

# Flight Replicas

# ***CAC Boomerang***

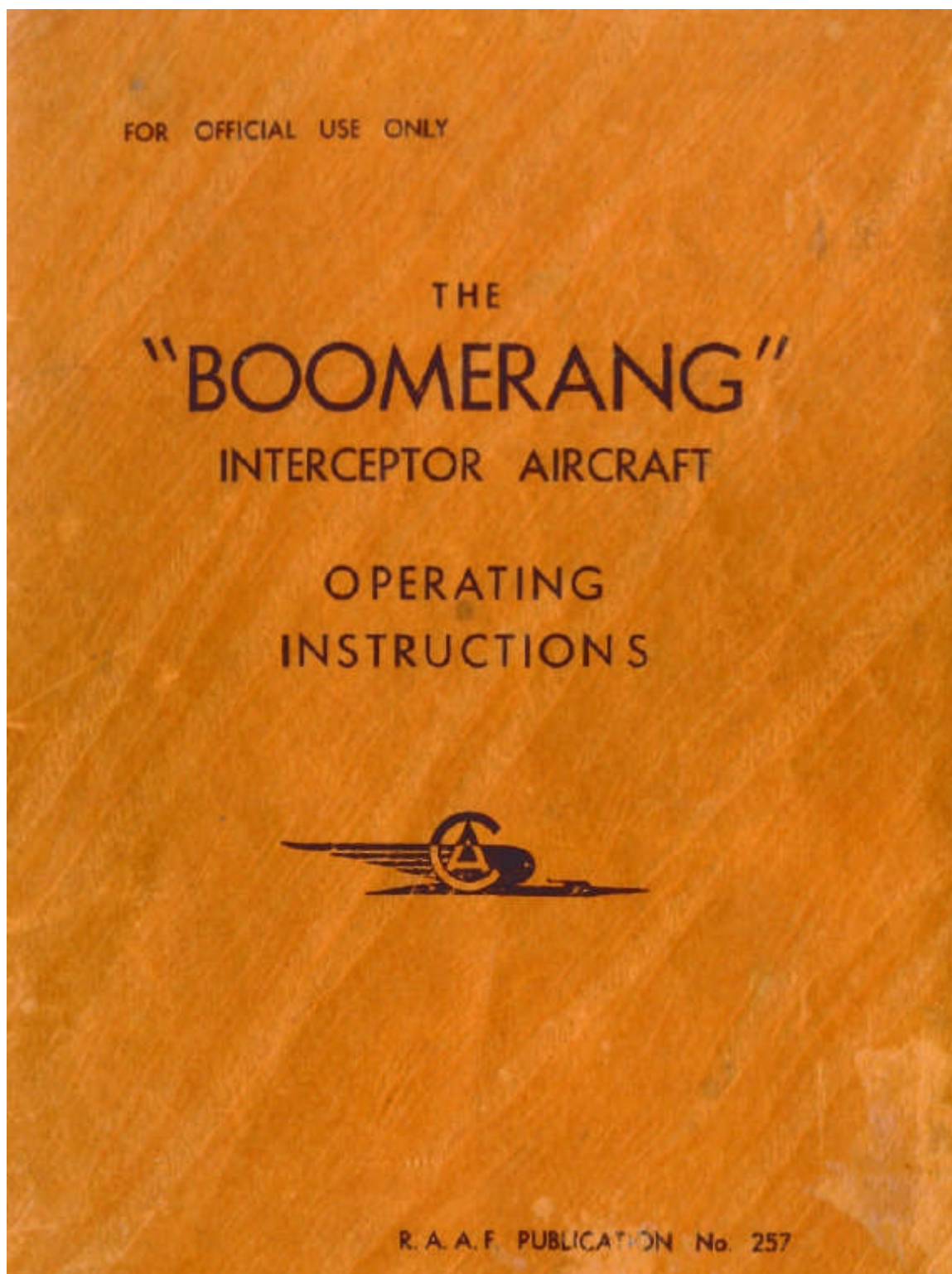
CA-12 and CA-13

For Microsoft FSX plus Acceleration



**This is a complex simulation. To get full enjoyment of this aircraft, please read this manual carefully.**

**Warning: This Manual and FSX model must not be used for real flight training purposes.**



# Introduction

The CAC Boomerang was a World War II fighter aircraft designed and manufactured in Australia between 1942 and 1945. The Boomerang was significant as the first combat aircraft designed and built entirely in Australia.

Following the Japanese air raids on Darwin in northern Australia on 19 February 1942, the need for interceptors became an urgent issue for Australian defense. A shortage of available fighters prompted the rapid development and pressing into service of the Boomerang - an impressive feat as the Australian aviation industry had never designed fighters before, or built them. Once production was underway, however, the rapid arrival of Curtiss P-40 Kittyhawks from the USA, and later, Spitfires from RAAF returning from the Europe theatre of operation, however, meant that the urgency of Boomerang production soon diminished, although production of limited numbers continued throughout WWII thanks to the Boomerang's unique capabilities.

