A-4 Skyhawk

for Microsoft Flight Simulator

User Manual

Introduction

The Douglas A-4 Skyhawk was designed to replace the piston-engined AD Skyraider in the close air support and interdiction role. It was capable of carrying both conventional and nuclear weapons.The prototype flew on 22 June, 1954.The first production model, the A-4A (165 built), entered service in 1956. The A-4B (542 built) entered service in 1957. The A-4C (638 built), entered service in 1960, and introduced a new radar unit which provided limited night and bad weather capability. The A-4E (498 built), was equipped with a more powerful engine and other improvements and entered service in late 1962. The A-4F was a modified version of the "E" model and included an upgraded engine, nose wheel steering, wing spoilers, a zero-zero ejection seat, and an upper avionics pod which gave the aircraft its characteristic "humpback" shape. The A-4G entered service with the Royal Australian Navy in 1967. It was armed with Sidewinder missiles and flew from the carrier Melbourne.

Support

Should you experience difficulties or require extra information about the Virtavia Skyhawk, please e-mail our technical support on
tech.support@virtavia.com

Copyright Information

Please help us provide you with more top quality flight simulator models like this one by NOT using pirate copies.

A-4E Package Contents

When selecting your aircraft in MSFS, you will see there are **four** categories of the Virtavia A-4E Skyhawk :
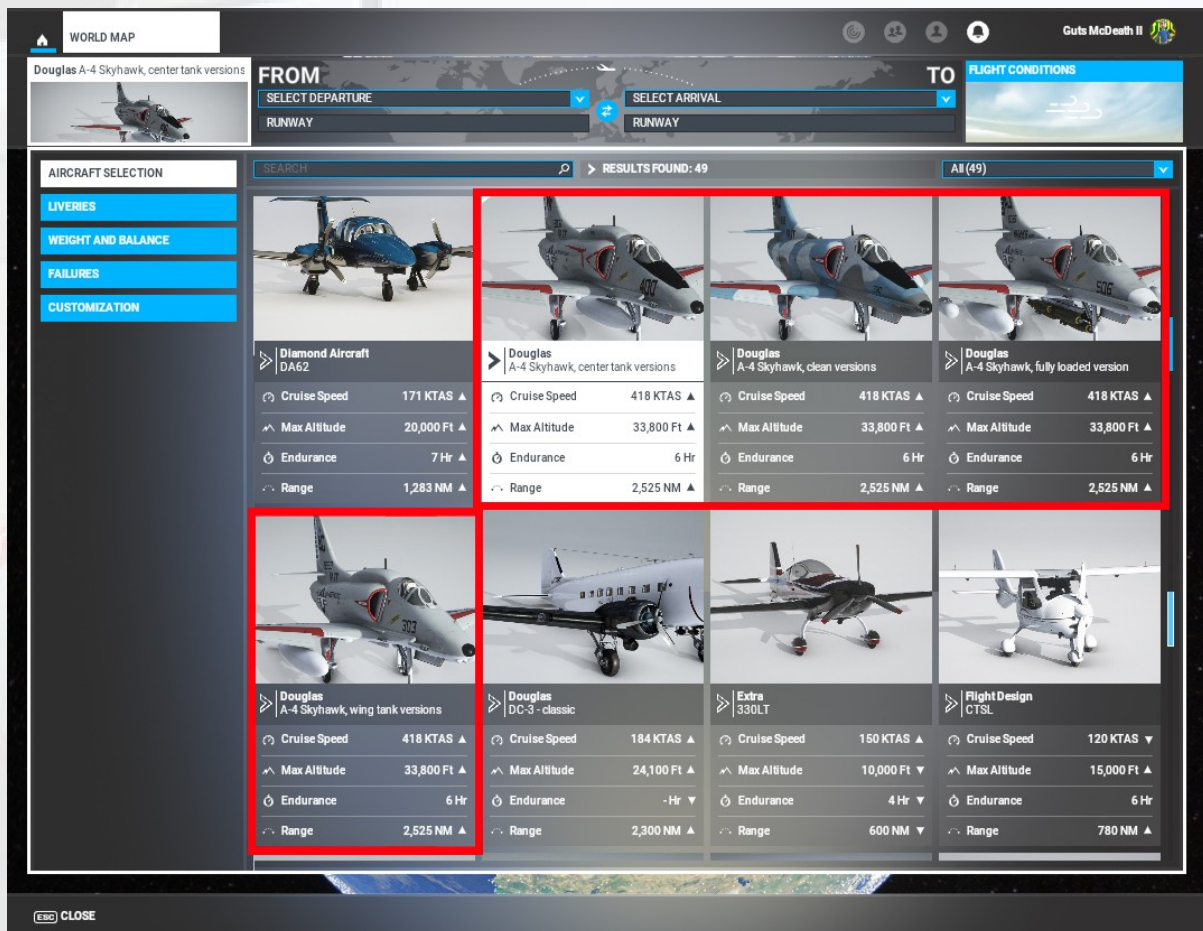
Each category holds various livery/loadout variants for the Skyhawks in that category.

The main reason for these separate categories is the different fuel tank loacations, this will affect the flight dynamics somewhat, especially when the tanks are full. The 'Clean' category is the lightest as it only uses internal fuel and so is the best for more 'high spirited' flying. This category system also keeps your selection menu from being overloaded by Skyhawks.

A description of the four categories :

Clean Versions : 2 Skyhawks, no underwing stores or pylons.

Center Tank Versions : 4 Skyhawks with the external centerline fuel tank fitted. Various liveries, weapon loadouts and pylon setups are available.

Fully Loaded : This is a single Skyhawk with a heavy loadout of bombs, rockets and the wing-mounted external tanks. This variant is unique in that it has all the weapons weights pre-entered into the MSFS Weights menu. The other categories of Skyhawk in this package will need to have their various payload weights entered manually, due to the payload variations across the multiple variants in that category. More information on weights and payloads can be found later in this manual.

Wing Tank Versions : 2 Skyhawks with the external wing tanks fitted.

