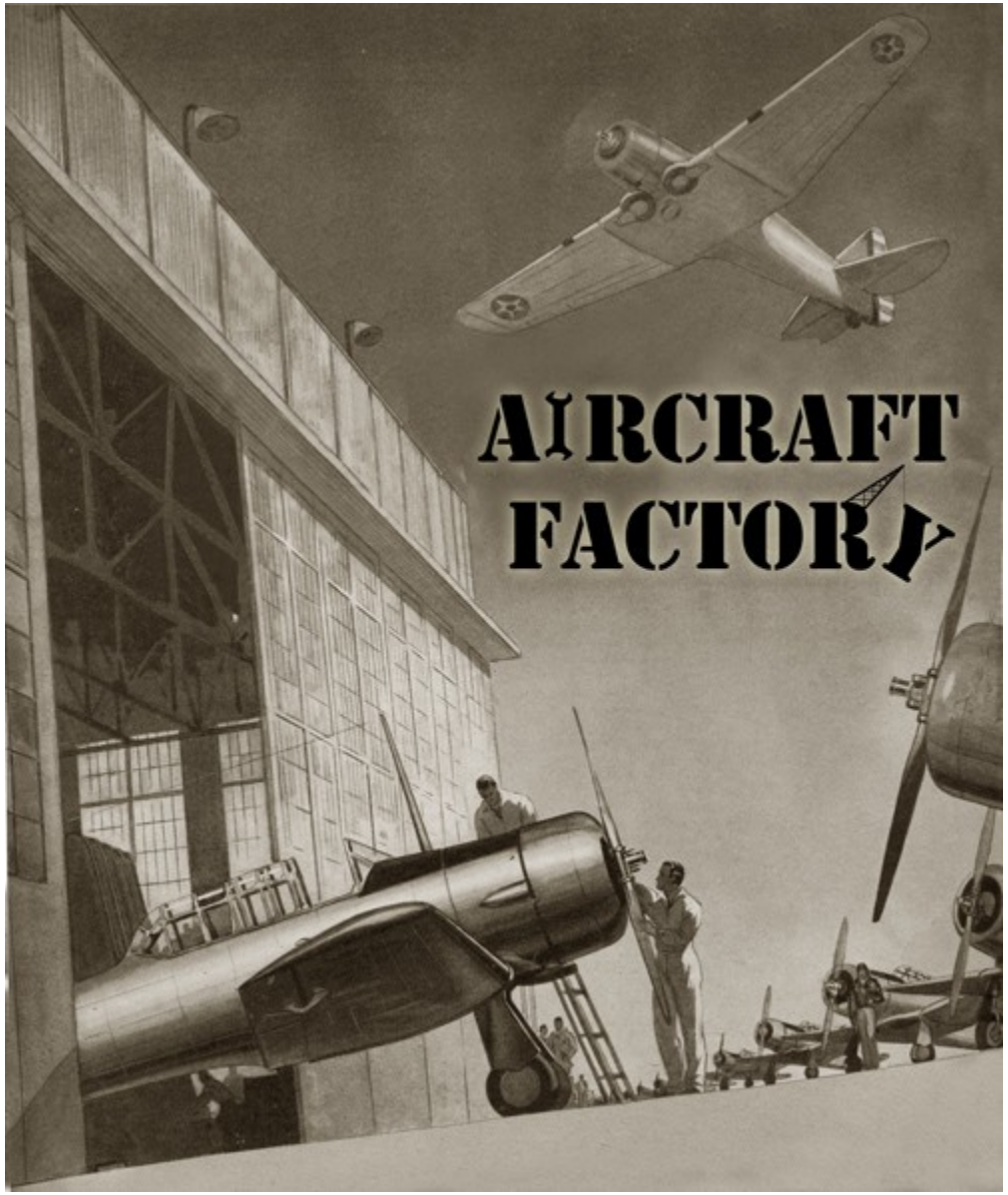

AIRCRAFT
FACTORY

AIRCRAFT FACTORY

Heinkel He 219 “Uhu”

Thank you for buying the
Aircraft Factory Heinkel He219 “Uhu”

- The Aircraft Factory Team

Heinkel He 219 “Uhu”

Published by the Aircraft Factory

RISKS AND SIDE EFFECTS

ERGONOMIC ADVICE

1) Always maintain a distance of at least 45 cm to the screen to avoid straining your eyes.
2) Sit upright and adjust the height of your chair so that your legs are at a right angle. The angle between your upper and forearm should be larger than 90 degrees.
3) The top edge of your screen should be at eye level or below, and the monitor should be tilted slightly backwards, to prevent strains to your cervical spine.
4) Reduce your screen's brightness to lower the contrast and use a flicker-free, low-radiation monitor.
5) Make sure the room you play in is well lit.
6) Avoid playing when tired or worn out and take a break (every hour), even if it's hard …

EPILEPSY WARNING

Some people experience epileptic seizures when viewing flashing lights or patterns in our daily environment. Consult your doctor before playing computer games if you, or someone of your family, have an epileptic condition.
Immediately stop the game, should you experience any of the following symptoms during play: dizziness, altered vision, eye or muscle twitching, mental confusion, loss of awareness of your surroundings, involuntary movements and/or convulsions.

ADITIONAL INFORMATION

Check for the latest information at www.a2asimulations.com

SYSTEM REQUIREMENTS

In order to play Aircraft Factory you must have an Intel PC compatible computer, which meets the following requirements:

MS Flight Simulator X.
Windows 9x/2000, Pentium II 500 MHz or faster
Hard drive space: at least 300 MB, CD ROM drive, 3D Graphics Card, DirectX 9 or higher

TECHNICAL SUPPORT

www.a2asimulations.com
Feel free to register and post on our forums. We watch these forums daily, and will try to be very quick to answer any of your questions.

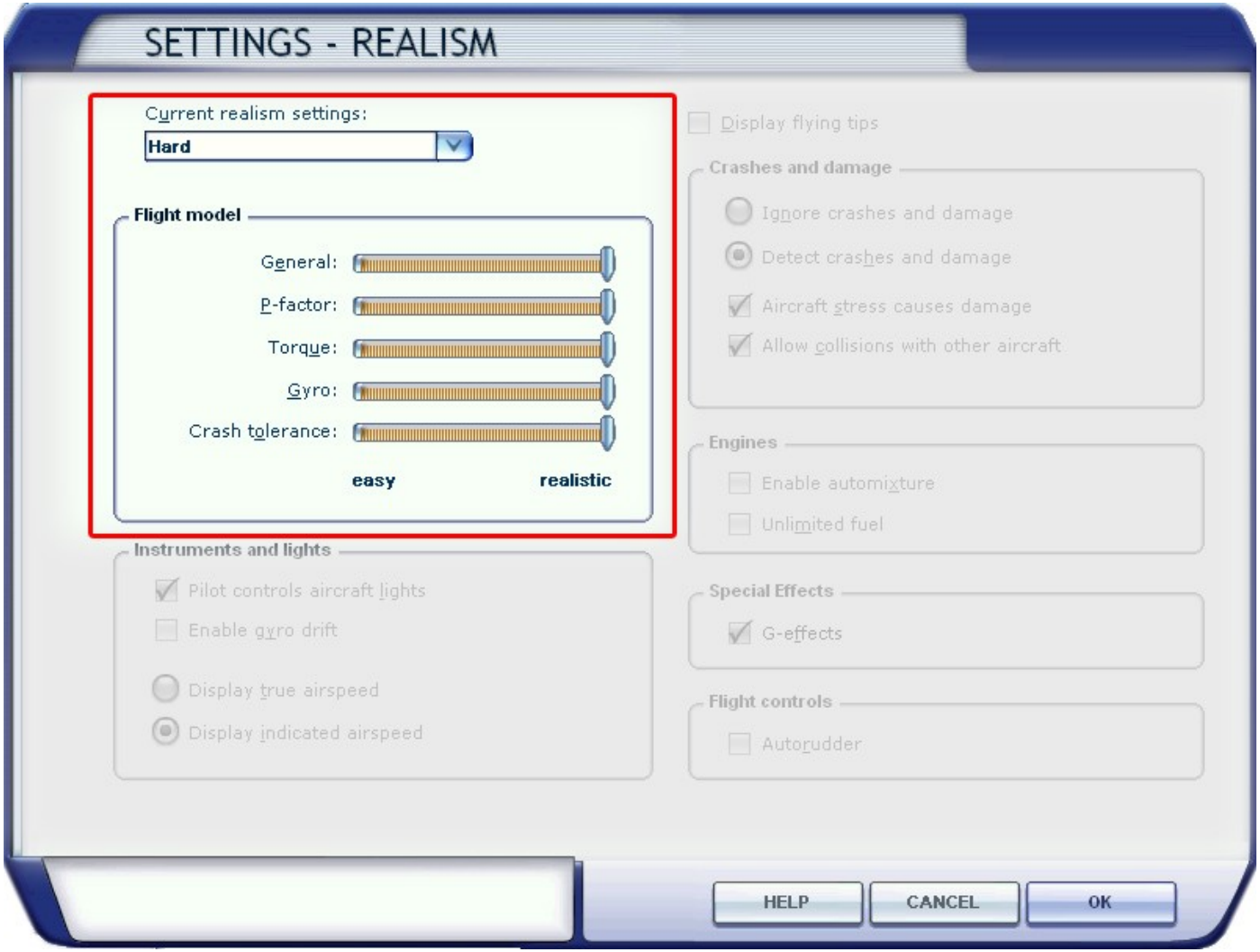
AIRCRAFT FACTORY

Heinkel He 219 “Uhu”

Table of Contents:

IMPORTANT! MUST READ

To make sure you are getting the most out Aircraft Factory, please verify that your IN-GAME REALISM settings are set to the following (see picture on next page):



History

Heinkel's He 219 Uhu is undoubtedly one of the most advanced aircraft to emerge from World War II. Conceived solely as a gun platform to serve as a defensive night fighter, the plane featured a bubble-top cockpit that was well forward, affording the pilot superb visibility. The cockpit was equipped with ejection seats, and was exceptionally well laid out. All controls were easy to reach and identify. Combined with the tricycle landing gear, this plane was truly a "pilot's aircraft" and was very easy to fly. It was stable and predictable, exactly what one would expect from a plane with the Uhu's intended purpose. The earlier versions were adequately powered by the Daimler-Benz DB 603A, and had good rates of climb and acceptable top speeds approaching 400 mph. However, later versions of the He 219 were much heavier, and because the more advanced, powerful engines were in short supply, these variants suffered in performance.

The He 219 was a superb and lethal gun platform and the later versions packed as many as eight cannon, including the potent 30mm "Schrage Musik" which fired upward into a bomber's belly at an oblique angle. These accompanied as many as six forward-firing cannon. The "Uhu" was absolutely devastating to any aircraft that came into range of its guns. This was accomplished through the use of radar, a new technology. Ground-based stations would direct the night fighter to the bomber stream, and when in range, the Uhu's radar operator would then take over and guide the pilot to within 100 meters of the target. The bristling antennae were ugly and added a lot of drag, reducing the aircraft's ultimate top speed substantially. But without the radar the plane would have been useless at night, and since the Uhu was still about 150 mph faster than the Allied four-engine bombers, this was really not a handicap. Some of the latest versions were used to track, hunt down, and kill the Mosquito bombers, which were a much more challenging quarry than the lumbering four-engine craft comprising most of the night fighter's prey.

In the end, the He 219 fell victim to bad decision-making and was too little, too late. But it was the most advanced aircraft for its time, signaling the shape of things to come.

Important things to know about your Aircraft Factory Heinkel He 219 “Uhu”

FUNCTION	KEY COMMAND (all except the LADDER can also be clicked via mouse in VC)
Drop External Fuel Tank	Shift-D
Retract Armoured Glass	O
Revi Gunsight Modes (OFF, NIGHT, DAY)	R
Ladder	“Wing Fold” key command
Canopy Eject	“Tail Hook” key command
Eject Seats	“Water Rudder” key command

NOTES:

- Due to the long canopy open and close times, wait 5 seconds after opening or closing the canopy before operating it again.
- To eject, you need to first pull the canopy jettison lever, then the large red ejection seat lever on the right.
- To manually manipulate the prop pitch, move the mouse over the thumb switches on the side of the throttle and use the mouse wheel.
- Later models are heavier and require more time to get airborne. These aircraft have more horsepower and a greater top speed, but also suffer from reduced climb performance due to the extra weight.
- Make sure the airplane is below the recommended flap and landing gear safe extension speed before deploying flaps or gear
- Notice the added realism of the animated oxygen gauges.
- Your aircraft is equipped with realistic fuel loads as well as many other loads including the pilot, guns, ammo, oil tank, oxygen, etc.
- Use the “i” key for natural engine smoke. The effect is very subtle but is toggled for your convenience as some like a clean burning engine and others like a little bit of engine smoke.
- On landing, raise your flaps once you touch down to settle the aircraft, pull back on the stick for additional elevator braking while you use your wheel brakes.
- Be careful with high-speed dives, as you can lose control of your aircraft if you exceed the maximum allowable speed.
- Allow the canopy to fully open before closing, or fully close before opening to avoid any timing issues with the canopy animation.

Aircraft Factory Heinkel He 219 General Reference

Conversion Factors

You will want to convert from metric to English or American units for convenience. Following is a list of conversion factors:

- Meters to feet - multiply by 3.281
- Kilometers per hour to miles per hour - divide by 1.61
- Miles per hour to knots (nautical miles per hour) - divide by 1.15
- Kilometers per hour to knots - divide by 1.85
- PS (Pfederstarke) to horsepower - multiply by 0.986

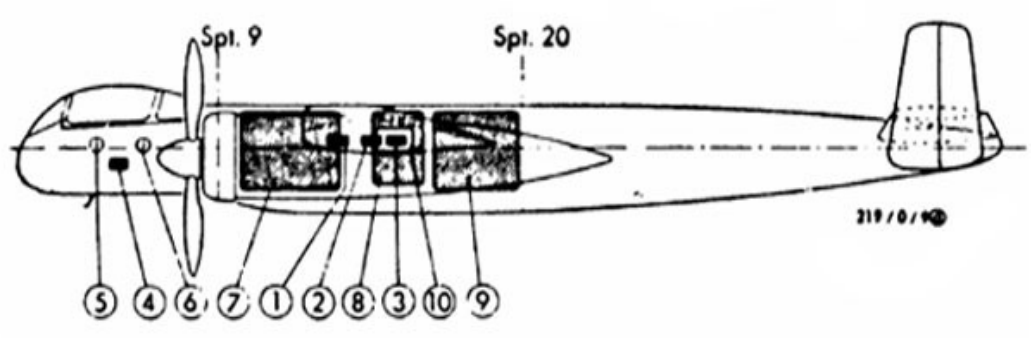
Weight and Loading

The Aircraft Factory He 219 is set up with a high level of realism, which extends to aircraft loading and fuel supply. The normal takeoff CG is about 28.5%. Read the chart below to determine your approximate center of gravity based on loading and fuel supply. It is normal for the red index mark on the pitch trim indicator to be several degrees forward of the the rudder and aileron trim indicators when all three are "zeroed". This is because for a normal takeoff, the trim is set nose-down when the index mark is at zero on the pitch trim indicator. As fuel is burned off and the CG moves forward, the pitch trim will come further back, until, for landing, it will be several degrees into the nose-up area. The offset "zero" position serves as a reminder to the pilot that the aircraft is trimmed for takeoff. The true neutral trim position (for a 25% CG condition) is at +2 degrees, when the red mark is lined up with the other trim indicators when they are at zero. With ammunition and fuel exhausted, the aircraft's center of gravity is about 24%, and with flaps and gear down on final approach, it may be necessary to use almost the full range of nose-up trim depending on the specific loading of the aircraft. The general rule is for each 2% of CG shift, 1 degree of trim is required for normal cruising flight or for takeoff. Thus, if a normal takeoff at 28.5% CG is done at 0 degrees pitch trim, a takeoff at 24.5% would be done at 2 degrees nose-up. Landing requires more trim because of the drag of the flaps and gear.

At high altitudes, stability will be very poor about the pitch axis, and autopilot performance will be unsatisfactory, if the fuel in the rear tank has not been burned off to move the CG forward. With 50% of the fuel gone from the rear fuselage tank and the other tanks full, the CG is at about 26.5% with normal payloads. Stability and handling will be excellent at high altitudes and the autopilot will function properly.

Wings of Power He 219 Uhu

Weight and balance chart
He 219 A-0



1. Forward ammunition trays, 600 rounds
2. Central ammunition trays, 600 rounds
3. Aft ammunition trays, 0 rounds
4. Miscellaneous*
5. Pilot
6. Radar Operator
7. Forward fuel tank (I)
8. Center fuel tank (II)
9. Aft fuel tank (III)
10. Oil tanks (2 each)*

*Weights are included in empty airframe weight and are not adjustable.

