Handley Page Hampden

for X-Plane 11

USER MANUAL

Virtavia HP Hampden XP
Manual Version 1

Introduction

The Handley-Page Hampden was an aircraft that was very nearly obsolete when it went into service. One of the first British bombers to see service in World War, it carried a payload similar to the Wellington and Whitley, but was much faster and more maneuverable. It was the newest design of these three, sporting a very slender fuselage and fixed guns. It was indeed faster and more agile but the defensive armament was inadequate and was later updated. Known as the "Flying Suitcase" due to its narrow fuselage and cramped crew positions, the Hampden was nearly as fast as the Blenheim but carried 4 x the load twice as far. It was initially used in daylight raids until combat losses dictated an improvement in defensive armament as well as a switch to night ops. At night, the Hampden continued with success in raids on Germany and particiapted in the first "1,000 bomber" raid before being withdrawn in 1942.

Support

Should you experience difficulties or require extra information about the Virtavia Handley Page Hampden, please e-mail our technical support on tech.support@virtavia.com

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Exterior Model

About this model

This model is a conversion to X-Plane 11, with some improvements and additions, of the 2nd-generation Hampden exterior model made under the AlphaSim brand for FS2004 and FSX in 2006/7 and updated (FSX only) in June 2016. This X-Plane version 1.0 was released in December 2021 and is a great improvement on the original Hampden product. Whilst the exterior model and textures remain similar to the original, notable additions are the automatic leading edge slats and a completely new, highly detailed cockpit model together with a new FMOD sounds package.

The exterior model has all the usual animations such as ailerons, elevators, landing gear and flaps. The leading edge slats extend automatically at 100 kts. Additional animations on the exterior model are:

Canopy

Press shift-F1 and the pilot's canopy will slide open. Alternatively there is a handle at the top of the canopy frame inside the cockpit which will perform the same function when clicked with the mouse.

Gunner's Canopy

Pressing shift-F2 operates the rear gunner's canopy.

Crew Access

The crew hatch can be open or closed using shift-F3.

Bomb Bay Doors

The shift-F4 key press opens and closes the bomb bay. Alternatively there is a switch for this on the right side of the cockpit, at the rear.

Crew Visibility Toggle

Pressing shift-F5 will toggle the crew on and off.

Lighting

The exterior lights are turned on and off using the usual X-Plane key presses (L for landing lights, N for nav lights) or the appropriate switches in the cockpit.

Please refer to the cockpit section of this manual for information regarding light switch location.

Quick Tips

Starting from cold – Assuming the aircraft was left in the fully shut down state and all switches and levers are in their usual OFF position, then follow the quick start procedure below or alternatively follow the in-game checklist, or use the historically accurate Handley Page step-by-step starting procedure at the end of this manual.

Video showing Hampden start-up procedure : 

Check bomb doors are closed, flaps up, park brake is on (lever is on the steering yoke). Set the left & right fuel cocks on the throttles pedestal to ON (down position). Set mixture lever on the throttles pedestal to RICH (down position). Turn on both battery switches (undercarriage status lamps will light up). Set the magneto switches to ON, flip up the switchcovers at the base of the lower left side of the panel to expose the starter buttons. The button for the left engine is difficult to access due to the presence of the large aileron trim controller, so it will be necessary to lower the viewpoint temporarily using the down arrow on the keyboard. Now start each engine by pressing the starter button for the appropriate engine. Return to the normal view position by pressing the backslash key (\). The pitch of the constant speed propellers is controlled automatically and needs no input from the user, the pitch levers will be seen to move according to throttle input. Boost pressure similarly is controlled by X-Plane. Close the starter switchcovers.

Take-Off - the combination of a taildragger configuration and two large radial engines with a relatively light airframe means that getting airborne in the Hampden is not a 'go to full throttle and pull back the stick' affair. Practice will be required.

Video showing Hampden take-off procedure : 

The Hampden's take-off run is unsurprisingly quite short. The amount of payload has little effect on take-off with this aircraft, the large wing area

makes getting airborne quite easy. However it is necessary to apply a few degrees of nose-up pitch and set flaps to 1 notch (15 degrees). Release the parking brake (mounted on the steering yoke) and advance throttles gently to no more than 50% initially. Sudden input or going to full thottle will cause the aircraft to pull hard to the right, due to the gyro forces from the propellers, which is made much worse by the taildragger configuration. So be very careful with a) throttle input and b) rudder/tailwheel input, too much of either can cause you to depart the runway ! Once 40-50 kts is shown, gradually increase throttle to 75%. Once the tail has risen (about 60-70 kts), stay at 75% throttle, concentrate on staying straight, then apply back stick pressure to get off the ground. Avoid the temptation to go to full throttle before getting airborne, the aircraft will lift off at 75% just fine. Once positive climb is achieved, leave flaps at one notch and immediately dial out the nose-down pitch trim which was put in earlier, failure to do this will cause unwanted pitch-up. Only once the aircraft is airborne and pitch trim is stable is it safe to apply 100% throttle and begin to climb out. Raise flaps at 100 kts. The Hampden is a challenge to get off the ground but satisfying once it is mastered. Once speed is above 150 kts it is advisable to dial in some right wing down trim on the aileron trim wheel (lower left of panel). This will counter the constant left roll produced by the engine/propellers' rotating mass.

Autopilot

The Virtavia Hampden's 'Auto Controls' presently only allow for vertical speed control, simulating the left/right bank control proved not to be possible. The 'speed' control on the Mk.4 Auto Controls was not a modern Speed Hold function, rather it was related to the left/right bank control, the speed was entered so the bank control could work more accurately. This was not enabled on the Hampden anyway.

