

Operations Manual

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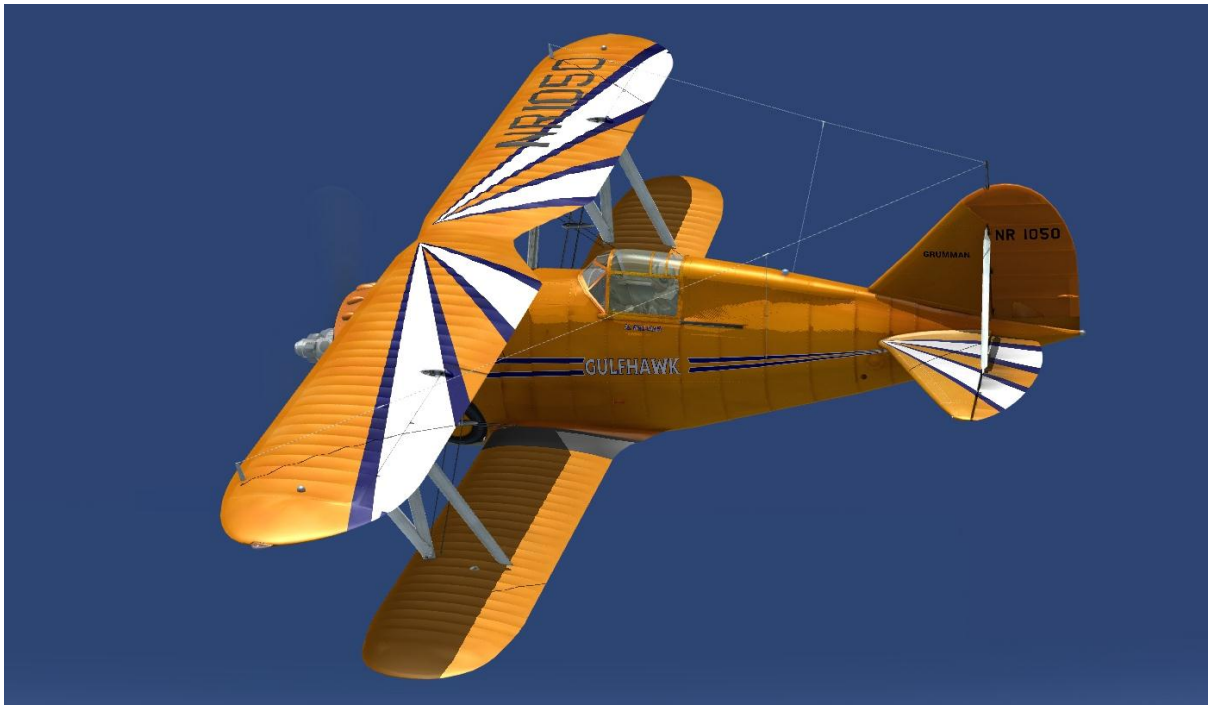
Please note that Microsoft Flight Simulator X Steam Edition must be correctly installed on your PC prior to the installation and use of this Gulfhawk simulation.

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INTRODUCTION

In the 1930s the Grumman Aircraft Company was looking for ways to promote its new line of fast biplane fighter-bombers, so in 1936 an F3F-1 was equipped with a 1,000 hp Wright Cyclone engine and specially modified for high-stress manoeuvring and aerobatics.

The standard F3F-1 of the period had a two-blade propeller but the new aircraft was fitted with a three-blade Hamilton Standard propeller of 9ft. diameter. With this power plant on board the aircraft could achieve speeds of close to 300 MPH and could climb at 2,000 feet per minute – impressive performance for 1936!



Delivered to the Gulf Oil Company, the aeroplane was flown extensively by Major Al Williams, Gulf's chief test pilot, to demonstrate the new techniques employed in tactical dive-bombing. Dubbed 'Gulfhawk II', the aircraft and its pilot toured the USA and Europe demonstrating high-speed aerobatics and precision flying.

In 1943 Major Williams was asked by General Henry H. 'Hap' Arnold to undertake a three-month tour of US airfields to demonstrate airmanship and precision flying. The aircraft made its last demonstration flight in 1948 before being retired to the Smithsonian National Air and Space Museum in Washington DC, where the brightly painted orange machine still hangs as a lasting reminder of those barnstorming days.

