

Flight Replicas

De Havilland DH.114 Heron



**For Microsoft Flight Simulator X (FSX) plus
Acceleration
(incl. DX10) plus P3D incl. V2.2**

Warning: This Manual must not be used for real flight training purposes.

History

The De Havilland DH.114 Heron first flew on 10 May 1950. It was a development of the twin-engine De Havilland Dove/Devon, featuring a stretched fuselage and an increase to four engines. The Heron was first designed with a fixed undercarriage, later upgraded with retracting undercarriage, coupled with the reliable un-geared un-supercharged Gipsy Queen 30 engines. It was designed as a rugged, conventional low-wing monoplane that could be used on regional and commuter routes, the emphasis on rugged simplicity, to produce an economical aircraft that could also be used in isolated and remote areas that did not possess modern airports.

150 were built, exported to approximately 30 countries, in both civilian and military roles.



(Photo taken by self from G-AORG, while flying past Mont Orgeuil castle, Jersey, Channel Islands, in 1999)

General Notes:

1. Cockpit Overhead Panel. Why is it empty? These were originally used to house the radios on early aircraft, but early on, as avionics developed, radios were frequently moved to the lower panel and the overhead left un-used or for use at the operators' discretion.
2. Fuel and Max Operating Weight: Be careful to make sure your Heron is within weight limits for take-off. A fully loaded Heron (passengers and baggage compartment max weights achieved) would not normally be able to carry full fuel especially in the auxiliary tanks. Plan routes accordingly.
3. Auxiliary tanks contents have been set at 4.5 gallons (basically empty), to prevent overweight conditions with max. passengers. If passenger/cargo weights are reduced, you can introduce fuel into the aux tanks by changing the aircraft.cfg entry here:

```
LeftAux= -4.0, -8.3, 0.0, 4.5, 1.0 //58 US gal max
RightAux= -4.0, 8.3, 0.0, 4.5, 1.0 //58 US gal max
```

4. Herons came in a variety of layouts, including Executive and ambulance, plus varieties of seat numbers (19 seat layout eliminating even the bathroom). For simplicity's sake (and the size of the package), the standard 14-seat layout has been used here.
5. You must have the default Cessna.dll and Bendix_king_radio.dll in your Microsoft Flight Simulator X/Gauges folder for the radios to work.
6. Cockpit Rear Bulkhead. This has been simplified from reality, to permit a greater number of polygons to be used elsewhere on the model.
7. **Paint Kit**: This is available from the Downloads page here: <http://www.flight-replicas.com/Downloads.htm> Instruction included.
8. **Support**: Please see the last page of this Manual.



Main Panel

- | | |
|---|---|
| 1. Windscreen Wiper Controls (Right click for ON and again for FAST. Left click to SLOW, and Left click again to OFF) | 13. Manifold Pressure |
| 2. Airspeed (dual) | 14. RPM (also automixture) |
| 3. Altimeter (dual) | 15. NAV1 VOR incl ILS |
| 4. Gear Warning Light | 16. NAV2 VOR |
| 5. Click loop to remove pilots | 17. Oil Pressure |
| 6. Click vent to remove left yoke | 18. ADF Indicator |
| 7. Click light to summon external passenger stairs | 19. OAT |
| 8. Artificial Horizon and cage knob | 20. Pneumatic Pressures |
| 9. Horizontal Situation Indicator (Gyro) (See HSI page for controls) | 21. Flap L Position |
| 10. Vertical Speed Indicator | 22. Flap R Position |
| 11. Turn and Skid | 23. Vacuum Source L/R (n/a) |
| 12. Clock | 24. Suction |
| | 25. Gear Position Indicator |
| | 26. Propeller Synchronization (using throttle position, compared to Throttle Engine No.1) |