Briefly, (refer to the cockpit section of this manual for the locations of the autopilot parts), level off the aircraft first and make certain that the speed is below 200 kts at all times the autopilot is in use. Then click on the Auto Controls lever and the aircraft will maintain level flight. The vertical speed can then be adjusted using the rotary lever. Due to the awkward perspective of the lever, manipulation can be difficult, so it is advisable to program some keys or joystick buttons to adjust autopilot VVI. The

aircraft will slowly adjust its rate of climb/descent to suit the setting of the rotary lever. **NOTE** : do not exceed **200** kts when on autopilot, this will cause an uncontrollable pitch up motion. It's presently not certain why X-Plane does this, it is hoped that it can be resolved with a future update. The small Flight Director switch (marked 'Main Switch') is manipulatable but this not required for autopilot use.

Video showing Autopilot use : 

Approach & Landing –

Landing the Hampden is much easier than taking off.

Approach : The aircraft has no speedbrakes so merely throttling back will allow the considerable frontal drag to slow the aircraft down. Reduce speed until 150 kts is reached and you can enter the pattern.

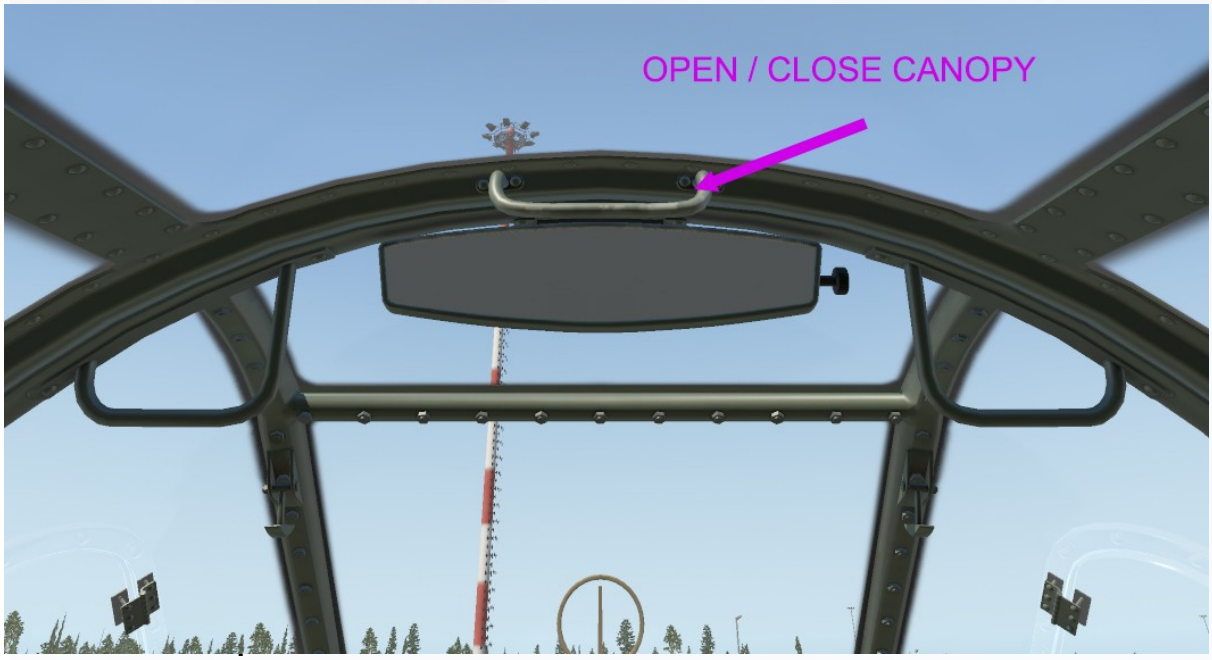
Final : Slow to 100 kts and lower the undercarriage. At 90 kts extend the flaps fully. Some light ballooning may be experienced, in this case, avoid diving to compensate, level off gradually and reduce throttle until a steady rate of descent of around 300 ft/min is achieved and speed is 80 kts. .

Landing : When the runway threshold is visible, hold speed at 80 kts. Once over the runway at 10-20 ft, cut throttles and pull the control yoke back to bleed off speed to 70 kts. Attempt to alight on all three wheels, braking hard on the Hampden can cause the nose to pitch down dangerously, so this effect is reduced if the tail is already down.