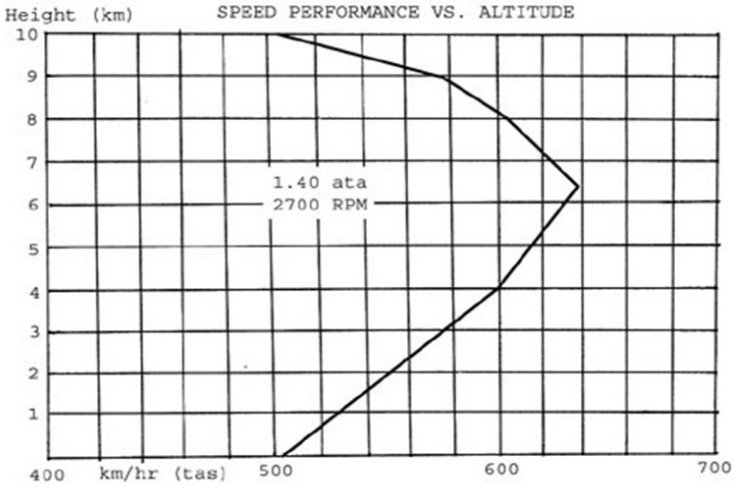
EMPTY AIRCRAFT CG WITH CREW.....23.4%
CG WITH CREW AND ALL AMMO.....23.3%
CG WITH CREW, AMMO, AND FORWARD TANK FULL.....21.5%
CG WITH CREW, AMMO, AND FORWARD/CENTER TANKS FULL...22.3%
CG WITH CREW, AMMO, AND ALL THREE TANKS FILLED.....28.4%

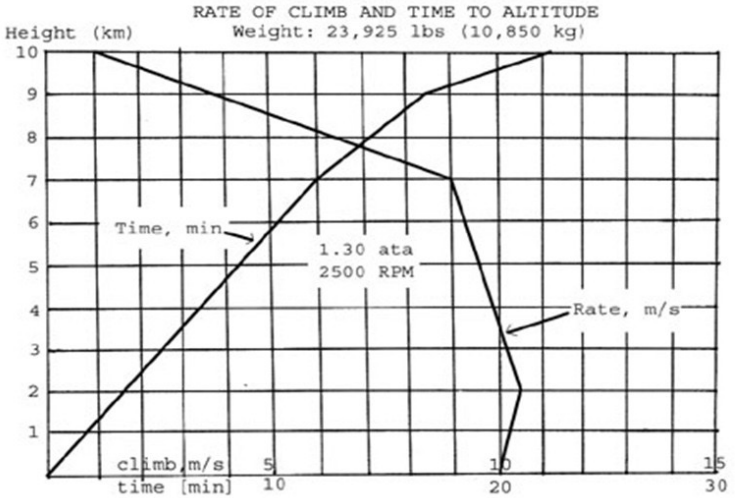
ACCEPTABLE CG RANGE IS 18.0% - 31.5%
TRIM CONTROL TO BE SET AT "0" FOR A 28.4% CG POSITION FOR TAKEOFF.

The following **Aircraft Performance** charts reflects the actual in-game performance of the Aircraft Factory He 219 A-7. Compare it to the charts for the real aircraft, taken from the original He 219 manual and you will see it is nearly an exact match.

Certified Performance

Heinkel He 219 A-0 Flight Test
7 Feb 2006
Engines: (2) Daimler-Benz DB 603A
Weight: 24912 lbs (11300 kg)

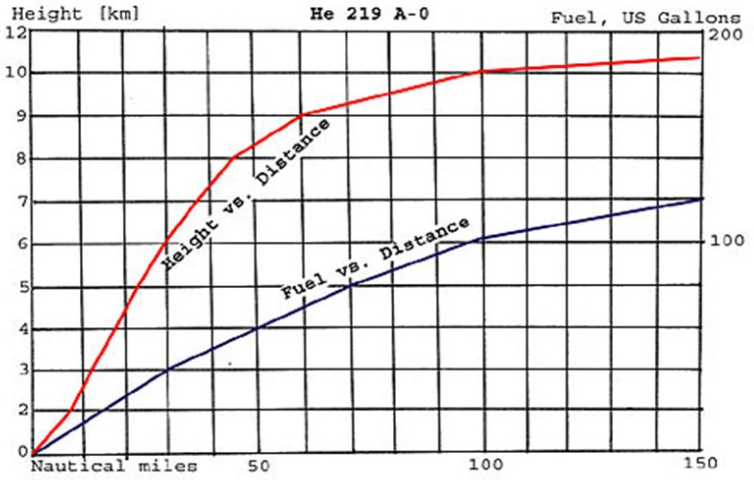


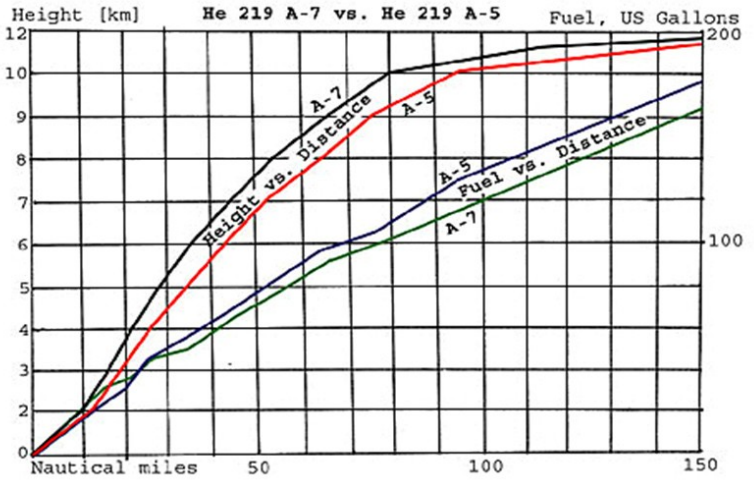


Climbing speed: constant 300 kph IAS to 8 km, decreasing to 265 kph IAS at 10 km

Heinkel He 219 Climb Performance
Fuel used vs. distance and altitude

Normal combat weight (all aircraft)



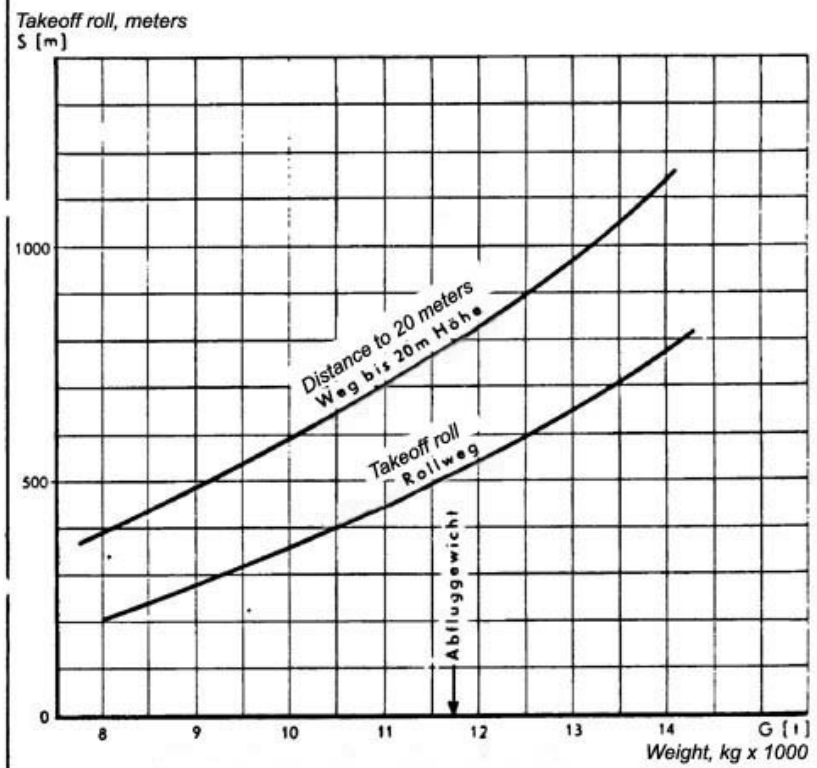


ROLLWEG UND WEG BIS 20 m HÖHE

He 219

F = 44,5 m²; b = 18,5 m; Λ = 7,7

Motor: 2 x **DB 603 A**



Bodenreibung μ = 00,3

15°C, 760 m/m QS; 0 m/s Wind

Geheim

– 11 –

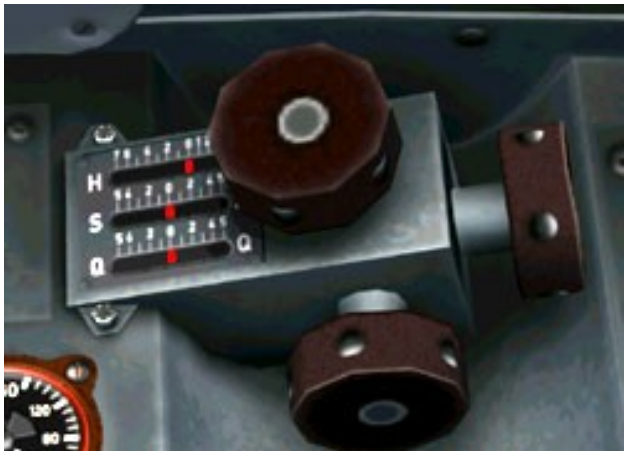
Kurzbeschreibung He 219 F. Gr. Nr. 8001/14An/Ki Dez. 1942.

Fuel System

This aircraft has three fuselage tanks. Each engine can be fed from any of the three tanks via separate fuel selectors adjacent to the throttle quadrant. Use the mouse to drag the fuel selector to the desired tank. The fuel gages are on the right side of the cockpit. Each tank has its own gage. The rearmost position, indexed in red, is a fuel cutoff position.

Trim

There is a three-axis trim control unit directly behind the throttles. Note that the "0" position for pitch trim is off center. This is the takeoff position, which is standardized for a 28.5% CG position. As fuel burns off, the CG will move forward, requiring the trim control to be moved closer to the center. See the weight and loading chart for above for exact information on CG changes with fuel load and trim settings for takeoff.

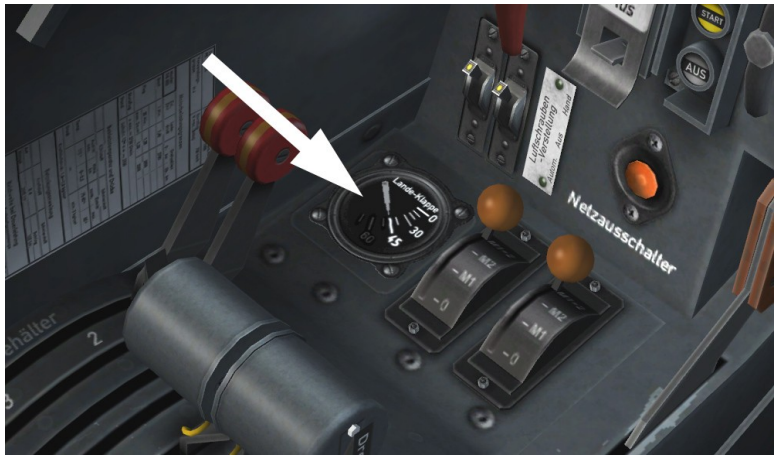


Flaps

The flaps have three basic positions: UP (EIN), START (takeoff), and DOWN (AUS). Clicking on the START button will automatically move the flaps to the 30 degree takeoff position. To extend to the landing position, hold the AUS button down until the flaps are fully extended. The EIN and AUS buttons are momentary switches, so the flaps will stop moving at any intermediate point when the button is released.

<u>Flaps Indicator</u>

He 219 A-0 Variant



Post He 219 A-0 Variants (Flaps & Gear)

Landing Gear

To raise / lower landing gear, lift the safety cover and click the switch. Avoid lowering landing gear over 300 kph. To see landing gear indicators

Landing Gear Indicator

He 219 A-0 Variant (for later variants, see previous page)

Propeller Control and Feathering

The He 219 has switches to manually control or feather the propellers should the need arise. These are located directly under the flaps controls. These have three positions: UP, which is normal, constant-speed control; CENTER, which fixes the propeller at the current pitch; and FEATHER, which feathers the propeller. To feather the prop, first cut the engine by cutting the fuel supply and turning off the magnetos. Then turn the switch for that engine to the FEATHER position.

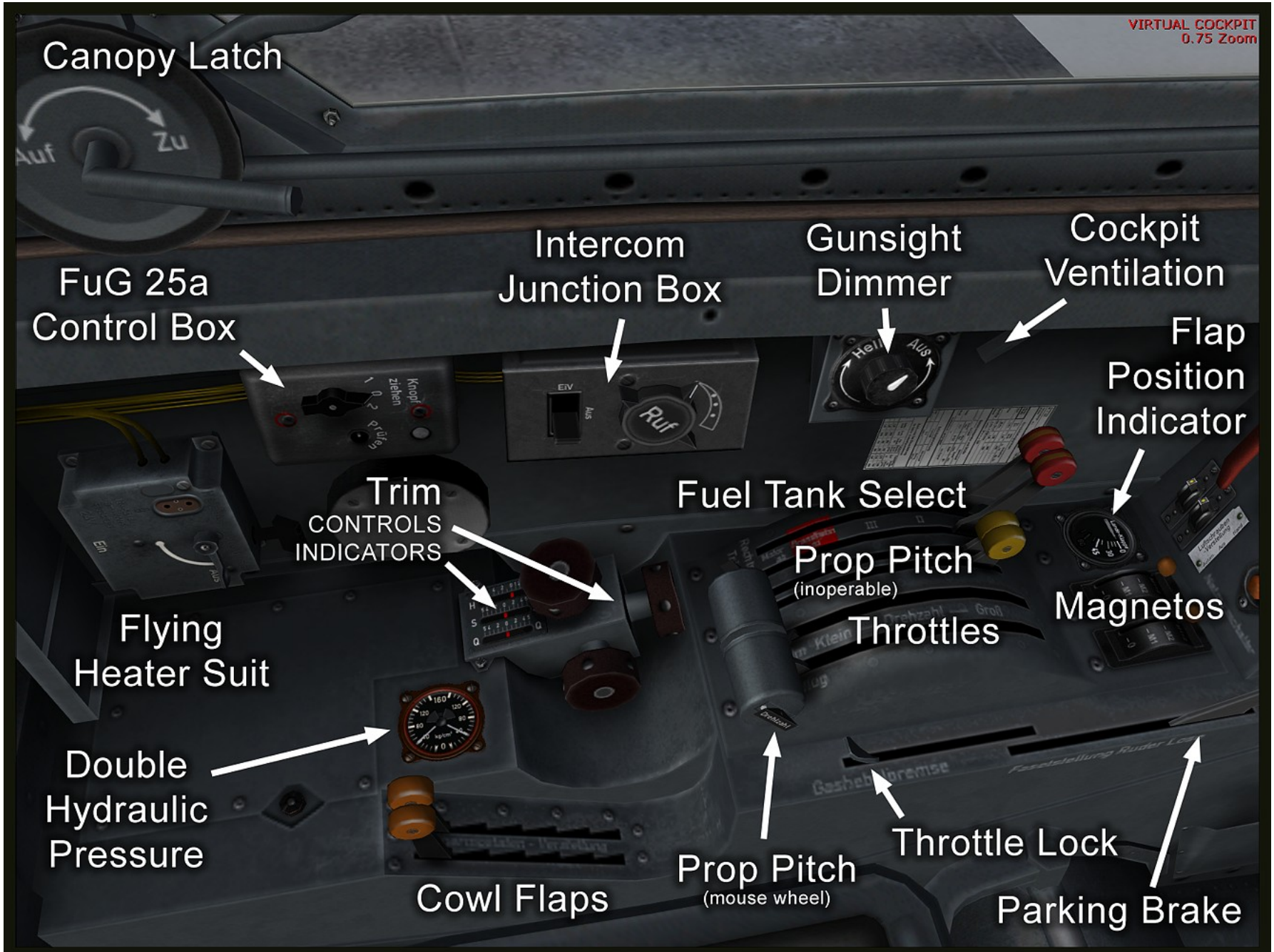
Aircraft Factory Heinkel He 219 A-0/R2 Uhu

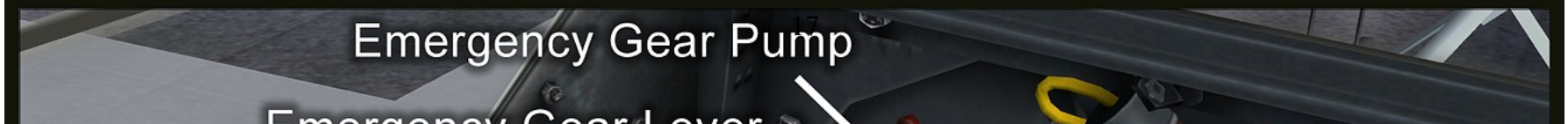
General Information - He 219 A-0/R2

The He 219 A-0 depicted here was armed with four cannon and was equipped with the FuG 202 BC radar system. This example was piloted by Major Werner Streib in Venlo (Holland), June 1943, who shot down five bombers in a single night, only to crash upon landing due to a faulty flaps operation system. Streib survived the crash, but his radar operator suffered two broken legs. The crash was used as an excuse to curtail development and production of the type.

