

Hawker's

NIMROD *Mk II* & FURY *Mk I*

A HIGH DEFINITION SIMULATION OF HAWKER'S CLASSIC PRE-WAR BIPLANES FOR MICROSOFT FLIGHT SIMULATOR

AEROPLANE HEAVEN



You're virtually there.

COCKPIT GUIDE & FLYING NOTES



The Hawker Nimrod and Fury were designed by Sydney Camm who was later to design the Hawker Hurricane and many more famous fighting machines.

The entire airframe was light and strong, the fuselage being mostly a stressed-metal skin over a light tubular frame. The aft fuselage section, wings and tail surfaces were doped fabric over tubular frames.

This well-tried build technique remained a popular choice for Camm's designs including the famous Hawker Hurricane, to come.

The airframe was powered by a Rolls Royce Kestrel V12 engine first producing 480 hp but later upgraded to 608 hp. The propeller was a fixed-pitch wooden Watts-type. First flown in early 1931, the Hawker Fury, with the later 608hp Kestrel, was the first RAF interceptor to reach speeds in excess of 200 mph. It was also a nimble flyer and an excellent aerobat. With a maximum climb rate of 2,400 ft per minute, the aeroplane was designed for a variety of roles including the interception of bombers.

Not to be outdone, the Royal Navy also wanted this new single-seat fighter for ship-borne duties. So the Fury design was modified to have a broader wingspan and navalised with the addition of arrestor hook, catapult equipment and a headrest for the pilot's comfort and safety during catapult launches. Both types initially had straight, constant-chord wings, with the lower wing significantly cranked aft of the upper.

The Royal Navy's Nimrods were later given broader, swept-back wings and designated Nimrod MkII.

For armament both aircraft were equipped with two forward-firing Vickers machine guns, firing through the propeller and could carry a small bomb-load beneath each wing.

The Hawker Fury first flew on the 25th March 1931 and entered service with the RAF in May of that year.

The Hawker Nimrod (MkI) first flew (as a carrier-based aircraft) on the 31st of October 1931 and the first of the Mk2 Nimrods were delivered to the Royal Navy in March 1933.

Eventually outpaced and out-manoeuvred by more "modern" machinery of the times, by 1939 the Nimrod and Fury had all but disappeared from front-line duties.

The Fury was operated as a trainer during the war years.

A monoplane version of the design was penned by Camm during the early 30's and when the first of the Merlin family of Rolls Royce engines started to appear, this design was further revised around the new engine and became the prototype Hawker Hurricane.

LEADING PARTICULARS

HAWKER NIMROD MKII

Crew:	1
Length	26ft. 5ins. (8.09m)
Height	9ft. 8ins. (3.0m)
Wingspan	33ft 6ins. (10.23m)
Wing Area	300sq.ft. (27.96sq.m)
Empty Weight	3,115 lb. (1,413 kg)
Gross Weight	4,059lb. (1,841 kg)
Power Plant	1 x Rolls Royce Kestrel V12 Piston Engine developing 608h.p.
Maximum Speed	193mph (168 kn) (311Kph)
Range	367 miles (1,500km)
Service ceiling	28,000 ft. (8,535 m)
Armament	2 x Vickers 0.303 Calibre Machine Guns



The Nimrod II differed in several ways. The most noticeable being the swept-back, larger-span wings and of course, the tailhook for carrier operations.

The Fury was the RAF's last front-line bi-plane fighter. In service right up to 1939 (and into the war years as a trainer) it was replaced by that other venerable Hawker fighter, the legendary Hurricane.



Fury K8267 was used as a fighter trainer, stationed at Montrose with the No.8 Flying School, RAF. With war on the near horizon, the bright multi-coloured liveries of the 30's gave way to the new regulation camouflage schemes. Bright yellow was used on all training types.



