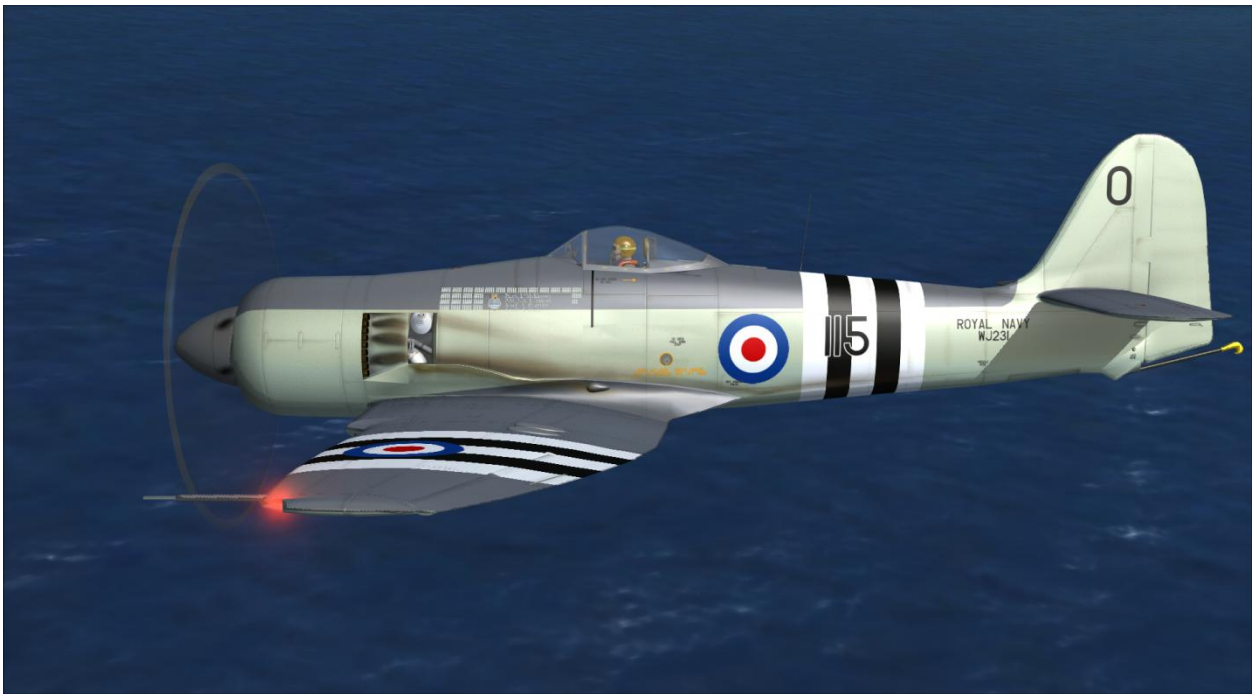
Flying Stations



Sea Fury FB.11

For FSX Acceleration

Introduction

The Hawker Sea Fury was the ultimate development of the Typhoon/Tempest line of fighters that saw use in the latter half of the Second World War. Although originally designed against the dual requirements of Air Ministry specification F.2/43 and Admiralty specification N.7/43 the end of hostilities saw the RAF's order cancelled leaving only the Bristol Centaurus XVIII powered Naval variant to enter production.

Two variants were produced, the F.10 and the FB.11, the range F.1-9 being reserved for potential air force versions that were never produced. The only difference between the two was the ability of the FB.11 to carry a bomb under each wing. With 2,480 HP available from the 18 cylinder radial engine the Sea Fury was one of the fastest piston powered aircraft produced and was able to hold her own against the early jets, notably in Korea where at least one MiG-15 fell to her 20mm cannons.

Entering squadron service with the Fleet Air Arm in 1947 the Sea Fury served with 9 front line squadrons as well as numerous second line units. Additionally the aircraft served with the navies of Australia, Canada and the Netherlands as well as the air forces of Iraq, Pakistan, Egypt, Burma and Cuba. Air force versions were a mixture of former RN examples de-navalised and purpose built examples which notably lacked the upsweep at the base of the rudder to accommodate the tail hook. To allow re-painters to represent air force de-navalised Furies the tail hook only appears on aircraft with the word 'Sea' in the Title = section of the aircraft.cfg file.