In contrast to the European or North African theatre of operations, the ground war in the jungles of the southwest Pacific was quite often a series of small unit actions fought at very close quarters by widely dispersed forces with no clear front lines. It was in this type of combat that the Boomerang found its niche throughout WWII, as a superb close ground support aircraft.

With good range, heavy armament, and excellent low-level handling characteristics, the aircraft could avoid ground fire in even rough terrain and still inflict heavy damage. The extensive armour plating protected the pilot, the aircraft's simple wood and aluminum airframe capable of absorbing a great deal of battle damage, the ability to drop target-marking smoke bombs for other attack forces, plus two cannons and four machine guns, made for a very effective low-level combat aircraft. Flying in pairs, Boomerang tasks included bombing, strafing, close infantry support and artillery spotting.

RAAF No. 4 Squadron and No. 5 Squadron flew Boomerangs in New Guinea, the Solomon Islands Campaign and Borneo Campaign, with marked success, their operations requiring very close contact with the enemy. The partnership between 5 Squadron Boomerangs and Royal New Zealand Air Force Corsair fighter-bombers during the Bougainville Campaign is just one noted example of the achievements of this outstandingly effective combat aircraft.

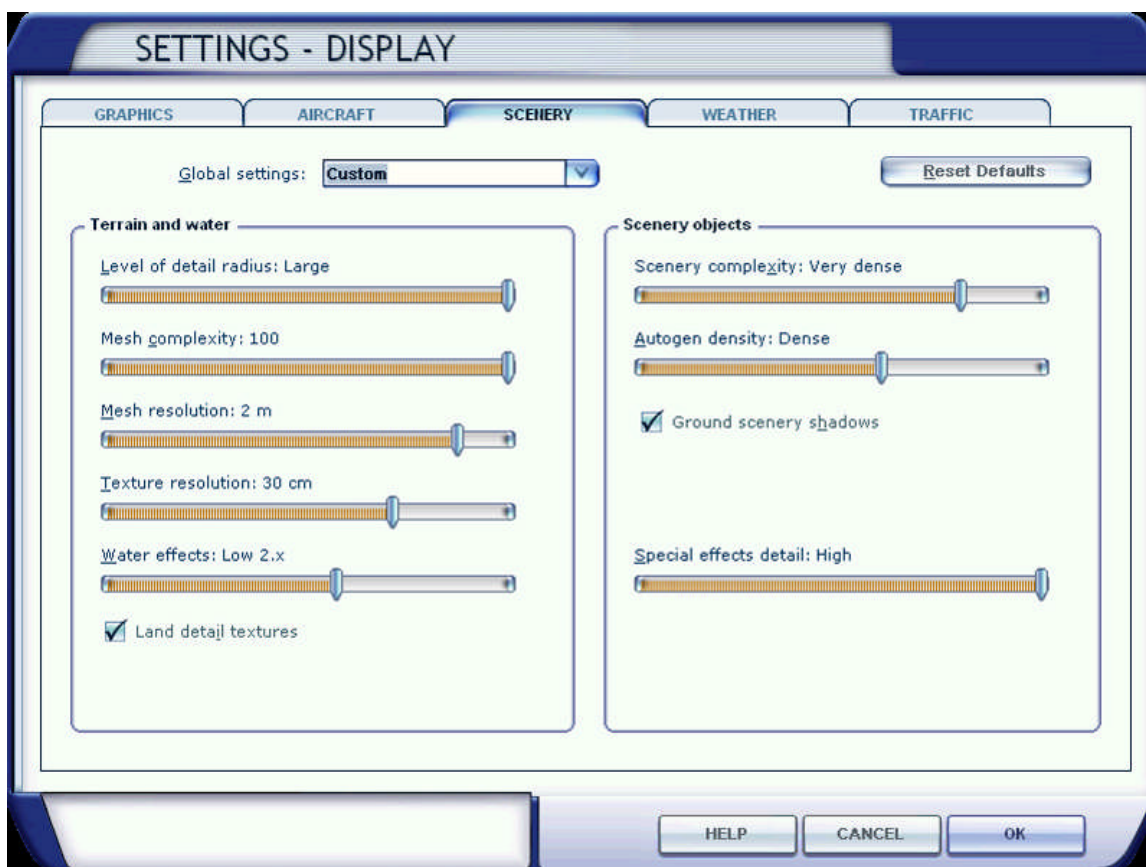
## Simulator settings

These are the settings at which the Boomerang was built and tested, and are those behind any performance-related statements. These settings are not necessarily a recommendation for your own computer – they are supplied as reference and illustrate conditions under which no unusual performance penalties were observed and the plane performed extremely well.