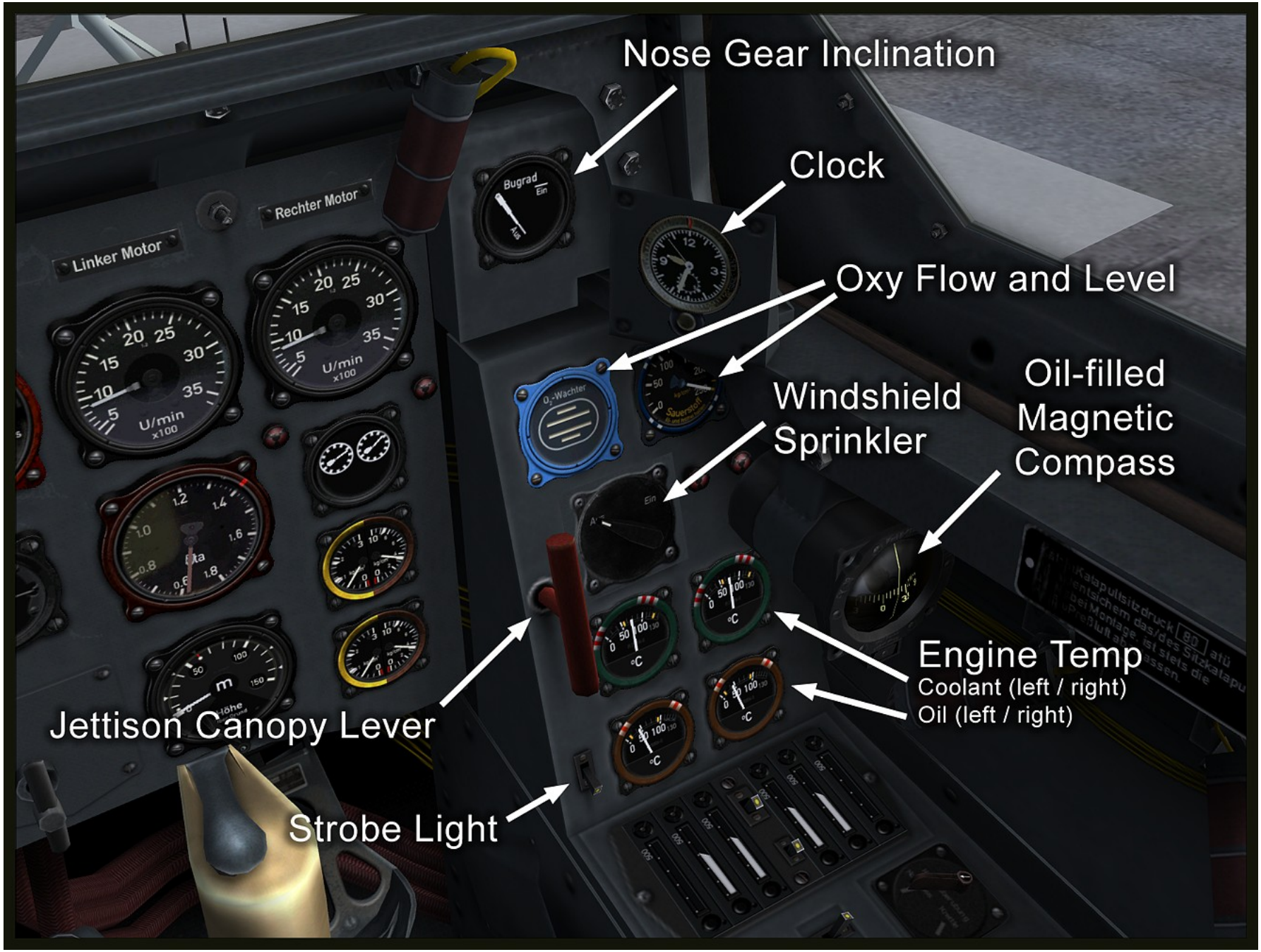
- Empty Weight: 21812 lbs. (9,893 kg)
- Wingspan: 60.7 feet
- Wing Area: 479 square feet
- Normal Takeoff Weight: 26,972 lbs. (12,234 kg)
- Maximum Takeoff Weight: 27,232 lbs. (12,350 kg)
- Top Speed, Sea Level: 313 mph (505 kph) TAS
- Top Speed: 396 mph TAS (638 kph) @ 26,280 feet (8,000 m)
- Stalling Speed, clean (25,500 lbs.): 116 mph (185 kph) IAS
- Stalling Speed, landing (25,500 lbs.): 100 mph (160 kph) IAS
- Combat Ceiling: 31,170 feet (9,500 m)
- Service Ceiling: 32,810 feet (10,000 m)
- Powerplant: Daimler-Benz DB 603A V-12, liquid-cooled with 1750 HP for takeoff.
- Armament: (4) Mk 103 30mm cannon in the ventral tray.

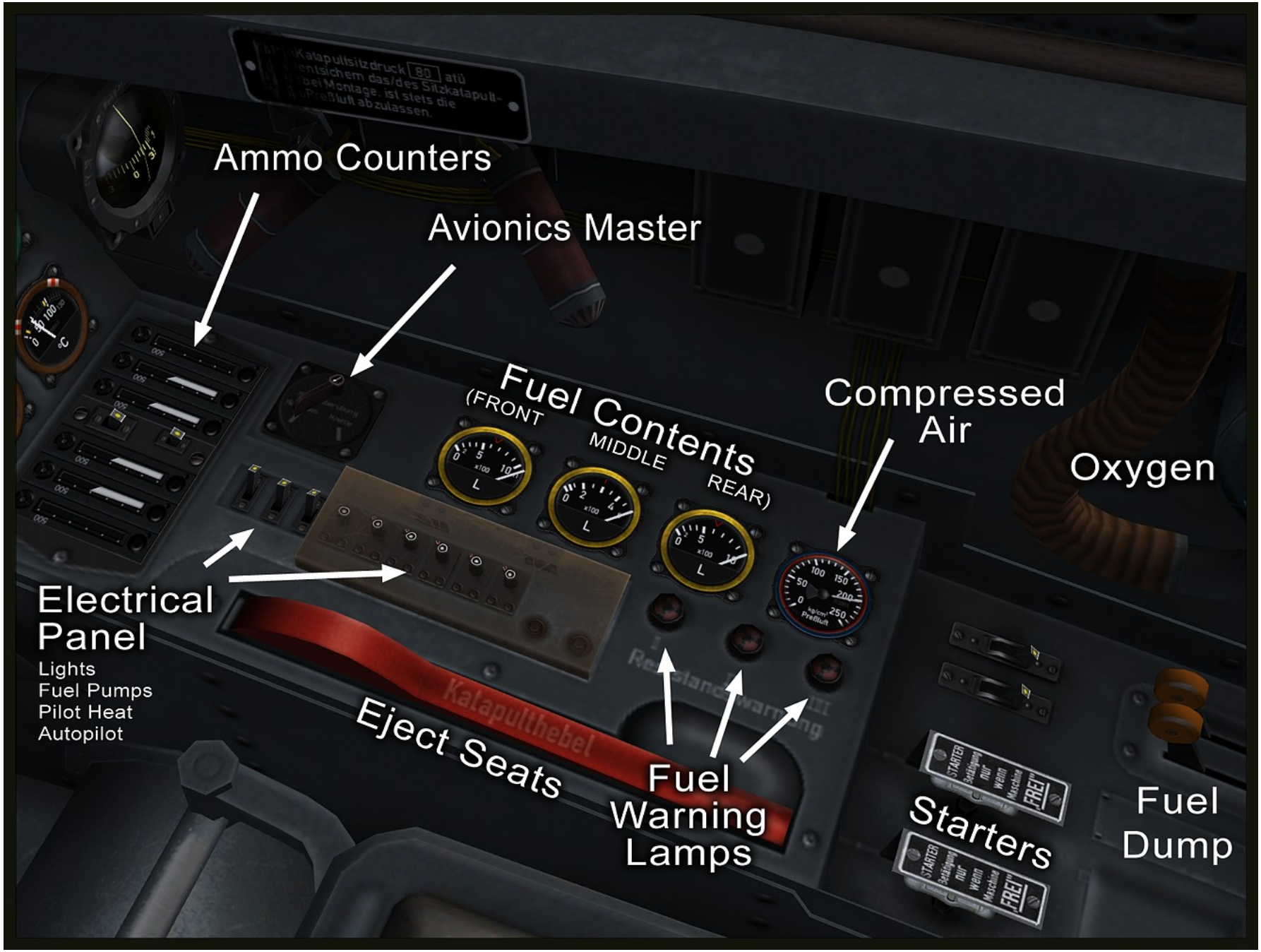

AIRCRAFT FACTORY
Heinkel He 219 A-0/R2
The world's first aircraft fitted with ejection seats
Germany's first tricycle-style landing gear
Exceptional visibility
Pressurized cockpit
Powerplant:
Daimler-Benz DB 603A V-12, liquid-cooled with 1750 HP for takeoff
Top Speed:
396 mph TAS (638 kph) @ 26,280 feet (8,000 m)
Stalling Speed:
Clean (25,500 lbs.): 116 mph (185 kph) IAS
Landing (25,500 lbs.): 100 mph (160 kph) IAS
Early canopy
- Long range
- Heavy fighter
- Advanced cockpit
The Most Advanced Piston Aircraft of the Second World War


VIRTUAL COCKPIT
0.75 Zoom
Canopy Latch
Auf
Zu
FuG 25a
Control Box
Intercom
Junction Box
Ruf
Gunsight
Dimmer
Cockpit
Ventilation
Flap
Position
Indicator
Trim
CONTROLS
INDICATORS
Fuel Tank Select
Prop Pitch
(inoperable)
Magnetos
Throttles
Flying
Heater Suit
Double
Hydraulic
Pressure
Cowl Flaps
Prop Pitch
(mouse wheel)
Throttle Lock
Parking Brake


Emergency Gear Pump


Combined Artificial Horizon / Turn and Bank
Pilot Tube Check
Auto-Pilot
Airspeed
Climb
Linker Motor
Rechter Motor
Engine RPM
Altitude
Manifold Pressure
Airscrew
ILS
Turn / Slip
Radio Altitude
Fuel / Oil Pressure
Patin Repeater Compass
Emergency Windscreen Cleaner


Nose Gear Inclination
Clock
Oxy Flow and Level
Windshield Sprinkler
Oil-filled Magnetic Compass
Engine Temp
Coolant (left / right)
Oil (left / right)
Jettison Canopy Lever
Strobe Light
Linker Motor
Rechter Motor
Bugrad
Ein
Aus
U/min
x100
O2-Wächter
Sauerstoff
°C


Ammo Counters
Avionics Master
Fuel Contents
(FRONT
MIDDLE
REAR)
Compressed
Air
Oxygen
Electrical
Panel
Lights
Fuel Pumps
Pilot Heat
Autopilot
Eject Seats
Fuel
Warning
Lamps
Starters
Fuel
Dump

Weights, Loading, and Trim

The Aircraft Factory He 219 is set up with a high level of realism, which extends to aircraft loading and fuel supply. The normal takeoff CG is about 28.5%. Pitch trim should be set to 0 degrees for takeoff. It is normal for the red index mark on the pitch trim indicator to be several degrees forward of the the rudder and aileron trim indicators when all three are "zeroed". This is because for a normal takeoff, the trim is set nose-down when the index mark is at zero on the pitch trim indicator. As fuel is burned off and the CG moves forward, the pitch trim will come further back, until, for landing, it will be several degrees into the nose-up area. The offset "zero" position serves as a reminder to the pilot that the aircraft is nose-heavy. The true neutral trim position (for a 25% CG condition) is at +2 degrees, when the red mark is lined up with the other trim indicators when they are at zero. With ammunition and fuel exhausted, the aircraft's center of gravity is about 24%, and with flaps and gear down on final approach, it may be necessary to use almost the full range of nose-up trim depending on the specific loading of the aircraft.

At high altitudes, stability will be very poor about the pitch axis, and autopilot performance will be unsatisfactory, if the fuel in the rear tank has not been burned off to move the CG forward. With 50% of the fuel gone from the rear fuselage tank and the other tanks full, the CG is at about 26.5% with normal payloads. Stability and handling will be excellent at high altitudes and the autopilot will function properly.

Cockpit Check - Controls (Maximum fuel load, all tanks full)

1. Parking Brake – Set
2. Fuel Selector - Set to Position III (rear fuselage tank)
3. Elevator Trim - 0 degrees (see reference for weight and loading)
4. Flaps - Takeoff (START) position (30 degrees)
5. Propeller Control - High speed (12:15 position)
6. Flight Instruments - Checked and Set
7. Engine Instruments - Checked
8. Switches - Checked

Mixture Control

This aircraft is equipped with a fully automatic mixture control.

Engine Starting

1. Cockpit Check - COMPLETE
2. Set or hold your parking brakes.
3. Turn the battery and generator switches to ON.
4. Put fuel selector in the desired position.
5. Turn on electric fuel pump.
6. Turn the Engine 1 magneto switch on BOTH.
7. Confirm fuel pressure rise.
8. Engage starter switch until the engine starts.
9. Check engine instruments to confirm oil pressure rises within 30 seconds.
10. Idle at 1200 RPM until the oil temperature reaches 40 degrees C.
11. Check all instruments for proper function.
12. After warm-up, idle at 800-1000 RPM.
13. Repeat for Engine 2.

Pre-takeoff Check

1. See that the elevator trim tab is properly set.
2. Check the magnetos at 2000 RPM. 100 RPM drop maximum.
3. Check the propeller control.
4. Turn the booster pumps ON.
5. Check flaps are at 30 degrees.
6. Check the cowl flap position (open for takeoff).

Normal Takeoff

After lining up with the runway, hold the brakes and run the engines up to 2000 RPM. Hold and confirm power is steady. Release the brakes and advance the throttles to full takeoff power. Rotate smoothly at about 200 kph to about eight degrees pitch. Retract the gear when a positive rate of climb is established and then retract the flaps. Set engines to climbing power of 1.30 ata and 2500 RPM and climb at 300 kph IAS. Normal takeoff power is 1.40 ata and 2700 RPM.

High-Performance Takeoff

Use the normal procedure, but rotate at 180 kph IAS to a ten-degree pitch up attitude. Hold this attitude until the wheels leave the ground, then immediately retract the gear and smoothly rotate to just under 15 degrees pitch. Hold until obstacles are cleared, then lower the nose to gain normal flying speed and retract the flaps.

After Takeoff

1. Raise the landing gear.
2. Raise the wing flaps.
3. Throttle back to normal climbing power.
4. Adjust the prop to climbing RPM.
5. Adjust cowl flaps as required.
6. Trim the aircraft as required for climbing.
7. Turn the booster pump to the normal position.
8. Check all instruments.

Climb Control

A normal climb is made at 300 kph IAS with a manifold pressure of 1.35 *ata* and the propeller set to 2500 RPM (1:15 position on the propeller pitch gauge). A climb to 6,000 meters (19,700 feet) can be accomplished in about 10 minutes and will cover about 30 nautical miles. Above 7,000 meters, allow the climbing speed to fall off gradually until you are climbing at 250 kph IAS at 11,000 meters.

Cruise Control Schedule

Calculate your fuel consumption and time to your destination using the following table. The best range is at the highest altitude with the lowest throttle setting.

Altitude	Pilot's IAS (km/hr)	Manifold Pressure	RPM (Prop pitch)	TAS (km/hr)	US GPH	Nautical miles per gallon
2100 m	460	1.20	2300 (9:40)	500	229	1.18
6000 m	430	1.20	2300 (9:40)	565	239	1.28
2100 m	400	1.00	2000 (6:00)	435	165	1.43
6000 m	360	1.00	2000 (6:00)	485	173	1.52
8000 m	380	1.10	2150 (7:15)	565	215	1.42

Engine Limitations and Characteristics

The Daimler-Benz DB 603A engine provides adequate performance to medium altitudes. Engine-out performance is poor on this aircraft at higher weights, especially if an engine fails on takeoff.

ENGINE POWER CHART	TAKEOFF MAXIMUM	TAKEOFF NORMAL	WAR EMERGENCY	MILITARY POWER	MAXIMUM CONTINUOUS	NORMAL CRUISE	ECONOMY CRUISE
Boost (ata)	1.40	1.40	1.40	1.30	1.20	1.10	1.00
RPM	2700	2700	2700	2500	2300	2150	2000
Full throttle height*	6400 m	6400 m	6400 m	6850 m	7420 m	8060 m	8670 m

*Full throttle height is the height at which full throttle is required to produce the indicated power in the chart. The power will decline above that height.

Landing

1. Check tanks and select the fullest tank for landing.
2. Put the fuel booster on normal.
3. Set the prop to about 2500 RPM.
4. Check the traffic pattern and obtain clearance to land.
5. Slow down to 300 kph and lower the flaps to the first position. Retrim as needed.
6. Lower the landing gear, allowing time for full extension (about 10 seconds).
7. The normal speed in the traffic pattern with wheels down is 250 kph.
8. Lower the flaps to the second position after turning to your final approach. Allow sufficient time to reach the full extension, about 10 seconds.
9. Fly the final approach at about 215 kph, crossing the runway threshold at about 195 kph.
10. Land the aircraft main wheels first, and let the nose settle gently. Brake as required.

