

SHRIKE

F-86F-30 SABRE - USER GUIDE

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Introduction

Welcome!

We are very excited that you've chosen to grace the virtual skies in a truly classic aircraft, the venerable F-86 Sabre!

This User Guide is designed to help you get started with your new Sabre. While not intended to be a full-on guide for all of the Sabre's systems, it contains useful information about using the aircraft, getting it in the air, as well as short summary of some of the more unique systems that the Sabre has. We recommend that you take a bit of time to read through this guide and to refer to it as needed.

Introducing the Sabre

With it's wide-open air intake up front and sharply swept wings sitting astride a gently curved yet imposingly stout fuselage, the Sabre is truly one of the most immediately identifiable fighter aircraft ever made.

The technological race that occurred during WWII brought many new and radical designs to the still-young field of aeronautics. Compared to the pace of today's engineering, design, and manufacturing standards, it's astounding to consider that the first flight of the Sabre in 1947 came only three short years after initial design proposals had been drafted to meet United States Army Air Forces requirements.

With an original straight wing design estimated to fall short of the required 600 mph top speed, changes to the design introduced the signature 35 degree swept wing. Multiple technological cues were borrowed from the Messerschmitt Me 262, such as an initial automatic slat design, and an electrically adjustable stabilizer.



By 1949, the initial Sabres were in service, assigned to the 22nd Bomb Wing, the 1st Fighter Wing, and the 1st Fighter Interceptor Wing. Through various production models, it proved to be very successful, serving as the primary U.S. air combat fighter during the Korean War.

As quick as the Sabre was developed, technological changes meant that throughout the production run, the aircraft underwent a number of model upgrades, with changes to the engine, fuselage, tail, and wing. The original wing design with it's leading edge slats was swapped to the '6-3' design for the 'F' model that omitted the slats and added 6" of chord to the root of the wing and 3" of extended chord at the tip.

Other variants included the F-86D; with a larger fuselage, a distinctive nose to house it's radar system, and omitted machine guns, it only shared 25% commonality with the rest of the production Sabres.

Although the majority of Sabres were produced in the United States, a significant number were pro-

duced under license in both Australia and Canada. The last production model to leave Canadian factories, the Sabre Mk.6, was considered in many ways to be the ultimate culmination of the F-86 Sabre.

The version of the Sabre we've recreated for your enjoyment is the F-86F-30. Equipped with the '6-3' wing and powered by the J47-GE-27 engine, it represents a typical in-service example of the aircraft midway through it's production run.

We've included the standard instrumentation typical for the aircraft in the era it was produced, but have made a few nods to usability in a simulated environment with the radios and, for those who desire some modern elements, a toggleable GPS.

Although the aircraft we're representing is a -30, we've included a variety of beautiful liveries that saw use across a wide selection of variants.

We sincerely hope that our Sabre gives you many hours of flying pleasure!

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Recommended Settings

The following recommendations, while optional, will allow the F-86 Sabre to be experienced as intended:

Sound:

The Shrike F-86 is designed to take advantage of **Active Spatial Sound** in the simulator, so that setting (located in the Sound Settings UI panel of the simulator) should be turned on.

Realism:

This product is designed to be flown with all realism settings enabled, with one possible exception: **AIRCRAFT STRESS DAMAGE** should be set to **DISABLED**. Not doing this may cause the simulator to register an unexpected aircraft crash if the canopy is opened while airborne.

Hardware Controllers:

This product is designed to be operated with standard hardware controllers. However, the Shrike F-86 has many custom systems that are designed to mimic the behavior of those systems in the real aircraft. It also features many controls that behave differently than most popular hardware controllers allow for, or that the default simulator hardware bindings were designed for. Specific available bindings that differ from what would be considered standard will be listed in the systems overview that follows.

It is not advised to mix control schemes for individual systems – for example, trying to operate the flaps with a hardware axis while also operating the cockpit flaps lever may result in a controller conflict.

Tooltip Visibility & Lock Interactions

This product is optimized for the modern 'LOCK' style of mouse interactions; using the 'LEGACY' system will result in certain controls not being fully capable of all interactions with as intended. In addition, when the legacy system is in use, not all intended feedback is displayed for the user. Finally, there are a number of purposely inoperative controls in the cockpit of the Sabre which have tooltips to describe them and state that they are in fact not operative; turning off tooltips may result in some confusion as this information will not be displayed.