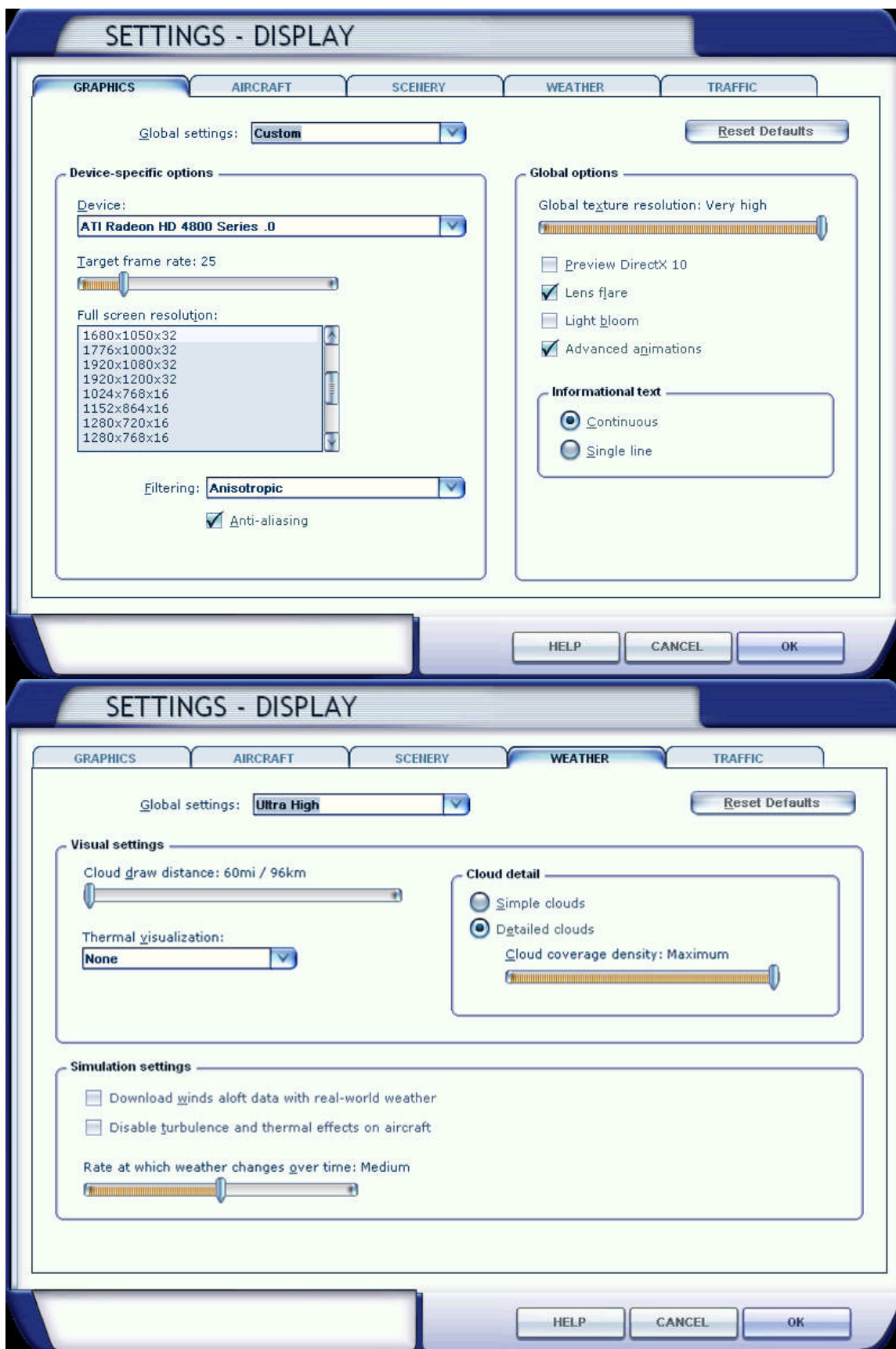
Beta testers had computers of different level capabilities, from what a knowledgeable casual observer could call “middle-of-the-road” to “strong” by today’s overall standards (2010).