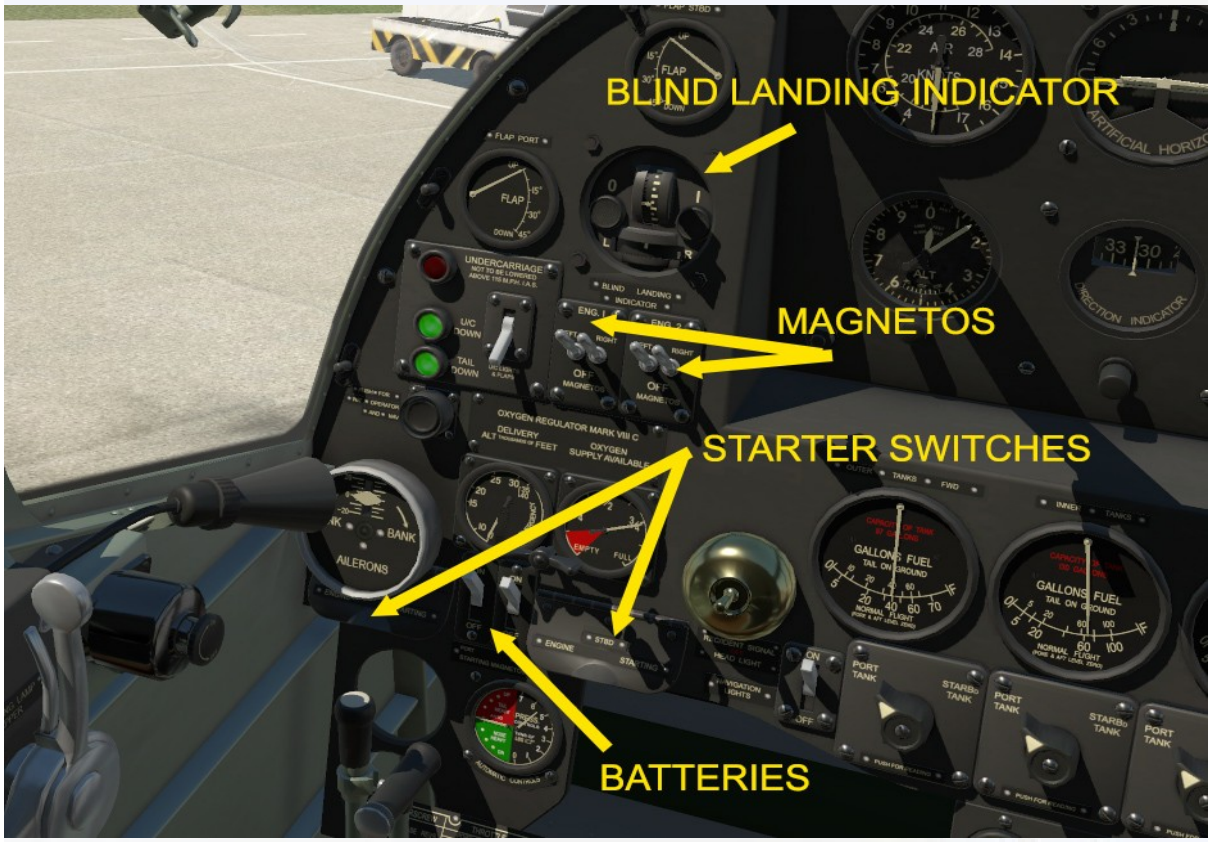
Video showing Hampden in landing configuration : 

Hampden Cockpit

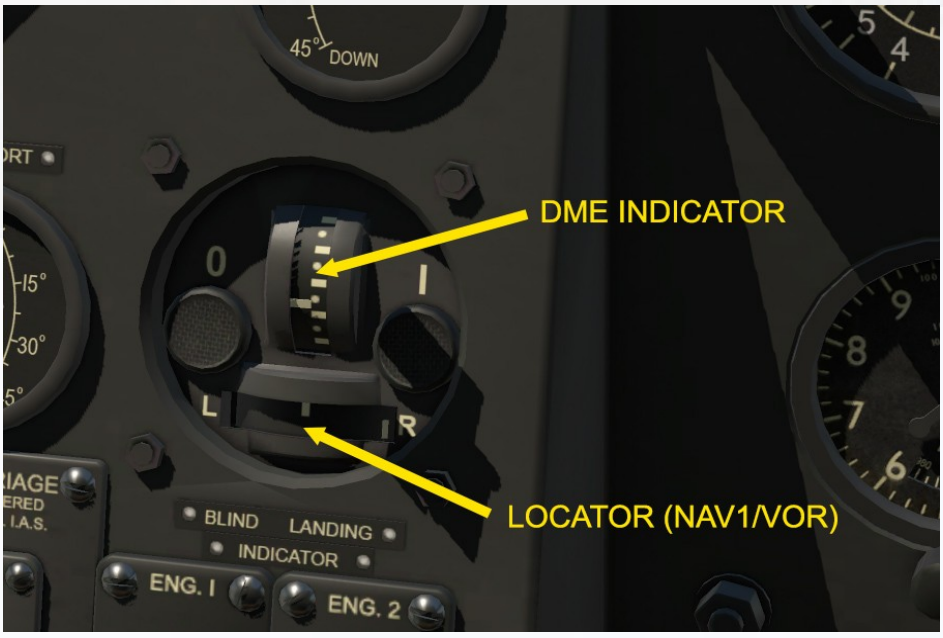
Selecting ‘View/Show Instrument Click Regions’ in X-Plane will highlight all the clickable objects in the cockpit. If View/Show Instrument Descriptions’ is enabled, then mousing over will reveal some text describing the object. Some of the more important manipulatable parts are shown below.



The left side of the panel. Most important here are the aircraft electrical controls - switches for magnetos, batteries and starter switches :



The 'Blind Landing Indicator', also know as the Lorentz Instrument is set up in this simulation as a LOC/DME indicator.