Flight Characteristics

The Heinkel He 219 is a very stable and predictable aircraft and can be trimmed "hands-off" for any flight regime. The rate of roll is modest at about 70 degrees per second at optimal cornering speed of 400 kph IAS. The plane was designed to be a rock-solid gun platform and its behavior reflects that mission. The maximum G for cornering is 6.0 at a normal combat weight.

Single-Engine Performance

In the event of engine failure, immediately cut the dead engine and feather the propeller (see the reference for details). Maintain directional control if at low speed and do not allow the airspeed to go below 250 kph IAS if at all possible. Find a place to land and go there.

Stalls

A stall in the He 219 is extremely gentle and very controllable. Recovery is completely normal.

Permissible Acrobatics

Acrobatics are verboten.

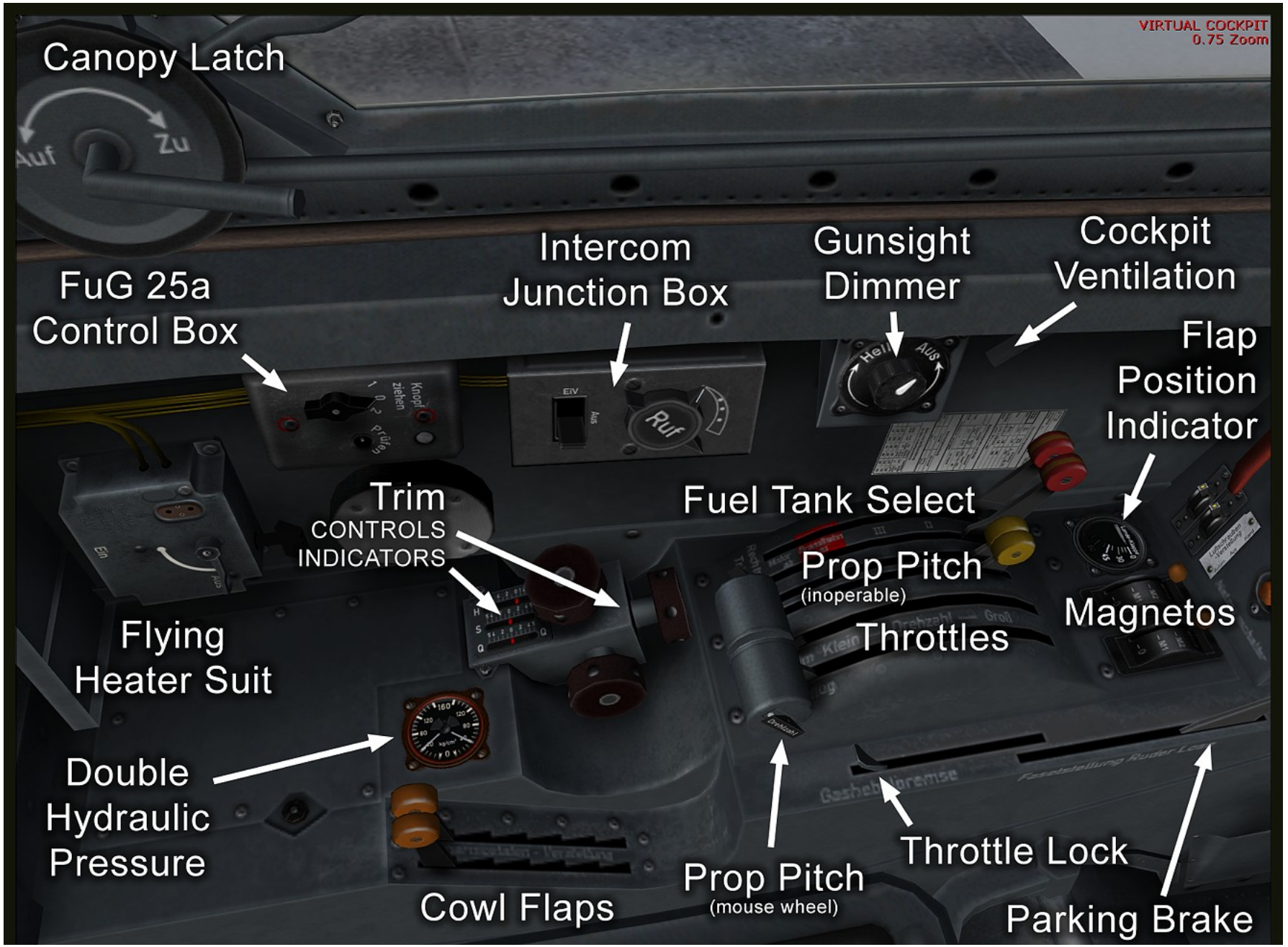
Aircraft Factory Heinkel He 219 A-O/R6 Uhu

General Information - He 219 A-0/R6

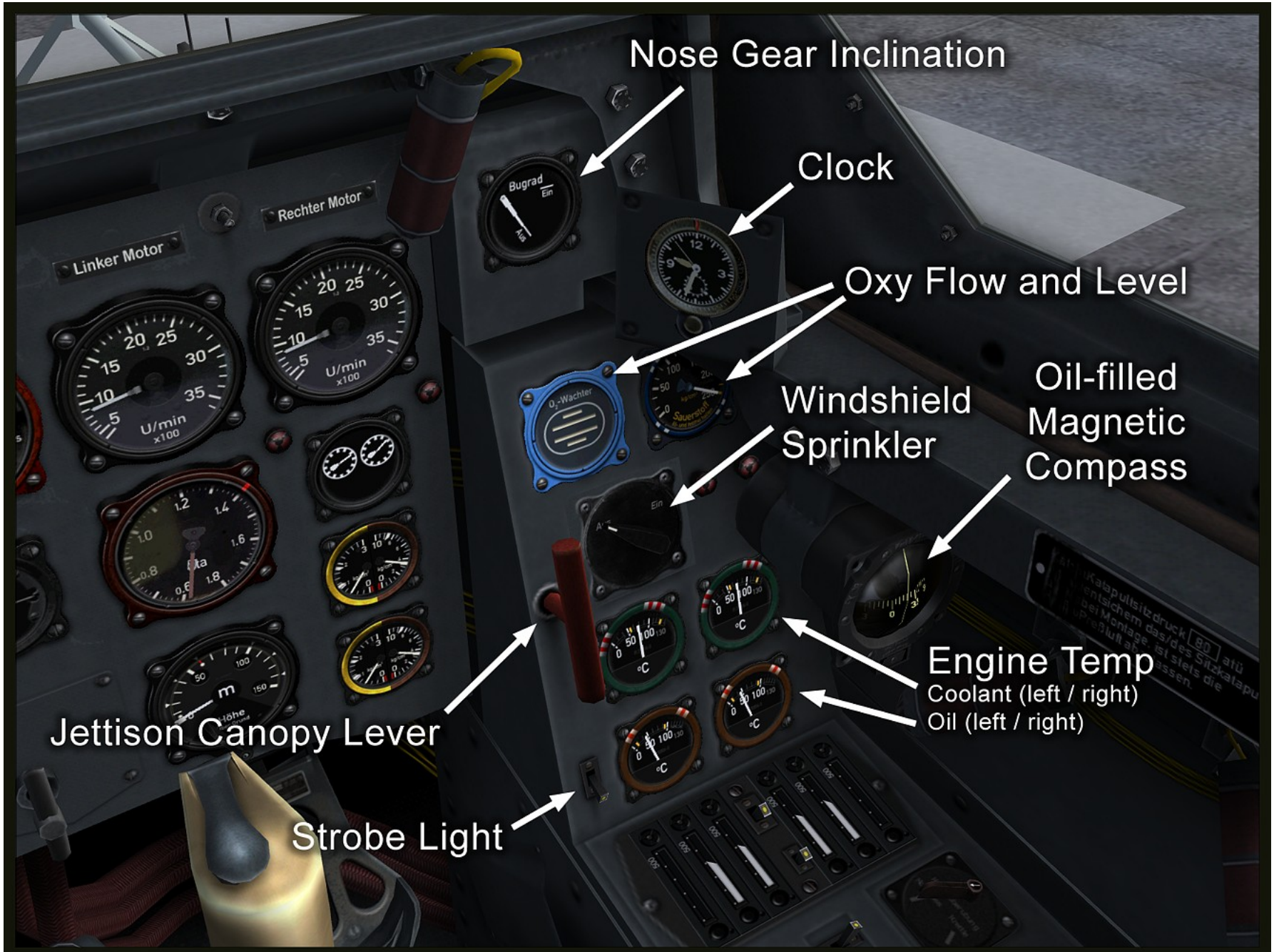
The He 219 A-0/R6 depicted here was armed with eight cannon. It was fitted with forward-looking FuG 212 and 220 radar as well as rear-warning FuG 220 radar. It was piloted by Oblt. Ernst-Wilhelm Modrow.

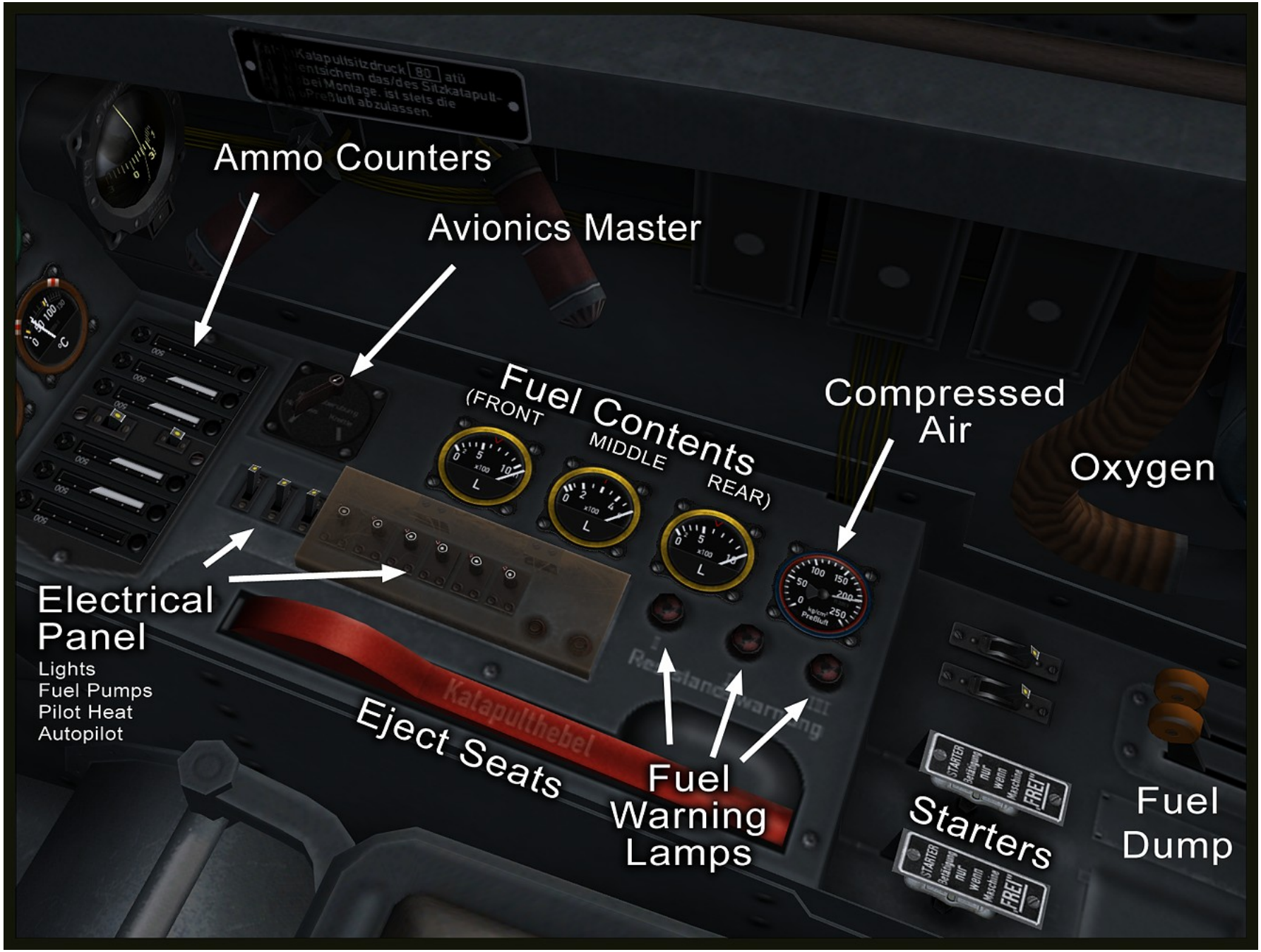
- Empty Weight: 22,709 lbs. (10,300 kg)
- Wingspan: 60.7 feet
- Wing Area: 479 square feet
- Normal Takeoff Weight: 28,199 lbs. (12,790 kg)
- Maximum Takeoff Weight: 27,232 lbs. (12,800 kg)
- Top Speed, Sea Level: 313 mph (505 kph) TAS
- Top Speed: 396 mph TAS (638 kph) @ 26,280 feet (8,000 m)
- Stalling Speed, clean (25,500 lbs.): 116 mph (185 kph) IAS
- Stalling Speed, landing (25,500 lbs.): 100 mph (160 kph) IAS
- Combat Ceiling: 31,170 feet (9,500 m)
- Service Ceiling: 32,810 feet (10,000 m)
- Powerplant: Daimler-Benz DB 603A V-12, liquid-cooled with 1750 HP for takeoff.
- Armament: (4) Mk108 in ventral tray, (2) MG121/20 in wing roots, (2) Mk108 as Schrage Musik


AIRCRAFT FACTORY
Heinkel He 219 A-0/R6
The world's first aircraft fitted with ejection seats
Germany's first tricycle-style landing gear
Exceptional visibility
Pressurized cockpit
Larger, FuG 212 / 220 radar antennas
"Schrage Musik" Upward Firing Cannon
- Long range
- Heavy fighter
- Advanced cockpit
The Most Advanced Piston Aircraft of the Second World War


VIRTUAL COCKPIT
0.75 Zoom
Canopy Latch
Auf
Zu
FuG 25a
Control Box
Intercom
Junction Box
Ruf
Gunsight
Dimmer
Cockpit
Ventilation
Flap
Position
Indicator
Trim
CONTROLS
INDICATORS
Fuel Tank Select
Prop Pitch
(inoperable)
Throttles
Magnetos
Flying
Heater Suit
Double
Hydraulic
Pressure
Cowl Flaps
Prop Pitch
(mouse wheel)
Throttle Lock
Parking Brake


Emergency Gear Pump
Emergency Gear Lever
Undercarrage Indicator
(nose, left main, right main)
Undercarrage
Emergency Flaps Lever
Prop Pitch
(Auto, Fixed, Feathered)
Flaps
(Up, Takeoff, Landing)
Armoured Windscreen
Electric Master


Nose Gear Inclination
Clock
Oxy Flow and Level
Windshield Sprinkler
Oil-filled Magnetic Compass
Engine Temp
Coolant (left / right)
Oil (left / right)
Jettison Canopy Lever
Strobe Light
Linker Motor
Rechter Motor
Bugrad
Ein
Aus
U/min
x100
O2-Wächter
Sauerstoff
°C


Ammo Counters
Avionics Master
Fuel Contents
(FRONT
MIDDLE
REAR)
Compressed
Air
Oxygen
Electrical
Panel
Lights
Fuel Pumps
Pilot Heat
Autopilot
Eject Seats
Fuel
Warning
Lamps
Starters
Fuel
Dump

Weights, Loading, and Trim

The Aircraft Factory He 219 is set up with a high level of realism, which extends to aircraft loading and fuel supply. The normal takeoff CG is about 29%. Pitch trim should be set to 0 degrees for takeoff. It is normal for the red index mark on the pitch trim indicator to be several degrees forward of the the rudder and aileron trim indicators when all three are "zeroed". This is because for a normal takeoff, the trim is set nose-down when the index mark is at zero on the pitch trim indicator. As fuel is burned off and the CG moves forward, the pitch trim will come further back, until, for landing, it will be several degrees into the nose-up area. The offset "zero" position serves as a reminder to the pilot that the aircraft is nose-heavy. The true neutral trim position (for a 25% CG condition) is at +2 degrees, when the red mark is lined up with the other trim indicators when they are at zero. With ammunition and fuel exhausted, the aircraft's center of gravity is about 24%, and with flaps and gear down on final approach, it may be necessary to use almost the full range of nose-up trim depending on the specific loading of the aircraft.

At high altitudes, stability will be very poor about the pitch axis, and autopilot performance will be unsatisfactory, if the fuel in the rear tank has not been burned off to move the CG forward. With 50% of the fuel gone from the rear fuselage tank and the other tanks full, the CG is at about 26.5% with normal payloads. Stability and handling will be excellent at high altitudes and the autopilot will function properly.

Cockpit Check - Controls (Maximum fuel load, all tanks full)

1. Parking Brake - Set
2. Fuel Selector - Set to Position II (center and rear fuselage tanks)
3. Elevator Trim - 0 degrees (see reference for weight and loading)
4. Flaps - Takeoff (START) position (30 degrees)
5. Propeller Control - High speed (12:15 position)
6. Flight Instruments - Checked and Set
7. Engine Instruments - Checked
8. Switches - Checked

Mixture Control

This aircraft is equipped with a fully automatic mixture control.