Systems Overview

Although our Shrike aircraft offerings are typically designed to be relatively easy to fly while remaining truthful to the real aircraft, the uniqueness of the F-86 Sabre offers some challenges in balancing ease-of-use with accuracy.

Also because we love this aircraft and felt a need to do it justice, there exists a certain level of depth to the systems in our rendition of the Sabre that we feel would require the user to have at least a basic level of knowledge on how to operate. In addition, some systems and controls have differences in how they function versus other aircraft.

So while this section isn't meant to be an in-depth or exhaustive discussion on all of the systems present in the aircraft, we will point out the areas that bear further explanation, or contain alternative control schemes.

External Equipment

The electrical starter on the F-86 Sabre is not designed to be powered by a battery source; it requires an external power source to be connected to the aircraft. For ease of use, the external power source is toggled on/off through the use of a 'repurposed' switch in the cockpit on the right hand front slanted console marked EXT. POWER.

External power is available at anytime while the aircraft is stationary and on the ground; however, the visual model for the generator is only available while the aircraft is at a parking spot.

Wheels chocks are visible on the aircraft while the parking brake is applied and the aircraft is at a parking spot. There is no control to hide or show them, they will appear or be removed automatically.

Engine Master Switch

The Engine Master switch, located on the right hand front slanted console, is required to be in the ON position for operation of the aircraft. This supplies primary bus power for controlling engine and fuel system components. Moving the switch to ON opens the fuel shutoff valve and connects the electrical circuits for starter and ignition.

Battery-Starter Switch

The three position Battery-Starter switch is located on the right hand front slanted console. With the switch at BATTERY, the battery is connected to and powers the primary bus, provided no other power source (generator, or external power unit) is present.

Moving the switch to STARTER, while the Engine Master switch is ON, permits the starter to be energized by the external power source. The switch is held in place until the engine rpm reaches approximately 23%, at which point it will return to OFF. It should be placed at BATTERY for all normal operations.

Throttle Operation

The Shrike F-86 attempts to adapt the throttle operation and fuel control as found in the real aircraft for use in Microsoft Flight Simulator while balancing maximum compatibility with a wide range of hardware throttle controllers. (For ease-of-use, the emergency fuel system is not simulated.)

The throttle has inboard and outboard movement while fully closed. To move the throttle outboard, left click on the text immediately to the right of the lower throttle range. While power is available and the ENGINE MASTER switch is ON, moving the throttle outboard starts the fuel booster pumps and energizes the ignition circuit. Subsequent forward movement of the throttle then opens the fuel stopcock.

To maximize compatibility with the simulator, any forward movement of a hardware controller from fully closed will automatically move the throttle outboard and open the stopcock at the same time.

To fully close the throttle and fuel for shutdown, a more complex operation is performed. While the throttle lever is pulled fully back (via mouse or hardware controller), holding the left mouse button and clicking the right mouse button (standard simulator 'lock' interaction) will close the fuel stopcock.

Once the fuel is shut off, a left click on the text immediately to the right of the throttle will then move the throttle inboard. For ease of use, or for those that do not wish to use the lock interactions, the inboard clickspot will function at any time that the throttle is less than 1% even if the above method of closing the fuel stopcock has not been performed; in this case the fuel stopcock will automatically be closed and the throttle moved to a 0% position and inboard.

Normal/Alternate Hydraulic Flight Control Systems

The F-86 has both an engine-driven normal hydraulic system as well as an electrically powered alternate hydraulic system that provides backup pressure for flight controls should the normal system lose pressure, as well as an engine-driven utility system. The hydraulic pressure indicator on the front panel may be switched between the normal, alternate, and utility read-outs.

An amber light on the front panel is lit whenever the alternate flight control system is active. A three-position switch located directly aft of the throttle allows manual switching between the normal and alternate systems, as well as providing a reset function that is required whenever the alternate system has been activated.

During initial aircraft start, when power is first connected and before the engine is started, the alternate system is automatically engaged. After engine start, the FLIGHT CONTROL switch must be moved to RESET to shift operation to the normal hydraulic system. The amber light on the front panel will extinguish once the normal hydraulic system is engaged.