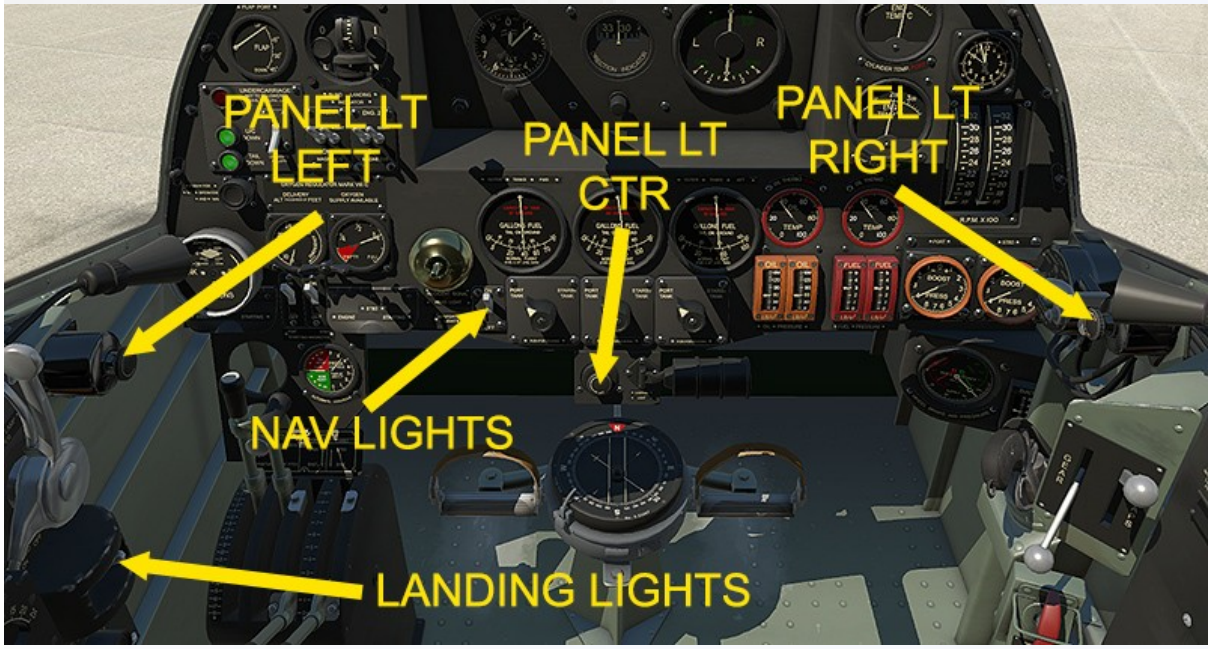


The upper instrument measures distance in nautical miles to the presently tuned NAV1 or TACAN station. The increments are 5 nm each, the needle will move downwards the closer the aircraft is to the station.

The lower instrument acts as locator needle which shows the left and right deviation from the presently tuned station. NOTE - the locator needle does not respond to TACAN, only NAV1.

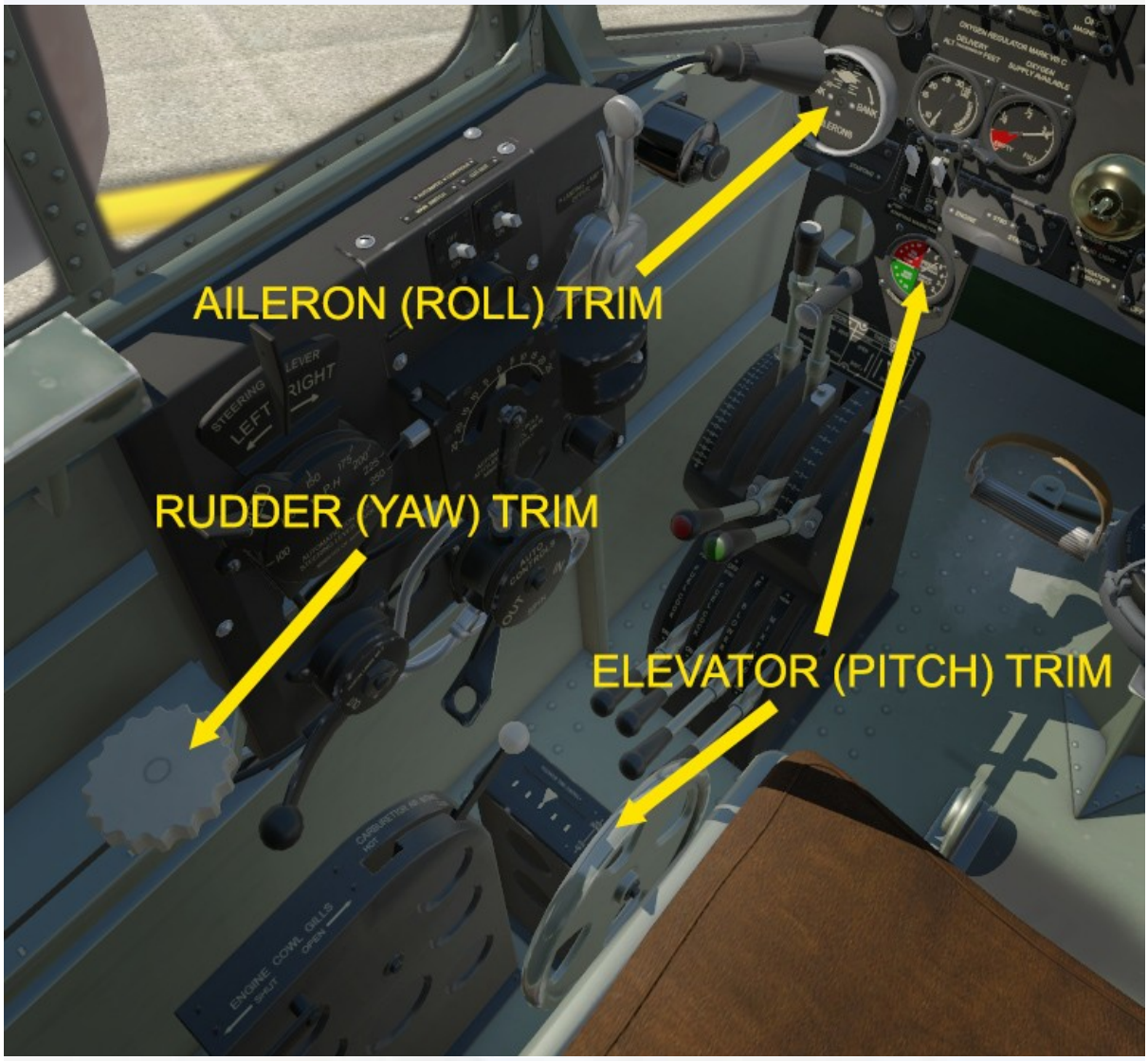
Video showing Lorentz Instrument in operation :

Here are the locations of the lights switches. The panel lighting has three separate lamps. The left and right lamps are physically modelled, the middle lamp is provided as a 'virtual lamp' to provide added illumination to the main panel, this is needed in dawn and dusk conditions but is too overwhelming in night 'black' conditions and can be left off. There is a modelled compass lamp by the P4 compass but this is not functional.