The F3F-1 evolved into the F3F-3 and became the Navy's last biplane fighter. It was used to train many of the young pilots destined to become aces in the Second World War.

Aircraft specifications

Dimensions

Length	23 ft (7.01 m)
Height (to top of fin)	10 ft 6in (3.2 m)
Wingspan	32 ft (9.75 m)
Wing area	260 ft^2 (24.15 m^2)

Power plants

Type	1 x Wright R-1820-22 ‘Cyclone’ radial
Power	1,000 hp

Weights

Empty weight	2,876 lb (1,305 kg)
Maximum take-off weight	4,403 lb (1,997 kg)

Performance

Cruise speed	220 MPH
Maximum speed	290 MPH
Maximum range	850 NM / 1,600 km
Ceiling altitude	32,000 ft
Rate of climb	2,000 ft/min

INSTALLATION, UPDATES AND SUPPORT

Installation is handled by Steam after purchase of the product. After purchasing the product the files will be downloaded and installation into the Scenery Library will be automatic.

Accessing the aircraft

To access the aircraft in FSX:

1. Click on ‘Free Flight’
2. Select ‘Just Flight’ from the ‘Publisher’ drop-down menu
3. Select ‘Grumman’ from the Manufacturer drop-down and choose the Gulfhawk

Updates

Updates to the product will automatically be deployed, downloaded and installed via Steam to all users who own the product.

Technical Support

To obtain technical support (in English) please visit the Customer Service http://www.justflight.com/support pages on the Just Flight website. As a Just Flight customer you can obtain free technical support for any Just Flight or Just Trains product.

For support specifically on the Steam version of the add-on please contact Dovetail Games.
https://dovetailgames.kayako.com/

Regular News

To get the latest news about Just Flight products, sign up for our Newsletter [http://www.justflight.com/newsletter] and regular emails.

You can also keep up to date with Just Flight via Facebook [www.facebook.com/justflight] and Twitter. [www.twitter.com/justflight]

WALK-AROUND

The first and most obvious observation one can make when approaching an F3F for the first time is the stout appearance of the tubby fuselage. The enormous Wright Cyclone engine dominates everything, with its huge three-blade variable-pitch propeller.



The engine cowling is studded with blisters which cover the engine's valve gear covers. Two exhaust stubs exit at the base of the cowling. In this simulation you will see the exhausts shudder and vibrate as the massive engine roars! The nine-foot three-blade propeller is non-standard for an F3F-1 but it was incorporated as part of the upgrade package installed in the Gulfhawk II.

Another unique aspect of the F3F is its undercarriage. Previously rare on a biplane, the fully retractable undercarriage was raised or lowered from the cockpit by chain-drive and crank. It has a very interesting and complex action which is well worth studying when it is in motion. This very same style of undercarriage continued through to the F4F Wildcat monoplane fighter which was so successful in the Pacific theatre of World War II.



The lower wings are somewhat shorter than the upper plane and have special handholds in the tips for the ground crew to walk the aircraft around the airfield. The port lower wing carries a retractable landing light and approach light on the underside of the leading edge. Towards the outer tip and on the top surface near the outer inter-plane strut is a ‘section’ light for identification of the aircraft from the air. The upper wings carried squadron recognition and formation lights which could also flash. Navigation lights are housed in small pods at the wing tips.

Just two large upper wing ailerons are used in this aeroplane and no flaps are used. The fuselage mid-section carries the fully glazed sliding canopy and steps for boarding. The turtle deck behind the canopy carries a small light used for section identification.

As you move towards the tail you will see a large braced metal horizontal tail plane and fabric-covered elevator. The large fin and rudder are needed for tight turning on carrier decks. The tail-wheel unit is fully retractable and aft of this would normally be a housing for the retractable carrier-landing tail hook which was removed from this one-off special variant. A white navigation lamp is mounted at the end of the tail-cone.