So select a category first, then click on 'Liveries' and select a Skyhawk variant to fly. For example, the image below shows the four variants in the 'Center Tank Versions' category :
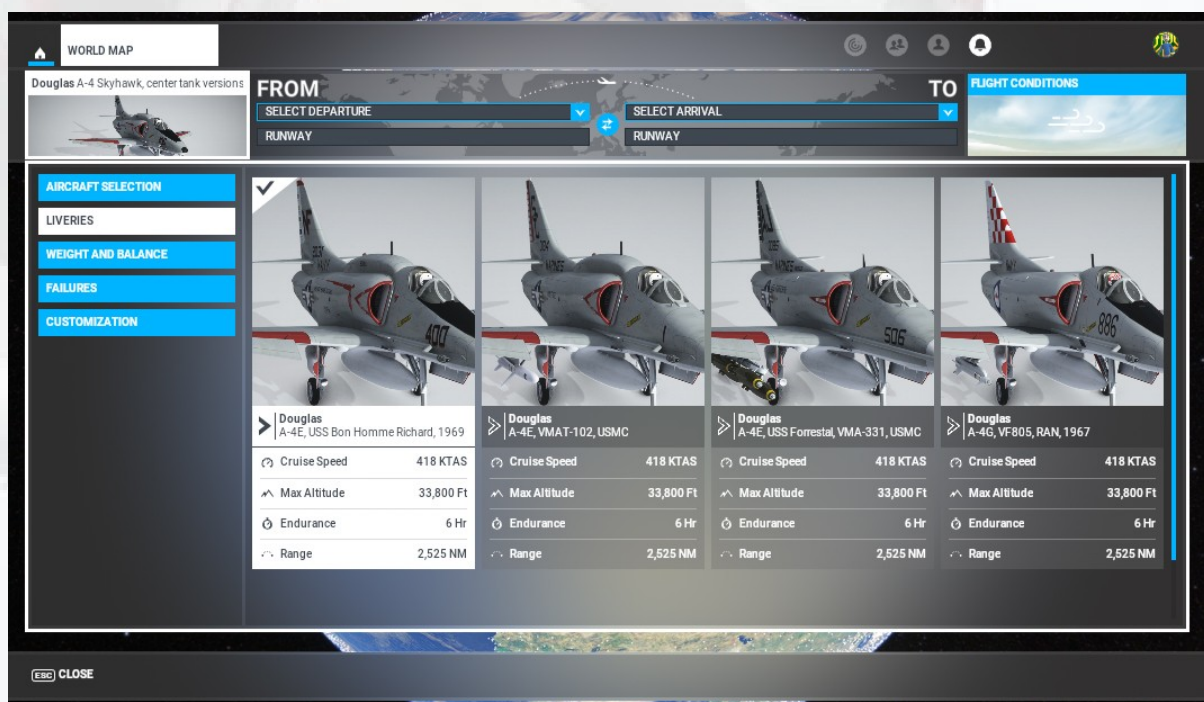
The 'Weight and Balance' section is examined further down in this manual. Next up is a 'Quick Start' section for those who just want to fly right away.

Quick Start

Once you have chosen a runway start point and clicked on 'Ready to Fly', your selected Skyhawk will load in to the simulation, on the runway with flaps already set to 15 degrees.

1) Set the Pitch Trim to 15-25 percent nose-up. You can use your controller's buttons or the keyboard for this, or even move the pitch trim lever manually (the small lever just behind the throttle lever). You can use the in-game HUD display or the trim gauge at the front of the right-side console to see the amount of trim which is set.

2) Release the Parking Brake. There is no switch or lever for this in the A-4, so a key press or a controller button can be used to toggle the brake.

3) Apply Full Throttle

4) Raise Gear and Flaps. This is best done with controller buttons or keyboard presses, however the Landing Gear Lever and Flaps Switch on the left-side console can also be used.

5) Reduce Pitch Trim as required to maintain climb or level flight.

Exterior Model

Leading Edge Slats

These are not powered and are held in place when in flight by wind pressure only. No input from the pilot is possible or required.

Wing spoilers

Armed by a switch in the cockpit, these will deploy on touchdown and retract as soon as throttle is re-applied. A red warning light next to the switch will illuminate on in the panel when the spoilers are armed. They will not work in flight and do not provide any retardation, their purpose is to 'spoil' the lift after landing, a safety measure for carrier landings where it is essential the aircraft stays down after touchdown on the deck. The

wing spoilers are only available on the later 'E' variants (the ones with the dorsal 'hump', plus the 'Adversary' variant).

Access ladder

Not an animation as such, the ladder can be toggled on/off using a switch in the cockpit. See the cockpit section of this manual for details.

Pilot

Like the ladder above, the pilot figure can also be toggled on/off using a switch in the cockpit.

Speedbrakes

The speedbrakes are on the rear of the fuselage and can be extended using a key press or joystick button. They are not enabled by default in MSFS, so a key will need to be assigned, the usual is the '/' key.

Tail Hook

The tail hook is deployed using the tail hook lever in the cockpit, or pressing ctrl-h on the keyboard.

Exterior Lighting

Pressing the L key will turn on all lights, you may however wish to turn them on using the appropriate switches in the cockpit, as the L key puts the on the navigation lights, taxi light and both red and white flood lighting in the cockpit, which should ideally be switched separately.

Taxi Light

There are no landing lights fitted to the A-4, which was typical of US Navy carrier-borne aircraft of the period. There is a taxi light fitted to the starboard mainear door.

Beacon Lights

The A-4 has both dorsal and underwing-mounted beacon lights.

Interior Lighting

There are two ways to experience the darkened cockpit -

1) set nighttime before flying, or

2) set nighttime during a flight using the in-game menu time slider.