Lighting

Like much of the rapidly evolving and innovative technology that arose post-WWII, the F-86 is full of unique (and perhaps overly complex) behaviors. The landing and taxi lights are no exception.

The landing and taxi lights are a pair of lights that, while retracted, lie flush with the underside of the aircraft nose. Electrical motors move the lights into position for use. These lights are controlled by a three-position switch on the left hand forward slanted console.

When the switch is moved to the EXTEND & ON position, both lights come on and are extended to the landing position (approx. 64 degrees). Upon touchdown, or whenever weight is on the nose gear, the landing (right) light goes out and the landing and taxi (left) light extends to the taxi position (approx. 80 degrees) and remains on. If a touch and go landing is made, and the switch is in the EXTEND & ON position, the landing light comes on again and the landing and taxi light return to the landing position. Both lights are turned off and retracted when the switch is moved to RETRACT. Both lights go off if the switch is moved to OFF.

Hardware control over this switch is possible using the default Landing Light assignments; please review the section in this document on Control Bindings.

The F-86 also features four position lights and two fuselage lights. A switch on the right hand slanted console allows the lights to be placed in a STEADY mode where they are continuously illuminated; moving the switch to FLASH allows the position lights to flash while the fuselage lights remain illuminated steadily. The brightness of the position and fuselage lights are controlled by a two-position switch also located on the right hand slanted console.

Internal lighting on the F-86 is controlled by three rheostats located on the lower sidewall of the right hand console.

Wing Flaps

The wing flaps on the F-86 are driven by a pair of electrical motors on each flap, with a mechanical interlink between the two in case either motor fails or loses electrical power.

Flaps are controlled by a three-position lever near the throttle with UP, DOWN, and HOLD positions. As in the real aircraft, moving the flaps lever to HOLD while the flaps are in motion allows the flaps to be held at any position between fully up and fully down. There is no indication of flap position in the cockpit.

Hardware control over the wing flaps lever is possible through several means, but it's noteworthy that they all differ in some manner from most aircraft. Please review the section in this document on Control Bindings.

Normal Trim Systems

The F-86 Sabre features lateral, longitudinal, and rudder trim systems. (The alternate lateral and longitudinal trim systems are not modeled in this simulation.) Lateral and longitudinal trim is operated via a spring-loaded hat switch on the top of the control grip, while rudder trim is operated via a toggle switch located on the rear right hand console, aft of the throttle.

The trim indication system in the Sabre, particularly for takeoff, warrants some discussion as it is particularly unique. There exists no manner of communicating the currently applied trim to the pilot. Rather, there is a takeoff trim indication light located on the upper portion of the front panel.

Replication of this light closely matches the real aircraft; it is not a lamp that stays continuously lit, but rather lights when any one of the three trim systems is moved into the correct range for takeoff and then goes out when that respective trim

switch is released. Slight changes from the real aircraft have been made to accommodate use in the simulation: Rather than the light going out when the respective switch is released by the pilot, the light will go off automatically after a very short duration.

As such, trimming for takeoff must be carefully monitored; rapid trimming will cause the trim to pass into, through and then out of the takeoff range which will also then cause the indicator light to go out.

Speed Brakes

The hydraulically controlled speed brakes on the Sabre are an important part of controlling airspeed and maneuverability. They are operated by an electrical, spring-loaded, three position switch on the throttle lever.

There is an emergency speed brake lever beside the throttle that dumps the hydraulic pressure, designed to allow the speed brakes to close against air pressure in the event of a failure in the hydraulic system. This has slightly simplified behavior in the simulator that allows the speed brakes to collapse to a closed position during flight. This lever is not used in normal operation and does not serve to hold the speed brakes in an extended position for use.

It should be noted that use of the emergency speed brake lever while using hardware axis bindings for the speed brakes themselves may result in a control conflict.

Nose Wheel Steering

In the real aircraft, nose wheel steering is engaged while the nose wheel steering button (lower left front of the control grip) is held. For ease of use in the simulator, the operation of this button has been changed to toggle the nose wheel steering on or off. The button defaults to ON for ease of use.

Radio Equipment

The ADF and COM radio equipment provided in our rendition of the F-86 Sabre, while realistically depicted, is not necessarily accurate to the era of the F-86F-30 aircraft as it would have originally been supplied. However, the units provided have been chosen so as to provide a balance between realism and usefulness to the pilot, as certain older radios aren't well supported in the simulator (if at all), nor are they easy to use.