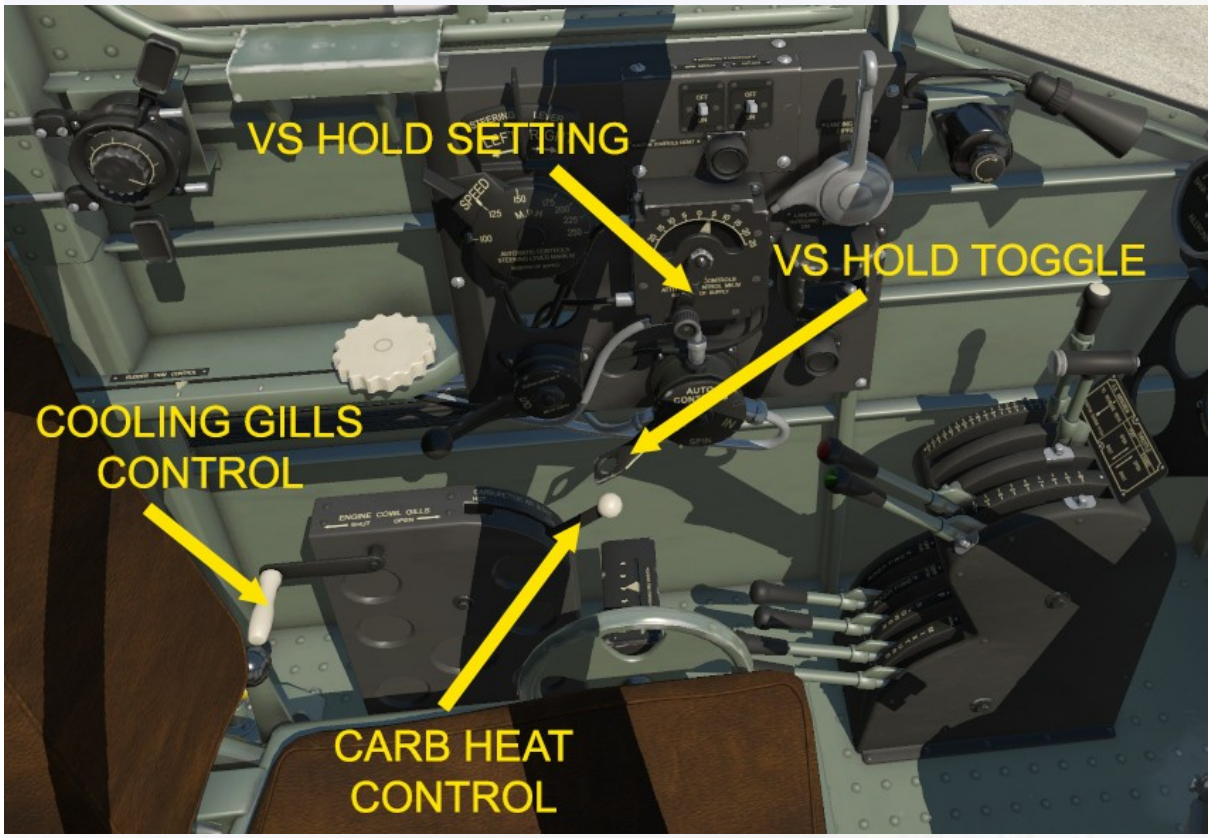
Video showing the panel lights in action :

The next image shows the three trim controls and their indicators :



The rudder and aileron trim knobs are easy to manipulate with the mouse cursor, the elevator trim wheel however is awkward to use given its orientation and position relative to the user. It is advised that the joystick buttons are used for elevator trim.