Engine Starting

1. Cockpit Check - COMPLETE
2. Set or hold your parking brakes.
3. Turn the battery and generator switches to ON.
4. Put fuel selector in the desired position.
5. Turn on electric fuel pump.
6. Turn the Engine 1 magneto switch on BOTH.
7. Confirm fuel pressure rise.
8. Engage starter switch until the engine starts.
9. Check engine instruments to confirm oil pressure rises within 30 seconds.
10. Idle at 1200 RPM until the oil temperature reaches 40 degrees C.
11. Check all instruments for proper function.
12. After warm-up, idle at 800-1000 RPM.
13. Repeat for Engine 2.

Pre-takeoff Check

1. See that the elevator trim tab is properly set.
2. Check the magnetos at 2000 RPM. 100 RPM drop maximum.
3. Check the propeller control.
4. Turn the booster pumps ON.
5. Check flaps are at 30 degrees.
6. Check the cowl flap position (open for takeoff).

Normal Takeoff

After lining up with the runway, hold the brakes and run the engines up to 2000 RPM. Hold and confirm power is steady. Release the brakes and advance the throttles to full takeoff power. Rotate smoothly at about 200 kph to about eight degrees pitch. Retract the gear when a positive rate of climb is established and then retract the flaps. Set engines to climbing power of 1.30 ata and 2500 RPM and climb at 300 kph IAS. Normal takeoff power is 1.40 ata and 2700 RPM.

High-Performance Takeoff

Use the normal procedure, but rotate at 180 kph IAS to a ten-degree pitch up attitude. Hold this attitude until the wheels leave the ground, then immediately retract the gear and smoothly rotate to just under 15 degrees pitch. Hold until obstacles are cleared, then lower the nose to gain normal flying speed and retract the flaps.

After Takeoff

1. Raise the landing gear.
2. Raise the wing flaps.
3. Throttle back to normal climbing power.
4. Adjust the prop to climbing RPM.
5. Trim the aircraft as required for climbing.
6. Adjust cowl flaps as required.
7. Turn the booster pump to the normal position.
8. Check all instruments.

Climb Control

A normal climb is made at 300 kph IAS with a manifold pressure of 1.30 *ata* and the propeller set to 2500 RPM. A climb to 6,000 meters (19,700 feet) can be accomplished in about 10 minutes and will cover about 30 nautical miles. Above 7,000 meters, allow the climbing speed to fall off gradually until you are climbing at 250 kph IAS at 10,000 meters.

Cruise Control Schedule

Calculate your fuel consumption and time to your destination using the following table. The best range is at the highest altitude with the lowest throttle setting.

Altitude	Pilot's IAS (km/hr)	Manifold Pressure	RPM (Prop pitch)	TAS (km/hr)	US GPH	Nautical miles per gallon
2100 m	460	1.20	2300 (9:40)	500	229	1.18
6000 m	430	1.20	2300 (9:40)	565	239	1.28
2100 m	400	1.00	2000 (6:00)	435	165	1.43
6000 m	360	1.00	2000 (6:00)	485	173	1.52
8000 m	380	1.10	2150 (7:15)	565	215	1.42

Engine Limitations and Characteristics

The Daimler-Benz DB 603A engine provides adequate performance to medium altitudes. Engine-out performance is poor on this aircraft at higher weights, especially if an engine fails on takeoff.

ENGINE POWER CHART	TAKEOFF MAXIMUM	TAKEOFF NORMAL	WAR EMERGENCY	MILITARY POWER	MAXIMUM CONTINUOUS	NORMAL CRUISE	ECONOMY CRUISE
Boost (ata)	1.40	1.40	1.40	1.30	1.20	1.10	1.00
RPM	2700	2700	2700	2500	2300	2150	2000
Full throttle height*	6400 m	6400 m	6400 m	6850 m	7420 m	8060 m	8670 m

*Full throttle height is the height at which full throttle is required to produce the indicated power in the chart. The power will decline above that height.

Landing

1. Check tanks and select the fullest tank for landing.
2. Put the fuel booster on normal.
3. Set the prop to about 2500 RPM.
4. Check the traffic pattern and obtain clearance to land.
5. Slow down to 300 kph and lower the flaps to the first position. Retrim as needed.
6. Lower the landing gear, allowing time for full extension (about 10 seconds).
7. The normal speed in the traffic pattern with wheels down is 250 kph.
8. Lower the flaps to the second position after turning to your final approach. Allow sufficient time to reach the full extension, about 10 seconds.
9. Fly the final approach at about 215 kph, crossing the runway threshold at about 195 kph.
10. Land the aircraft main wheels first, and let the nose settle gently. Brake as required.

Flight Characteristics

The Heinkel He 219 is a very stable and predictable aircraft and can be trimmed "hands-off" for any flight regime. The rate of roll is modest at about 70 degrees per second at optimal cornering speed of 400 kph IAS. The plane was designed to be a rock-solid gun platform and its behavior reflects that mission. The maximum G for cornering is 6.0 at a normal combat weight.

Single-Engine Performance

In the event of engine failure, immediately cut the dead engine and feather the propeller (see the reference for details). Maintain directional control if at low speed and do not allow the airspeed to go below 250 kph IAS if at all possible. Find a place to land and go there.

Stalls

A stall in the He 219 is extremely gentle and very controllable. Recovery is completely normal.

Permissible Acrobatics

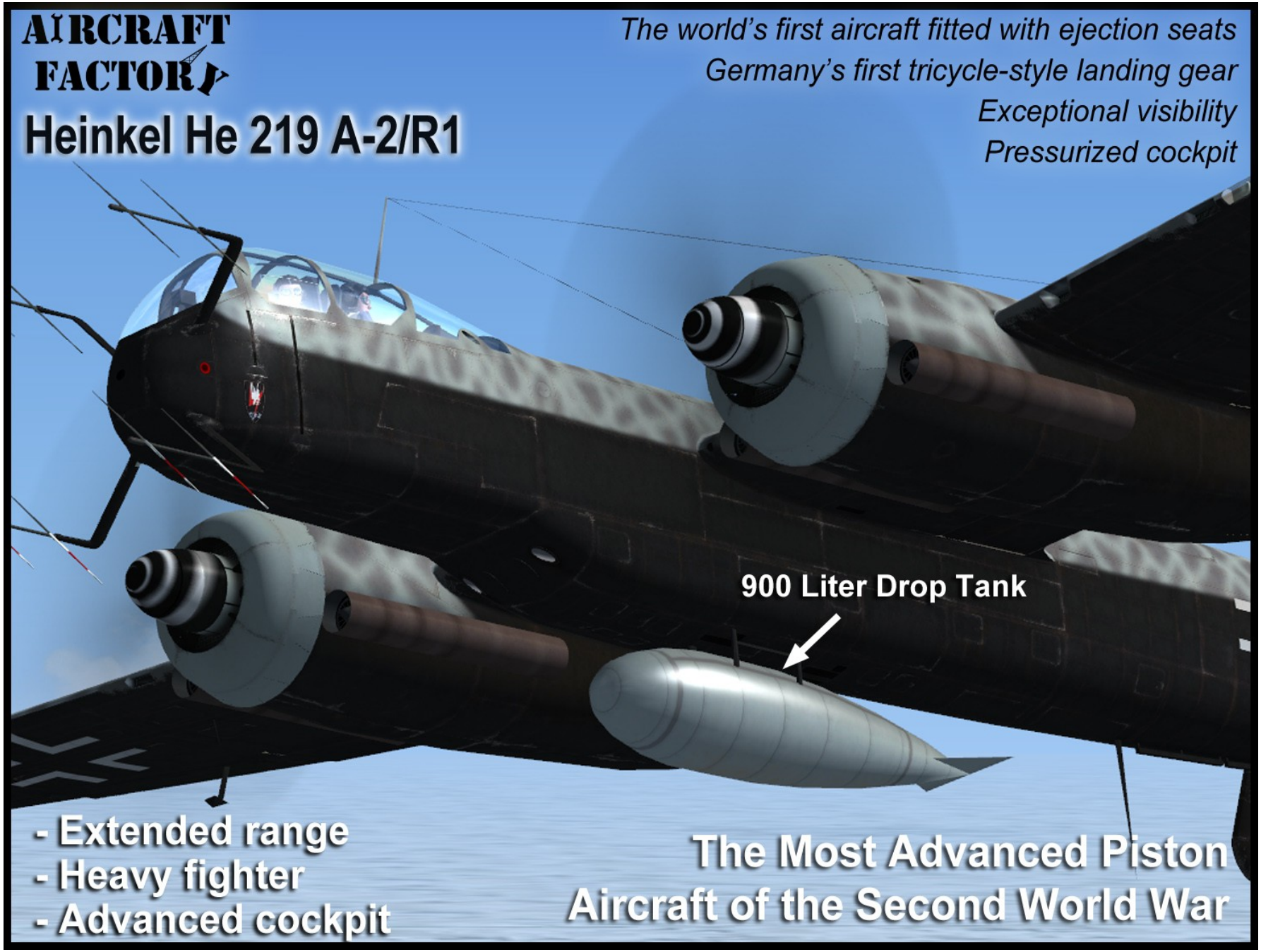
Acrobatics are verboten.

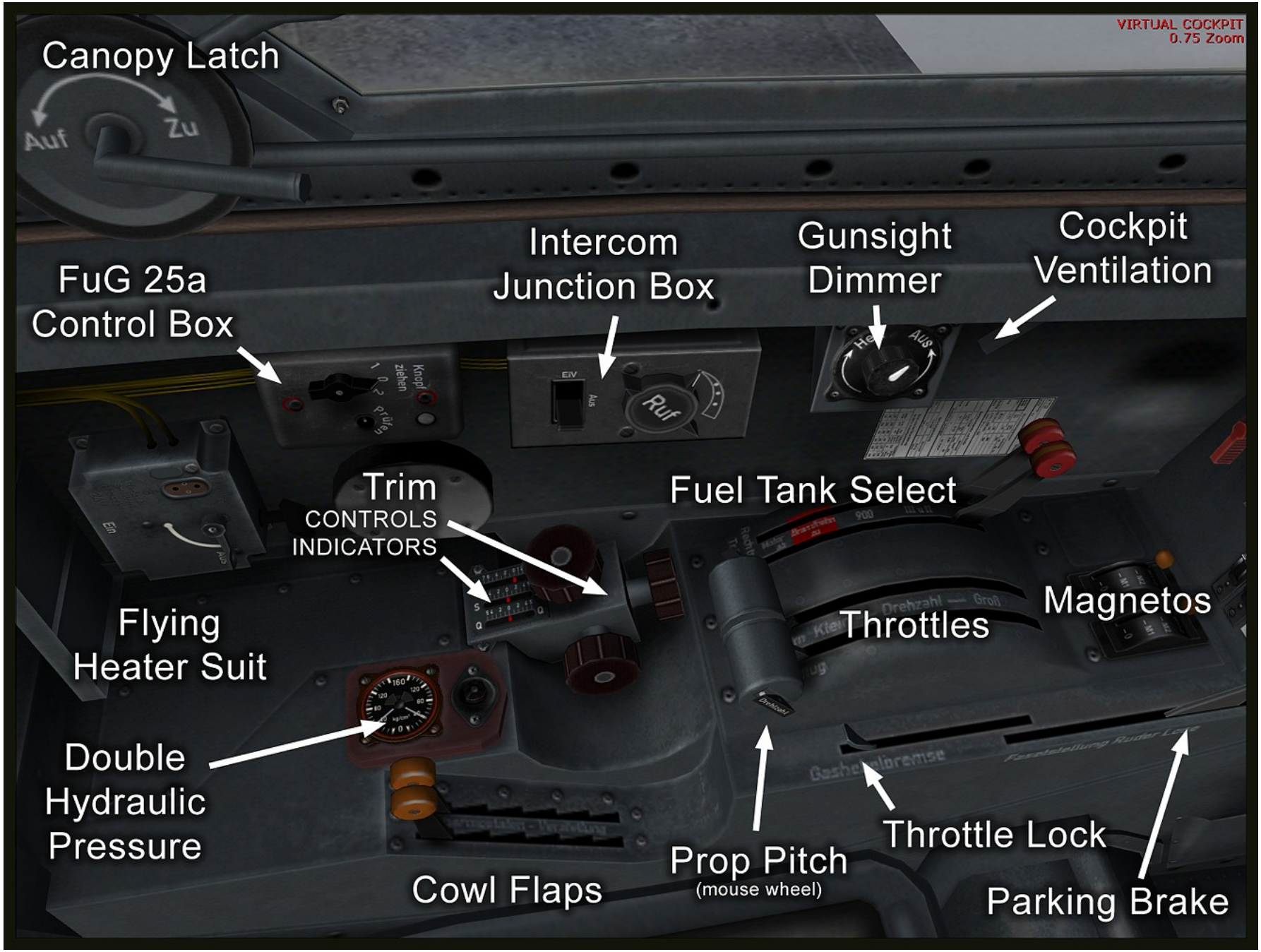
Aircraft Factory Heinkel He 219 A-2/R1 Uhu

General Information - He 219 A-2/R1

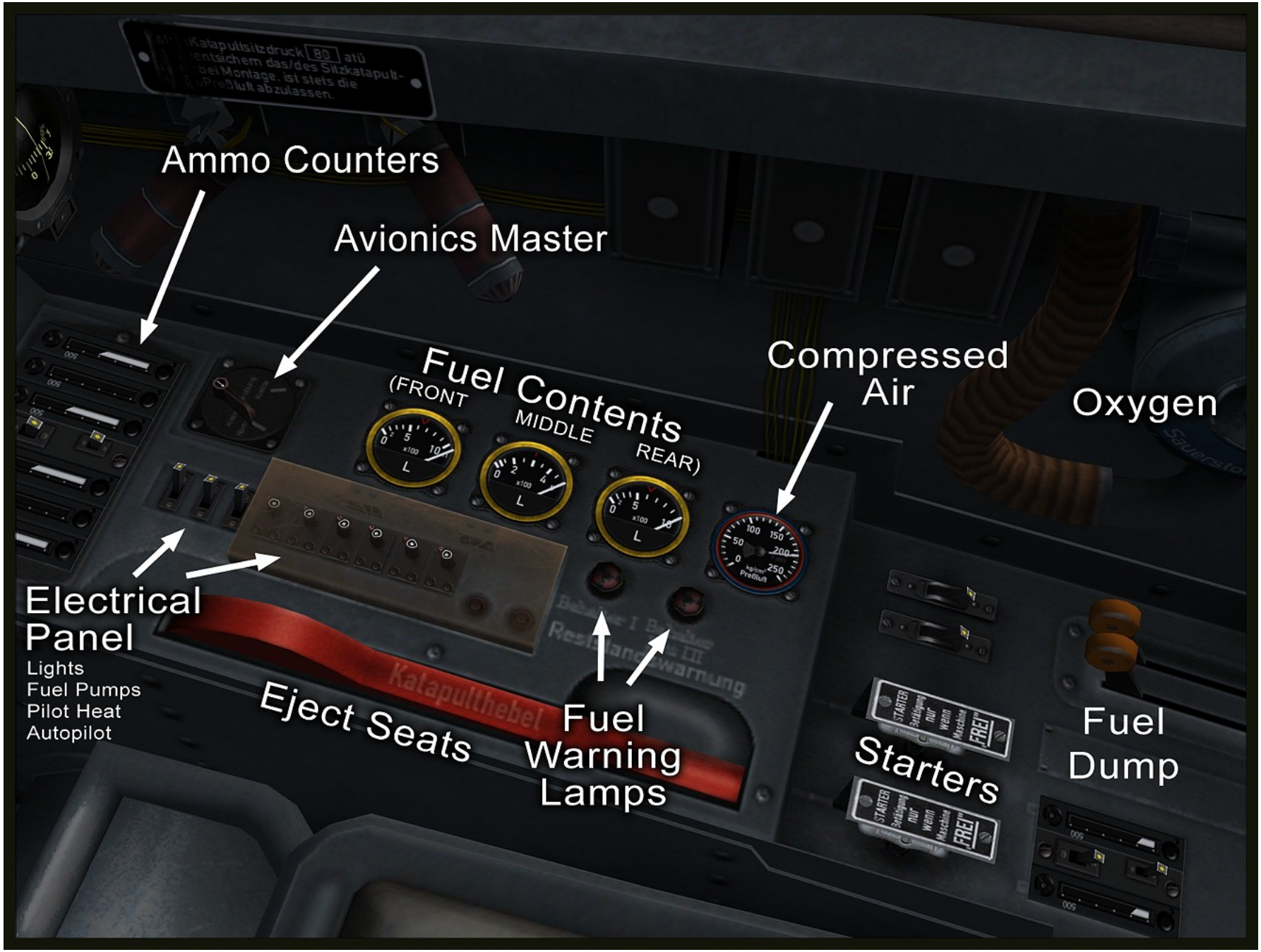
The He 219 A-2/R1 depicted here was armed with six cannon, and operated from Munster-Handorf in late 1944. It was fitted with forward-looking FuG 220 Lichtenstein SN-2 and FuG 212 Lichtenstein C-1 Morgenstern radar systems.