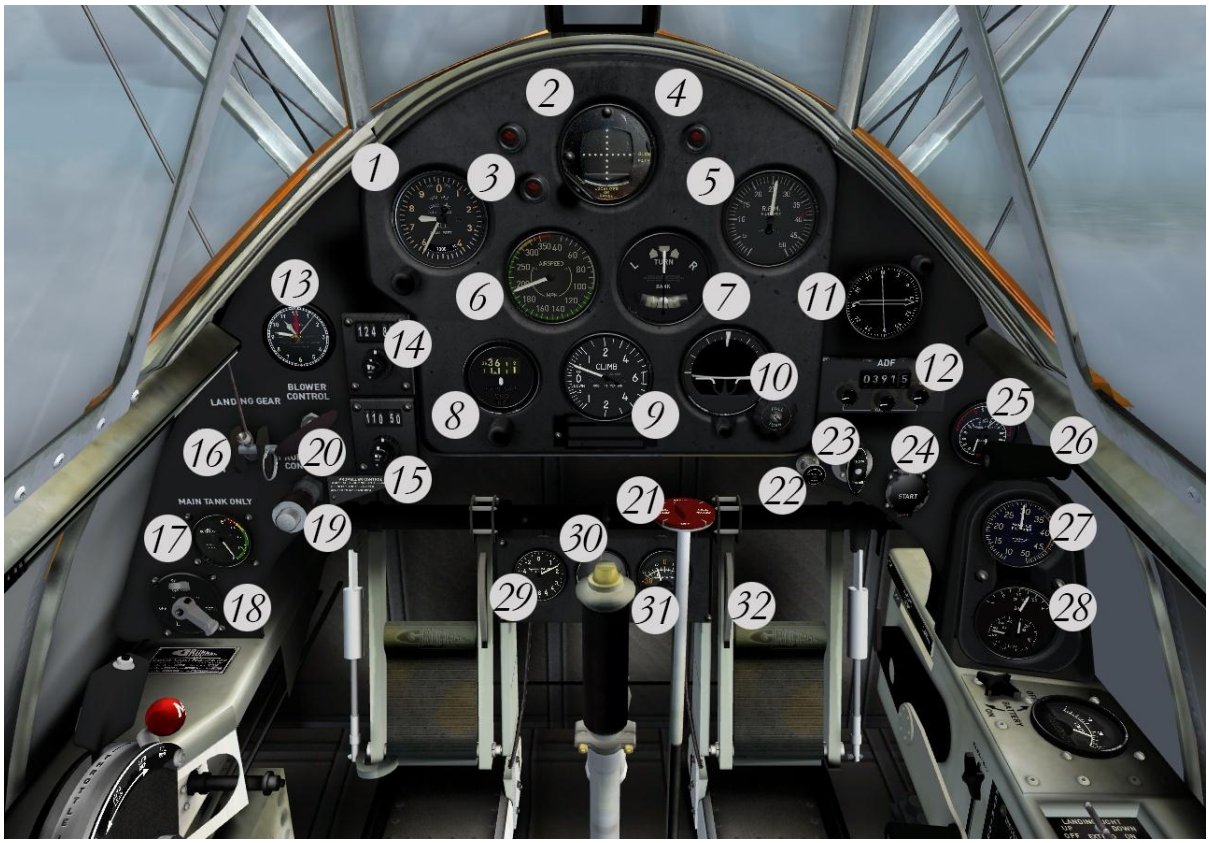


It’s now time to climb aboard the aircraft and get acquainted with the cockpit. It’s a big stretch up to that step so mind how you go!



PANEL GUIDE

Main panel



1. Altimeter
2. ILS indicator
3. Warning lights – low oil pressure and battery status
4. Landing gear warning light
5. Tachometer
6. Airspeed indicator (MPH)
7. Turn/Slip indicator
8. Gyro compass
9. Vertical Speed Indicator (VSI)
10. Artificial Horizon Indicator (AHI)

11. Radio-Magnetic Indicator (RMI) – the single-needle pointer displays the bearing to the NAV 1 beacon (VOR) and the double-bar needle displays the bearing to the ADF 1 beacon (NDB)