In the case of (1), the cockpit will be totally dark until the 'L' key is pressed, this will turn on the MSFS 'headlamp'. Use this light to look at the RIGHT SIDE console, right at the rear. Here you will see the lighting controls :
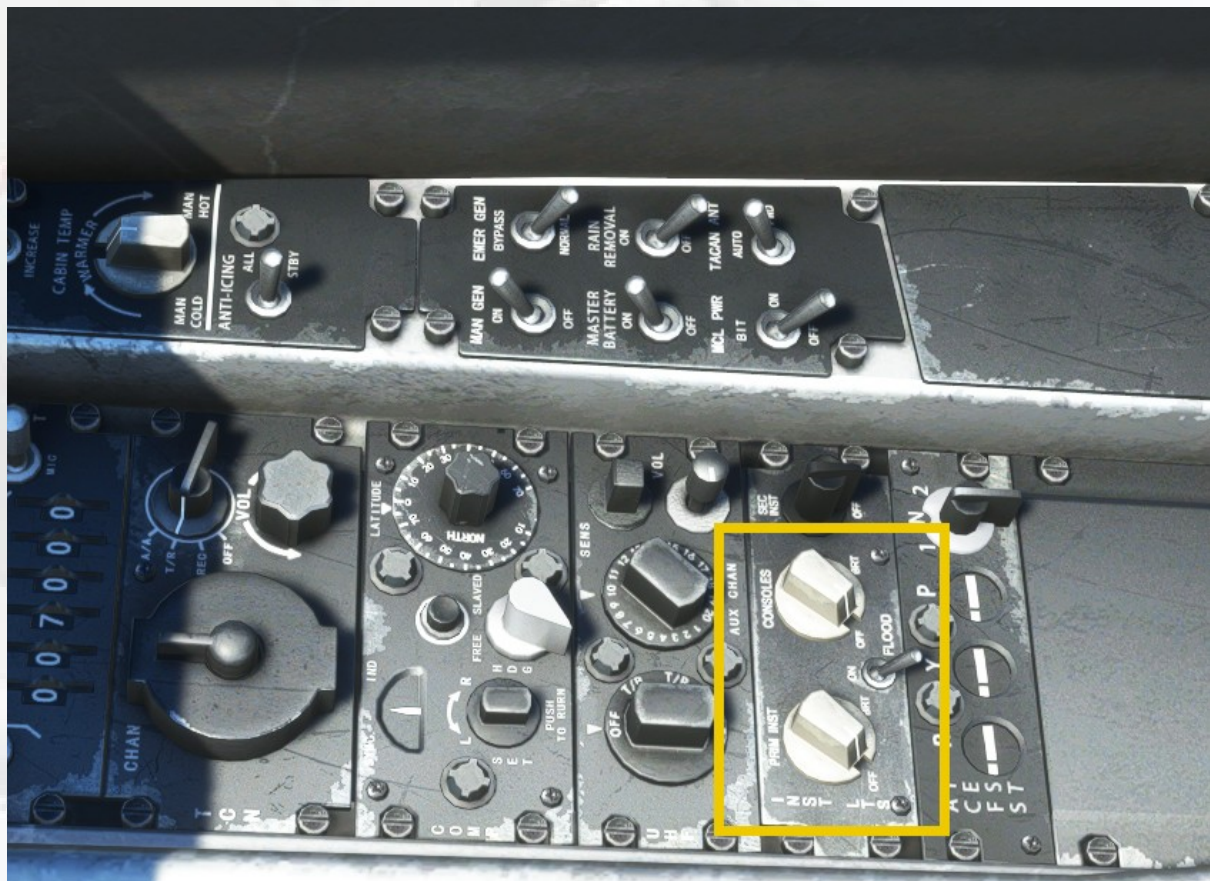
There are two potentiometers (rotary knobs), one controls the brightness of the main panel text and gauges, the other controls the brightness of the left and right console text and gauges. The center toggle switch is for the 'white flood' light, a general bright light for cockpit entry/egress, it is not normally used in flight.

With the headlamp lighting up the lights switch panel, press the 'L' key twice. This will turn off the headlamp and then turn on the white flood light. Now the interior can be clearly seen. You can now set the potentiometers, drag with the mouse or use the mouse whelel, a percent value will be displayed. A 50% setting is a good starting point. The main panel is typically set a little less bright than the sides. The red lighting of the panels and gauges will also provide a light ambient light to illuminate the switches and knobs. Turn of the white flood light.

In case (2), where you have used the slider to set the time of day to night, the panel and side console lights (ie. the potentiometers) will already be set by default and no further action should be necessary. If for some reason the lights are off, put the white flood on and then set the pots as required, turn off the white flood.

Virtual Cockpit Functions

Main Panel
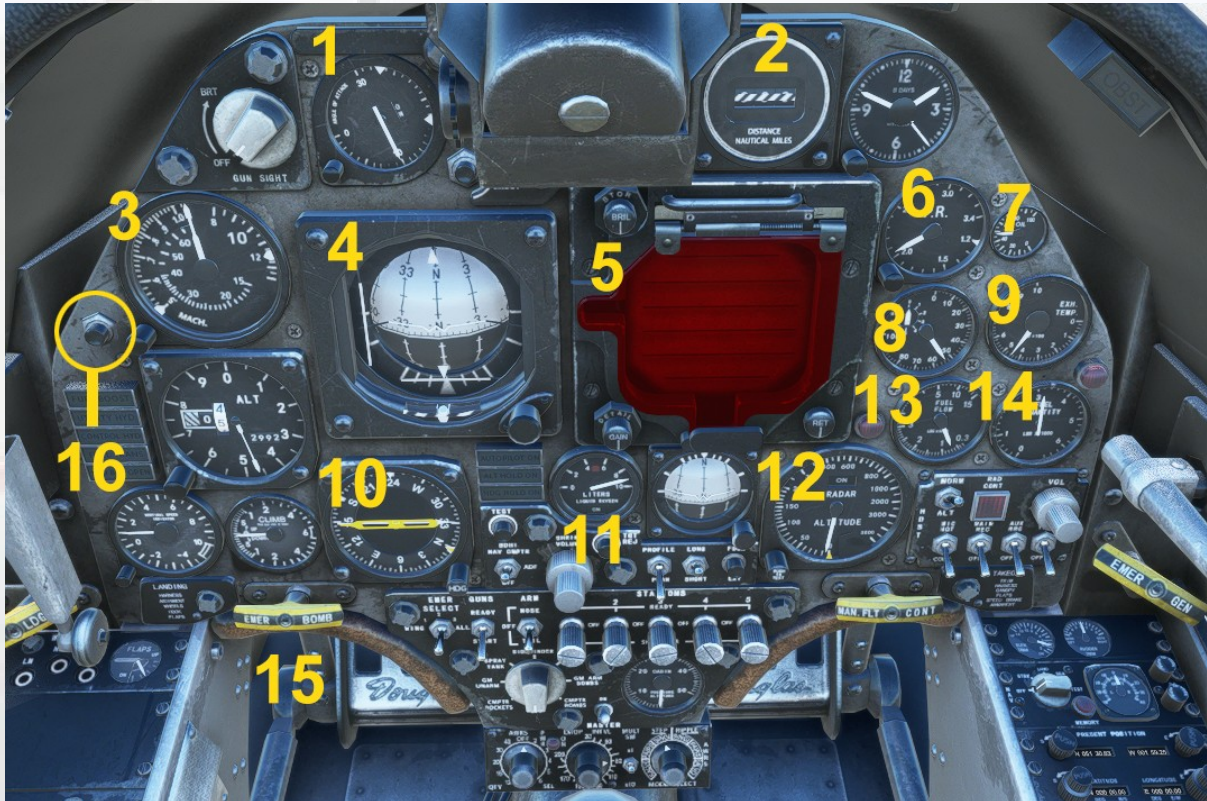
1) **Angle of Attack Indicator**. Shows the AoA in 'units', not actual degrees. The correct approach AoA of 30 units is indicated with a white bug at the 3 o'clock position.