Installation Notes

To accommodate various extra functions in the aircraft on first loading you will be asked if you want to allow the Centaurus.dll gauge to operate. Additionally the following extra control has been added:

Weapons Release - Ctrl+Shift+m or Joystick Button 0 (trigger)

Aircraft Configuration

Once the aircraft is loaded it is possible to set the desired fuel and weapon load via the loading sheet (Shift+1). It is necessary for the parking brake to be applied for the load to be successful. Note, the loading sheet fuel total refers to internal fuel only, hence without the drop tanks selected FSX will indicate approximately 68% fuel load.

Aircraft Systems

Fuel System

The Sea Fury's fuel system comprises 4 internal tanks and two optional drop tanks. The internal tanks comprise a 127 Imperial Gallon main tank aft of the firewall, a 28 Imp Gal inter-spar tank in each wing and a 17 Imp Gal nose tank in the starboard wing (replaced by the oil cooler in the port wing). Fuel from the wing tanks is transferred automatically to the main tank via air pressure from the exhaust side of the engine's vacuum pump.

If drop tanks are fitted a selector lever (42) on the cockpit starboard shelf allows the pilot to transfer fuel from the drop tanks in the forward position or the wing tanks in the aft position. Note if drop tanks are not fitted and the lever is in the forward position the wing fuel will not be transferred to the main tank.

Contents gauges for the internal tanks (47, 48, 49) are located on the cockpit starboard shelf, together with a low fuel warning light (41) that illuminates when the main tank level falls below 107 Imp Gal.

A fuel tanks air pressure gauge (39) is also located on the starboard cockpit shelf, in normal operation it should indicate between 3 ¼ and 5 lb/sq. in, if the pressure falls below 3 ¼ ib/sq. in fuel may not transfer satisfactorily at altitude.

Flying Controls

The flying controls consist of direct controls for the rudder and elevator and servo tabs for the ailerons. Consequently trim is only available in pitch and yaw, the hand wheels (1, 5) for which are located on the cockpit port shelf with the indicator unit (2) positioned between them. Note, the servo tabs operating the ailerons require a flow of air over them to actuate the control surface, consequently when the aircraft is stationary on the ground only servo tab movement will occur when the controls are moved.

Engine Controls

The engine controls allow single lever operation of the engine as well as preventing over boosting of the engine.

The two speed supercharger allows +9.5 lb/sq. in boost to be maintained to 4000' in 'M' gear and 16000' in 'S' gear. Note due to the reduced heating of the charge air in 'M' gear there is around 500hp more power at sea level and there is no advantage to using 'S' gear until around 7500'. The supercharger lever (7) allows for selection of the 'M' and 'S' gearing, if the 'S' gearing is selected below 7000' a warning lamp will illuminate on the front panel.

The throttle lever (11) is linked to the engine via a barometric unit that prevents the butterfly valve opening beyond +9.5 lb/sq. in of boost, consequently the pilot is not required to monitor the boost level while moving the throttle.

The R.P.M. control lever (10) allows setting of the engine R.P.M. via the propeller constant speed unit in the usual manner, additionally by moving it fully aft (within the final 5% of movement in FSX) the system enters automatic mode and will set the R.P.M. as appropriate for the current boost setting. Thus the automatic mode relieves the pilot of the requirement to set the R.P.M. while changing throttle settings.

Mixture control is fully automatic and the control (8) only needs to be touched to cut the fuel supply for engine shut down.

The cooling flaps are operated by a spring loaded switch (29) on the front console, left clicking moves the switch to the open position, right clicking to the close position. The switch will return to the off position on release or reaching the fully open/closed position. In general operation it is sufficient to fully open or close the flaps as required hence no indicator is provided.

Radio and Autopilot

The original production Sea Furies were fitted with a four channel VHF transceiver, this allowed for one of four pre-tuned frequencies to be selected, no manual tuning was possible. They were subsequently upgraded with 10 and then 40 channel units. Due to the incompatibility of such systems with the FSX ATC network a pop-up radio panel is included featuring a communication radio and transponder. Although the real aircraft was not fitted with one a basic autopilot is also included to ease pilot workload on long range transits. The radio sub-panel is accessed via Shift+2. Additionally a GPS is accessible via Shift+3

Armaments

As modelled the FB.11 is capable of carrying either two 500lb bombs or 2-6 60lb rockets. Once loaded via the armament panel they can be selected for launch via the armament switch (6), left clicking to move aft, right clicking to move forwards. Once a selected the stores may be fired via the trigger button on the joystick, or the Ctrl+Shift+m key combination. Note as the trigger is typically mapped to the aircraft brakes as well it is unwise to make the armament switch prior to take-off.