12. ADF radio

13. Clock

14. COM 1 radio

15. NAV 1 radio

16. Landing gear lock pin and selector switch

17. Main fuel tank contents gauge

18. Magneto and ignition switches

19. Propeller control – right-click and drag to unlock/lock

20. Blower control

21. Fuel tank selector switch

22. Carburettor heat control

23. Engine primer lever

24. Starter switch

25. Brake pressure indicator

26. Canopy lever

27. Manifold pressure

28. Engine gauge – oil temperature, oil pressure and fuel pressure

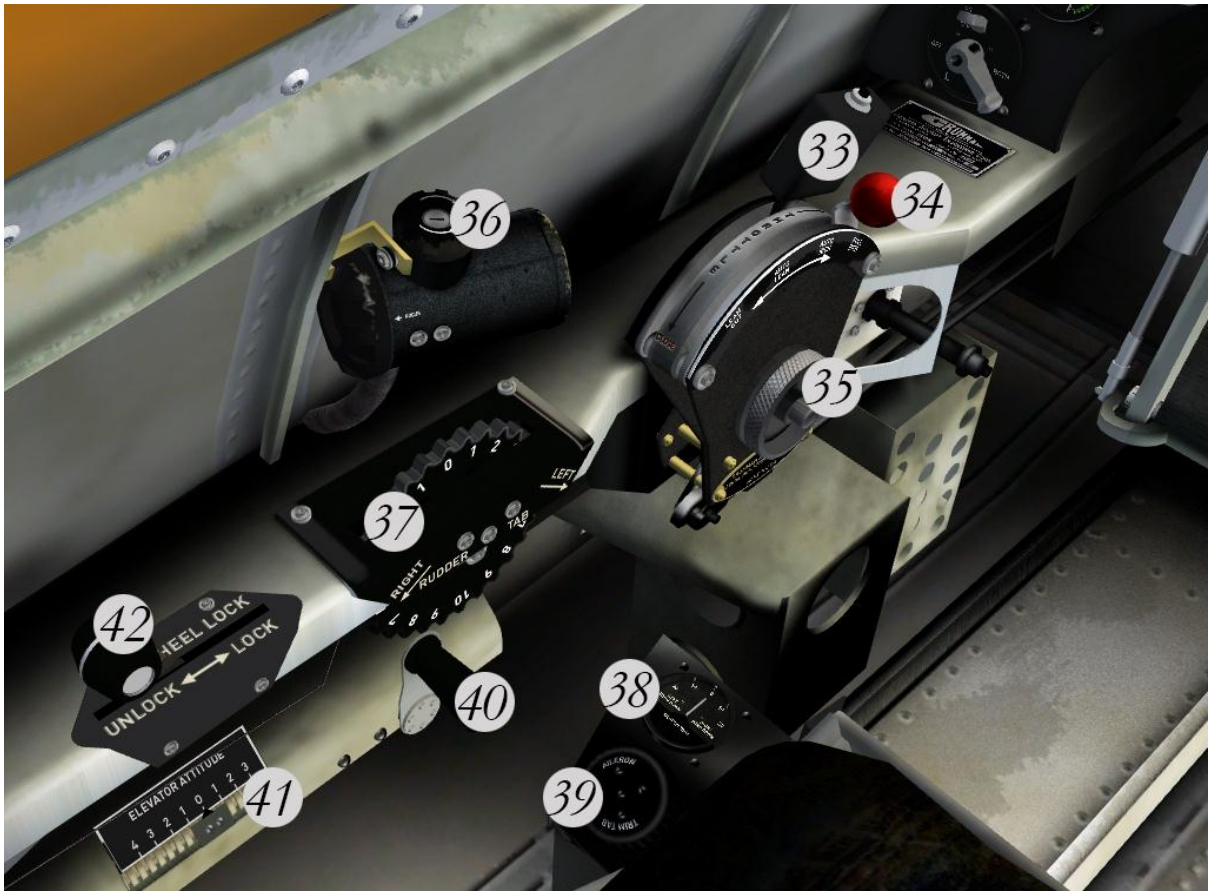
29. Accelerometer (G-meter)