The COM radio provided is manually tuneable, but will interact with the ATC panel in the simulator and is able to receive frequencies set by that panel.

The ADF radio is manually tuneable as well, with the RMI instrument being located on the left hand side of the front panel. It should be noted that there are three frequency ranges that must be manually selected with the lower (larger) right hand dial before you can tune within that range with the upper (smaller) dial.

The UHF radio and the IFF panel at the rear of the right hand console are inoperative and not implemented.

GPS & Transponder

The Shrike F-86 can swap between the original A-4 gunsight and a default handheld GPS unit that allows for convenience and modern navigation. To swap between the two configurations, left click on the red emergency placard on the glareshield.

While the GPS is present, the lower weapons panel is switched out for a modern transponder unit as well.

External Fuel Tank Operation

As with the real F-86 aircraft, the fuel quantity gauge does not indicate the quantity of fuel remaining in the external drop tanks. As such, correct procedure is to utilize drop tank fuel before using internal fuel. To do so, place the External Fuel Tank selector (left hand mid-forward console) to OUTBD ON & JETT. Usage is only confirmed by the lack of movement on the fuel quantity indicator.

When the fuel tanks are empty, the OUTBOARD TANKS EMPTY warning lamp will come on. At this time (or before, if needed), the tanks are jettisonable while power is available, and the External Fuel Tank selector is at a position that allows the external outboard tanks to be jettisoned.

The manual jettison control (under front panel, left hand side) can be used without power at any time to jettison the external fuel tanks.

Special Features

KBAB Beale Air Force Base Compatibility

The Shrike F-86 Sabre is compatible with the hangar doors at the addon KBAB airport sold by BlackBird Simulations. The hangar doors may be controlled by toggling visibility of the control stick by clicking on the base of the control stick.

Canopy Glass Hiding

Night reflections of the instruments on the canopy glass can be distracting, depending on your camera angle. While this is quite realistic, provision has been made to allow the canopy glass to be hidden, by clicking on the mirror located at the top of the canopy.



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External Loadouts & Weapons Operation

Important Note: The Shrike F-86 Sabre, when purchased from the in-game Microsoft Flight Simulator Marketplace, does not feature visible weapons, nor will the visual or audio effects of the guns be present. This is a requirement for the Marketplace that is outside our control. As such, systems described below that pertain to weapons will not apply to that version of the aircraft.

Loadouts

The Shrike F-86 Sabre can mount a full complement of 16 5" HVAR rockets (inboard and outboard stations) and 500lb bombs (inboard stations only), in addition to or in combination with functional 200 gallon external fuel drop tanks (outboard stations only). This is in addition to the six onboard .50 calibre guns. (Due to the above restrictions, the marketplace version of this product only offers the 200 gallon external drop tanks.)

All loadout options are accessed through the simulation's standard weight & balance menu.

External Fuel Drop Tanks: Adding any quantity of fuel to the left or right drop tanks will cause the tanks to visually appear on the F-86. Note that this will override any weight selection made for the outboard wing stations.

Outboard Wing Stations: Adding a weight of **1050 lbs** (or greater than 1000 lbs) will cause the outboard 5" HVAR rockets to display. This is not compatible with the external drop tanks; any fuel added to the drop tanks will cause the weight and visual load for this station to disappear.

Inboard wing Stations: Adding a weight of **1050 lbs** (or greater than 1000 lbs) will cause the inboard 5" HVAR rockets to display. Adding a weight **between 900 and 1000 lbs** will cause the 500 lb bombs to display. Either inner wing station load is compatible with both the external drop tanks and the outboard 5" HVAR rockets.

Rockets / Bombs / Tanks Jettison

There are multiple methods for jettisoning the external load of the aircraft. As noted above, the external fuel tanks may be jettisoned via the dedicated fuel tank controls. In addition, all external stores may be jettisoned while power is available using the JETTISON BOMB ROCKET TANK button (left hand mid-forward console). Note that an interlock prevents rockets from being jettisoned via this

method while weight is on the wheels.

The emergency manual jettison handle may also be used to jettison all stores without power. This control has been simplified for use within the simulator and functions only as a three-stage toggle: safe – guard open – jettison.