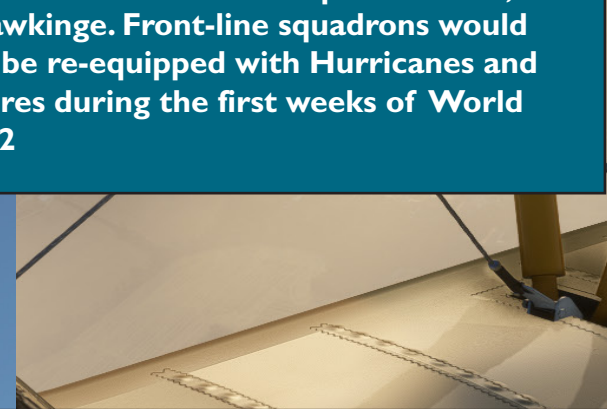
Fury K5674 belonged to 43 Squadron RAF, known as the "Fighting Cocks". This machine was the personal aircraft of the "B" wing commander. This is the only flying example of a Fury MkI having been meticulously restored (first flight 2012).



Construction techniques used by Hawker in the Nimrod and Fury continued to be critical in the development of the Hawker Hurricane. A combination of steel and alloy tubing, wood and fabric created immensely strong, durable structures which would prove their worth in combat.



Fury K2071 flew with 25 Squadron RAF, out of Hawkinge. Front-line squadrons would soon be re-equipped with Hurricanes and Spitfires during the first weeks of World War 2



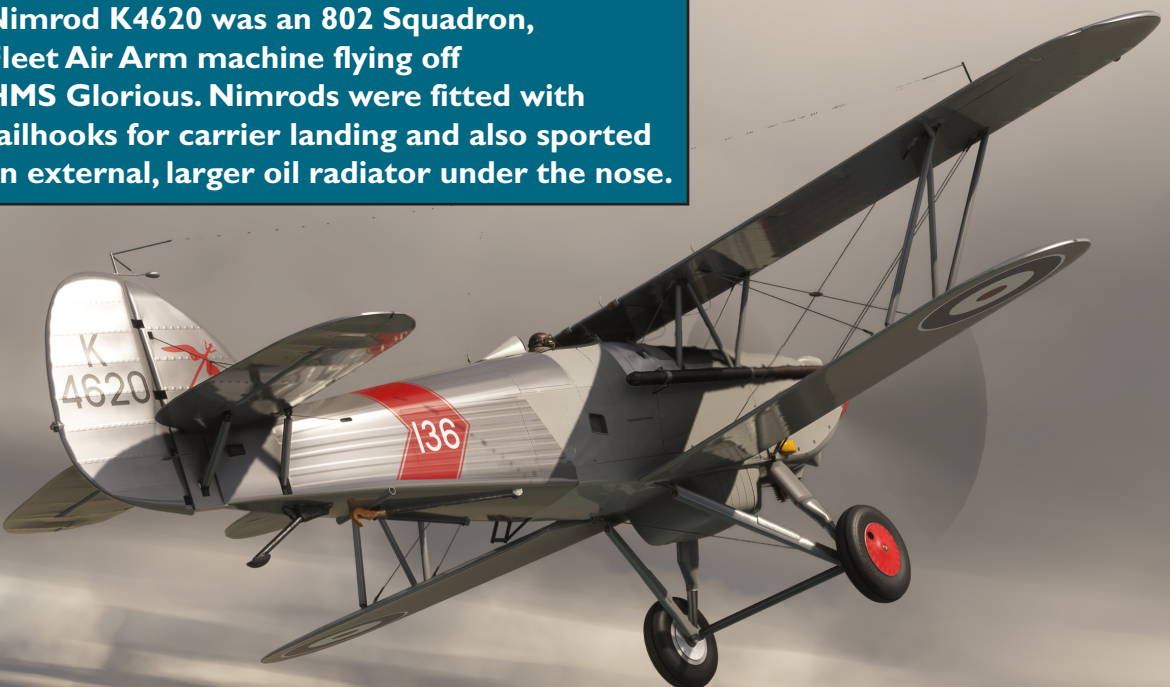
Nimrod K3661 was with Royal Navy Squadron 802 when operating in the Mediterranean. This particular aeroplane has been fully restored to flying status and appears at airshows. It is the only original Nimrod still flying.



Nimrod K3646 was an 800 Squadron machine. This shot illustrates the much broader, swept-back wings of the Nimrod II when compared with the Fury. Also you can see the additional headrest for the pilot - essential protection for catapult launches.