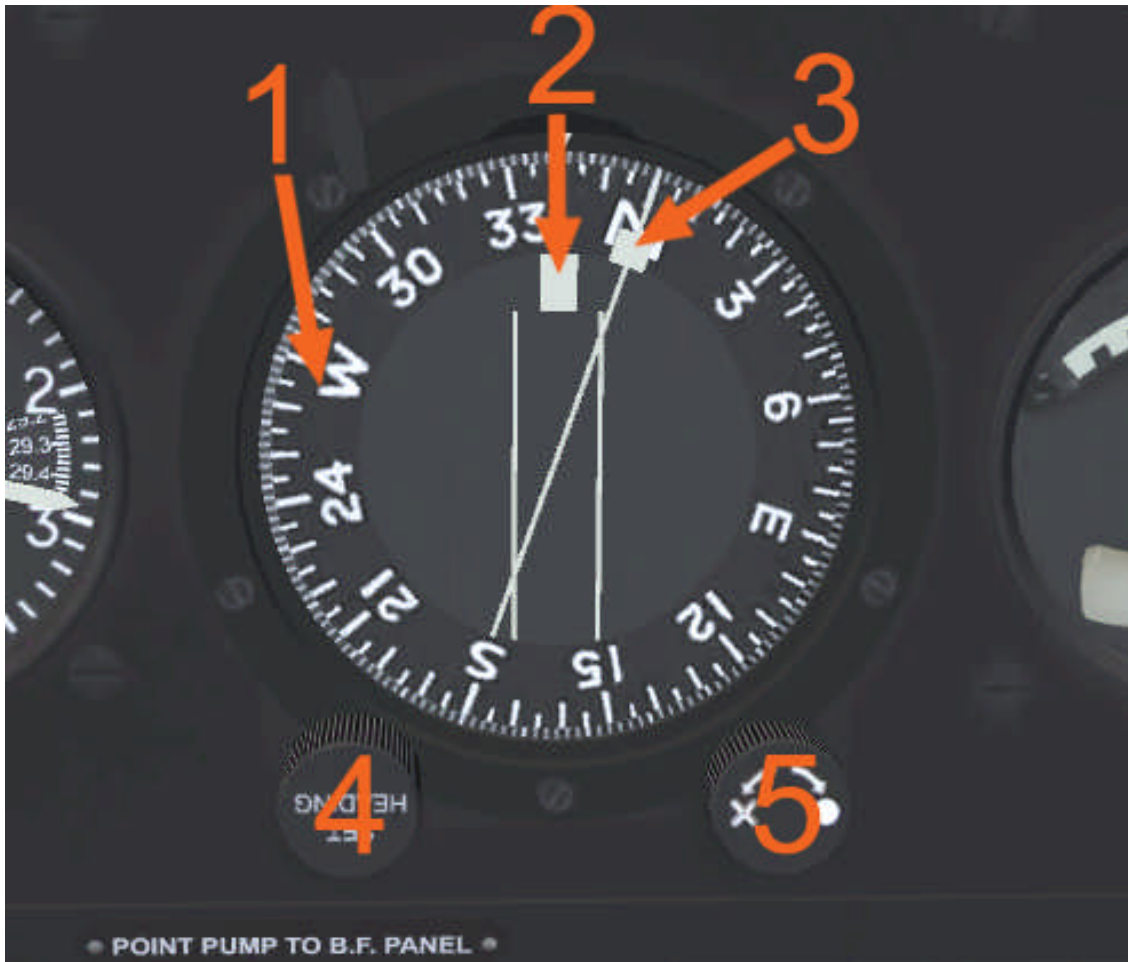
Panel Changes on Later Model

1. Fire warning light test buttons
2. Propeller feathering buttons
3. Re-positioned whiskey compass
4. ADF
5. Vertical speed indicator (VSI)



Secondary and Radio Panel

- | | |
|-------------------------------------|--|
| 1. Click to remove right yoke | 10. ADF Frequency Selection |
| 2. NAV1/2 DME | 11. Fuel Quantity Main Tank Left |
| 3. Artificial Horizon and cage knob | 12. Fuel Boost Pump needed Main Tank Left |
| 4. Intercom controls | 13. Magneto Switches |
| 5. Transponder | 14. Fuel Boost Pump needed Main Tank Right |
| 6. Audio Panel | 15. Fuel Quantity Main Tank Right |
| 7. NAVCOM 1 | 16. Fuel Quantities Auxiliary Tanks |
| 8. NAVCOM 2 | 17. FLIGHT/GROUND switch |
| 9. Autopilot | |



Horizontal Situation Indicator (Gyro)

1. Gyro Compass
2. Lubber Lines
3. Pointer
4. Heading Selector (also connects to Autopilot “HDG” button when on)
5. Gyro drift correction knob