30. Ball (whiskey) compass

31. Outside air temperature (OAT – °C)

32. Parking brake lever

Left console panel



33. Throttle lever

34. Mixture control lever

35. Friction knob

36. Cockpit torch

37. Rudder trim control wheel

38. Aileron trim indicator

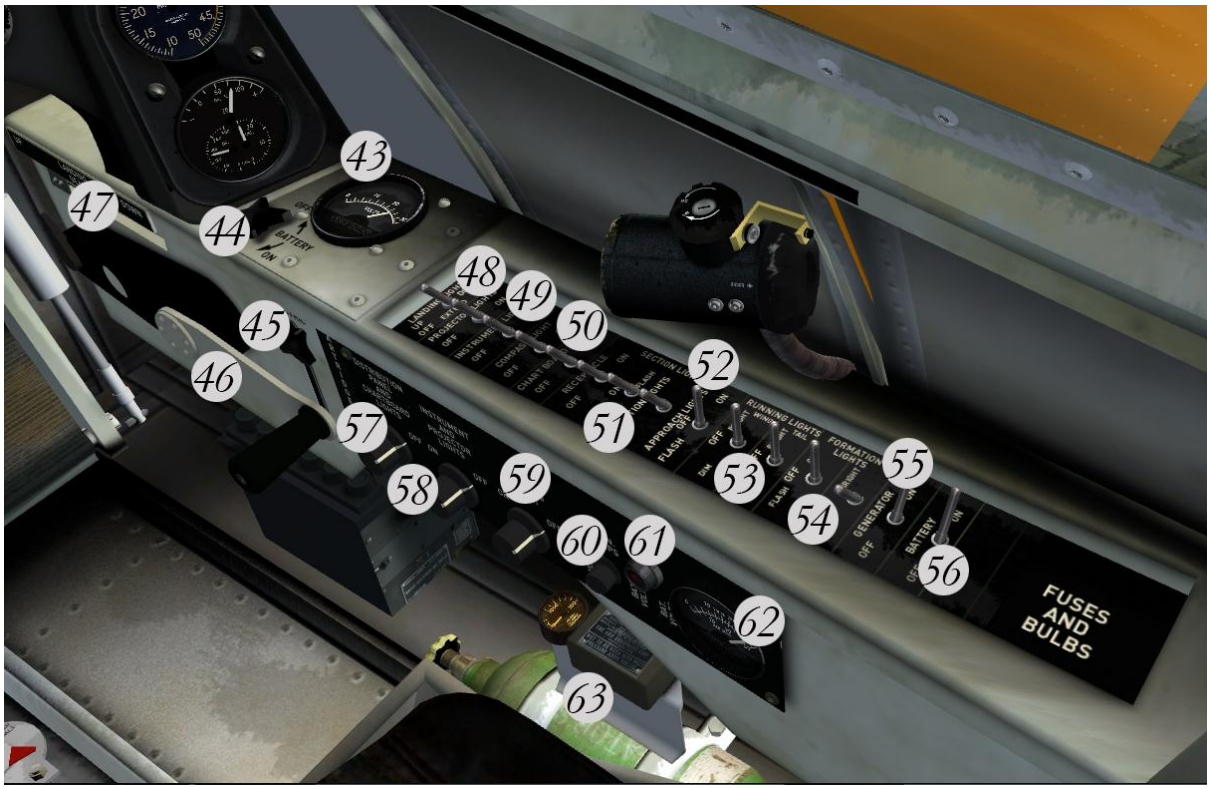
39. Aileron trim control knob

40. Elevator trim control wheel

41. Elevator trim indicator

42. Tailwheel lock lever

Right console panel



43. Voltmeter

44. Battery switch

45. Electric or cartridge start selector

46. Landing gear crank handle

47. Landing gear position indicator

48. Landing light switch

49. Instrument lights switch

50. Chart light switch

51. Section lights

52. Approach lights switch

53. Running lights (NAV) switches

54. Formation light switches

55. Generator switch

56. Back-up battery switch

57. Distribution panel and chart board lights switch

58. Instrument and projector lights switch

59. Compass light switch

60. Ammeter scale selector

61. Voltage warning light

62. Multi-display ammeter/voltmeter

63. Oxygen bottle

Options panel



Press the [Shift] + [1] keys to display the Options panel.

The four ‘movement’ buttons allow you to adjust your viewpoint forwards, backwards, left and right, and the two ‘height’ buttons allow you to adjust your viewpoint up or down.