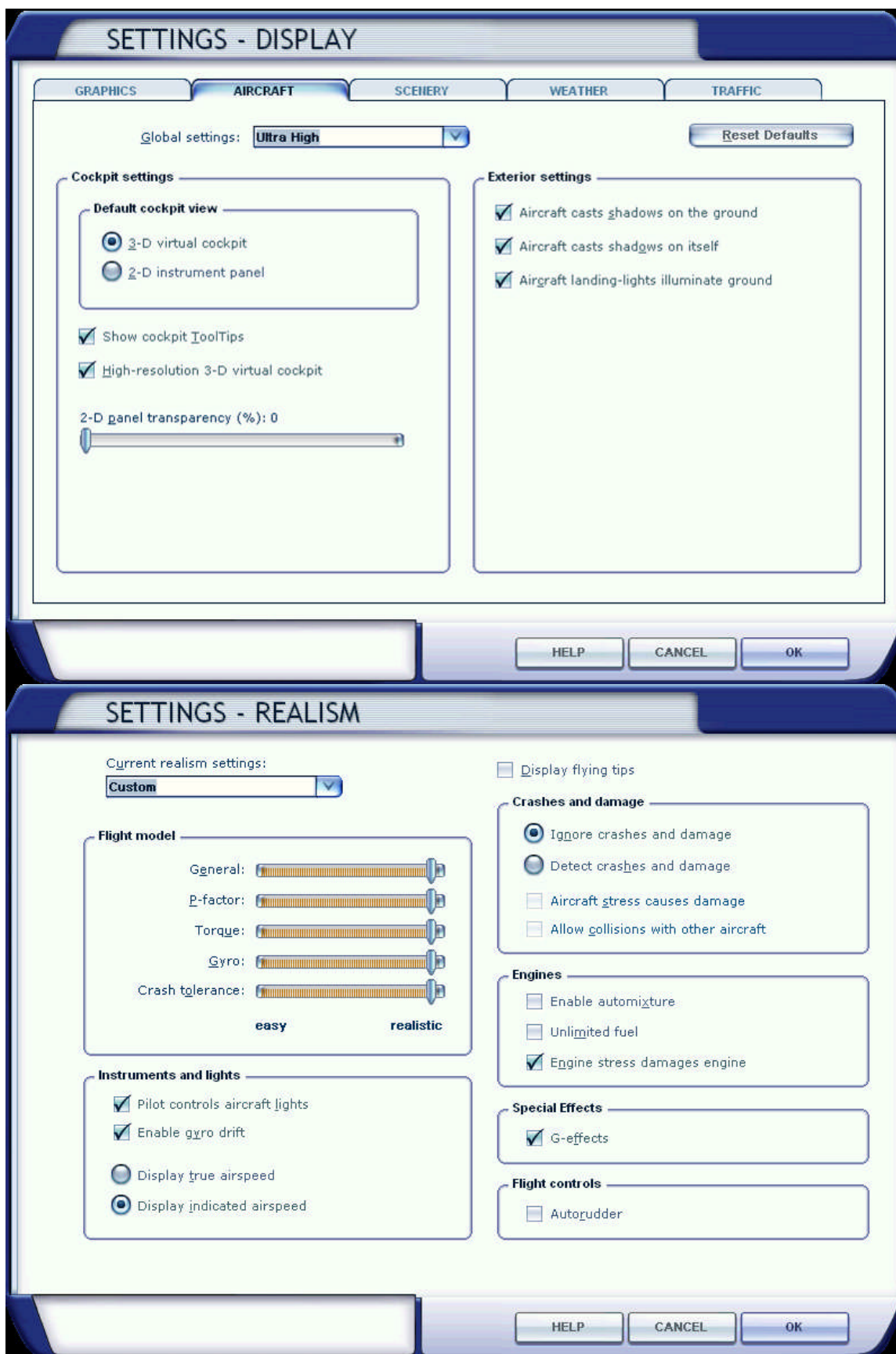
The Boomerang is a fairly complex model. You may have to adjust your computer as necessary. Realism sliders here are at 95%: feel free to go to 100%.

The only strong recommendation is to have fps limited to 25 or lower.









## **Master Battery Switch:**

On the Boomerang, the battery switch was outside the cockpit, operated by the ground crew. To turn the battery on and off, you will need to assign a key to the master battery function, and use your keyboard or switch/button on your controller.

## **Gun Systems:**

Please note: To enable the same trigger button to be used for brakes on the ground and guns in the air, the gun system uses brake code, and so you may see the small red "Brake" message on screen when firing the guns.

There are two gun systems in the Boomerang: Cannon and Machine gun. To operate:

### ***Cannon:***

1. Turn on Cannon system on left sub panel, making sure light illuminates
2. Prime the cannons, by clicking the two cannon priming knobs
3. When the red arrows on the two cannon priming knobs point down, the guns are ready to fire

### ***Machine Guns:***

1. Turn on Machine Gun system on left sub panel, making sure light illuminates
2. Prime the guns by pulling up the red handles, which are by your right foot
3. When handles are raised, guns are ready to fire

You may select both systems or a single one, depending on mission requirements.

When fired, cannons have yellow tracers; the machines tracers are red (which is accurate). Gun systems are de-activated when the aircraft is on the ground.