2) **DME Indicator**. Displays the distance in nautical miles to the currently tuned NAV station or ILS beacon. The bar obscures the display when there is no station tuned or the tuned one is obscured or out of range.

3) **Airspeed Indicator**. Shows IAS in knots, with a separate Mach number indicator segment on the left side. The knob at the bottom left is used to adjust the small marker bug, which is set by default to 120 kts, the lower limit speed with gear and flaps extended.

4) **Artificial Horizon**. The A-4's AH is typical of the era in that it also provides navigational control by using steering prompts in the form of moving bars for NAV station direction (localiser), glideslope indication and turn & slip indicators. The horizon ball has degree gradations around the vertical axis, this is because the real A-4 horizon ball could also rotate to indicate heading, like a compass. It was not possible to replicate this in the model, but the markings are retained for authenticity.
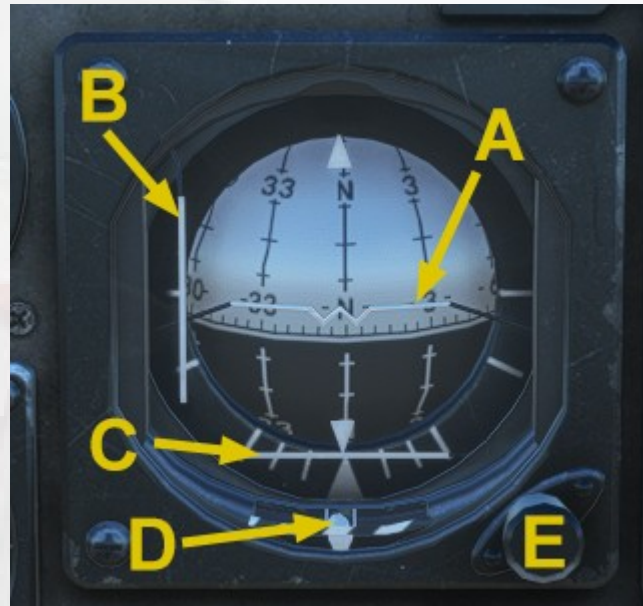
A) Aircraft Indicator. Represents the aircraft pitch and roll angle with respect to the horizon ball.

B) Localiser Bar. Used to indicate direction relative to the aircraft of the tuned NAV or ILS. When no NAV or ILS is tuned, the bar will sit at the left of the instrument.

C) Glideslope Bar. Used to indicate glideslope angle. When no NAV or ILS is tuned, the bar will sit at the bottom of the instrument.

D) Slip Ball and Turn Pointer. Standard turn & slip indicator.

E) Aircraft Indicator Adjuster. Used to raise or lower the bar to compensate for high angles of attack.

5) **APG-53A Radar.**

The radar used in the A-4E was used for locating ground targets only, there was no air-to-air capability, nor was there any target lock facility, it merely provided a means of all-weather scanning of the ground ahead.

The MSFS version of the Virtavia A-4 only has the Terrain Collision (TC) mode of the radar which is functional. The other modes present in the FSX/P3D version of the model could not be implemented in MSFS.

Radar Modes Selector Knob

The Radar Modes Selector knob can be seen on the left side console. The default is OFF. The knob is advanced with a left mouse click and returned with a right mouse click.

STBY MODE – turns radar on, but not transmitting, so there is no return on the screen :

SRCH MODE – non-functional

TC MODE – Terrain Clearance. As it suggests, this radar mode is used to show height above ground , although it does so in a graphical manner. The fuzzy curve on the right side represents the ground, the sharp curve on the left represents an imaginary line 1,000 feet below the aircraft. The right curve will advance to the left the closer the aircraft is to the ground – if they meet then the aircraft is within 1,000 feet of the terrain and should climb. The small vertical tick marks on the long horizontal line represent distances of 2 miles or 4 miles from the aircraft (shown by the green aircraft graphic on the left of the unit.

The red-tinted glare shield can be opened by click on the small latch at the bottom of the unit. The three knobs can be manipulated, although they have no function in the simulation.

6) **Engine Pressure Ratio Indicator**. The knob on the gauge is a simple adjuster for the indicator bug on the gauge and serves no purpose in the simulation.

7) **Oil Pressure Gauge**. Shows engine oil pressure in lbs/in^2.

8) **RPM Gauge**. Percent RPM of N1.

9) **Exhaust Gas Temperature Gauge**. Degrees C.

10) **Radio Magnetic Indicator**. The RMI main disc is a simple compass which indicates the present heading in degrees. The larger yellow pointer indicated NAV1 direction, the smaller white pointer indicates ADF direction. The small white triangle at the top of the display in the 12 o'clock position is fixed to show the heading on the RMI disc. The knob bottom right sets the autopilot heading (HDG). The set heading is shown both by the knob's own tooltip and the yellow triangular pointer at the gauge perimeter, which rotates as the knob is turned, using left click drag or mousewheel input.

11) **Lower Main Panel**. See separate section below.

10) **Low Fuel Warning Lamp**.

12) **Radar Altimeter**. The gauge has a SET knob which is used to move the small triangular bug around the perimeter of the gauge. The position of the bug indicates the set low altitude warning threshold, when the red warning lamp on the gauge will illuminate. If the aircraft exceeds 5,000 ft AGL, the device loses radio contact with the terrain causing the gauge pointer to move behind a small shield part at the bottom of the gauge.

13) **Fuel Flow Gauge**. Fuel delivery to the engine in lbs per hour.

14) **Fuel Quantity Gauge**. Shows internal fuel. Press and hold the button marked 'Fus/Ext' at the far right of the central sub-panel and this will cause the fuel quantity of any external tanks to be shown. The gauge can also be tested by pressing and holding the button, top left on the sub-panel. The pointer will fall to zero to indicate a fully working gauge. A red warning light will come on when total quantity of the internal tanks is less than 170 Gals.

15) **Control Column Hide**. The T-handle marked 'Emer Bomb' will toggle the visibility of the control column upper part to enable better access to the lower panel.