- Empty Weight: 22,428 lbs. (10,173 kg)
- Wingspan: 60.7 feet
- Wing Area: 479 square feet
- Normal Takeoff Weight: 29,135 lbs. (13,215 kg)
- Maximum Takeoff Weight: 29,300 lbs. (13,290 kg)
- Top Speed, Sea Level: 313 mph (505 kph) TAS
- Top Speed: 396 mph TAS (638 kph) @ 26,280 feet (8,000 m)
- Stalling Speed, clean (25,500 lbs.): 116 mph (185 kph) IAS
- Stalling Speed, landing (25,500 lbs.): 100 mph (160 kph) IAS
- Combat Ceiling: 31,170 feet (9,500 m)
- Service Ceiling: 32,810 feet (10,000 m)
- Powerplant: Daimler-Benz DB 603A V-12, liquid-cooled with 1750 HP for takeoff.
- Armament: (2) Mk103 in ventral tray, (2) MG121/20 in wing roots, (2) Mk108 as Schrage Musik


AIRCRAFT FACTORY
Heinkel He 219 A-2/R1
The world's first aircraft fitted with ejection seats
Germany's first tricycle-style landing gear
Exceptional visibility
Pressurized cockpit
900 Liter Drop Tank
- Extended range
- Heavy fighter
- Advanced cockpit
The Most Advanced Piston Aircraft of the Second World War


VIRTUAL COCKPIT
0.75 Zoom
Canopy Latch
Auf
Zu
FuG 25a
Control Box
Intercom
Junction Box
Gunsight
Dimmer
Cockpit
Ventilation
Trim
CONTROLS
INDICATORS
Fuel Tank Select
Flying
Heater Suit
Throttles
Magnetos
Double
Hydraulic
Pressure
Cowl Flaps
Prop Pitch
(mouse wheel)
Throttle Lock
Parking Brake


Combined Artificial Horizon /
Turn and Bank
Pilot Tube
Check
Auto-Pilot
Airspeed
Climb
Linker Motor
Rechter Motor
Engine RPM
Altitude
ILS
Airscrew
Manifold
Pressure
Radio
Altitude
Fuel / Oil
Pressure
Patin Repeater
Compass


Ammo Counters
Avionics Master
Fuel Contents
(FRONT
MIDDLE
REAR)
Compressed
Air
Oxygen
Electrical
Panel
Lights
Fuel Pumps
Pilot Heat
Autopilot
Eject Seats
Fuel
Warning
Lamps
Starters
Fuel
Dump

Weights, Loading, and Trim

The Aircraft Factory He 219 is set up with a high level of realism, which extends to aircraft loading and fuel supply. The normal takeoff CG is about 28.5%. Pitch trim should be set to 0 degrees for takeoff. It is normal for the red index mark on the pitch trim indicator to be several degrees forward of the the rudder and aileron trim indicators when all three are "zeroed". This is because for a normal takeoff, the trim is set nose-down when the index mark is at zero on the pitch trim indicator. As fuel is burned off and the CG moves forward, the pitch trim will come further back, until, for landing, it will be several degrees into the nose-up area. The offset "zero" position serves as a reminder to the pilot that the aircraft is nose-heavy. The true neutral trim position (for a 25% CG condition) is at +2 degrees, when the red mark is lined up with the other trim indicators when they are at zero. With ammunition and fuel exhausted, the aircraft's center of gravity is about 24%, and with flaps and gear down on final approach, it may be necessary to use almost the full range of nose-up trim depending on the specific loading of the aircraft.

At high altitudes, stability will be very poor about the pitch axis, and autopilot performance will be unsatisfactory, if the fuel in the rear tank has not been burned off to move the CG forward. With 50% of the fuel gone from the rear fuselage tank and the other tanks full, the CG is at about 26.5% with normal payloads. Stability and handling will be excellent at high altitudes and the autopilot will function properly.

Cockpit Check - Controls (Maximum fuel load, all tanks full)

1. Parking Brake - Set
2. Fuel Selector - Set to Position II (center and rear fuselage tanks)
3. Elevator Trim - 0 degrees (see reference for weight and loading)
4. Flaps - Takeoff (START) position (30 degrees)
5. Propeller Control - High speed (12:15 position)
6. Flight Instruments - Checked and Set
7. Engine Instruments - Checked
8. Switches - Checked

Mixture Control

This aircraft is equipped with a fully automatic mixture control.

Engine Starting

1. Cockpit Check - COMPLETE
2. Set or hold your parking brakes.
3. Turn the battery and generator switches to ON.
4. Put fuel selector in the desired position.
5. Turn on electric fuel pump.
6. Turn the Engine 1 magneto switch on BOTH.
7. Set mixture control to RICH.
8. Confirm fuel pressure rise.
9. Engage starter switch until the engine starts.
10. Check engine instruments to confirm oil pressure rises within 30 seconds.
11. Idle at 1200 RPM until the oil temperature reaches 40 degrees C.
12. Check all instruments for proper function.
13. After warm-up, idle at 800-1000 RPM.
14. Repeat for Engine 2.

Pre-takeoff Check

1. See that the elevator trim tab is properly set.
2. Check the magnetos at 2000 RPM. 100 RPM drop maximum.
3. Check the propeller control.
4. Turn the booster pumps ON.
5. Check flaps are at 30 degrees.
6. Check the cowl flap position (open for takeoff).

Normal Takeoff

After lining up with the runway, hold the brakes and run the engines up to 2000 RPM. Hold and confirm power is steady. Release the brakes and advance the throttles to full takeoff power. Rotate smoothly at about 200 kph to about eight degrees pitch. Retract the gear when a positive rate of climb is established and then retract the flaps. Set engines to climbing power of 1.30 ata and 2500 RPM and climb at 300 kph IAS. Normal takeoff power is 1.40 ata and 2700 RPM.

High-Performance Takeoff

Use the normal procedure, but rotate at 180 kph IAS to a ten-degree pitch up attitude. Hold this attitude until the wheels leave the ground, then immediately retract the gear and smoothly rotate to just under 15 degrees pitch. Hold until obstacles are cleared, then lower the nose to gain normal flying speed and retract the flaps.

After Takeoff

1. Raise the landing gear.
2. Raise the wing flaps.
3. Throttle back to normal climbing power.
4. Adjust the prop to climbing RPM.
5. Trim the aircraft as required for climbing.
6. Adjust cowl flaps as required.
7. Turn the booster pump to the normal position.
8. Check all instruments.
9. Switch to drop tank after reaching 5,000 feet.

Climb Control

A normal climb is made at 300 kph IAS with a manifold pressure of 1.30 *ata* and the propeller set to 2500 RPM. A climb to 6,000 meters (19,700 feet) can be accomplished in about 10 minutes and will cover about 30 nautical miles. Above 7,000 meters, allow the climbing speed to fall off gradually until you are climbing at 250 kph IAS at 10,000 meters.

Cruise Control Schedule

Calculate your fuel consumption and time to your destination using the following table. The best range is at the highest altitude with the lowest throttle setting.

Altitude	Pilot's IAS (km/hr)	Manifold Pressure	RPM (Prop pitch)	TAS (km/hr)	US GPH	Nautical miles per gallon
2100 m	460	1.20	2300 (9:40)	500	229	1.18
6000 m	430	1.20	2300 (9:40)	565	239	1.28
2100 m	400	1.00	2000 (6:00)	435	165	1.43
6000 m	360	1.00	2000 (6:00)	485	173	1.52
8000 m	380	1.10	2150 (7:15)	565	215	1.42

Engine Limitations and Characteristics

The Daimler-Benz DB 603A engine provides adequate performance to medium altitudes. Engine-out performance is poor on this aircraft at higher weights, especially if an engine fails on takeoff.

ENGINE POWER CHART	TAKEOFF MAXIMUM	TAKEOFF NORMAL	WAR EMERGENCY	MILITARY POWER	MAXIMUM CONTINUOUS	NORMAL CRUISE	ECONOMY CRUISE
Boost (ata)	1.40	1.40	1.40	1.30	1.20	1.10	1.00
RPM	2700	2700	2700	2500	2300	2150	2000
Full throttle height*	6400 m	6400 m	6400 m	6850 m	7420 m	8060 m	8670 m

*Full throttle height is the height at which full throttle is required to produce the indicated power in the chart. The power will decline above that height.

Landing

1. Check tanks and select the fullest tank for landing.
2. Put the fuel booster on normal.
3. Set the prop to about 2500 RPM.
4. Check the traffic pattern and obtain clearance to land.
5. Slow down to 300 kph and lower the flaps to the first position. Retrim as needed.
6. Lower the landing gear, allowing time for full extension (about 10 seconds).
7. The normal speed in the traffic pattern with wheels down is 250 kph.
8. Lower the flaps to the second position after turning to your final approach. Allow sufficient time to reach the full extension, about 10 seconds.
9. Fly the final approach at about 215 kph, crossing the runway threshold at about 195 kph.
10. Land the aircraft main wheels first, and let the nose settle gently. Brake as required.

Flight Characteristics

The Heinkel He 219 is a very stable and predictable aircraft and can be trimmed "hands-off" for any flight regime. The rate of roll is modest at about 70 degrees per second at optimal cornering speed of 400 kph IAS. The plane was designed to be a rock-solid gun platform and its behavior reflects that mission. The maximum G for cornering is 6.0 at a normal combat weight.

Single-Engine Performance

In the event of engine failure, immediately cut the dead engine and feather the propeller (see the reference for details). Maintain directional control if at low speed and do not allow the airspeed to go below 250 kph IAS if at all possible. Find a place to land and go there.

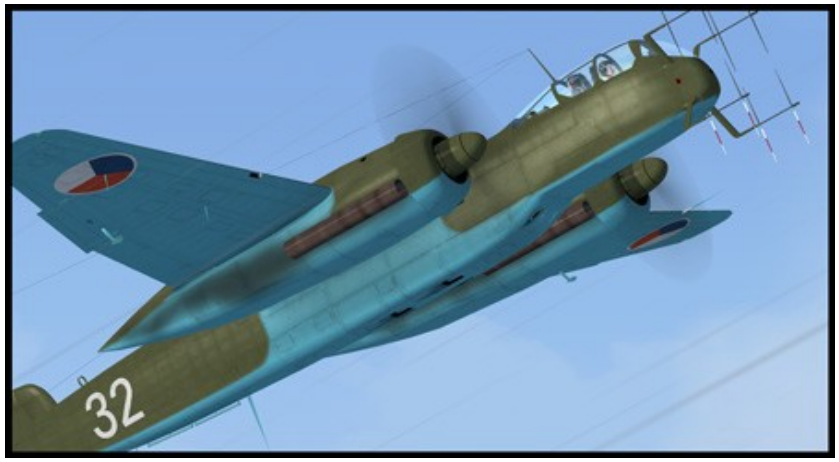
Stalls

A stall in the He 219 is extremely gentle and very controllable. Recovery is completely normal.

Permissible Acrobatics

Acrobatics are verboten.

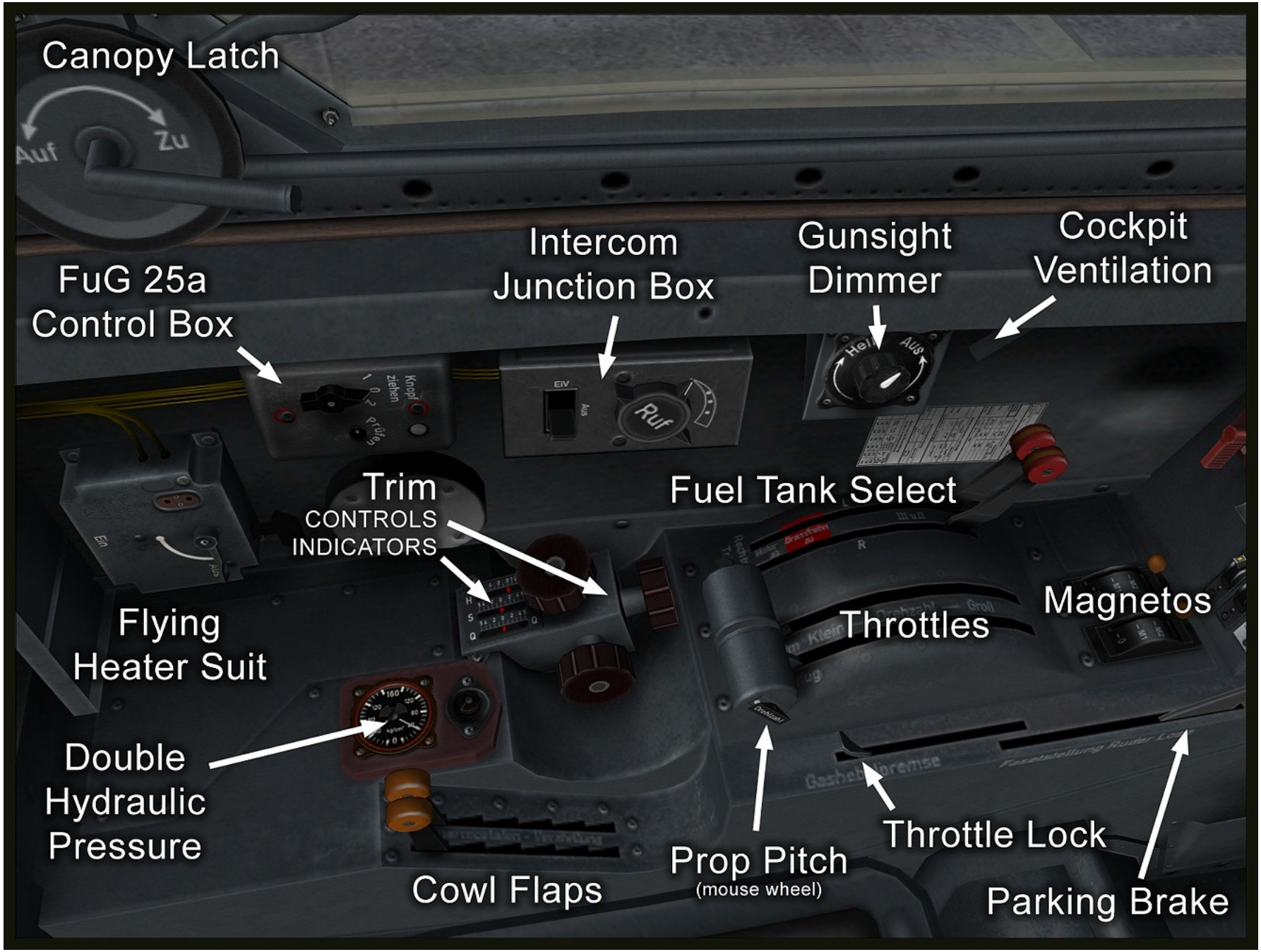
Aircraft Factory Heinkel He 219 A-5 Uhu



General Information - He 219 A-5

This unusual aircraft was a two-seat Czech conversion. It was lightly armed, with just four cannon, but carried a lot of fuel because of the two extra nacelle tanks of 105 US gallons each. It was equipped with a FuG 220 Lichtenstein search radar.

- Empty Weight: 22,949 lbs. (10,409 kg)
- Wingspan: 60.7 feet
- Wing Area: 479 square feet
- Normal Takeoff Weight: 29,492 lbs. (13,376 kg)
- Maximum Takeoff Weight: 29,874 lbs. (13,550 kg)
- Top Speed, Sea Level: 319 mph (515 kph) TAS
- Top Speed: 402-++++++``````````````````````````````````` mph (647 kph)TAS @ 27,600 feet (8,400 m)
- Stalling Speed, clean (25,500 lbs.): 116 mph (185 kph) IAS
- Stalling Speed, landing (25,500 lbs.): 100 mph (160 kph) IAS
- Combat Ceiling: 36,135 feet (11,000 m)
- Service Ceiling: 39,372 feet (12,000 m)
- Powerplant: Daimler-Benz DB 603E V-12, liquid-cooled with 1800 HP for takeoff.
- Armament: (2) Mk 103 30mm cannon in the belly pan and (2) MG 151 20mm cannon in the wing roots.