# Your *Boomerang* Cockpit:

**Note: On the ground, pilot can be made to vacate the cockpit by clicking the windscreen frame**



- |                                  |  |
|----------------------------------|--|
| 1. Cannon system switch          | 19. Gyro horizon bird adjust                 |
| 2. Machine gun system switch     | 20. Gyro horizon cage knob                   |
| 3. Gunsight on/off (inop)        | 21. Carb temp and OAT                        |
| 4. Magneto switch                | 22. Oil temp, oil pressure and fuel pressure |
| 5. Suction                       | 23. Cylinder head temp                       |
| 6. Select Warbird lower panel    | 24. Carb temp and OAT selector               |
| 7. Turn and Slip                 | 25. Starter Handle                           |
| 8. Altitude                      | 26. Parking brake                            |
| 9. Airspeed (mph)                | 27. Cannon arming switches                   |
| 10. Manifold Pressure            | 28. Blower high/low selector                 |
| 11. RPM                          | 29. P8 compass                               |
| 12. Gyro Compass                 | 30. Oxygen alt pressure                      |
| 13. Gyro Compass correction knob | 31. Oxygen quantity                          |
| 14. Warning lights               | 32. Oxygen system on/off                     |
| 15. VSI                          | 33. Primer                                   |
| 16. Select Warbird GPS           | 34. Windscreen de-ice                        |
| 17. Fuselage fuel tank quantity  | 35. Canopy open/close                        |
| 18. Gyro horizon                 |  |



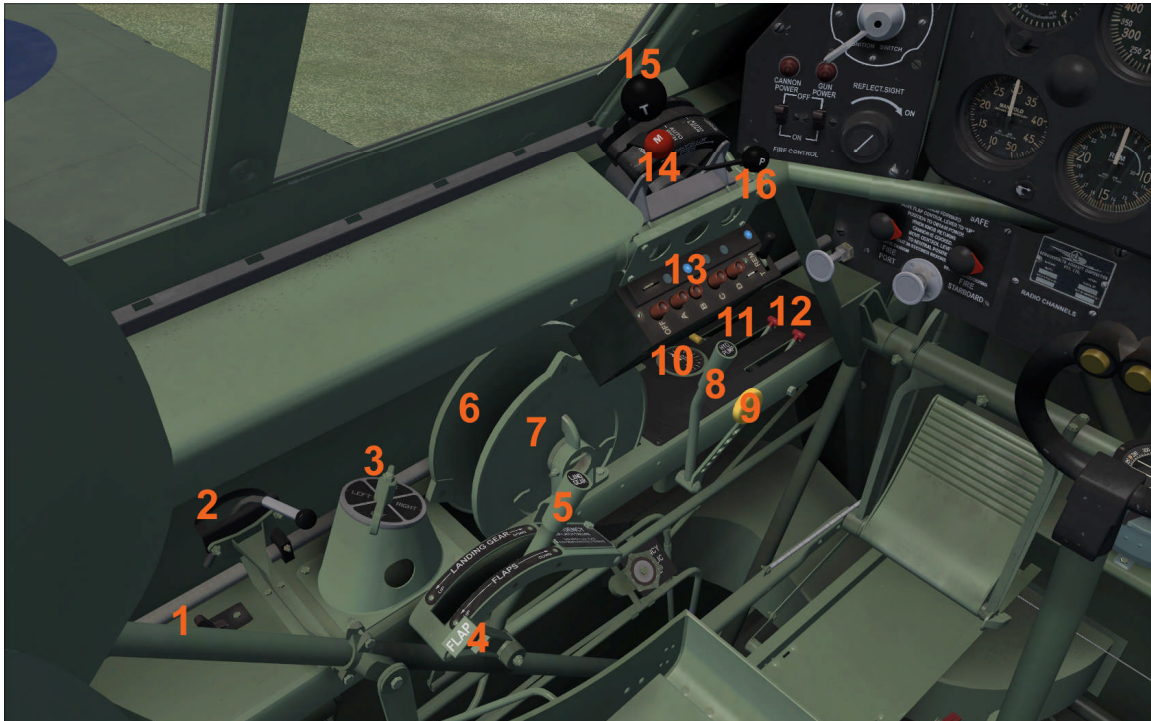
## ***Modern Warbird Panel Options***

Clicking on 4 and 5 will enable you to transform your Boomerang into a modern day 'restoration', or Warbird.