RATOG

Rocket Assisted Take-Off Gear can be loaded via the Loading Panel. Rocket burn is ~4 seconds giving a ~45kt speed boost.

To operate, ensure the Armament Selector (6) is set to safe and the RATOG Master Switch (9) is on (Up), this will make the trigger live. Commence the take-off run as normal to ensure the aircraft is running true, operate the trigger to initiate the RATOG burn, apply slight left aileron and lift the aircraft off the ground once flying speed has been achieved ~100kts.

Once the aircraft is safely airborne and cleaned up the RATOG can be jettisoned via the pushbutton (4).

Identification Lights

Three under wing identification lights are fitted, the Red and Green ones under the starboard wing and the Amber under the port wing. To select the desired colour use switch (51) left clicking to move it aft, right clicking to move it forwards. The OFF/MORSE/STEADY switch (50) allows the selected light to either be used as a Morse signalling lamp via the Morse key (52) or a continuously illuminated light. Again left clicking will move the switch aft, right clicking forwards.

Handling

Engine start and warm up

Prior to start confirm:

Ignition Switches (18)	OFF
Main Fuel Cock (40)	ON
Fuel Cut-Off (8)	RICH
Throttle (11)	½" Open
R.P.M. Control (10)	MAXIMUM
Engine Cooling Shutters (29)	OPEN
Supercharger Control (7)	M

Note the static boost reading (usually 0 lb/sq. in under standard atmosphere conditions at sea level) (31).

Prime the injectors with the pushbutton (44).

Prime the cylinders with the pushbutton (45).

Index the starter breech (16) and switch ON the ignition (18).

Press the starter pushbutton (46), the starter cartridge will accelerate the engine to ~500 R.P.M. almost instantaneously.

If a cartridge fires but fails to start the engine, repeat the above procedure, ensuring the engine is re-primed.

Run the engine at 1200 R.P.M. and warm up at this speed.

Exercising and Testing

Warm up to ~120°C C.H.T. and >15°C Oil Temperature.

Test each magneto before increasing power further.

Holding the control column well back increase the throttle until the static boost reading is obtained, check the generator failure lamp is out.

At the same boost, check the operation of the constant speed propeller by moving the control lever over its full range at least twice (note moving the lever below 5% will activate the automatic control unit and is not necessary for the test) then return to maximum.

At the same boost exercise the supercharger by changing to high gear, R.P.M. should drop by ~150. After around 30 seconds change back to low gear and confirm the R.P.M. rises.

At the same boost test each magneto in turn; single ignition drop should not exceed 50 R.P.M.

Take Off

Trimming Tabs:

Elevator	Neutral (without flap)
	½ Div nose up (with flap)
R.P.M. Lever	Max R.P.M. position
Fuel	Check contents
Flaps	Up (airfield)
	Max lift (catapult)
	Take-off (carrier)
Wings	Spread and locked
Engine cooling shutters	Open
Supercharger	'M' (low gear)
Canopy	Open
Tail wheel	Locked

Full throttle should always be used for take-off, although the aircraft may become airborne before the full throttle position is reached. Note due to the large amount of torque generated by the Centaurus engine it is inadvisable to rapidly open the throttle.

The tendency to swing to the right can be controlled easily by the rudder particularly if the aircraft is flown off tail down.

When taking off with flap deployed the aircraft should be flown off tail down.

When comfortably airborne move the R.P.M. control lever smoothly back to AUTO before reducing boost.

Climbing

Maximum rate of climb speed is 165 knots from sea level to 20000', thereafter decreasing by 5 knots per 4000' increase in altitude. There is little loss in rate of climb, and the handling is better, if the climbing speed is increased to 185 knots.

For economical climbing, place the R.P.M. lever in AUTO, set the throttle to give no more than 2250 R.P.M. and climb at 165 knots, reducing as appropriate above 20000'.