Canopy Latch
Auf
Zu
FuG 25a
Control Box
Intercom
Junction Box
Gunsight
Dimmer
Cockpit
Ventilation
Trim
CONTROLS
INDICATORS
Fuel Tank Select
Flying
Heater Suit
Throttles
Magnetos
Double
Hydraulic
Pressure
Cowl Flaps
Prop Pitch
(mouse wheel)
Throttle Lock
Parking Brake


Combined Artificial Horizon /
Turn and Bank
Pilot Tube
Check
Auto-Pilot
Airspeed
Climb
Linker Motor
Rechter Motor
Engine RPM
Altitude
ILS
Manifold
Pressure
Airscrew
Fuel / Oil
Pressure
Patin Repeater
Compass


Nose Gear Inclination
Clock
Oxy Flow and Level
Windshield Sprinkler
Armoured Windscreen
Oil-filled Magnetic Compass
Engine Temp
Coolant (left / right)
Oil (left / right)
Jettison Canopy Lever
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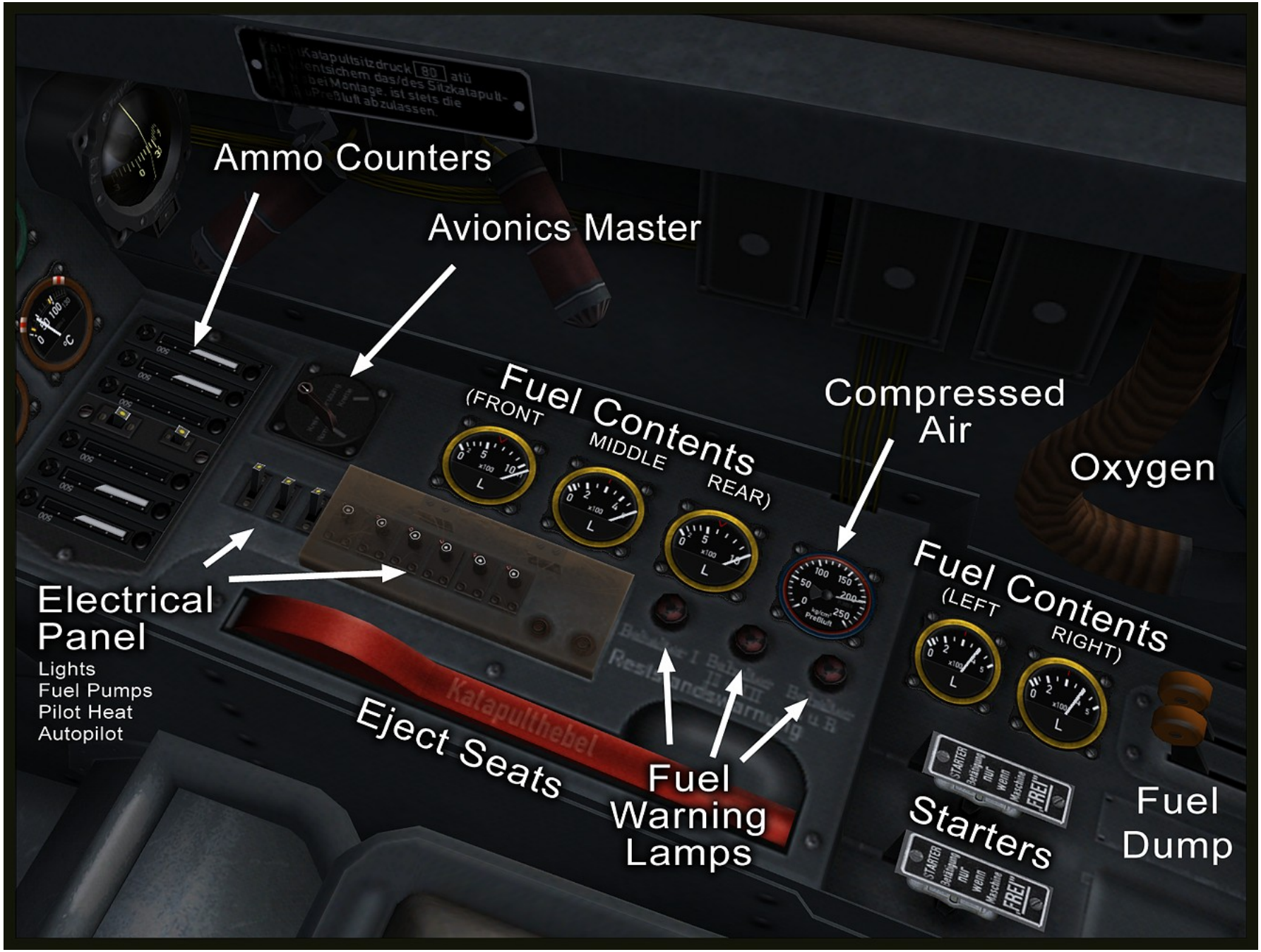
Ein
U/min x100
O_2-Wächter
Sauerstoff
°C


Ammo Counters
Avionics Master
Fuel Contents
(FRONT
MIDDLE
REAR)
Compressed
Air
Oxygen
Fuel Contents
(LEFT
RIGHT)
Electrical
Panel
Lights
Fuel Pumps
Pilot Heat
Autopilot
Eject Seats
Fuel
Warning
Lamps
Starters
Fuel
Dump

Weights, Loading, and Trim

The Aircraft Factory He 219 is set up with a high level of realism, which extends to aircraft loading and fuel supply. This aircraft features two auxiliary fuel tanks, one in each engine nacelle. When full, these move the aircraft's CG to the rearmost limit of 31.5%. Pitch trim should be set to 3 degrees nose-down when these tanks are full for takeoff. When these tanks are empty and only the fuselage tanks are full, the CG is at the normal 28.5%. Set all trim controls to zero (neutral) for takeoff for this configuration. It is normal for the red index mark on the pitch trim indicator to be several degrees forward of the the rudder and aileron trim indicators when all three are "zeroed". This is because for a normal takeoff, the trim is set nose-down when the index mark is at zero on the pitch trim indicator. As fuel is burned off and the CG moves forward, the pitch trim will come further back, until, for landing, it will be several degrees into the nose-up area. The offset "zero" position serves as a reminder to the pilot that the aircraft is nose-heavy. The neutral trim position (for a 25% CG condition) is at +2 degrees, when the red mark is lined up with the other trim indicators when they are at zero. With ammunition and fuel exhausted, the aircraft's center of gravity is about 24%, and with flaps and gear down on final approach, it may be necessary to use almost the full range of nose-up trim depending on the specific loading of the aircraft.

At high altitudes, stability will be very poor about the pitch axis, and autopilot performance will be unsatisfactory, if the fuel in the rear tanks has not been burned off to move the CG forward.

Cockpit Check - Controls (Maximum fuel load, all tanks full)

1. Parking Brake - Set
2. Fuel Selector - Set to Position II (center and rear fuselage tanks)
3. Elevator Trim - 3 degrees nose-down (see reference for weight and loading)
4. Flaps - Takeoff (START) position (30 degrees)
5. Propeller Control - High speed (12:15 position)
6. Flight Instruments - Checked and Set
7. Engine Instruments - Checked
8. Switches - Checked

Mixture Control

This aircraft is equipped with a fully automatic mixture control.

Engine Starting

1. Cockpit Check - COMPLETE
2. Set or hold your parking brakes.
3. Turn the battery and generator switches to ON.
4. Put fuel selector in the desired position.
5. Turn on electric fuel pump.
6. Turn the Engine 1 magneto switch on BOTH.
7. Set mixture control to RICH.
8. Confirm fuel pressure rise.
9. Engage starter switch until the engine starts.
10. Check engine instruments to confirm oil pressure rises within 30 seconds.
11. Idle at 1200 RPM until the oil temperature reaches 40 degrees C.
12. Check the suction gauge to see if it is working.
13. Check all instruments for proper function.
14. After warm-up, idle at 800-1000 RPM.
15. Repeat for Engine 2.

Pre-takeoff Check

1. See that the elevator trim tab is properly set - 0 for empty nacelle tanks, +2 degrees if full.
2. Check the magnetos at 2000 RPM. 100 RPM drop maximum.
3. Check the propeller control.
4. Turn the booster pumps ON.
5. Check flaps are at 30 degrees.
6. Check the cowl flap position (open for takeoff).

Normal Takeoff

After lining up with the runway, hold the brakes and run the engines up to 2000 RPM. Hold and confirm power is steady. Release the brakes and advance the throttles to full takeoff power. Rotate smoothly at about 200 kph to about eight degrees pitch. Retract the gear when a positive rate of climb is established and then retract the flaps. Set engines to climbing power of 1.35 ata and 2500 RPM and climb at 300 kph IAS. Normal takeoff power is 1.48 ata and 2700 RPM.

High-Performance Takeoff

Use the normal procedure, but rotate at 180 kph IAS to a ten-degree pitch up attitude. Hold this attitude until the wheels leave the ground, then immediately retract the gear and smoothly rotate to just under 15 degrees pitch. Hold until obstacles are cleared, then lower the nose to gain normal flying speed and retract the flaps.

After Takeoff

1. Raise the landing gear.
2. Raise the wing flaps.
3. Throttle back to normal climbing power.
4. Adjust the prop to climbing RPM.
5. Trim the aircraft as required for climbing.
6. Adjust cowl flaps as required.
7. Turn the booster pump to the normal position.
8. Check all instruments.
9. Switch to nacelle tanks (Position III) after reaching 5,000 feet.

Climb Control

A normal climb is made at 300 kph IAS with a manifold pressure of 1.35 *ata* and the propeller set to 2500 RPM. A climb to 6,000 meters (19,700 feet) can be accomplished in about 12 minutes and will cover about 35 nautical miles. Above 8,000 meters, allow the climbing speed to fall off gradually until you are climbing at 250 kph IAS at 11,000 meters.

Cruise Control Schedule

Calculate your fuel consumption and time to your destination using the following table. The best range is at the highest altitude with the lowest throttle setting.

Altitude	Pilot's IAS (km/hr)	Manifold Pressure	RPM (Prop pitch)	TAS (km/hr)	US GPH	Nautical miles per gallon
2100 m	465	1.25	2300 (9:40)	505	233	1.17
6000 m	420	1.25	2300 (9:40)	555	230	1.27
8000 m	385	1.25	2300 (9:40)	575	245	1.26
2100 m	400	1.05	2000 (6:00)	440	170	1.41
6000 m	365	1.05	2000 (6:00)	490	176	1.50
8000 m	330	1.05	2000 (6:00)	500	177	1.52

Engine Limitations and Characteristics

The Daimler-Benz DB 603E engine provides adequate performance to reasonably high altitudes. Engine-out performance is poor on this aircraft at higher weights, especially if an engine fails on takeoff.

ENGINE POWER CHART	TAKEOFF MAXIMUM	TAKEOFF NORMAL	WAR EMERGENCY	MILITARY POWER	MAXIMUM CONTINUOUS	NORMAL CRUISE	ECONOMY CRUISE
Boost (ata)	1.48	1.48	1.48	1.35	1.25	1.15	1.05
RPM	2700	2700	2700	2500	2300	2200	2000
Full throttle height*	8400 m	8400 m	8400 m	8960 m	9470 m	10050 m	10600 m

*Full throttle height is the height at which full throttle is required to produce the indicated power in the chart. The power will decline above that height.

Landing

1. Check tanks and select the fullest tank for landing.
2. Put the fuel booster on normal.
3. Set the prop to about 2500 RPM.
4. Check the traffic pattern and obtain clearance to land.
5. Slow down to 300 kph and lower the flaps to the first position. Retrim as needed.
6. Lower the landing gear, allowing time for full extension (about 10 seconds).
7. The normal speed in the traffic pattern with wheels down is 250 kph.
8. Lower the flaps to the second position after turning to your final approach. Allow sufficient time to reach the full extension, about 10 seconds.
9. Fly the final approach at about 215 kph, crossing the runway threshold at about 195 kph.
10. Land the aircraft main wheels first, and let the nose settle gently. Brake as required.

Flight Characteristics

The Heinkel He 219 is a very stable and predictable aircraft and can be trimmed "hands-off" for any flight regime. The rate of roll is modest at about 70 degrees per second at optimal cornering speed of 400 kph IAS. The plane was designed to be a rock-solid gun platform and its behavior reflects that mission. The maximum G for cornering is 6.0 at a normal combat weight.

Single-Engine Performance

In the event of engine failure, immediately cut the dead engine and feather the propeller (see the reference for details). Maintain directional control if at low speed and do not allow the airspeed to go below 250 kph IAS if at all possible. Find a place to land and go there.

Stalls

A stall in the He 219 is extremely gentle and very controllable. Recovery is completely normal.

Permissible Acrobatics

Acrobatics are verboten.

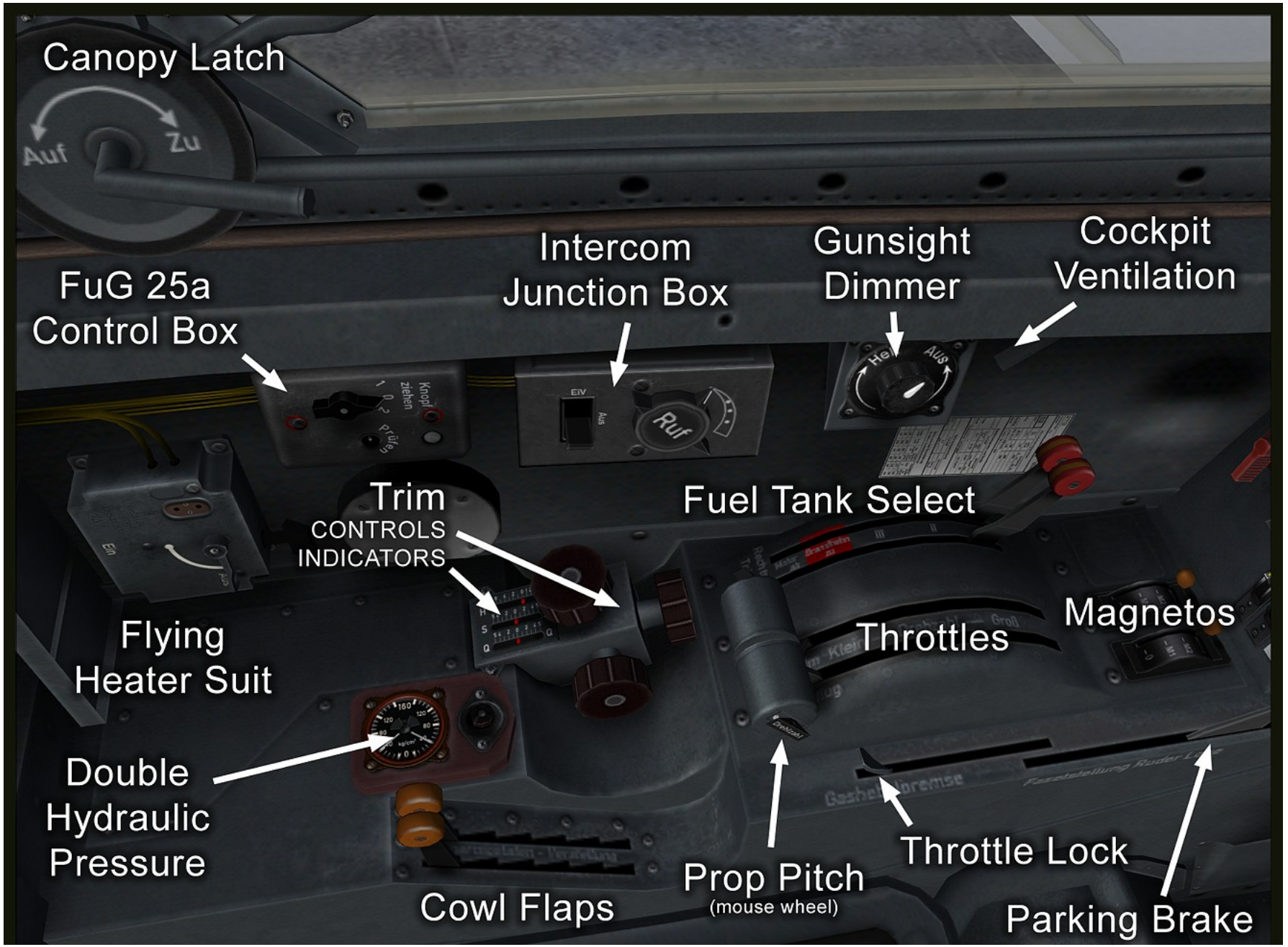
Aircraft Factory Heinkel He 219 A-7 Uhu

General Information - He 219 A-7

The He 219 A-7 depicted here was armed with eight cannon, including two in the dorsal, upward-firing "Schrage Musik" installation. It was equipped with the FuG 220 Lichtenstein search radar and a rear-warning FuG 220 radar set.

- Empty Weight: 24,692 lbs. (11,200 kg)
- Wingspan: 60.7 feet
- Wing Area: 479 square feet
- Normal Takeoff Weight: 30,419 lbs. (13,798 kg)
- Maximum Takeoff Weight: 33,730 lbs. (15,300 kg)
- Top Speed, Sea Level: 323 mph (520 kph) TAS
- Top Speed: 408 mph TAS (657 kph) @ 26,280 feet (8,000 m)
- Stalling Speed, clean (25,500 lbs.): 116 mph (185 kph) IAS
- Stalling Speed, landing (25,500 lbs.): 100 mph (160 kph) IAS
- Combat Ceiling: 32,810 feet (10,000 m)
- Service Ceiling: 36,135 feet (11,000 m)
- Powerplant: Daimler-Benz DB 603G V-12, liquid-cooled with 1900 HP for takeoff.
- Armament: (4) Mk 103 30mm cannon, two in the wing roots and two in the belly pan. (2) MG 151 20mm cannon in the belly pan, and (2) Mk 108 30mm cannon firing upward as Schrage Musik.