- |                |                               |
|----------------|-------------------------------|
| 1. GPS         | 4. Select Warbird lower panel |
| 2. Com radio   | 5. Select Warbird GPS         |
| 3. Transponder |                               |

## Cockpit Left



- |                                    |  |
|------------------------------------|--|
| 1. Fuel pump switch                | 10. Hydraulic pressure                       |
| 2. Oil cooler handle               | 11. Flaps up/down indicator                  |
| 3. Fuel tank selector switch       | 12. Undercarriage up/down indicators         |
| 4. Flap selector                   | 13. Radio selector (on if Master Battery on) |
| 5. Undercarriage selector          | 14. Mixture lever                            |
| 6. Rudder trim (inop)              | 15. Throttle lever                           |
| 7. Elevator trim                   | 16. Propeller pitch lever                    |
| 8. Hydraulic manual pump           |  |
| 9. Engine cooling gills open/close |  |

## Cockpit Right



- |   |   |
|---|---|
| 1. Machine gun priming handles                          | 8. System switches (see other page)                     |
| 2. Master Battery light (on when generator not running) | 9. Tailwheel steering lock                              |
| 3. Ammeter  | 10. R3003 IFF unit                                      |
| 4. Generator on/off switch                              | 11. R3003 destruct switches (to avoid capture by enemy) |
| 5. Panel lights switch                                  | 12. Morse code keys                                     |
| 6. Navigation lights switch                             |   |
| 7. Recognition lights selector (amber, green and red)   |   |

## ***Electrical Panel Switches***



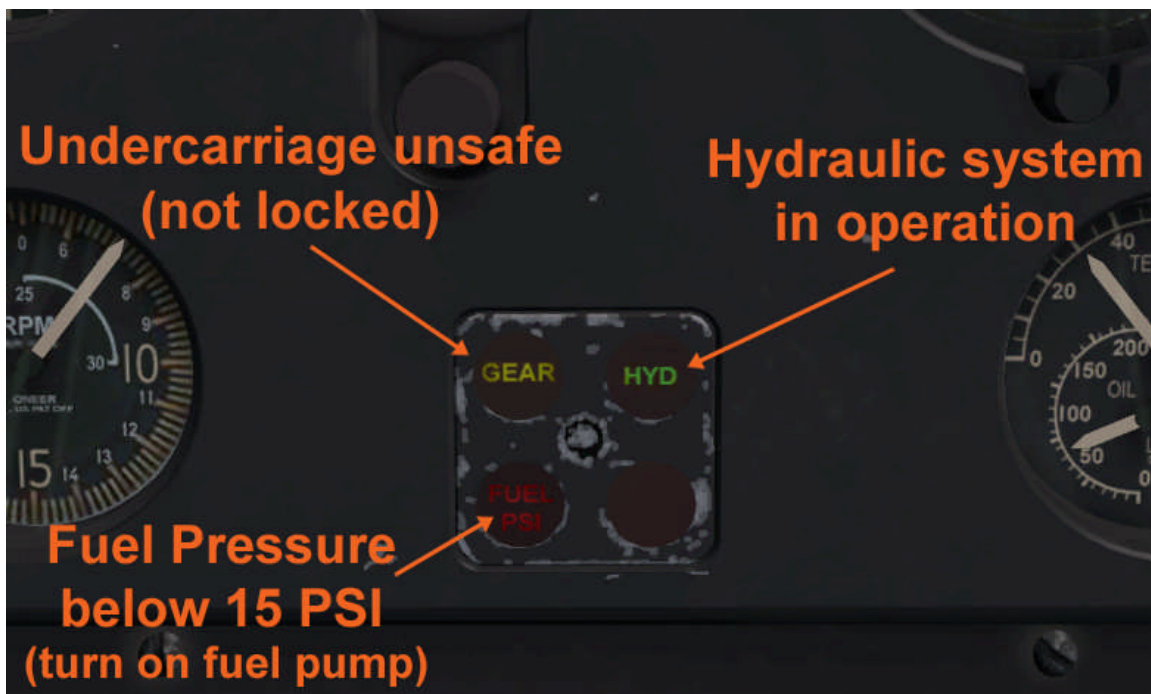


## ***Wing Tank Gauges***

(Each side of seat)



## ***Warning Lights***





# ***Flying the Boomerang***

*(This procedure assumes you have saved a flight with the aircraft in 'cold and dark' mode. If not, certain actions will already be set.)*

## **Before Starting:**

1. External **battery switch** on (by ground crew)
2. Set **parking brake**
3. Set **elevator trim** to neutral
4. Set **mixture control** to idle/cut off (full forward)
5. Set **propeller pitch** to fully fine (full forward)
6. Turn **fuel selector** to desired tank
7. Check all **fuel gauges**
8. Turn **carburetor air temperature switch** to 1
9. Ensure **blower handle** in low ratio (full in)
10. Check all **gun system** switches off
11. Place **cooling gills** in fully open position

## **Starting the Engine:**

1. Open **throttle** approximately one quarter
2. Turn on **fuel pump** and raise fuel pressure to 15psi
3. **Prime** engine according to outside temperature
4. Turn **magneto switch** to 'both'
5. Return **mixture control** to 'rich' (full aft)
6. When all clear, pull **starter handle**, wait for max inertial starter revs, then release starter handle
7. When engine starts, set throttle to **600-800 rpm** for 30 seconds
8. Switch **generator switch** to 'on'