16) **Pop-Up Radios**. The unmarked button will toggle a set of modern-type navigation radios. These are added for convenience and are not authentic.

Lower Main Panel

1) **Warning Lights Test**. When this is pressed all warning lights will illuminate. The Oxygen Quantity and Fuel Quantity gauges' needles will also be tested by them moving to zero and back again when released.

2) **Autopilot Annunciators**. These lamps indicate if a particular autopilot function is on (Master, ALT, HDG). The autopilot panel is covered in more detail in the Left Side Console section below.

3) **Oxygen Quanity Gauge**. The gauge has a red warning lamp when O_2 quantity gets too low. The lamp can be tested by pressing and holding the button, top left on the sub-panel. The lamp will illuminate and the pointer will fall to zero to indicate a fully working gauge.

4) **Standby Artificial Horizon**. As with the main AH, the knob at the bottom right of the gauge can be used to adjust the airfraft indicator bar at the centre of the horizon ball to compensate for high AoA states.

5) **Pilot Visibility Switch**. The switch marked 'Profile/Plan' has been repurposed to toggle the visibility of the pilot figure on and off.

6) **Ladder Visibility Switch**. The switch marked 'Long/Short' has been repurposed to toggle the visibility of the pilot's access ladder on and off.

7) **External Tanks Quantity Button**. The switch marked 'Fuel/Ext' is used to override the fuel tank quantity needle so that it shows the fuel level in the centerline or wing tanks rather than the internal tanks level.

8) **Cabin Pressure Altitude Gauge**. This displays the pressure inside the cockpit, expressed as thousands of feet altitude.

9) **Weapons Visibility Switch**. The Master Arm switch has been repurposed to toggle the visibility of any externally mounted weapons on and off. This is useful to simulate target egress state, especially if the weights of the weapons were initially set and have now been set to zero for the return leg of a mission. Refer to the Weights & Payloads section of this manual for information on this topic.

Upper Panel and Canopy
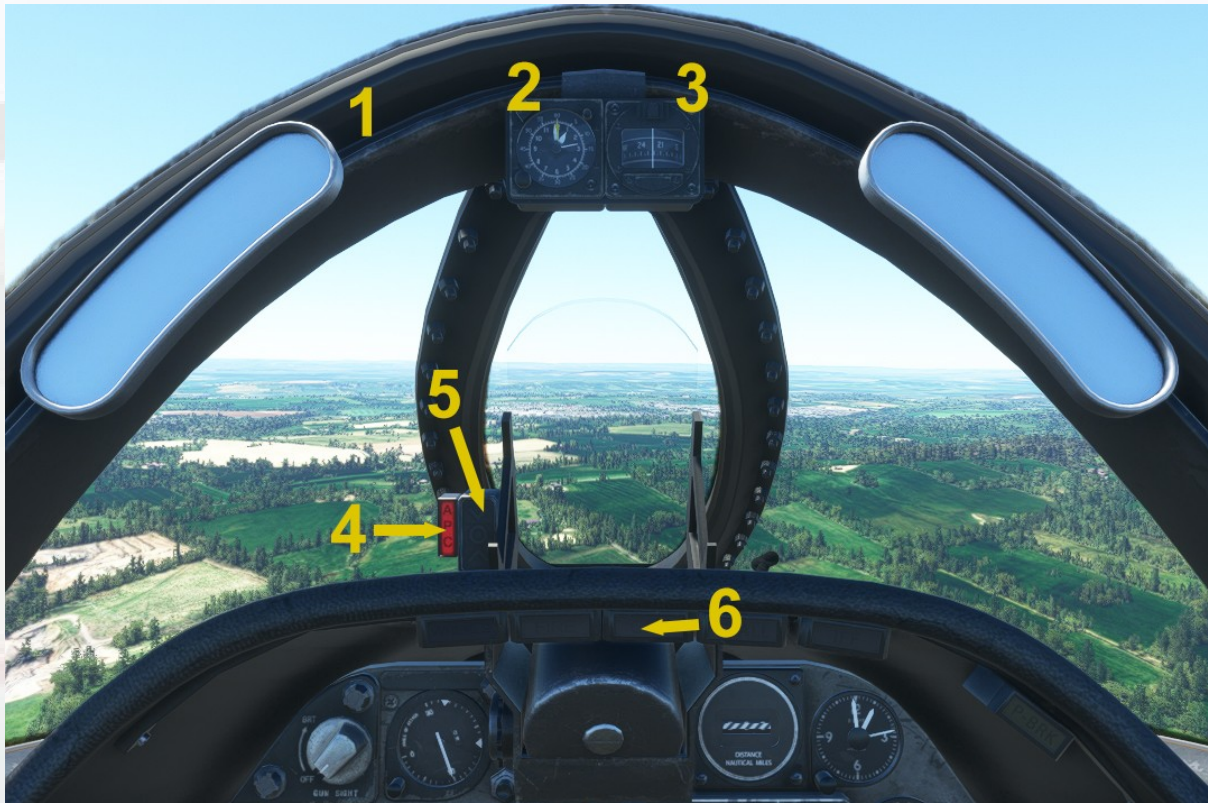
NOTE: The glass part in the center is not a HUD. This was a simple reflector gunsight and is presently not functional in MSFS.

1) **Mirrors**. MSFS does not support truly reflective mirror surfaces, these would likely have a high impact on FPS for most users if they were implemented. The mirrors in this model are set mildly reflective, enough to reflect sky or land. Any higher refectivity and the dazzle from the sun when at the rear of the aircraft becomes overpowering.

2) **Mission Clock**. The knob bottom left on the gauge sets the position of the yellow needle, likely a timer in the real A-4. It has no function in the simulation.

3) **Whiskey Compass**. A simple backup compass.

4) **APC Warning**. The A-4s of this era were supposed to be flown with autopilot Speed Hold ON when on approach as a safeguard against stall caused by inattention to speed due to the high workload of carrier pilots. In this simulation the APC lamp indicates speed hold (SPD) is ON. Please refer to the autopilot section of this manual for more information.

5) Angle of Attack (AoA) Indexer.

The AOA indexer is comprised of three lights. The light indications are a green chevron (v) showing 'too high AOA' at the top, a yellow doughnut (O) showing proper AOA in the centre, and a red chevron (^) showing 'too low AOA' at the bottom.

A **GREEN** **chevron** indicates that the nose must be lowered and the throttle manipulated to suit.

An **AMBER** **doughnut** indicates that AOA is optimum for the approach.