Switch Panel

- | | |
|---|---|
| 1. Switch to extend/retract landing light | 8. Fuel Booster Pump Switch Right |
| 2. Landing Light on/off (dual filament) | 9. Pedestal Light (n/a) |
| 3. Taxi Light (on nose of aircraft) | 10. Ultraviolet Lamps (on appropriate models) |
| 4. Compass Light | 11. Panel Lights |
| 5. Navigation Lights | 12. Cabin Sign: Seat Belts |
| 6. Pitot Heat (switch operates both) | 13. Cabin Sign: No Smoking |
| 7. Fuel Booster Pump Switch Left | 14. Gyro Heater 1 (n/a) |
| | 15. Gyro Heater 2 (n/a) |



Cockpit Lower Left

1. Oil Cooler Shutter Handles (up=closed)
2. Engine Priming (n/a)
3. Master Air Valve (n/a)



Pedestal

1. Elevator trim wheel
2. Elevator trim position indicator
3. Throttles
4. Starter buttons (click cover to open)
5. Gear lever
6. Rudder trim handle and position indicator
7. Flap position selector (0°, 20°, 60°)
8. Carburettor air (carb heat) (all) hot/cold
9. Fuel valves
10. Aileron trim



Ammeter & De-ice Panel

1. Engine 1 ammeter
2. Engine 1 generator on/off switch
3. Engine 2 generator on/off switch
4. Engine 2 ammeter
5. Engine 3 ammeter
6. Engine 3 generator on/off switch
7. Engine 4 generator on/off switch
8. Engine 4 ammeter
9. Wing de-ice system pressure
10. Propeller de-ice pump on/off (audible for system check)
11. Propeller de-ice fluid in system



Clearview Windows

Left side opens to full open, while right side opens to first position.

1. & 2. Clickspots to open/close windows.



Rear Cockpit Bulkhead

1. Fuel tank cross-feed (n/a)
2. Clickspot to close cockpit door (latch plate)
3. Wing de-ice on/off
4. Seat position adjust (n/a)
5. Passenger cabin heat



Upper Rear Bulkhead

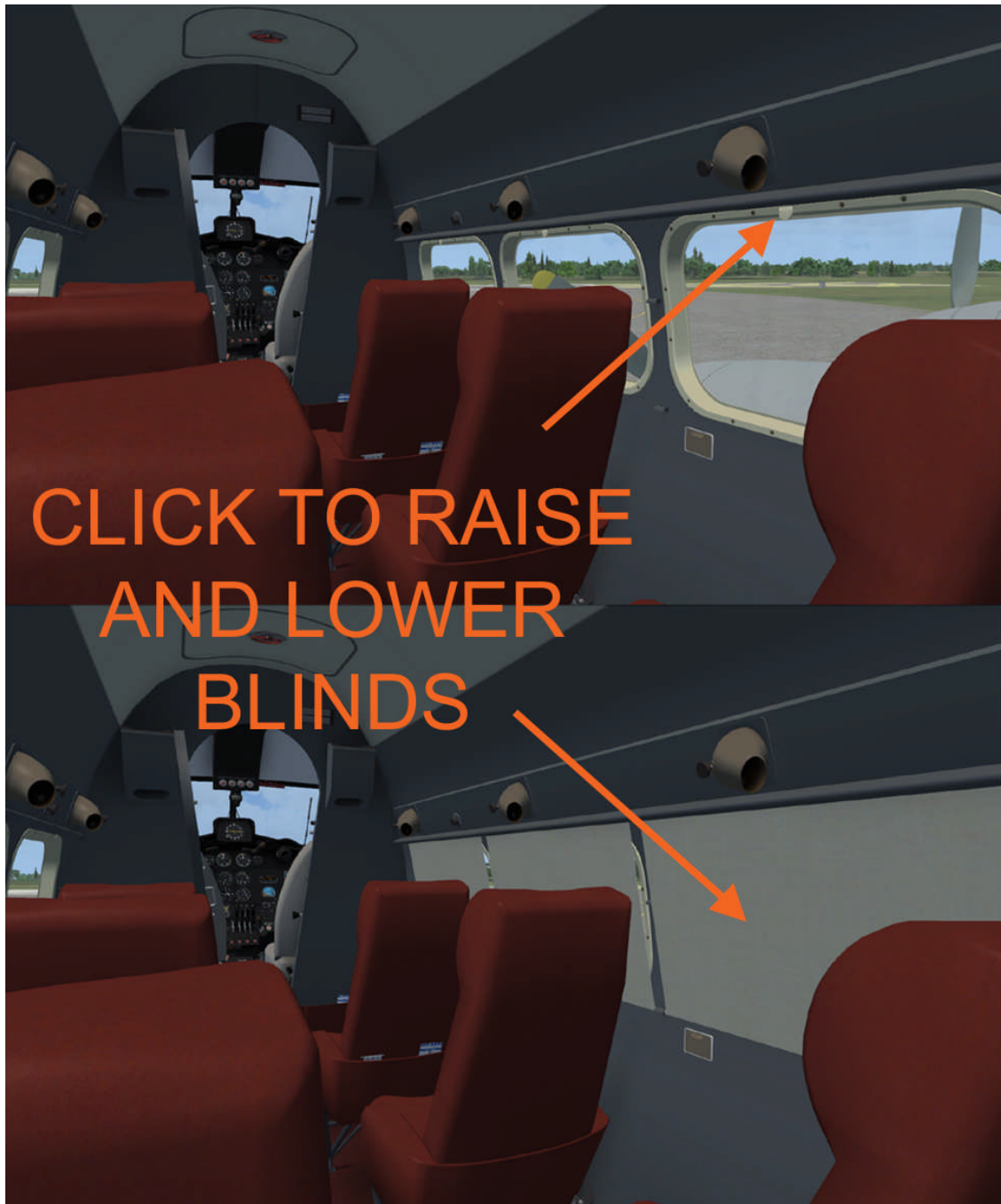
1. Auxiliary fuel tank valve switch (n/a)
2. Passenger cabin light switch
3. Click door to open/close
4. Click to open peep hole