## 9. **Warm up** engine at 1000 rpm

### **Taxiing:**

1. Take off as **soon as possible** to avoid overheating
2. Do not wear out **brakes** by excessive use and fast taxiing

### **Before Take-Off:**

1. Face aircraft **into circuit** 45 degrees out of wind
2. Check **oil temperatures** 45 C minimum
3. Check **blower** is in low regime (full in)
4. Run up engine to 30 inches of boost and 2000 rpm. Check **oil and fuel** pressures
5. Check **magneto switches** to L and R at 1500 rpm and note any rpm loss
6. Check **cylinder head temperatures** are minimum 160 C
7. Check free operation of **fuel tank selector**
8. Check position of **trim tabs**
9. Check **controls** for free movement

### **Take-Off:**

1. **Tail wheel lock** on
2. Ensure engine **cooling gills** fully open
3. **Propeller pitch** control fully forward
4. **Observe and check** for the approach of any aircraft. If none, release brakes and roll into take-off position, airplane lines up with the runway.
10. Open **throttle** slowly to 48" hg max
11. When aircraft has gained **sufficient speed**, raise tail slightly.
12. When flying speed (approx. 90 mph) has been reached, **allow the airplane to fly itself off the ground, using slight back pressure on the control stick.**

**After Take-Off:**

1. Retract **undercarriage**
2. Reduce **manifold pressure and rpm** to climb settings (Boost **41" hg**; use prop pitch to set **2550 rpm**) while undercarriage is retracting
3. Adjust **cooling gills**
4. Best **climb speed** (sea level to 8000') is 140 mph

**General Flying:**

1. Change from low blower to high blower at 10,000' altitude

**Normal Landing:**

1. Turn **fuel tank selector** to fullest tank
2. Set **mixture** to rich (full aft)
3. Set **blower** to low ratio (full in)
4. Set **propeller pitch** to full fine (full forward)
5. Select **undercarriage** down. Check gear safety light goes off.
6. Select landing **flaps** full down.
7. Engine **cooling gills** may be closed during final approach, but must be opened immediately after landing run)
8. **Tail wheel lock** on

**Landing Roll:**

1. Remain alert for any swerve, bounce or skip on landing. A sudden swerve may occur when landing with a slight drift.
2. Whenever possible, take advantage of runway length to save brakes.

**Stopping Engine:**

1. Apply **parking brake**
2. Open throttle to approximately 1300 rpm, and then pull the mixture control to the **IDLE CUT-OFF** position.

3. When the propeller stops spinning, turn the magneto switch to **OFF**
4. All **electrical switches** to off
5. **Generator switch** to off
6. **Battery off** by external switch (ground crew)

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## NOTES:

### Engine settings in Flight:

(Unless indicated, lower blower is 0-10,000'; high blower 10,000' and higher.)

#### **Maximum speed level flight** (5 minutes maximum):

Low blower: **2700 rpm; 45" Hg** manifold pressure

High blower: **2700 rpm; 41" Hg** manifold pressure

#### **Maximum continuous cruising:**

Low blower: **2550 rpm; 41" Hg** manifold pressure

High blower: **2550 rpm; 40" Hg** manifold pressure

#### **Maximum cruising (range):**

Low blower: **2250 rpm; 28" Hg** manifold pressure

High blower: **2250 rpm; 29.5" Hg** manifold pressure

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## Stalls:

(Dependant on weight and other factors)

### Engine off:

Flaps and undercarriage **up**: 90-92 mph I.A.S.

Flaps and undercarriage **down**: 74-76 mph I.A.S.

### Engine on (2000 rpm; 20" Hg manifold pressure)

Flaps and undercarriage **up**: 77-79 mph I.A.S.

Flaps and undercarriage **down**: 67-69 mph I.A.S.

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## Approach and Landing:

### Preparation:

Slow to 180 mph I.A.S.; lower gear and flaps, etc., as per section "**Normal Landing**" above

### Approach:

Engine-on approach: 100-105 mph I.A.S.

Gliding approach: 110 mph I.A.S.

Precautionary: 90 mph I.A.S.

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## Emergencies:

In the event of engine failure, undercarriage and flaps will not work due to loss of the automatic hydraulic pump. In order to lower the flaps and undercarriage:

1. Move undercarriage/flap selectors to down, as required
2. Pump (click) manual hydraulic pump lever until undercarriage/flaps are down (check indicators).

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## Using the P8 Compass:

1. Turn the outer ring so that the heading you want is lined up with the lubber line
2. Turn the aircraft so that the compass lines up with north (small cross piece is on the south-pointing side).