Nimrod K4620 was an 802 Squadron, Fleet Air Arm machine flying off HMS Glorious. Nimrods were fitted with tailhooks for carrier landing and also sported an external, larger oil radiator under the nose.



The Nimrod/Fury cockpit.

The early Hawker cockpits were rudimentary in design. Open cockpits like these provided little protection from the elements and all controls and equipment were mounted directly to the airframe tubular structure using clamps and brackets. In fact not much had changed since the fighters of WW1.

The only real difference between the Nimrod and Fury cockpits is the tail-hook control wheel found in the Nimrod. Otherwise, both cockpits can be considered identical.

There are three main areas of the cockpit which need to be studied in order for you to operate your aeroplane correctly and feel "at home"

These are: 1. Main Panel
2. Left Cockpit
3. Right Cockpit

Main Panel

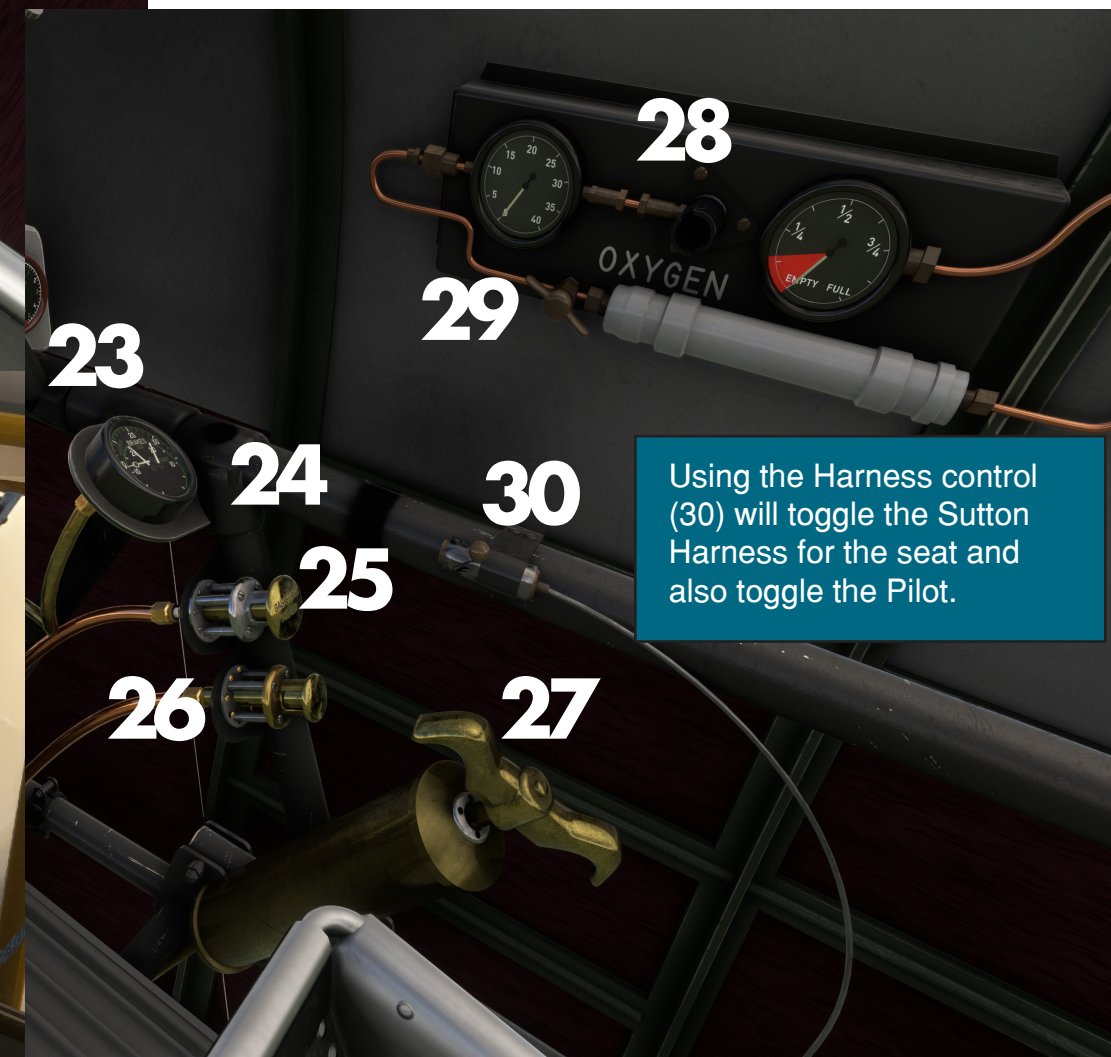
1. Turn/Slip
2. Airspeed Indicator
3. Tachometer
4. Altimeter
5. Fuel Gauge (Main Tank Only)
6. Oil Temp. & Pressure
7. RMI
8. Nav Gauge
9. Starting Magneto
10. Wind-up Magneto
11. Radiator Temp.
12. Boost Gauge
13. Magnetic Compass
14. Magneto Switches
15. Floor Starter
16. Radios (Nav&Coms)