A **RED** **chevron** indicates that the nose must be raised and the throttle manipulated to suit.

At intermediate stages the AOA indexer may also display two symbols at a time. For example, a doughnut and a green chevron would indicate that the aircraft is nearing optimum AOA, providing the nose is lowered further. A doughnut and a red chevron would indicate the opposite.

6) **Warning Lights**. A series of high impact warning annunciators. The red lamps indicate Wheels Up (comes on as soon as flaps are deployed), Engine Fire Warning, Electrical Generator Off Warning, Stall Warning, IFF Off Warning (not functional) and to the right, a repurposed lamp which indicates the status of the Parking Brake (there is no parking brake switch, please assign a keyboard or controller button for this purpose). These lights can be tested by pressing the warning lights test button, detailed in the previous section of this manual.

Left Console
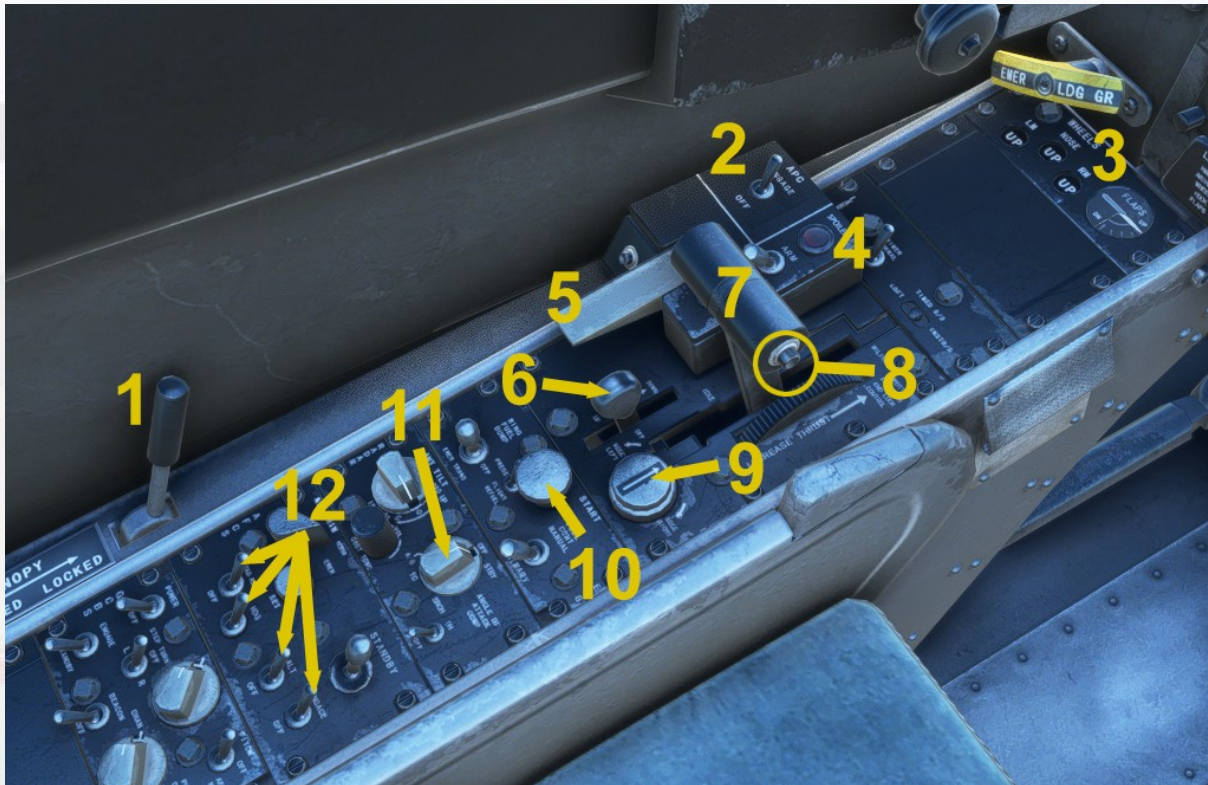
1) **CanopyLever**. A simple toggle to open/close the canopy. Only operable when on the ground.

2) **Automatic Power Compensator (Speed Hold)**. Toggles Speed Hold (SPD) on/off. NOTE – the Speed Hold function will 'grab' the current speed, there is no ability to set a speed in advance.

3) **Landing Gear Indicators and Flaps Gauge**. A white ring is displayed when the gear is up and locked. The red banded symbol appears when the gear is in transition, or has stuck in an unsafe position.

4) **Spoilers Arming Switch**. When activated, the red lamp above will stay illuminated. The WING spoilers will deploy automatically upon touchdown. Note: the wing spoilers are not speedbrakes. They are only fitted to the later A-4E's in this package, ie. the ones with the dorsal avionics hump and also the Top Gun 'Adversary' aircraft. The spoilers

are cancelled as soon as throttle is applied. The Spoilers Armed lamp will remain lit until the switch is returned to the OFF position.

5) **Flaps Switch**. Drag on this switch with the mouse to deploy or retract the wing flaps.

6) **Elevator Trim Lever**. This lever can be used to adjust the pitch of the aircraft, although it is adviable to use a pair of buttons on your controller for this purpose.

7) **Throttle Control Lever**. The mouse can be used, but it is better to use a controller throttle for this purpose.

8) **Fuel Shutoff**. The throttle is used in the usual way to apply or reduce power. However it also doubles as the Fuel Shutoff Valve and is so used to stop the engine.

ENGINE SHUTDOWN PROCEDURE :

Set throttle to IDLE. It is best to press the F1 key as throttle must be at 0% for the shutdown to work, some controllers do not always go fully to zero. Carefully position the mouse (or VR controller) pointer over the small black button on the end of the throttle lever. It will highlight glowing blue. When clicked, the throttle lever will move outboard slightly and the fuel to the engine will be shut off. The engine will commence to spool down. This function will work when the aircraft is on the ground or airborne.

RE-STARTING ENGINE :

Click on the small button again to re-open the Fuel Valve and also return the throttle to the normal idle position, ready for re-starting.

9) **Rudder Trim Control Knob**.

10) **Starter Button.** To use, first make sure the Fuel Valve is ON (see above for the location and operation of the Fuel Valve). Then PRESS AND HOLD the starter button for approximately 15 seconds until the engine is heard to start up. The throttle will remain unresponsive until the engine RPM is at approximately 50%. If the Fuel Valve is in the OFF position, the Starter Button will not move when clicked.

11) **Radar Modes Selector Knob**.