General Flying

Changes of Trim

Gear Down	Slightly Nose Down
Gear Up	Nose Up
Flaps Down	Nose Down
Flaps Up	Nose Up
Engine Cooling Shutters Open	Nose Down
Engine Cooling Shutters Closed	Nose Up

Due to the torque from the engine there is a change in directional trim with alterations is speed and power.

Flying at reduced airspeed should be done with opening the canopy below 170 knots, and lowering the flaps to MAX LIFT. Set the R.P.M. control to give 2200 R.P.M. and fly at about 145 knots.

Stalling, the approximate stall speeds, engine off, cooling shutters closed in knots are:

	12400lb	14650lb
Flaps and gear up	105	115
Flaps and gear down	90	100

Power on,

approach configuration	80-82

Diving, there is little change of trim when diving to the limiting speed. Speed is gained rapidly however and care should be taken not to exceed the limiting speeds.

Spinning is prohibited, should an accidental spin occur normal recovery action should be taken and a speed of 175 knots attained before recovery from the resulting dive.

Normal aerobatics are easy to perform, recommended entry speeds are as follows:

Roll	200 to 250 knots
Loop	320 to 360 knots
Roll off loop	320 to 360 knots
Upward roll	350 to 400 knots

Approach and Landing

Before landing reduce airspeed below 185 knots and check:

Supercharger	'M'
Fuel	Contents
Engine cooling shutters	CLOSED
Tail wheel	Locked (airfield)
	Unlocked (carrier)
Canopy	Open
Gear	Down and locked
	Green lights on
Flaps	MAX LIFT
R.P.M. Lever	Set for 2400 R.P.M.

Speed below 140 knots:

Flaps	DOWN

Recommended final approach speeds in knots are:

	12400lb	14000lb
Flaps down, engine on	100	110
Flaps up, engine on	115	125

Initial approach should be 10-15 knots faster.

Power off landings should not normally be made with full flap as the glide path is very steep. The appropriate procedure is:

Flaps	TAKE OFF
Speed	130 knots

When certain of reaching the airfield:

Flaps	MAX LIFT

Round out should be made at 130 knots allowing speed to reduce to 115 knots over the airfield boundary to allow for a normal hold off and landing.

Deck Landing

Lower the arrestor hook and check the indicator light.

Ensure tail wheel is unlocked.

With R.P.M. lever set to give 2400 R.P.M. approximately -1lb/sq. in boost will be necessary during the initial turn in, falling to -3 to -4lb/sq. in towards the latter stages of the approach.

The recommended speed for deck landing is 90-92 knots, it is necessary to pull the control column well back to effect a three-point touch down.

Going Round

The aircraft will climb away easily, gear and flaps down at climbing power.

Raise the gear and climb at 125 knots, raise the flaps in stages above a safe height.

Note, at low airspeed sudden opening of the throttle can cause a torque roll sufficient to invert the aircraft. It is recommended pilots familiarise themselves with

this phenomena at altitude at the earliest opportunity to enable them to anticipate and counteract it.

Running Down and Stopping the Engine

The engine should be idled at 800 – 1000 R.P.M. and the magnetos checked for a dead cut.

Stop the engine by closing the throttle and setting the fuel cut off to CUT-OFF.

Ignition Switches	OFF
Fuel Cock	OFF
Electrical Services	OFF
Ground/Flight Switch	GROUND