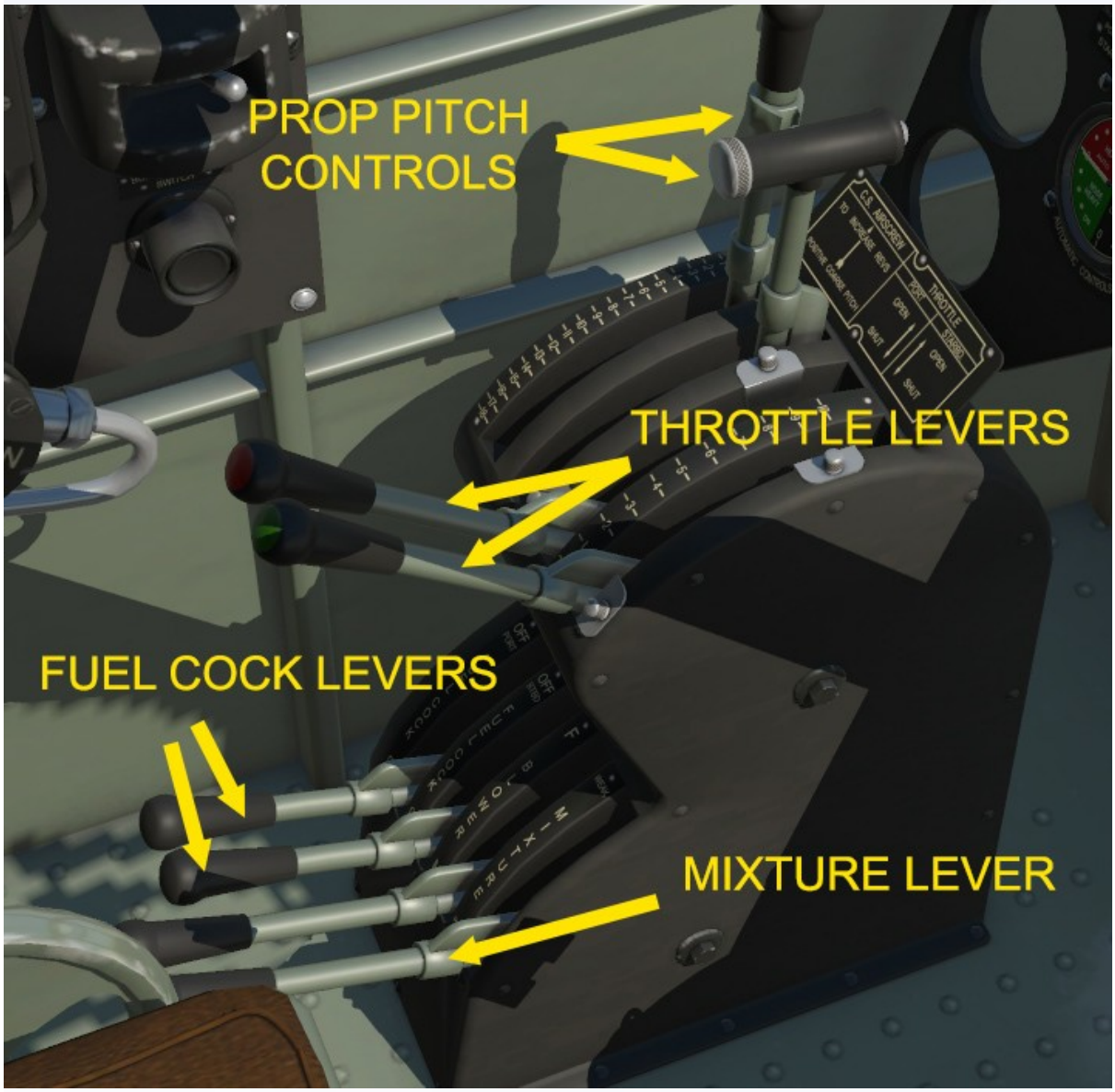
The image below shows the left side of the cockpit, specifically the Auto Controls and the side pedestal :



The cooling gills (cowl flaps) lever is operated by click-and-hold, the lever will rotate and both engines' gills will open/close as long as the lever is turning. The carb heat lever is self-explanatory. It will be necessary to raise the arm rest out of the way to access these levers, do this by clicking on any part of it.

The Auto Controls (autopilot) presently only feature VS hold (vertical speed or pitch control). The activation lever is set ON by clicking it with the mouse (DO NOT use over 200 kts). The VS rate of climb/descent is set using the rotary handle (or set up some VVI keys or joystick buttons). This can be set before engaging the VS hold if desired. Because of how XP works, the Flight Director function is engaged at the same time as VS hold. To disengage VS hold, clicking the lever is not sufficient, you will need to apply some pitch trim, up or down, this will disengage VS hold and turn off the FD. Unfortunately the AI voice will say 'caution' and an alarm will briefly sound. Hopefully this can be eliminated in a future XP update.

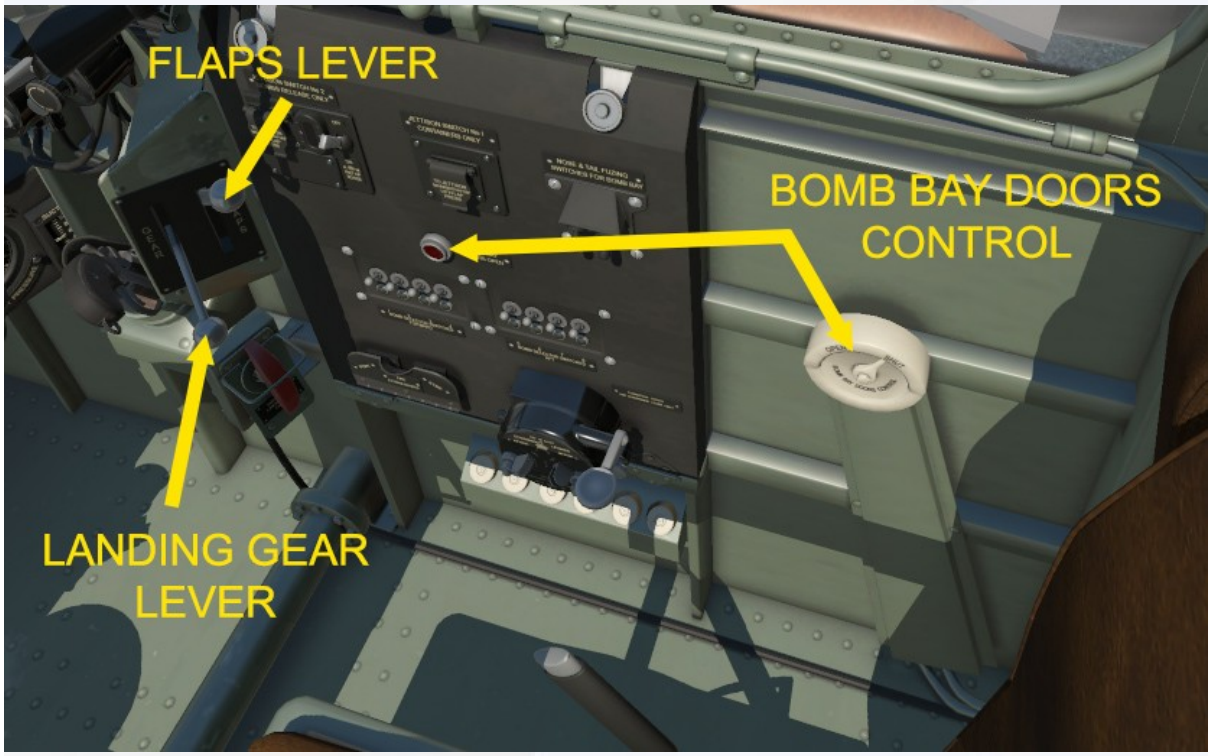
This image shows the engine control pedestal. The two throttle levers are self-explanatory, the adjacent propeller pitch controls are controlled automatically by X-Plane. The Hampden.acf file can be edited if desired to change the setting in the Prop section from Constant Speed to 'Manual', then the levers will require manual input. The boost gauges are similarly controlled by the prop pitch setting, from 'positive coarse pitch' to maximum r.p.m, more boost will show when pitch is coarse.