The knob (A) is advanced by left-clicking and returned by right-clicking. There are four radar modes – STBY, SRCH, TC (Terrain Clearance) and A/G (Air to Ground Ranging). Only TC Mode is available in MSFS.

12) **AFCS Panel**. The Automatic Flight Control System is essentially the Autopilot of the Skyhawk. There are four simple toggle switches :

Yaw Damper - should be ON at all times.

Heading Hold - works in conjunction with the HDG knob on the Main Panel BDHI (Bearing, Heading & Direction Indicator).

Altitude Hold - this will grab the current altitude, it can also be used to grab climb or descent up to 500 ft/min. Trim to approximate level flight before activating altitude hold, if this is what is required.

Autopilot Master Switch - toggles the ACFS on or off. Speed Hold is unaffected by this switch, it is toggled separately.

Right Console
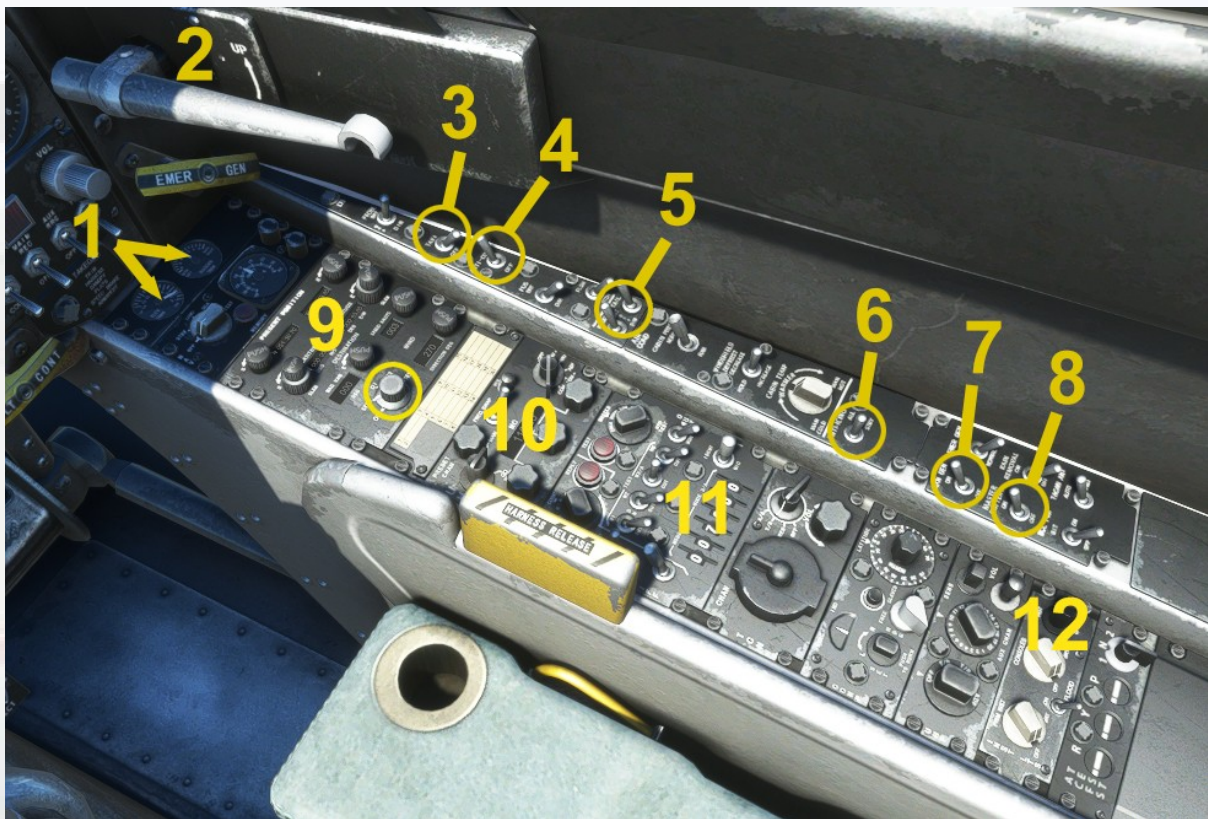
1) **Trim Gauges Panel**. Pitch Trim and Yaw Trim Indicators.

2) **Tail Hook Handle**

3) **Taxi Light**. There is a single taxi light mounted to the right main gear door. The Skyhawk does not have landing lights. NOTE: it does not seem presently possible to have a light 'splash' on the ground associated with the taxi light. Hopefully this can be resolved in future.

4) **Anti-Collision Lights**. These are the flashing red beacon lights.

5) **Navigation Lights**. These are the normal red/green/white lamps found on all modern aircraft.

Important note on LIGHTS. Pressing the L key to turn on the lights will turn ALL lights on at the same time, so the cockpit may appear unusually bright because the White Flood Light will have been switched on. It is far better to use the correct switches for the required lights than pressing the L key.

6) **Anti-Ice Switch.** Toggles pitot heating.

7) **Generator Switch**.

8) **Master Battery Switch**.

9) **Navigation Control Indicator Panel**. This panel is a representation of the A-4's basic FMC and displays various flight data readouts. MSFS cannot easily support a programmable *anaolgue* computer of this kind with manual LAT/LON input, so the readouts, whilst accurate, are not adjustable. The inputs would normally go to the BDHI NAV1 needle under a special 'NAV-PAC' mode to provide a steering prompt to the pilot. The knob highlighted in the image above is a simple on/off switch to reduce the light output of the displays to zero. The displays themselves are simulations of the physical 'roller' type numeric indicators and so would not normally be switched on or off.

10) **Multi-Function Radio Panel**. The real A-4 has a Communication Radio with an integrated ADF Receiver and a VORTAC Radio which relies on a preset channel system. For practical purposes this model utilises a compromise multi-function radio receiver system.

1) **Frequency Swap Switch**. Used to push the STBY frequency into ACTIVE status. 1-click to swap.

2) **Audio Toggle**. Used to switch the audio signal of the selected mode (NAV, ADF or COM).

3) **Mode Selector Switch**. Left clicking moves the switch from OFF to NAV1 ACTIVE, NAV1 STANDBY, ADF, COM1 ACTIVE and COM1 STANDBY. According to which mode is selected, the correspoding frequency will display in the frequency window. The ACTIVE frequency text is marked with a '+'. Note – only STBY frequencies can be adjusted. Right-clicking the switch will move it in steps anticlockwise, back to the OFF position.