Left Cockpit

17. Mixture Control
18. Throttle
19. Elevator Trim Control
20. Oil Cooler Door Control
21. Main Fuel Tank Selector
22. TailHook Control (Nimrod ONLY)

Right Cockpit

23. Fuse Box (INOP)
24. Voltmeter
25. Battery indicator lamp
26. Panel lights Rheostat
27. Formation lights Switch
28. Generator Switch
29. Battery Switch
30. Left Landing Light Switch



Using the Harness control (30) will toggle the Sutton Harness for the seat and also toggle the Pilot.

Starting the Kestrel.

The Hawker Nimrod and Fury share the same Rolls Royce V12 Kestrel engine. There are special pre-start sequences which MUST be followed if you are to get a successful start.

Following WWI practises, the engine uses magneto ignition and pressurised, atomised fuel which when introduced to the engine under pressure, turns the engine over for starting. The magnetos do the rest. If you follow the correct procedure and allow the prescribed wait times, you should have no trouble coaxing the big V12 into life.

Study the following 7-STEP sequence and memorise it. You will not be able to start the engine unless you do so. First of all, make sure that the main fuel tank selector is ON (21) and the Mixture Control (18) is on FULL RICH

Then...

STEP 1) Turn on the Starting Magneto

STEP 2) Pump the Gas Start Primer 10 times - this pressurises the atomised fuel for starting.

STEP 3) Open the Gas Starter Master Cock and pressurised fuel will begin to flow.

STEP 4) Unlock the Engine Primer and pump 4 - 5 strokes. Lock the Primer.

STEP 5) Press and hold the Wind-Up Magneto for 5 seconds.

STEP 6) Push down the Gas Starter (Red plunger on the floor) whilst the Wind-Up Magneto is still turning - this is important, if you allow the handle to stop turning before you press the Gas Starter, you will not be able to start the engine and will have to begin the process all over again.

The engine will turn over and the prop will start to accelerate.

STEP 7) Switch UP the two small Engine Magneto Switches. The engine should fire into life.

After a successful start, turn off the Start Magneto and close the Gas Starter Master Cock.



Radio Comms and Nav.

The original Nimrod and Fury were fitted with a basic communications radio set. For the purposes of this simulation and to make life a little easier for the sim-pilot, we have installed a Comms and Nav (1) radio with standby and active frequency readouts. The NAV radio drives the two (non-standard) additional instruments in the centre of the instrument panel. These provide visual indication of CDI (Course Deviation) and GSI (Glideslope) and NAV 1 radial direction when the NAV radio frequency is set and receiving. The COMMS radio receives the standard ATC comms transmissions.

Using the compass.

The Nimrod and Fury are fitted with a Maritime-type, oil-filled magnetic compass. You will find it mounted in its own tray immediately in front of the control column. This type of compass is designed to give the pilot a rapid indication of the current heading and a desired course which can be set, using the bezel. The compass has a lubber line and has a lock lever which locks the bezel on the set course.