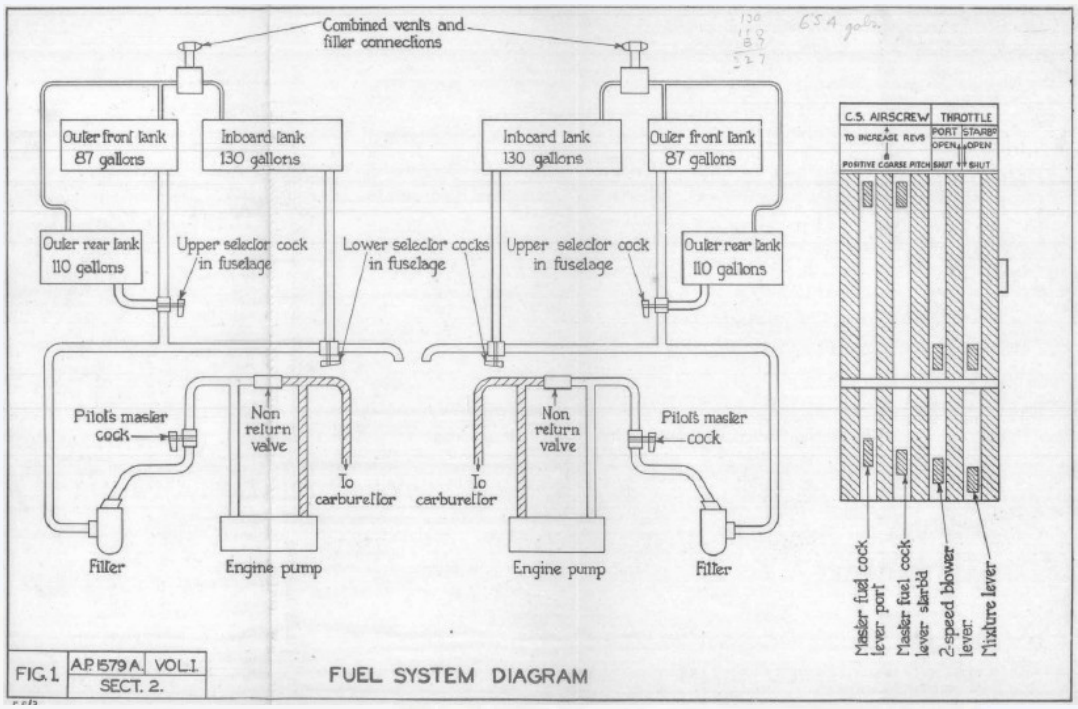
The mixture lever controls both engines, the down position (RICH) is the normal setting for running engines. It can be raised to about half way to waeken the mixture, any higher and the engines will stall. The two fuel cock levers control the fuel supply to left and right engines. The

supercharger lever is presently non-functional, a future XP update might mean it can be made to work properly.

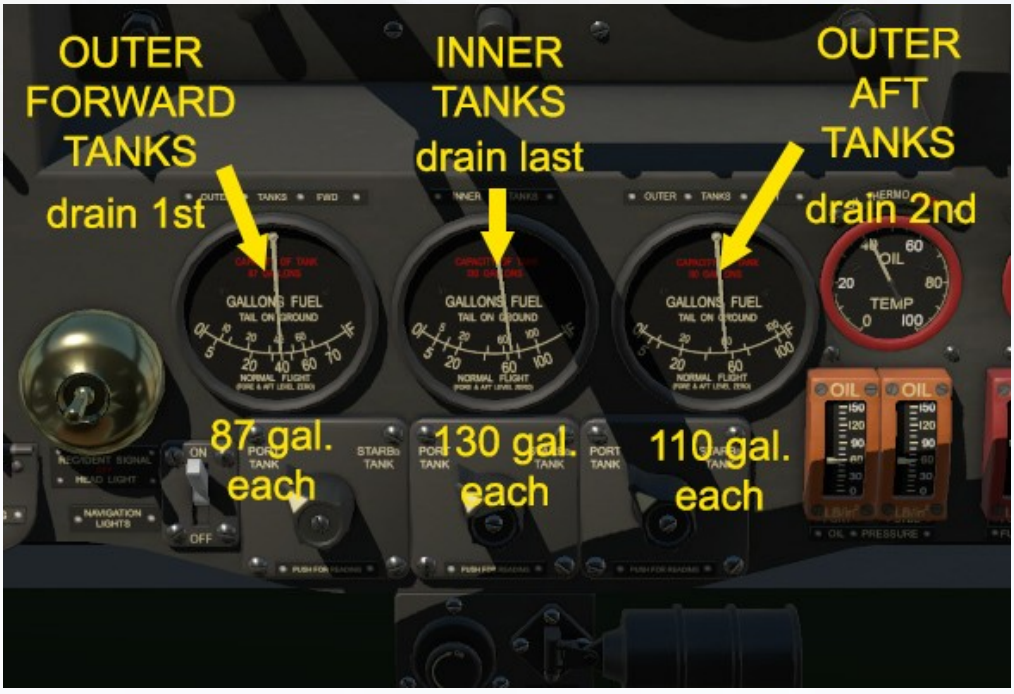
On the right side of the cockpit, the array of switches on the side panel all concern arming, selecting and jettisoning bombs and other stores in the bomb bay. These are non-functional as the Hampden does not presently support weapons. It is hoped a future update of X-Plane will include a better implementation and explanation of weapons in the sim, this will ensure a future update of the Hampden will be equipped in this regard.