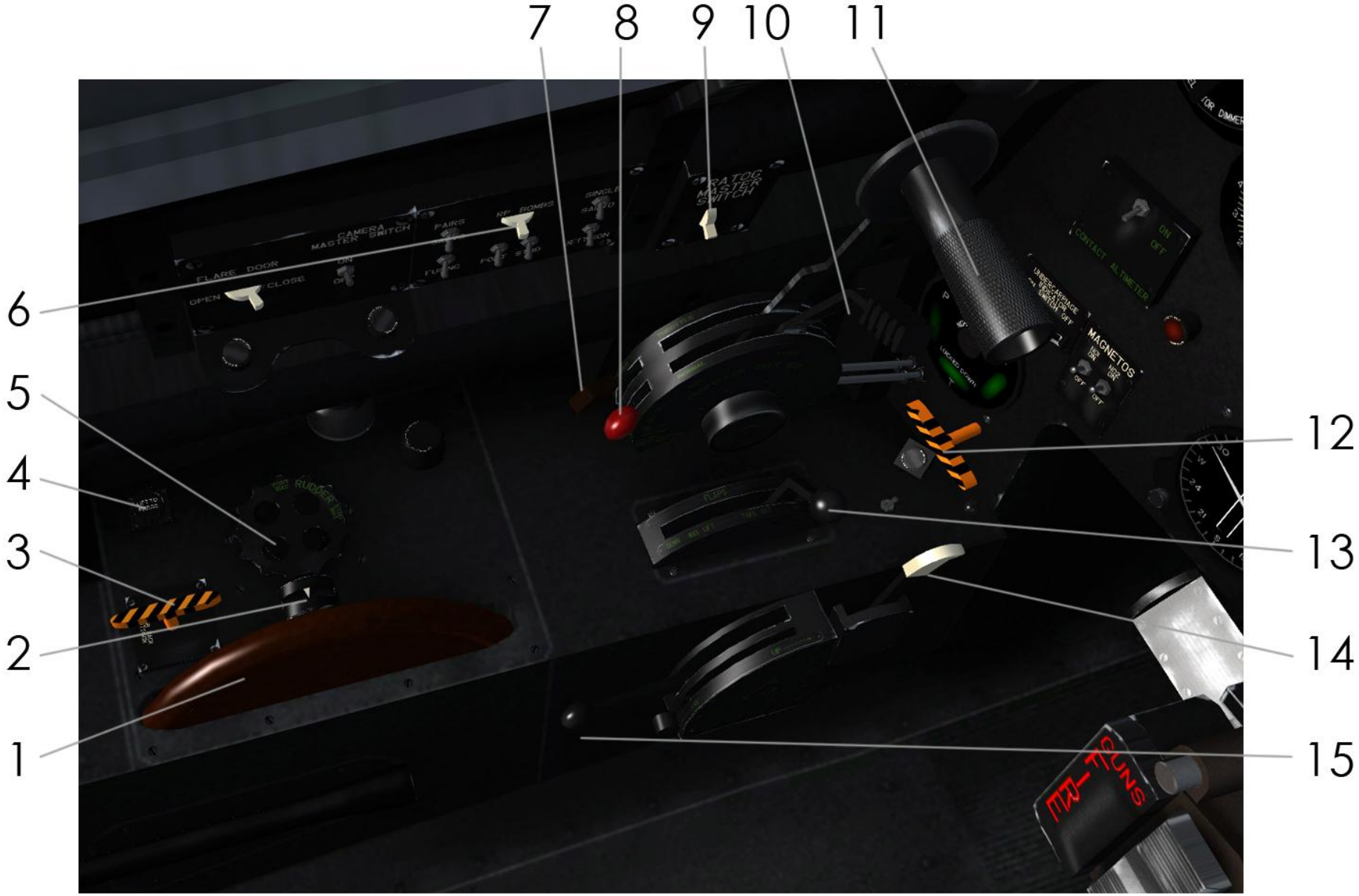
ILLUSTRATIONS

1. Cockpit Left View
2. Cockpit Front View
3. Cockpit Right View and Sub-Panel Inset

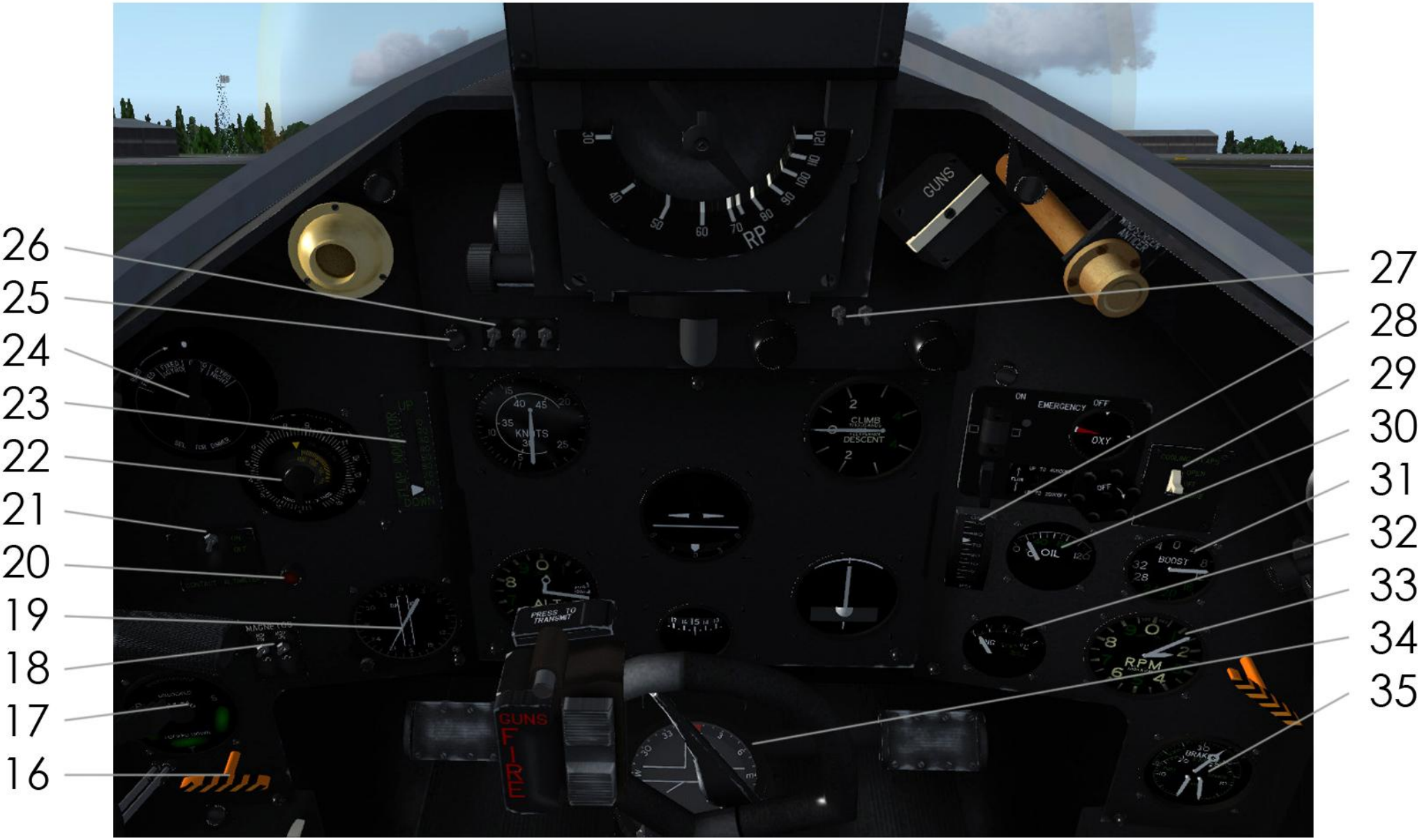
Key to Illustrations

1	Elevator trim wheel
2	Trim indicators
3	Stores jettison
4	RATOG Jettison
5	Rudder trim wheel
6	R.P. Bombs Selector Switch
7	Supercharger gear change lever
8	Fuel cut-off control
9	RATOG Master switch
10	R.P.M. lever
11	Throttle lever
12	Tail hook indicator lamp
13	Flap lever
14	Tail hook lever
15	Gear lever
16	Starter re-indexing control
17	Gear indicator
18	Magneto switches
19	R.I. compass indicator
20	Supercharger warning light
21	Contacting altimeter switch
22	Contacting altimeter
23	Flap indicator
24	Gyro gun sight dimmer
25	Gear warning light
26	Gyro gun sight master switch
27	Cockpit lighting switch
28	Oil pressure gauge
29	Cooling flaps switch
30	Oil temperature gauge