The compass needle has a white cross which is indicating the current course. In the illustration, this would appear to be 235° . Later we wish to turn to a course of 293° . So, by turning the bezel of the compass so that the 293 mark is opposite the lubber line, we can lock the bezel there. By using the lock, you can be sure your desired course will not move until you are ready to turn. Then, when the time comes for the course change we simply turn our aircraft until the needle is nestling in between the course marks on the bezel glass. We will then be on a 293° heading.

Just by turning the bezel and then turning the aircraft, the pilot can change course with a high degree of accuracy and yet just glance at the compass. Simple but highly effective.



Microsoft **Flight Simulator**

AEROPLANE HEAVEN



You're virtually there.

Flying the Nimrod & Fury.

At the end of this manual you will find a complete set of CHECKLISTS. However, it will be useful to run through a few things about handling and flying these Hawkers.

Just a short note on ground-handling. These aircraft are what we call “tail-draggers” that is they have a tailskid and sit on the ground in a three-point stance,

Tail-draggers are notoriously difficult to handle properly on the ground, especially in takeoff and landing rolls.

We have spent a lot of time taming the behaviour of the aircraft on the ground. We believe we now have the handling somewhere close to what a real Nimrod or Fury has. However, you will still need a lot of care and attention when operating on the ground. Mind you, that can be said for the real thing too!

So, let's get started. We are going to assume you are starting from a “Cold-Dark” state. That is a cockpit where everything is OFF or Neutral.

Use the **HARNES SWITCH (30)** to load the pilot.

Ensure that the **PARKING BRAKE is ON**

N.B. there is no actual lever in this simulation - you must use the relevant keystroke. However a quick check of the allow brake levers, mounted on the pedals will provide an indication of brakes state.

Flight Simulator has a drop down menu for fuel. Make sure you have the fuel tanks full and set the **MAIN FUEL TANK SELECTOR to “ON” (21)**.

The fuel gauge on the main panel ONLY shows the condition of the **UPPER** central fuselage tank (27 gallons) **ONLY**. The Nimrod is fitted with two additional wing tanks of 16 gallons each. These can be accessed by pulling on the “T” handles mounted above the cockpit in the wing trailing edge. Remember they are only 15 gallons each so only use as reserves!

Open the OIL COOLER DOOR (20)

Turn on the Starting Magneto **(9)**

Pump the Gas Start Primer 10 times **(25)**

Open the Gas Starter Master Cock **(27)**

Unlock the Engine Primer and pump 4 - 5 strokes **(26)**

Press and hold the Wind-Up Magneto for 5 seconds. **(10)**

Push down the Gas Starter **(15)**

Switch UP the two small Engine Magneto Switches **(14)**

After a successful start, turn off the Start Magneto and the close the Gas Starter Master Cock.

MAGNETO TEST

Open the throttle to give 1500 RPM. Now, switch OFF the left magneto and observe the tachometer reading. You should see a drop in RPM of around 100 RPM, no more. Switch ON the left magneto again and repeat the procedure for the right magneto. Return the switch to ON.

TAXY

You are now ready to taxy to your takeoff position. These aircraft have a very long nose which makes forward vision almost impossible for the pilot to see where he is going. So, we have provided a special “LANDING VIEW” in the view presets which will make taxying a lot easier.

Open the throttle a small amount and release the brakes. Normally you would taxy using slow, long ‘S’ turns in a weaving pattern so that the pilot can see the road ahead. With this camera view you should be able to just taxy to the takeoff point using rudder and differential braking in the usual way.

Before takeoff, apply the parking brake and double check your instruments. Feed in a small amount of NOSE DOWN trim using the elevator trim-wheel.

TAKEOFF

Open up slowly and release the brakes. As you roll forward, gathering speed, open up to +61/4 boost and shortly the tail will rise. Hold her there, using small rudder inputs to keep straight. DO NOT BE TEMPTED TO OVER-CORRECT!

Flying these old aeroplanes successfully is largely a balancing act between careful engine management and power use and getting a “feel” for the airframe as it moves through the air.

Although the climb attitude can look quite flat but can actually be 2,000 fpm.

Top speed is around 195mph and best cruise speed is 122 mph.