AIRCRAFT FACTORY
Heinkel He 219 A-7/R2
Powerplant:
Daimler-Benz DB 603G V-12, liquid-cooled with 1900 HP for takeoff
Top Speed:
408 mph TAS (657 kph) @ 26,280 feet (8,000 m)
The world's first aircraft fitted with ejection seats
Germany's first tricycle-style landing gear
Exceptional visibility
Pressurized cockpit
- Heaviest (Normal Takeoff Weight: 30,419 lbs. (13,798 kg)
- Most Powerful
- Fastest
- Slower Climb
The Most Advanced Piston Aircraft of the Second World War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Dimmer
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Fuel Tank Select
Flying
Heater Suit
Throttles
Magnetos
Double
Hydraulic
Pressure
Cowl Flaps
Prop Pitch
(mouse wheel)
Throttle Lock
Parking Brake


Emergency Gear Pump
Emergency Gear Lever
Undercarrage
and flaps Indicator
(nose, left main, right main)
Electric Master
Emergency Flaps Lever
Flaps
(Up, Takeoff, Landing)
Undercarrage
Prop Pitch
(Auto, Fixed, Feathered)


Combined Artificial Horizon /
Turn and Bank
Pilot Tube
Check
Auto-Pilot
Airspeed
Climb
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Rechter Motor
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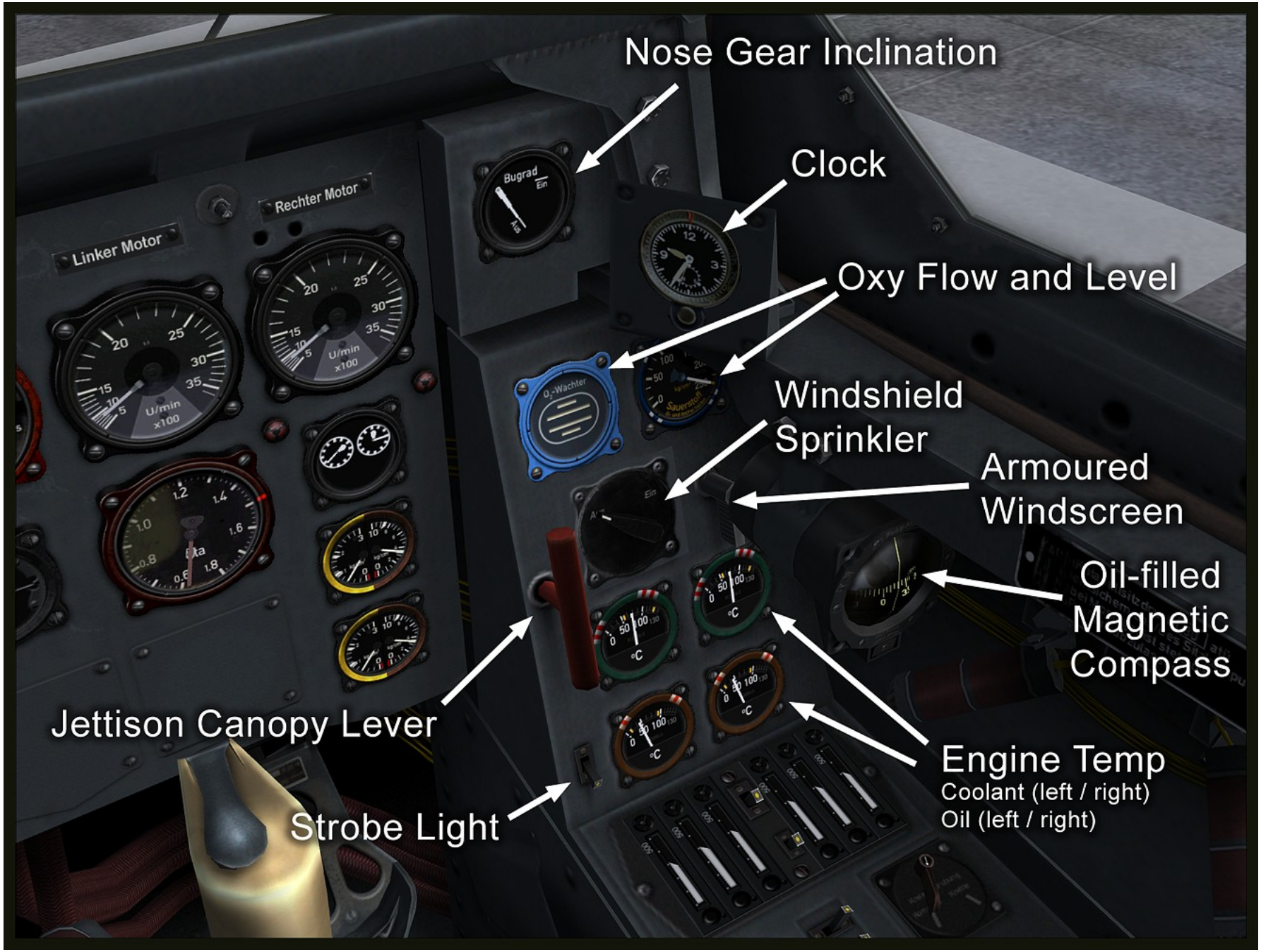
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Armoured Windscreen
Oil-filled Magnetic Compass
Jettison Canopy Lever
Strobe Light
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Oil (left / right)
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Rechter Motor
Bugrad
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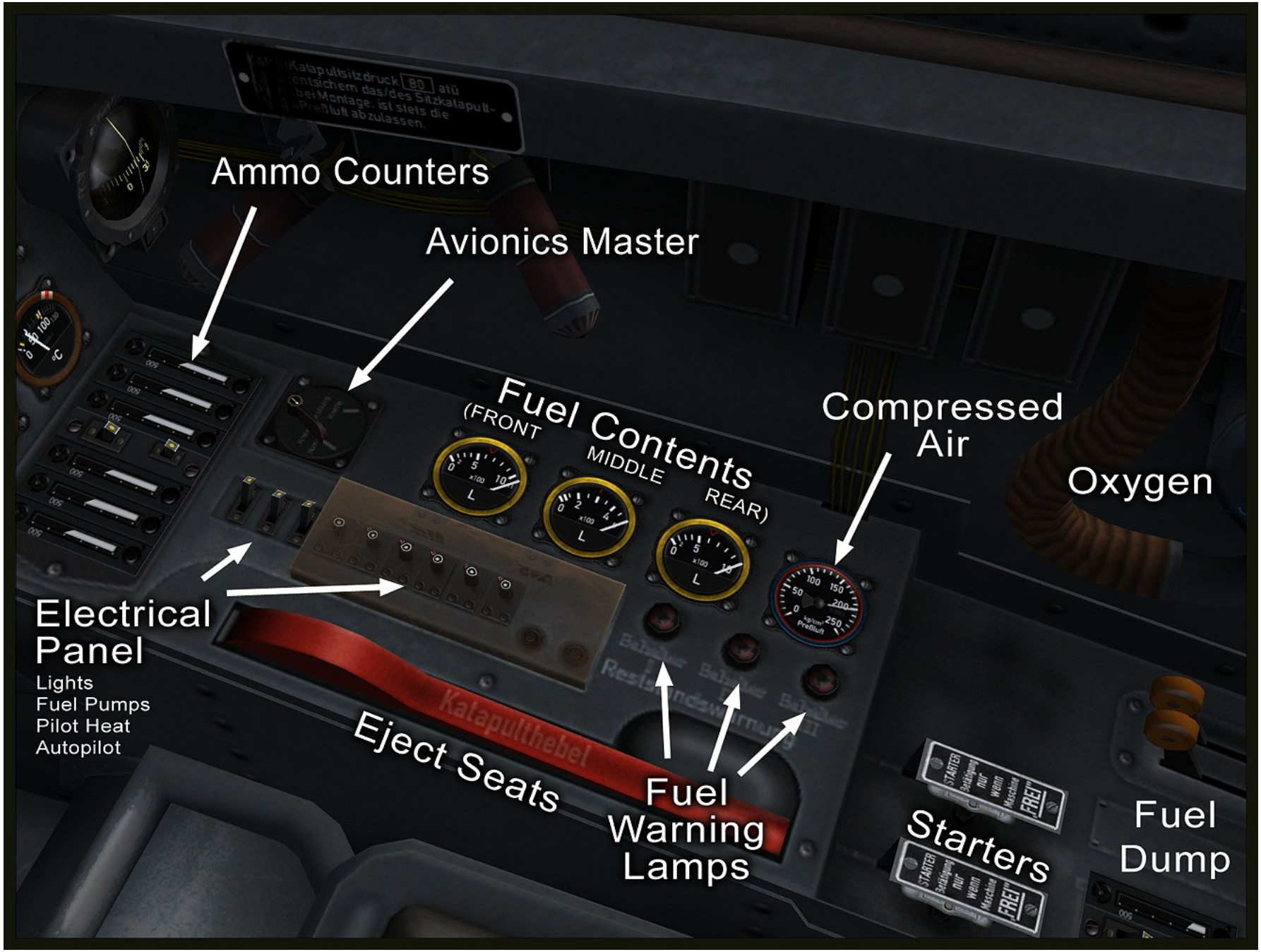
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Fuel Pumps
Pilot Heat
Autopilot
Eject Seats
Fuel
Warning
Lamps
Starters
Fuel
Dump

Weights, Loading, and Trim

The Aircraft Factory He 219 is set up with a high level of realism, which extends to aircraft loading and fuel supply. The normal takeoff CG is about 29%. Pitch trim should be set to about 1 degree nose-down for takeoff. It is normal for the red index mark on the pitch trim indicator to be several degrees forward of the the rudder and aileron trim indicators when all three are "zeroed". This is because for a normal takeoff, the trim is set nose-down when the index mark is at zero on the pitch trim indicator. As fuel is burned off and the CG moves forward, the pitch trim will come further back, until, for landing, it will be several degrees into the nose-up area. The offset "zero" position serves as a reminder to the pilot that the aircraft is nose-heavy. The neutral trim position (for a 25% CG condition) is at +2 degrees, when the red mark is lined up with the other trim indicators when they are at zero. With ammunition and fuel exhausted, the aircraft's center of gravity is about 24%, and with flaps and gear down on final approach, it may be necessary to use almost the full range of nose-up trim depending on the specific loading of the aircraft.

At high altitudes, stability will be very poor about the pitch axis, and autopilot performance will be unsatisfactory, if the fuel in the rear tank has not been burned off to move the CG forward. With 50% of the fuel gone from the rear fuselage tank and the other tanks full, the CG is at about 26.5% with normal payloads. Stability and handling will be excellent at high altitudes and the autopilot will function properly.

Cockpit Check - Controls (Maximum fuel load, all tanks full)

1. Parking Brake - Set
2. Fuel Selector - Set to Position II (center and rear fuselage tanks)
3. Elevator Trim - 1 degree nose-down (see reference for weight and loading)
4. Flaps - Takeoff (START) position (30 degrees)
5. Propeller Control - High speed (12:15 position)
6. Flight Instruments - Checked and Set
7. Engine Instruments - Checked
8. Switches - Checked

Mixture Control

This aircraft is equipped with a fully automatic mixture control.

Engine Starting

1. Cockpit Check - COMPLETE
2. Set or hold your parking brakes.
3. Turn the battery and generator switches to ON.
4. Put fuel selector in the desired position.
5. Turn on electric fuel pump.
6. Turn the Engine 1 magneto switch on BOTH.
7. Set mixture control to RICH.
8. Confirm fuel pressure rise.
9. Engage starter switch until the engine starts.
10. Check engine instruments to confirm oil pressure rises within 30 seconds.
11. Idle at 1200 RPM until the oil temperature reaches 40 degrees C.
12. Check the suction gauge to see if it is working.
13. Check all instruments for proper function.
14. After warm-up, idle at 800-1000 RPM.
15. Repeat for Engine 2.

Pre-takeoff Check

1. See that the elevator trim tab is properly set - 0 for empty nacelle tanks, +2 degrees if full.
2. Check the magnetos at 2000 RPM. 100 RPM drop maximum.
3. Check the propeller control.
4. Turn the booster pumps ON.
5. Check flaps are at 30 degrees.
6. Check the cowl flap position (open for takeoff).

Normal Takeoff

After lining up with the runway, hold the brakes and run the engines up to 2000 RPM. Hold and confirm power is steady. Release the brakes and advance the throttles to full takeoff power. Rotate smoothly at about 200 kph to about eight degrees pitch. Retract the gear when a positive rate of climb is established and then retract the flaps. Set engines to climbing power of 1.35 ata and 2500 RPM and climb at 300 kph IAS. Normal takeoff power is 1.50 ata and 2700 RPM.

High-Performance Takeoff

Use the normal procedure, but rotate at 180 kph IAS to a ten-degree pitch up attitude. Hold this attitude until the wheels leave the ground, then immediately retract the gear and smoothly rotate to just under 15 degrees pitch. Hold until obstacles are cleared, then lower the nose to gain normal flying speed and retract the flaps.

After Takeoff

1. Raise the landing gear.
2. Raise the wing flaps.
3. Throttle back to normal climbing power.
4. Adjust the prop to climbing RPM.
5. Trim the aircraft as required for climbing.
6. Adjust cowl flaps as required.
7. Turn the booster pump to the normal position.
8. Check all instruments.

Climb Control

A normal climb is made at 300 kph IAS with a manifold pressure of 1.35 *ata* and the propeller set to 2500 RPM. A climb to 6,000 meters (19,700 feet) can be accomplished in about 14 minutes and will cover about 43 nautical miles. Above 8,000 meters, allow the climbing speed to fall off gradually until you are climbing at 250 kph IAS at 11,000 meters.

Cruise Control Schedule

Calculate your fuel consumption and time to your destination using the following table. The best range is at the highest altitude with the lowest throttle setting.

Altitude	Pilot's IAS (km/hr)	Manifold Pressure	RPM (Prop pitch)	TAS (km/hr)	US GPH	Nautical miles per gallon
2100 m	475	1.25	2300 (9:40)	515	245	1.13
6000 m	430	1.25	2300 (9:40)	565	255	1.20
8000 m	400	1.25	2300 (9:40)	596	261	1.23
2100 m	410	1.05	2000 (6:00)	450	179	1.35
6000 m	370	1.05	2000 (6:00)	495	186	1.43
8000 m	335	1.05	2000 (6:00)	505	188	1.45

Engine Limitations and Characteristics

The Daimler-Benz DB 603G engine provides adequate performance to reasonably high altitudes. Engine-out performance is poor on this aircraft at higher weights, especially if an engine fails on takeoff.

ENGINE POWER CHART	TAKEOFF MAXIMUM	TAKEOFF NORMAL	WAR EMERGENCY	MILITARY POWER	MAXIMUM CONTINUOUS	NORMAL CRUISE	ECONOMY CRUISE
Boost (ata)	1.50	1.50	1.50	1.35	1.25	1.15	1.05
RPM	2700	2700	2700	2500	2300	2200	2000
Full throttle height*	8000 m	8000 m	8000 m	8140 m	8660 m	9210 m	9815 m

*Full throttle height is the height at which full throttle is required to produce the indicated power in the chart. The power will decline above that height.

Landing

1. Check tanks and select the fullest tank for landing.
2. Put the fuel booster on normal.
3. Set the prop to about 2500 RPM.
4. Check the traffic pattern and obtain clearance to land.
5. Slow down to 300 kph and lower the flaps to the first position. Retrim as needed.
6. Lower the landing gear, allowing time for full extension (about 10 seconds).
7. The normal speed in the traffic pattern with wheels down is 250 kph.
8. Lower the flaps to the second position after turning to your final approach. Allow sufficient time to reach the full extension, about 10 seconds.
9. Fly the final approach at about 215 kph, crossing the runway threshold at about 195 kph.
10. Land the aircraft main wheels first, and let the nose settle gently. Brake as required.

Flight Characteristics

The Heinkel He 219 is a very stable and predictable aircraft and can be trimmed "hands-off" for any flight regime. The rate of roll is modest at about 70 degrees per second at optimal cornering speed of 400 kph IAS. The plane was designed to be a rock-solid gun platform and its behavior reflects that mission. The maximum G for cornering is 6.0 at a normal combat weight.

Single-Engine Performance

In the event of engine failure, immediately cut the dead engine and feather the propeller (see the reference for details). Maintain directional control if at low speed and do not allow the airspeed to go below 250 kph IAS if at all possible. Find a place to land and go there.

Stalls

A stall in the He 219 is extremely gentle and very controllable. Recovery is completely normal.

Permissible Acrobatics

Acrobatics are verboten.

REFERENCES

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- **Russ Lee** of the Smithsonian Air & Space Museum
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- **Col. Ernie Bankey**, U.S. Army Air Force P-51D/P-38 pilot/Ace-in-a-Day
- **Harry Goldman**, U.S. Army Air Force B-26 pilot/First Pathfinder Division
- **Gene Koscinski**, U.S. Army Air Force B-24 Bombardier
- **Bud Lindahl**, U.S. Army Air Force B-24 Navigator/Bombardier
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- **Gordon Rapp** Certified instructor / T-6 owner
- **Roy Test**, U.S. Army Air Force B-17G co-pilot (32 missions)
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- **Michael Karatsonyi**, Luftwaffe Me 109 G pilot
- **Mike Dornheim**, Aeronautical Engineer and aviation journalist

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Manual
SimDynamics Research

Quality Control
The team

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Thank you for being our customer