4) **Set Mhz**. With NAV or COM set to STBY mode, use left/right click to increment/decrement the MHz, ie. the integer or 'hundreds' part of the frequency. When the desired frequency appears in the window, click the Swap Switch (1) to push the new STBY frequency in ACTIVE.

5) **Set KHz**. As with MHz, but the decimal or 'tens' part of the frequency. When the desired frequency appears in the window, click the Swap Switch (1) to push the new STBY frequency in ACTIVE. Note ADF has no STBY, its ACTIVE can be adjusted.

11) **Transponder Panel**. The four right side adjuster wheels are used to set the transponder frequency in the civil-only Mode 3/A. The first two wheels are not used (Mode 1, military IFF only, not supported). All other switches and lamps are related IFF comms and are not functional. Use left-click & right-click to move the wheels.

12) **Interior Lights Panel**.

A) **Red Cockpit & Instrument Lighting**. These rotary switches provide the low-level red lighting used for most night operations. See the 'Interior LIghts' Section earlier in this manual.

B) **White Flood**. This toggle switch will turn a general white light which will illuminate the whole cockpit. It can be used at the same time as the normal red lighting to augment it, or on its own for a brighter general light in the cockpit.

Setting Payload Weights

Only the 'Fully Loaded' category Skyhawk has the weights of the ordnance and pylons pre-entered into the MSFS 'Weight and Balance' area, which is available both from the Main Menu and the in-game Menu system. All the other models have the five payload stations left at zero Pounds. The can be set using real-world values for the various pylon and ordnance carried by the provided models.

In the example below, the payloads for the four AGM-45 Shrikes are entered. 'Center 1' and 'Center 2' represent the internal tanks of the A-4 and can be set as desired. Their effect on handling is minimal. 'External 1' is the centerline external fuel tank, these are normally filled to maximum prior to a flight.

Virtavia A-4 Skyhawk for MSFS
Manual Version 1.3

In this case, the combined weight of each missile and its pylon comes to 564 lbs, the center pylon (which on this model carries the 150-gal external fuel tank) also contributes 75 lbs to the overall weight. The weight of the fuel is calculated automatically by MSFS and needs no user input. These weights can also be reduced, and in conjunction with toggling off the visibility of the carried weapons, can simulate returning from a mission with a lighter and more agile aircraft. Once the weights are set, the flight can be saved to avoid having to re-enter the values.

Use the weights in Pounds listed below to provide accurate payloads for those Skyhawks in the package which carry weaponry. The figure in brackets is the weight to enter to simulate the absence to the ordnance, in other words, just the weight of the empty pylon :

CENTER TANK VERSIONS

Loadout 1 : centerline external fuel tank, 4 x Mk82 Snakeyes on MERs inboard, rocket pods outboard

> CENTER PYLON : 75
>
> LEFT PYLON INNER : 2653 (393)
>
> LEFT PYLON OUTER : 628 (64)
>
> RIGHT PYLON INNER : 2653 (393)
>
> RIGHT PYLON OUTER : 628 (64)

Loadout 2 : centerline external fuel tank, AGM-45 Shrikes inboard, AGM-45 Shrikes outboard

> CENTER PYLON : 75
>
> LEFT PYLON INNER : 564 (174)
>
> LEFT PYLON OUTER : 564 (174)
>
> RIGHT PYLON INNER : 564 (174)
>
> RIGHT PYLON OUTER : 564 (174)

Loadout 3 : centerline external fuel tank, AIM-9s inboard (A-4G)

    CENTER PYLON : 75

    LEFT PYLON INNER : 289 (134)

    LEFT PYLON OUTER : 68

    RIGHT PYLON INNER : 289 (134)

    RIGHT PYLON OUTER : 68

FULLY LOADED VERSION

Weights are pre-set, but empty pylon weights are still useful :

Loadout : 6 x Mk82 Snakeyes on MER centerline, wing external fuel tanks, rocket pods outboard

    CENTER PYLON : 3783 (393)

    LEFT PYLON INNER : 68

    LEFT PYLON OUTER : 628 (64)

    RIGHT PYLON INNER : 68

    RIGHT PYLON OUTER : 628 (64)

WING TANKS VERSION (A-4G)

Loadout : wing external fuel tanks, AIM-9s outboard

    CENTER PYLON : 0

    LEFT PYLON INNER : 68

    LEFT PYLON OUTER : 289 (134)

    RIGHT PYLON INNER : 68

    RIGHT PYLON OUTER : 289 (134)

Virtavia - A-4 SKYHAWK REFERENCE INFORMATION

Total aircraft weight empty 10,391 lbs

Maximum take-off weight 24,500 lbs

Maximum landing weight (field) 16,000 lbs

Maximum landing weight (arrested) 14,500 lbs

Reference Speeds for TOW 15,968 lbs :

Take-Off Run, ASL, calm. 1,950 ft

Take-Off Run, ASL, 25kt wind. 1,270 ft

Rate of Climb, ASL. 8,750 ft/min

Service Ceiling. 42,700 ft

Range, clean. 1,130 nm

Range, 3 x 300 tanks. 1,856 nm

Combat Radius / Mission Time 530 nm / 2.5 hrs

V1 - Takeoff Decision Speed (dry runway; std temp) 75 KIAS

VR - Rotation Speed (dry runway; std temp) Sea Level 90 KIAS (16,000 lbs)

V2 - Takeoff Safety Speed (dry runway, std temp) Sea Level 110 KIAS (16,000 lbs)

VREF - Landing Approach Speed (full flaps; gear down) 120 KIAS (16,000 lbs)

VMO - Maximum Operating Speed 584 KIAS ASL

VLO - Maximum Gear Operating Speed 200 KIAS

VLE - Maximum Landing Gear Extension Speed 250 KIAS

VFE - Maximum Flaps Extended Speed 250 KIAS

Landing touchdown speed   80 KIAS

Best Glide Speed   130 KIAS (gear and flaps up; engine inoperative)

Stall speed, clean, 16,000 lbs.   80 KIAS

Stall speed, gear down, full flaps, 16,000 lbs.   70 KIAS

AEROBATICS & SPINS :

The optimum speed for aerobatics such barrel rolls is 300 knots IAS. Aerobatics under 250 knots IAS can be achieved with gentle roll inputs, but sufficient altitude (5,000 ft min.) must be allowed. Stalls are usually recoverable, adding maximum nose-up trim will greatly aid control if the aircraft enters a spin.