As a general rule, +1.5lbs of boost is fine for most flying but go higher for climb and some aerobatics.

Talking of which, aerobatics are a joy in these Hawkers. Loops should be entered at 170 mph and barrel rolls at 180 mph minimum. Maximum diving speed is 215 mph. In a loop, keep an eye on the boost and revs. The Kestrel's power can drop away smartly at the top of a loop and in some cases the engine can cut momentarily.

Stall happens around 53 mph and is quite benign with a small drop in the nose and one wing will begin to drop. A straightforward, safe recovery comes with power on and nose down. Don't over correct with rudder!

For landing use a curved approach - it is easier to see where you are going and the speed can be eased off sooner. Drop to 80 mph and straighten at around 30 ft. Keep a small amount of power on at the threshold and slowly let her sink onto the mains. Cut the power and keep her tail up as long as possible with a small amount of forward stick. Let the tail drop and when the skid is planted, pull right back on the stick and apply brakes GENTLY.

The aircraft will want to wander, left or right so use small amounts of rudder to correct and stay straight. There is no reason behind the swing, she'll choose left or right at will so be ready.

SHUT-DOWN

Cut the engine by switching off the magnetos, turn off the fuel and then depress the Gas Starter on the floor to check that the system is no longer “live”

We hope you have as much enjoyment from flying these silver beauties as we did making them. Happy Flying!

CHECKLISTS

PRE-START

PILOT	ABOARD
CONTROLS	ALL FREE AND CORRECT
PARKING BRAKE	ON
START MAGNETO	OFF
MAGNETOS	OFF
FUEL SELECTOR	ON
PITOT HEAT	ON

START

START MAGNETO	ON
GAS PRIMER	10 STROKES
GAS MASTER VALVE	ON
ENGINE PRIMER	UNLOCK THEN 5 STROKES THEN LOCK
MIXTURE	FULL RICH
THROTTLE	CRACKED
MAGNETO (WIND-UP)	45 SECONDS
FLOOR STARTER	ON (ALLOW PROP TO ROTATE)
MAGNETOS	ON (BOTH)

ENGINE WARM AND RUN-UP

RADIATOR SHUTTER	FULL OPEN
BRAKE PRESSURES	CHECK
ALTIMETER	SET
COMPASS	FREE AND BEZEL SET AS DESIRED
TEMPERATURES	CHECK

MAG TEST

RPM	1500
LEFT MAG	OFF 100 RPM DROP ON
RIGHT MAG	OFF 100 RPM DROP ON
THROTTLE	IDLE
NAV LIGHTS	ON

TAXY

PARKING BRAKE	RELEASE
INSTRUMENTS	CHECK
ALTIMETER	SET

PRE-TAKEOFF

ENGINE	CHECK INSTRUMENTS
THROTTLE	IDLE
TRIM	NOSE DOWN (3 DEGREES)

TAKEOFF

BRAKES	RELEASE
THROTTLE	SMOOTHLY TO MAX RPM
ROTATION	75 - 85 MPH
ATTITUDE	LEVEL UNTIL 150 MPH

CLIMB

THROTTLE	+1.5LB BOOST
TRIM	MAINTAIN 1800 FPM AT 165 MPH

LANDING

THROTTLE	TO MAINTAIN 80-90 MPH
TRIM	AS REQUIRED
THROTTLE	TO GIVE 75 MPH OVER THRESHOLD
THROTTLE	IDLE TO LAND AT 70 MPH

SHUT-DOWN

THROTTLE	CLOSED
MAGNETOS	OFF
FUEL TANK SELECTOR	OFF
GAS MASTER VALVE	OFF
GAS STARTER (FLOOR)	DEPRESS - CHECK FOR NO PROP ROTATION

AEROPLANE HEAVEN



You're virtually there.

A SPECIAL CREDIT MUST GO TO ECHO 19 WHO AUTHORED THE MAGNIFICENT ROLLS ROYCE SOUNDS FOR THIS NIMROD/FURY PACKAGE.

AND TO WELLS SULLIVAN WHO AUTHORED THE FLIGHT MODEL AND ENGINE FILES.