Passenger Cabin Rear Bulkhead

1. Click door to open
2. Clickspots (washbasin surround & ladder) that will deploy boarding ladder.
Useful to operate when looking aft from the cockpit.

3.



Clickspots operates all blinds on one or both sides. In sunny situations this was used to keep the cabin, with its large window area, cool.



Night Lighting

Early Herons came with both red cockpit lamps, plus Ultraviolet (UV) lamps to make anything white stand out. The UV lights were eliminated on the final models.

Notes:

When full cockpit night lighting is in use, switching on the passenger cabin lights will result in some of the cockpit lights turning off. This is an FSX bug.

The more modern instruments, such as the ADF, Artificial Horizon, and VOR's, have their own lighting.

Later red lighting only:



Passenger cabin lighting:



Flying the DH.114 Heron

Departure

Before Departure:

1. Entrance Ladder ... Correctly Stowed
2. Entrance Door ... Closed, check for ease of opening, then re-close.
3. Cabin Lighting ... As required.

Departure:

1. Switches ... All OFF, except cabin lights as necessary.
2. Windows ... Clean, free from crazing
3. Direct Vision windows... Satisfactory opening. Closed and locked.
4. Pneumatic System:
 - Master Air Supply... ON
 - Air Supply ... 450 to 650 p.s.i.
 - Brake Pressure ... 120 to 185 p.s.i. when applied. Check pressure zero when Brakes released.
5. All Circuit Breakers ... ON
6. Ground/Flight Switch ... To FLIGHT
7. Fire Warning Lamps (On applicable models) Filament illumination checked (by pressing button over each pair of warning lamps).
8. Alighting Gear Electrical Indicator... Green lights on.
9. Rudder Pedals ... Check locking bar is released and stowed.
10. Flying Controls ... Checked for freedom of operation.
11. Fuel Tank Contents ... (Main and outer wing) Gauge readings.

12. Outer Wing Fuel Cocks (On)

13. Propeller De-icing:

Tank Contents ... Gauge reading

Pump Functioning Pump switched ON, checked aurally for functioning, switched OFF.

14. Lifejackets (if carried): Correct stowage.

15. Cabin Signs: ... ON

16. Flaps: ... UP

Starting Engines:

Engines are normally started in sequence 1 to 4.