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## Sounds:

Sounds are a mixture of default and custom sounds. Added sounds have been provided by the use of a custom sound module.



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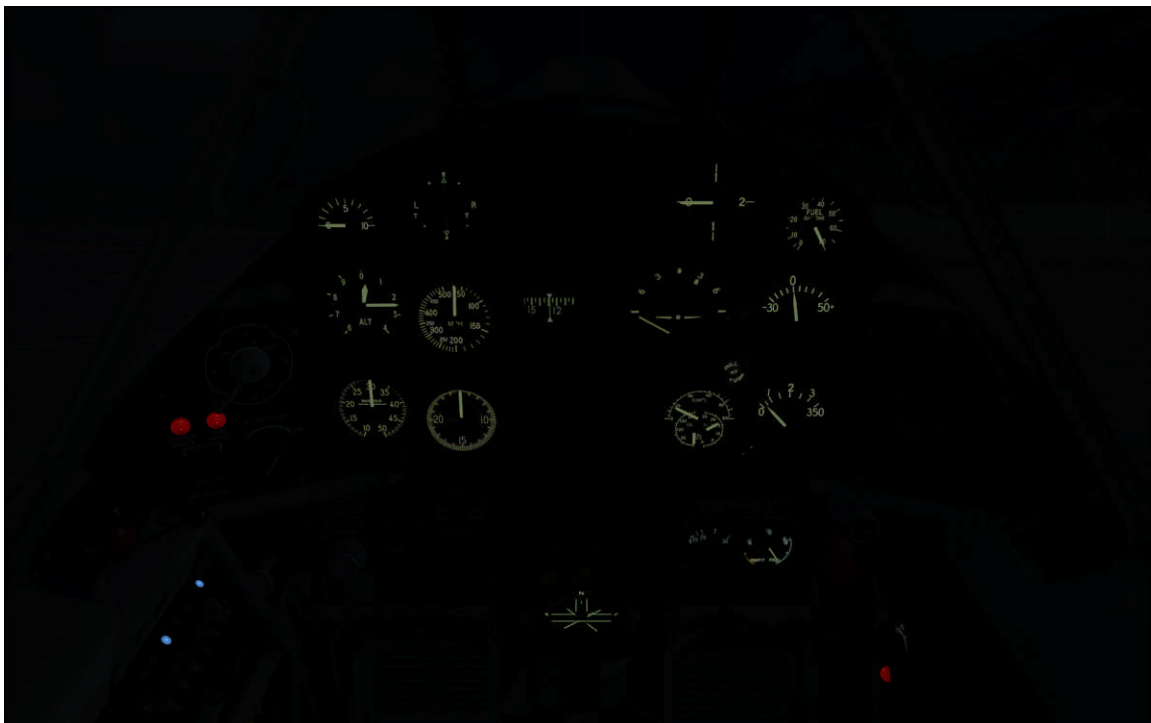
## Night Operations:

There are three choices of cockpit lighting, for night flying:

1. Photo luminescent
2. Panel lights
3. Cockpit lights

Any combination may be chosen. Switches are found on the electrical panel on the right-hand side of the cockpit.

### *Photo luminescent*



(Night lighting cont'd....)

## ***Panel lights***



(Night lighting cont'd....)

## ***Cockpit lights***



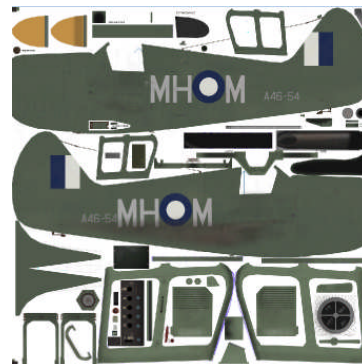
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## Paint Kit:

Every model is supplied with its own paint kit. These are the folders entitled “texture.blank” that can be found in the aircraft folder. The content of the kits have been kept to a minimum, to keep down the size. Nonetheless, all the textures required for the external and internal colours are supplied.

The kits consist of .psd files, and assume that users know how to convert them into .dds files once complete, plus add the appropriate entry into the aircraft.cfg to make the new paint schemes appear in the simulator.

If you find you need .psd's for other areas, or help in any way, feel free to get in touch.



*(Example of fuselage .psd texture)*



**Thanks:**

This Boomerang has been made what it is with the help of Wozza (Warwick Carter), thanks to his expertise and superb gauge creation and general assistance, plus beta testing.

Thanks also to Bernt Stolle, Chet Two Wolves and J.G. for testing.

**Support:**

[Flight-Replicas@hotmail.com](mailto:Flight-Replicas@hotmail.com)

All requests for support must be accompanied by **all** the following information:

1. Place/website where the Boomerang was purchased;
2. Order number;
3. Name used when purchasing; and
4. Date of purchase.

No support will be forthcoming without this information.

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