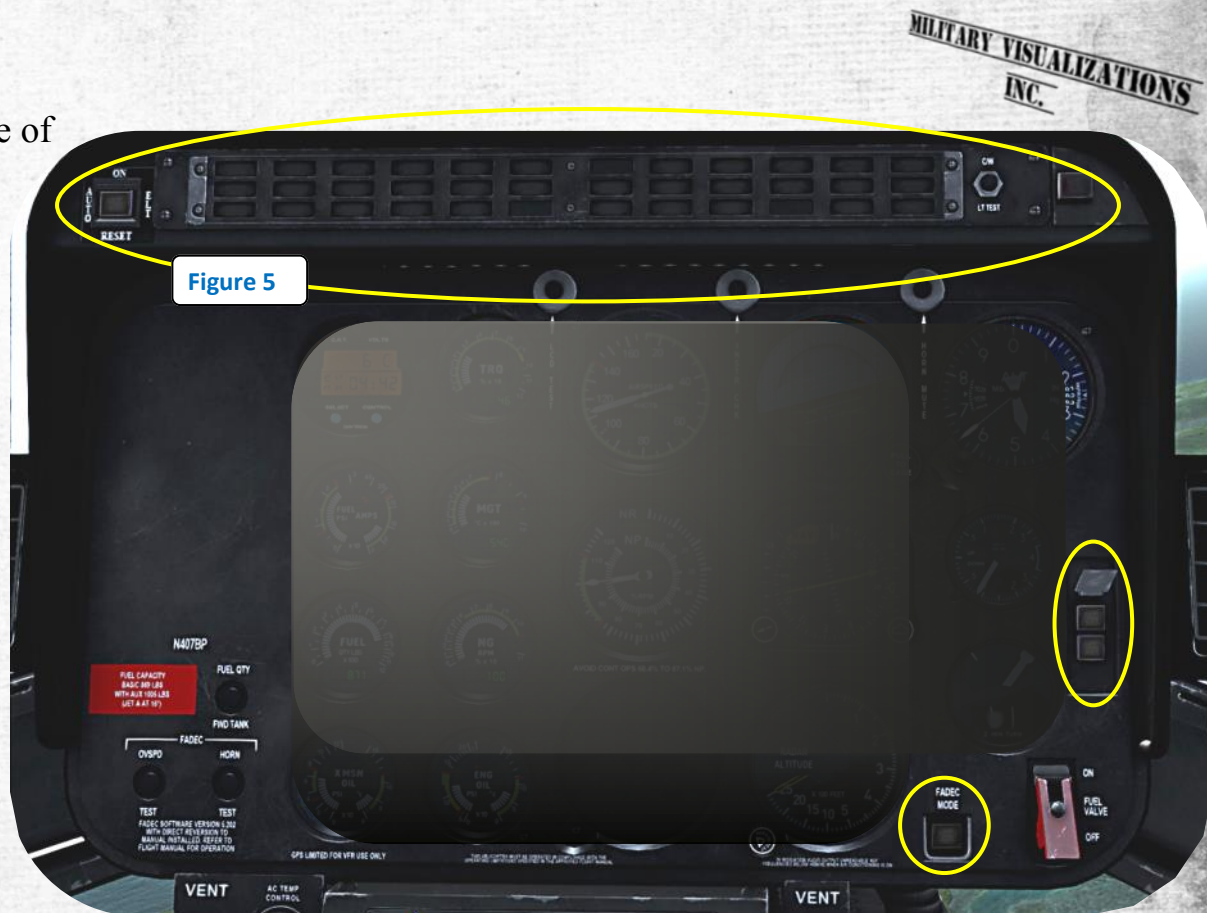


Figure 5

Shutdown Procedure

1. **Collective full down**
2. **Cyclic and Pedals centered** (Cyclic centering light extinguished)
3. **Landing Light & Nav Switches off** (Anti-Collision light switch can be left on as a personal preference)
4. **Reduce Throttle to Idle Stop** (NR/NP lights will come on at 95% or less)
5. **Horn Mute button** (due to low RPM)
6. **Monitor MGT level for 2 minutes** (should be stable at this point)
7. **Eng Ice, heaters, Pitot, etc. to OFF** (or as needed or applicable)
8. **Flight Instrument switches OFF** (all 3)
9. **Left Fuel Booster switch OFF**
10. **Avionics Master OFF**
11. **Generator Switch OFF** -Note: an Over speed test can be done at this point if wanted- (BHT-407-FM-1 page 56, step 14)
12. **Click Throttle Idle Release** button to cut off engine. (“Eng Out” light and Horn will sound at 55% NR or less)
13. **Press Horn Mute** *Note: If Horn persists, press the Horn Mute button once more **AFTER** turning off the Battery Switch*
14. **Fuel Valve Switch to OFF** *Note: the **Rotor Brake**, (activated by left clicking the handle overhead), will **only operate** when the NR has gone down to, or below, 40%. It will return to the stowed position automatically. Also, the **Rotor Brake** will not operate if the NR is less than 10%.*
15. **All remaining Overhead switches to OFF** (except for the Hydraulic Switch)
16. **Battery Switch OFF** when the NG (Gas Producer RPM), is at zero
17. **Rotor Brake** (Optional, as needed and providing the NR is 40% or lower as stated in step 14)



Included Features:

Inside and Out

Some Walk Around Perks:

Hidden click points include the Map Lamp, Rotor Brake handle, Pilot's Seat, Cyclic Grip, Door Handle release, and Fuel Cap.