Proceed as follows:

1. Brakes ... ON

2. Generator Switches ON

3. Anti-collision lamps ON

4. Engine Interconnected Oil and Fuel Cocks ON

6. Main Wing Tanks Cross-feed Cock Normal

7. Oil Cooler Shutters ... CLOSED (up), or as appropriate.

8. Carburettor Air ... COLD

9. Check main wing fuel tanks booster pumps:

Fuel Pressure Warning Lights ON

Booster Pumps ... ON, checked aurally

Fuel Pressure Warning Lights OUT

Booster Pumps ... OFF

Each Engine:

1. Priming Pump: ... Operate Kigass pump until resistance is felt (inop)

2. Throttle: ... Slightly open

3. Magneto Switches ... ON

4. Start Engines ... Press appropriate STARTER button

- 5. Warm Up Engines ... 1,200 to 1,400 r.p.m.
- 6. Oil Pressure ... Immediately satisfactory: if not, shut down and investigate.
- 7. Generator Warning Lights Out

Ground Running:

- 1. Ground/Flight Switch ... FLIGHT
- 2. Landing Lamp (if used) ... Extension, retraction and illumination checked
- 3. Oil Pressure and Temperature: Readings
- 4. Flight Instruments ... Checked
- 5. Gyro Compass ... Checked and synchronized
- 6. Artificial Horizon ... OFF flag not showing
- 7. Radios ... ON
- 8. Oil Temperature ... Suitable for opening up
- 9. Magneto Switches ... Proved at 1,200 r.p.m.
- 10. Vacuum Pressure ... Checked
- 11. Throttle ... Fully open
- 12. Magnetos ... Check drop readings
- 13. Manifold Pressure ... Gauge readings
- 14. Carburettor Air Intake Control Checked
- 15. Accumulator Cut-out ... Checked: as throttle is brought back check that power failure warning lamp lights
- 16. Slow Running ... Checked
- 17. Ice Formation Spot Lamps Checked
- 18. Chocks ... Removed

Taxying:

- 1. Pneumatic System ... 450 to 650 p.s.i.

- 2. Instruments ... Check gyro instruments and oil temperatures while taxiing
- 3. Brakes ... Check while taxiing (it is not necessary to put them on fully)

Before Take-off:

While carrying out the following vital actions, engines should be running at above 1,200 r.p.m., with brakes on, to ensure that the generators are providing out-put.

VITAL ACTIONS: T, C, P, F, F, F, G, G, A, H, A

- 1. **T**rimmers, elevator, aileron and rudder Neutral
- 2. **C**arb. Air ... COLD, normally
- 3. **P**neumatic Pressure ... Checked
- 4. **F**uel:
 - Tank Contents: ... Sufficient for flight
 - Oil and Fuel Cock Levers ON
 - Main Wing Tanks Booster Pumps ON
 - Cross-feed Cock ... Normal
- 5. **F**laps ... 20 deg. DOWN (take-off position)
- 6. **F**reedom of Flying Controls ... Checked
- 7. **G**yro Instruments ... Checked
- 8. **G**auges ... Checked
- 9. (**G**ills) Oil Cooler Shutters ... As Required
- 10. **A**utopilot ... OFF
- 11. (**H**atches) Direct-view windows ... Closed
- 12. **A**irframe De-icing ... OFF

After Take-off:

- 1. Alighting Gear UP, indicator lights out (on appropriate models)
- 2. Flaps UP (90 knots; climb at 110 knots)
- 3. Carburettor Air COLD, or as required

4. Pneumatic System	650 p.s.i.
5. Vacuum Gauge	Min. 3.5 +/- 0.125 in.Hg
6. Generators	Checked, charging, power failure lights out.
7. Ammeter Readings	Checked for load balance
8. Cabin Signs	OFF
9. Booster Pumps	OFF

ARRIVAL

Field Approach:

1. Fuel Contents and Landing Weight	Checked
2. Booster Pumps	ON
3. Cabin Signs	ON
4. Pneumatic Pressure	Checked
5. Airframe De-icing	OFF
6. Autopilot	OFF
7. Flaps	20 deg.

Before Landing:

1. U/C: (on appropriate models)	
Alighting Gear	... Selected DOWN
Green Lights	... All on
Mechanical Indicators	... Up (indicating U/C down)
2. Brakes:	
Pressure	... Sufficient
Operation	... Satisfactory
Brake Lever	... Off
Pressure	... Released
4. Carb. Air	... As required

- 5. Fuel: Tank Contents, Booster Pumps ... Checked
- 6. Flaps ... Fully DOWN
- 7. Landing Lamp ... Switch to DOWN (if required)

After Landing:

- 1. Landing Lamp ... (if used) OFF
- 2. Flaps ... UP
- 3. Fuel Booster Pumps ... OFF
- 4. Engines No. 2 and 3 ... Stop