The pilot removal switch is used to remove the pilot from the cockpit when the aircraft is parked on the ground.

The CLOSE button in the top right corner of the panel can be used to close the Options panel.

LANDING GEAR OPERATION

To operate the gear selector and lock switch (16), first pull the pin using the ring pull. Toggle the switch to the DOWN position and then re-insert the lock pin. To lower the undercarriage, move to the right console and use the landing gear crank handle (46) to lower the gear. A small indicator near the crank handle (47) will indicate the gear state.

PROPELLER CONTROL OPERATION

The propeller control (19) has a locked position. To unlock, use the right mouse button and drag. You will see the control rotate to the unlocked state, allowing you to push or pull the control to change propeller settings.

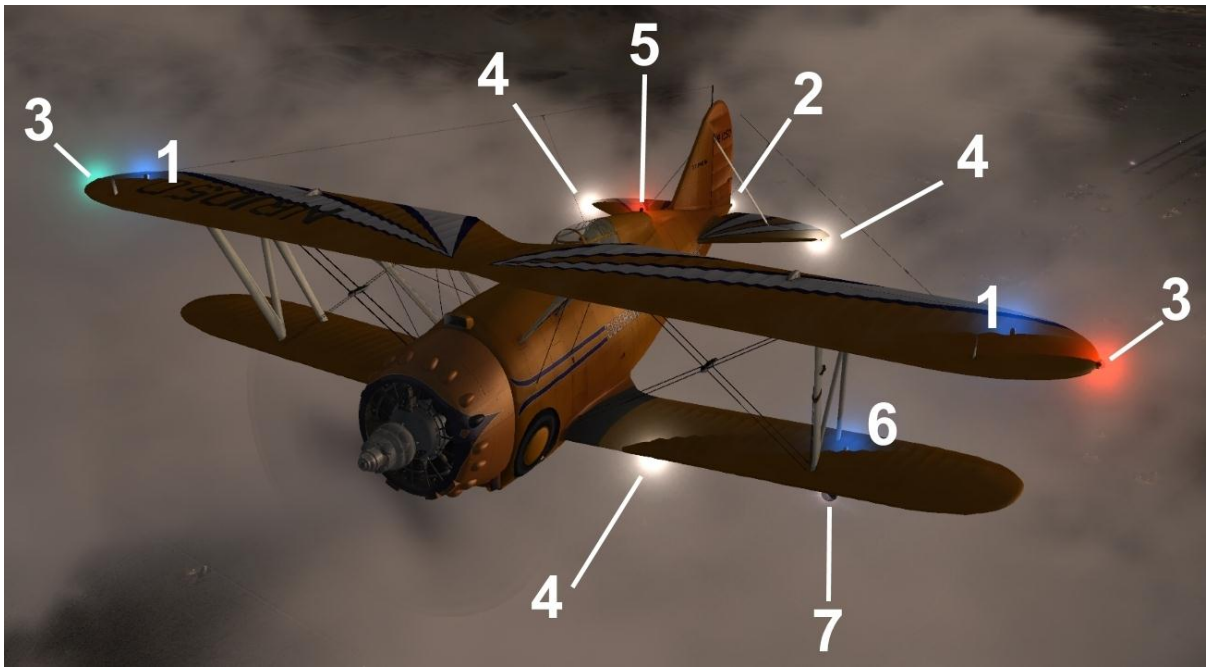
ENGINE STARTING

To start the engine you must press and hold the starter button in. The Gulfhawk has a set of special start-up effects to simulate the unique start-up characteristics of the real Wright Cyclone engine. If you are using the [Ctrl] + [E] auto start keys to start the engine, you must press and hold the [Ctrl] and [E] keys down.

We have also given you the option of either a manual cartridge start or an electric start sequence. Cartridge starting involves an oversize shotgun shell which is loaded into a special breach mechanism and fired to swing the big propeller over, sufficient to energise the magnetos and starter. Be prepared for a loud bang when using the system!

EXTERNAL LIGHTING

The aircraft has a variety of external lights which can be controlled using the corresponding switches on the right console.