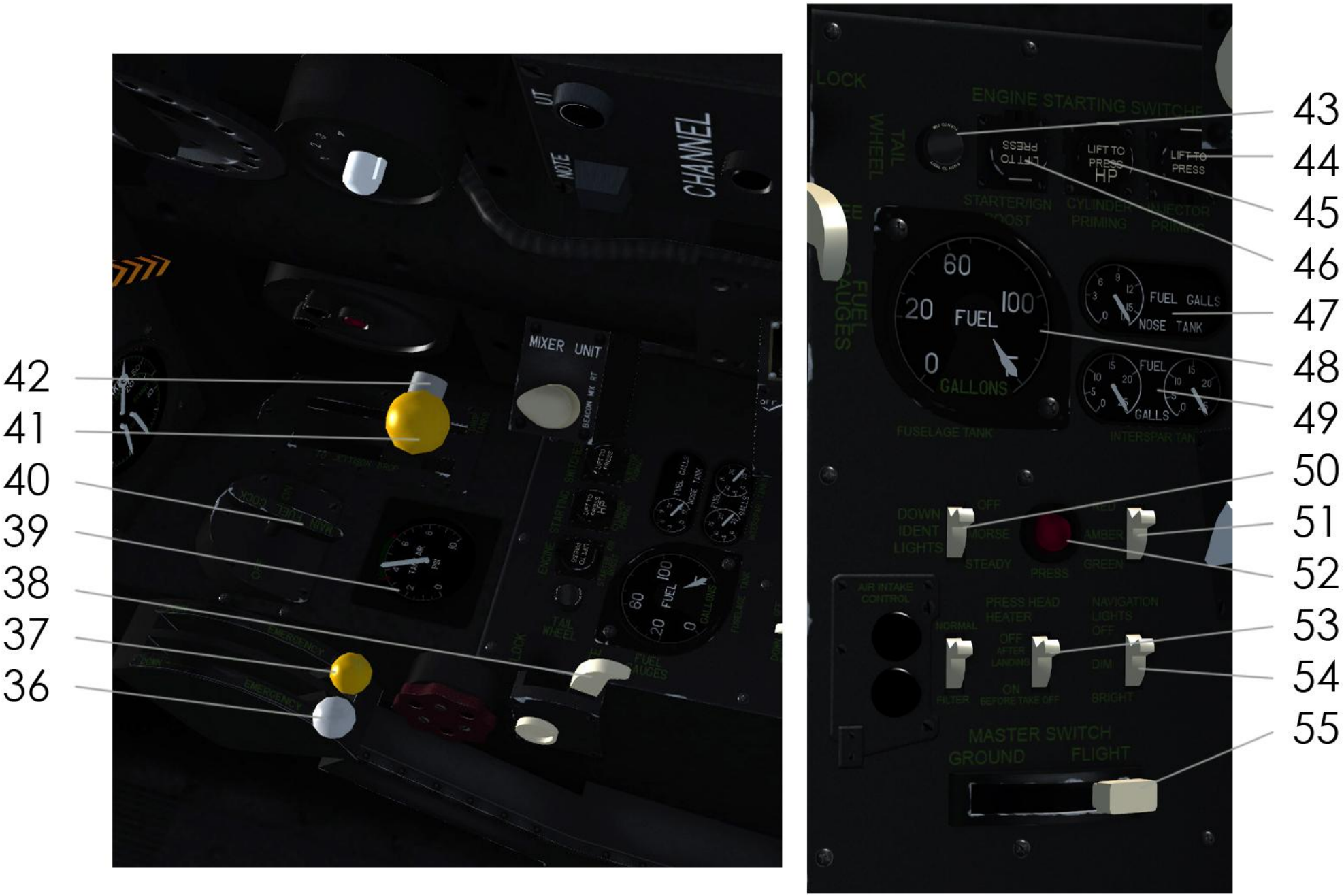
31 Boost gauge
32 C.H.T. gauge
33 R.P.M. gauge
34 Brake pressure gauge
35 Magnetic compass
36 Emergency flap lever
37 Emergency gear lever
38 Tail wheel lock
39 Fuel tank air pressure gauge
40 Fuel cock
41 Drop tanks jettison control
42 Drop tanks selector lever
43 Low fuel warning lamp
44 Injector priming pushbutton
45 Cylinder priming pushbutton
46 Cartridge starter pushbutton
47 Nose tank fuel gauge
48 Main tank fuel gauge
49 Interspar tanks fuel gauge
50 Downward identification lights signalling switch
51 Downward identification lights colour selector switch
52 Downward identification lights signalling pushbutton
53 Pitot head heater switch
54 Navigation lights switch
55 Ground Flight master switch (operates as Battery Switch in FSX)



Cockpit Left View



Cockpit Front View



Cockpit Right View

Credits/Blame

Philip J Chandler	-	3D Model, Gauge Programming, Flight Model
Fraser M Paterson	-	Textures, Testing
Rich Ruscoe	-	Flight Model,
Steve Beeny	-	Web Guru

Feedback is appreciated via our web forums http://z13.invisionfree.com/Flying_Stations/.