The fuel system of the Hampden :



In the real aircraft, the fuel gauges can read the contents of either left or right tanks by turning the associated left/right selector knob. It was not possible to replicate this function in X-Plane so the gauges read only the left side. However, as the tanks drain uniformly, there would be no difference under normal circumstances between the contents of either side. Capacities are in US gallons (XP limitation) rather than Imperial gallons.



Hampden Specifications

Specifications (nominal, clean configuration)

- Engines: Two Bristol Pegasus XVIII 9-cylinder air-cooled radials
- Power: 1,000 h.p. at 3,000 feet
- Maximum speed: 247 mph at 13,800 feet
- Cruise speed: 206 mph at 15,000 feet
- Service ceiling: 19,000 feet
- Combat radius: 1,790 miles
- Wingspan: 69 feet 2 inches
- Length: 53 feet 7 inches
- Height: 14 feet 11 inches
- Wing area: 668 square feet.
- Empty Weight: 12,764 pounds
- Maximum Weight: 22,500 pounds
- Armament: One fixed .303 Browning M1919 machine gun in upper nose position, two pairs of .303 Vickers K machine guns in dorsal and ventral positions. Later aircraft used an extra single .303 in the glazed nose.
- Maximum bombload: 4,000 pounds, one 18 in. torpedo or mines

Speed Limitations

- Full Flaps: 80 kts
- Landing Gear: 100 kts
- Maximum indicated speed: 215 kts

Hampden Procedures

Engine Start

1. Set Parking Brake ON.
2. Turn both Battery switches ON.
3. Turn Nav lights ON.
4. Set Throttle Levers to IDLE.
5. Set Cooling Gills to fully OPEN.
6. Set Mixture lever to RICH.
7. Set Blower Lever to M (automatic).
8. Set Airscrew Levers to fully FINE (automatic).
9. Set Carb Heat Lever to COLD.
10. Set both Fuel Cock Levers to ON.
11. Shout to Ground Crew 'Petrol on, switches off !'.
12. Wait for Ground Crew signal that both engines are primed.
13. Shout to Ground Crew 'All clear both engines - contact !'.
14. Starter Button Engine 1 PRESS.
15. Engine 1 Oil Pressure 80 psi & Temperature 40-60 deg. CHECK.
16. Engine 1 Fuel Pressure approx. 3 psi CHECK.
17. Repeat steps 14-16 for Engine 2.
18. Brake Air Pressure 120 lbs CHECK.
19. Landing Flaps operation CHECK.
20. Altimeter set to ZERO.
21. Fuel Quantity Status CHECK.

Taking Off

1. Set Parking Brake OFF.
2. Check Mixture Lever RICH.
3. Airscrew Pitch Levers fully FINE (automatic).
4. Set Cooling Gills fully CLOSED.
5. Landing Flaps to one notch down (15 deg.) SET.
6. Partial Nose-up Trim APPLY.
7. Brakes SET.
8. 50% power smoothly APPLY.
9. Brakes RELEASE.
10. Accelerate to 50 kts first, then apply 75% power.
11. At 70 kts tail will lift, apply back stick and lift off.

After Take- Off

1. Landing Gear RAISE.
2. Pitch Trim ADJUST LEVEL.
3. Landing Flaps RAISE.
4. Engine Power to 100% SET.
5. Aileron Trim Right Wing Down APPLY.
6. Cylinder Temperature 210 deg. max. in climb CHECK.

Descent

1. Set Carb Heat Lever to HOT (as required, only if icing possible).
2. Blower Lever set to M CHECK (automatic).

Approach and Landing

1. Airfield can be approached at high speed.
2. Retard throttles to idle, raise nose to lose speed.
3. Switch Landing Lights ON, as required.
4. Set Canopy OPEN.
5. Extend Landing Gear at 100 kts.
6. Extend Landing Flaps fully at 90 kts.
7. Apply power to maintain speed to runway threshold.
8. Limit descent rate to 300 fpm.
9. Apply back stick to lose speed at 10 ft.
10. Make 3-point Touchdown at 70 kts.

After Landing

1. Apply brakes, taking care not to raise the tail.
2. Landing Flaps RAISE.
3. Set Cooling Gills fully OPEN.
4. Taxy to parking area.
5. Set Parking Brake ON.
6. Set Landing Lights to OFF.

Shutdown

1. Set both Engines' Magneto Switches to OFF.
2. Set both Fuel Cock Levers to OFF.
3. Set Mixture Lever to fully WEAK.
4. Set Nav Lights to OFF.
5. Set Panel Lights to OFF (as required).
6. Exit aircraft.