1. Formation lights
2. Running lights – tail
3. Running lights – wing
4. Approach lights
5. Section lights – fuselage
6. Section lights – wing
7. Landing light

TUTORIAL – FLYING THE GULFHAWK

The ‘Flying Barrel’ is actually a bit of a misnomer. The aircraft is powerful and very agile, and pilots of the day reported that it was extremely rewarding to fly and possessed excellent performance and handling. An in-service F3F-2 could get airborne in less than 200 feet, with the huge Wright radial hauling the tubby little airframe into the air at an impressive climb rate of 2,800 feet per minute. During testing the aircraft was put into a dive, achieving well over 400 MPH before pulling out, such was the strength of the airframe.

We’re now going to go through a typical procedure for starting and flying the aircraft.

Getting started



Check that the parking brake is set. The big radial imparts a large amount of torque when starting and the aircraft can leap forward if the brakes are not set.



Set the fuel tank selector to **MAIN TANK**.



Unlock and set the propeller control to **LOW RPM**.



Set the mixture control to **50%** and then crack the throttle open slightly.



Turn the battery switch **ON**. If you are going to use cartridge start, select **MANUAL**, using the option control.



Confirm that you have sufficient fuel for the flight.



Turn **ON** the ignition switch (mounted on the magneto panel).



If it’s a cold start, unlock the primer lever and prime the engine with up to five strokes before locking the primer.

Starting the engine



Switch the magneto control to **BOTH**.



Open the starter cover and depress and hold the starter button until the engine has fired and is starting the first combustion pass. This will take quite a few seconds so be patient and keep holding the starter button in.

If you are using [Ctrl] + [E] to start, hold the keys down until the engine has started. If the engine fails to fire, just repeat the starter operation until it does.



With the engine idling, allow it to warm up and check that the low pressure light is out on the main instrument panel. Check that the manifold pressure gauge is reading and then apply a small amount of throttle before confirming a manifold pressure rise.

Return the throttle to idle and allow the engine to warm up for a minute or two.

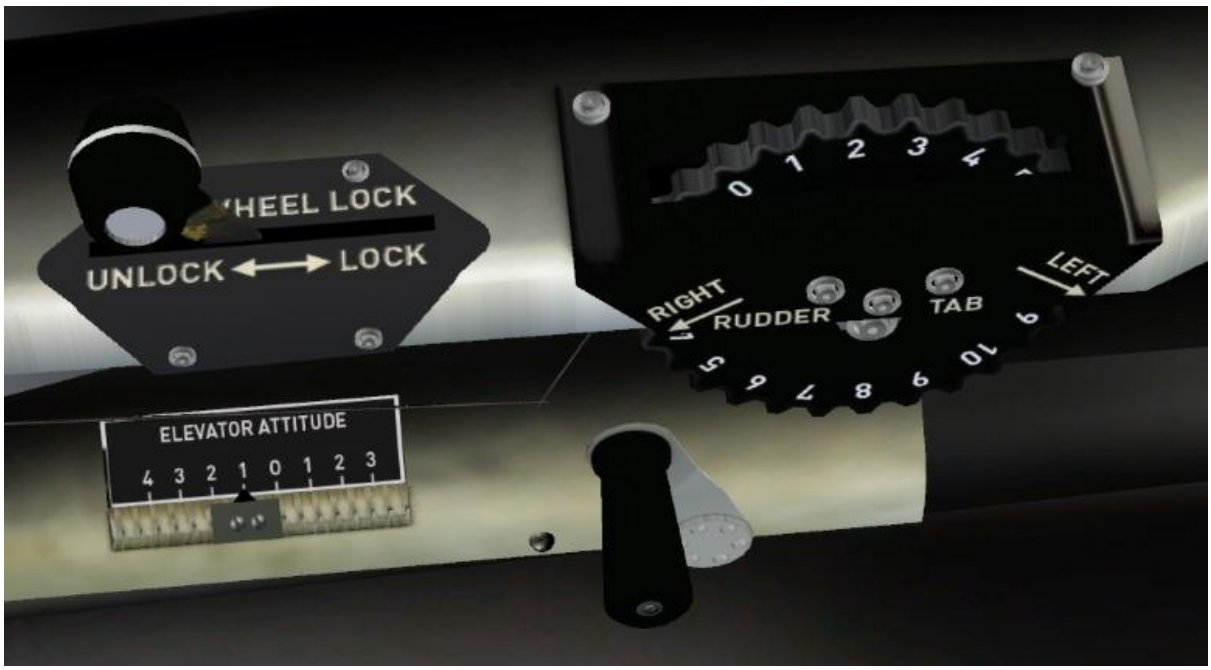


Taxi



Confirm that the gear is down and locked. The selector switch should be in the **DOWN** position with the pin inserted, and the gear indicator should be showing **DOWN**.