Post Flight Checks:

- 1. Engines No, 1 and 4 ... Stop
- 2. Brakes ... Parked
- 3. Cabin Signs ... OFF
- 4. All Magneto Switches ... OFF
- 5. Fuel Cocks ... OFF
- 6. Oil Cooler Air Outlet Shutters CLOSED
- 7. Master Air Valve ... OFF
- 8. Pitot Heat ... OFF
- 9. Windscreen Wipers ... (if used) OFF (resistance returned to slow speed, then parked)
- 10. Direct Vision Panels ... Closed and locked
- 11. Carburettor Air ... As required
- 12. Radios ... OFF
- 13. All Switches ... Checked OFF

14. Ground/Flight Switch ... OFF

Flying Notes:

Max. Gross Weight: 13,800 lbs

Max Landing Weight: 13,150 lbs

The Heron does not gain altitude quickly on initial take-off – be prepared.

Take-Off: 76 knots

Flaps Up: 90 knots

Climb: 110 knots (max. 125 knots) On take-off, RPM from max to 2200 when 110 knots reached..

Sample Cruise Indicated Airspeeds:

Will differ with atmospheric and aircraft weight differences, etc..

8000' 113 knots

6000' 122 knots

4000' 130 knots

2000' 139 knots

Sea Level 148 knots

Approach (at 13,150 lbs):

Gear Down: 135 knots

Flaps 20: 135 knots

Flaps 60: 100 knots

Final Approach: 76 knots

SEE NEXT PAGE FOR EXERPT FROM ORIGINAL PILOT MANUAL

From original Pilot's Notes:

Flight conditions	Speed knots I.A.S.
TAKE-OFF (Associated conditions: gross weight, 13,800 lb.; altitude, sea level and above) : Safety speed (flaps 20 deg.)	76 +
CLIMB AFTER TAKE-OFF (Associated conditions: gross weight, 13,800 lb.; altitude, sea level and above) : Safety speed (flaps 20 deg.) Safety speed (flaps 0 deg.)	76 + 88*
STALLING (Associated conditions: gross weight, 13,800 lb.; power off) : Flaps 0 deg., alighting gear retracted Flaps 20 deg., alighting gear retracted Flaps 60 deg., alighting gear retracted	75* 65* 62*

Flight conditions	R.P.M.
TAKE-OFF	Approx. 2,400 static, in- creasing to 2,500
OPERATIONAL CLIMB	2,200
CRUISE NOTE : Maximum manifold pressure for WEAK MIXTURE is 26 in.Hg.	2,100 or as required
OPERATIONAL DESCENT	1,800
IDLING, BEFORE CUT-OUT	700 to 900

Flight conditions	Speed knots I.A.S.
TURBULENCE climb, cruise, descent	115 to 125
FLAP LOWERING : Max. speed for lowering 20 deg. flap and for flight in this configuration	135
Max. speed for lowering 60 deg. flap and for flight in this configuration	100
ALIGHTING GEAR LOWERING : Max. speed for lowering alighting gear and for flight in this configuration	135
FINAL APPROACH (Associated conditions : gross weight, 13,150 lb.) : Full flaps	76*
CLIMB FROM BALKED LANDING (Associated conditions: gross weight 13,150 lb.) : Flaps 20 deg.	78*

Control selection	Tendency
Flaps : UP 20 deg. DOWN 60 deg. DOWN	NOSE DOWN NOSE UP NOSE UP
Alighting gear UP or DOWN	Negligible

Flight conditions	R.P.M.
OIL WARMING	1,200 to 1,400
MAGNETO TESTING : Max. permissible r.p.m. drop at full throttle when ground testing magnetos	120

Sounds: Sounds in this package are a combination of default and custom.

Thanks

Special thanks go to Warwick Carter (Wozza) for allowing use of his gauge code to combine throttle and mixture functions (automixture) (as well as beta testing).

Thanks, too, to the FSDeveloper forum for code that enabled working windshield wipers.

And additional thanks go to **Roger Bacon, Pat Cox, Dave Garwood** and everyone else for their testing, encouragement, input and contributions! -

Support:

support@flight-replicas.com

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

1. Place/website where the DH.114 Heron was purchased;
2. Order number;
3. Name used when purchasing; and
4. Date of purchase.

No support will be available without this information.

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