Feed in a small amount of nose-up elevator trim and set a small amount of right rudder trim; this will help offset the torque created by the big radial during take-off.





Gently open the throttle a small amount and release the brakes. Once the aircraft is rolling forward, use the rudder pedals to steer to the runway. The freewheeling tailwheel yoke will help steer the aircraft around tight corners. Lock the tailwheel once you are lined up on the runway.

Take-off



Set the propeller control to **MAX RPM** and the mixture control lever to **100%**.

Advance the throttle smoothly and release the brakes.

The aircraft will accelerate quickly and will unstick in around 190 feet of runway. Be ready to ‘catch’ the torque effect of the big propeller with the stick to in order to level the aircraft for the climb.



Once above 50 feet, unlock the gear selector by pulling the pin and selecting **UP**. Now cross over to the right console and crank the gear lever until the gear is up and the indicator light is extinguished on the instrument panel.



Re-lock the selector switch, ensuring that the pin is back in. In real life the pilot has to change hands on the stick to do all this. A trap for novice pilots!





Climb

Once the gear is up and locked, reduce the throttle slightly to achieve around 30 inches of mercury on the Manifold Pressure gauge.



Climb to your desired altitude and level out, reducing throttle for the cruise which should be around 150 MPH.

It is important to monitor the mixture control as you climb to give the engine the correct air-to-fuel ratio. Once above approximately 3,500 ft you will need to be ready to reduce the mixture control setting. A rise in engine RPM will be heard as you do this, indicating correct engine management.

As temperatures drop at higher altitudes, you may need to use the carburettor heat control.

Approach and landing

On the approach your speed should be reduced to around 90 MPH and the mixture control lever should be moved back to **100%**.





Unlock the landing gear selector switch and select **DOWN** and use the crank handle to lower the gear. Ensure that the indicator is showing **DOWN** and the light has illuminated on the main instrument panel.

Your airspeed should be around 75-85 MPH over the threshold. Bring the throttle back to idle and pull the stick back gently to flare, aiming for a three-point landing. Keep the aircraft straight with small amounts of rudder correction. Don't worry if your landing is not perfect and the main wheels touch first as the aircraft will settle on its tailwheel soon after.



Once the tailwheel is on the ground, apply braking and slow to taxi speed.

The Grumman Gulfhawk is fully aerobatic – that's what she was made for! Please look after your engine and make sure that you do not overstress the airframe. You will find flying the 'Barrel' a tremendously rewarding experience.

Enjoy your Gulfhawk and we hope you will enjoy flying her as much as we did making her!

CREDITS

Aircraft modelling, texturing, cockpit systems and sounds	Aeroplane Heaven
Flight dynamics	Wayne Tudor
Project management	Alex Ford
Installer	Martin Wright
Design	Fink Creative
Technical support	Martin Wright

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Don't be fooled by a load of old tosh about file 'sharing'. The sites that host these 'shared' files cover their backsides with the excuse that they are simply a 'gateway' to the files. In fact, they actively encourage piracy and are often funded by advertising. Most of them are illegal money-laundering operations by another name.

The people who really suffer from game piracy are the artists, programmers and other committed game development staff. Piracy and theft directly affects people and their families. Loss of revenue to the games industry through piracy means many are losing their jobs due to cut-backs that have to be made to ensure developers and publishers survive. The logical outcome of this is that eventually the supply of flight simulation programs will dry up because developers think it is not worth the hassle.

It's not just copying software that is against the law. Owning copied software also constitutes a criminal offence; so anyone buying or downloading from these people is also at risk of arrest and prosecution.

To find out more about the implications of piracy please click on the Piracy link on our website at justflight.com.