Bombs and/or rockets may also be jettisoned through the use of the lower weapons panel and the BOMB/ROCKET RELEASE button located on the control stick. To jettison bombs, move the BOMB RELEASE switch to MANUAL, and the BOMB SEQ SELECT switch to ALL. Then press the BOMB/ROCKET RELEASE button on the control stick. (Note that many of the lower weapons switches have been simplified or made inoperative except for the ability to jettison without arming.)

To jettison rockets, move the ROCKET JETTISON switch to READY and press the BOMB/ROCKET RELEASE button on the control stick. Note that an interlock prevents rockets from being jettisoned via this method while weight is on the wheels.

Guns & Gunsight Usage

The Shrike F-86 offers .50 calibre machine guns that can be fired for effect only (Effects limited to sounds and aircraft visuals), alongside a basic simulation of the A-4 gunsight (caged mode only). To use the guns as well as the gunsight, the guarded GUNS switch (lower weapons panel) must be moved to ALL ON. At this point the targeting reticle will be visible, and the guns may be triggered via a keybind (see below).

The guarded GUNS switch may also be moved to the SIGHT CAMERA & RADAR position to have the targeting reticle visible without the guns being active. To control the brightness of the targeting reticle, there is a brightness knob to the right of the gunsight, on top of the glareshield. In addition, the outer diameter of the targeting reticle may be adjusted using the radar ranging knob to the left of the gunsight. This isn't correct to the real aircraft – manual control would normally be done through a spring-loaded rotation of the throttle grip – but it's there to provide a bit of extra detail!

As noted, the gunsight is only simulating basic operation that resembles a caged mode. There is no possibility of un-caging the gunsight, there is no active radar, nor are there any additional modes or functionality that the gunsight would have in the real aircraft for releasing bombs and rockets.

Controller Assignments & Keybinds

While the majority of the standard controller assignments will work correctly in the F-86 Sabre, there are several areas where the functionality in the aircraft exceeds what can normally controlled through default assignments, or where default bindings simply don't exist. In these cases, and where it could assist users in aircraft operation, we have provided an alternative controller assignment. These may be assigned through the simulator Controls Options window.

CONTROL ASSIGNMENT NAME	AIRCRAFT FUNCTION
TOGGLE WATER RUDDER	FIRE GUNS (NON-MARKETPLACE ONLY)
TRIGGER HORN	PRESS GEAR WARN SILENCE BUTTON
PROPELLER AXIS	CONTROL FLAPS LEVER (UPPER 5%: FLAPS UP, LOWER 5%: FLAPS DOWN, MIDDLE: FLAPS HOLD)
LANDING LIGHTS ON	SET LANDING LIGHTS SWITCH TO EXTEND & ON
LANDING LIGHTS OFF	SET LANDING LIGHTS SWITCH TO OFF
LANDING LIGHTS HOME	SET LANDING LIGHTS SWITCH TO RETRACT
LANDING LIGHTS TOGGLE	LANDING LIGHTS SWITCH TRIPLE TOGGLE: EXTEND & ON > RETRACT > OFF
NAV LIGHTS ON	POSITION & FUSELAGE LIGHTS SWITCH TO STEADY
NAV LIGHTS OFF	POSITION & FUSELAGE LIGHTS SWITCH TO OFF
TOGGLE NAV LIGHTS	TOGGLE POSITION & FUSELAGE LIGHTS SWITCH BETWEEN STEADY AND OFF
STROBES ON	POSITION & FUSELAGE LIGHTS SWITCH TO STEADY
STROBES OFF	POSITION & FUSELAGE LIGHTS SWITCH TO OFF
TOGGLE STROBES	TOGGLE POSITION & FUSELAGE LIGHTS SWITCH BETWEEN STEADY AND OFF

CONTROL ASSIGNMENT NAME	AIRCRAFT FUNCTION
BEACON LIGHTS ON	POSITION & FUSELAGE LIGHTS SWITCH TO STEADY
BEACON LIGHTS OFF	POSITION & FUSELAGE LIGHTS SWITCH TO OFF
TOGGLE BEACON LIGHTS	TOGGLE POSITION & FUSELAGE LIGHTS SWITCH BETWEEN STEADY AND OFF

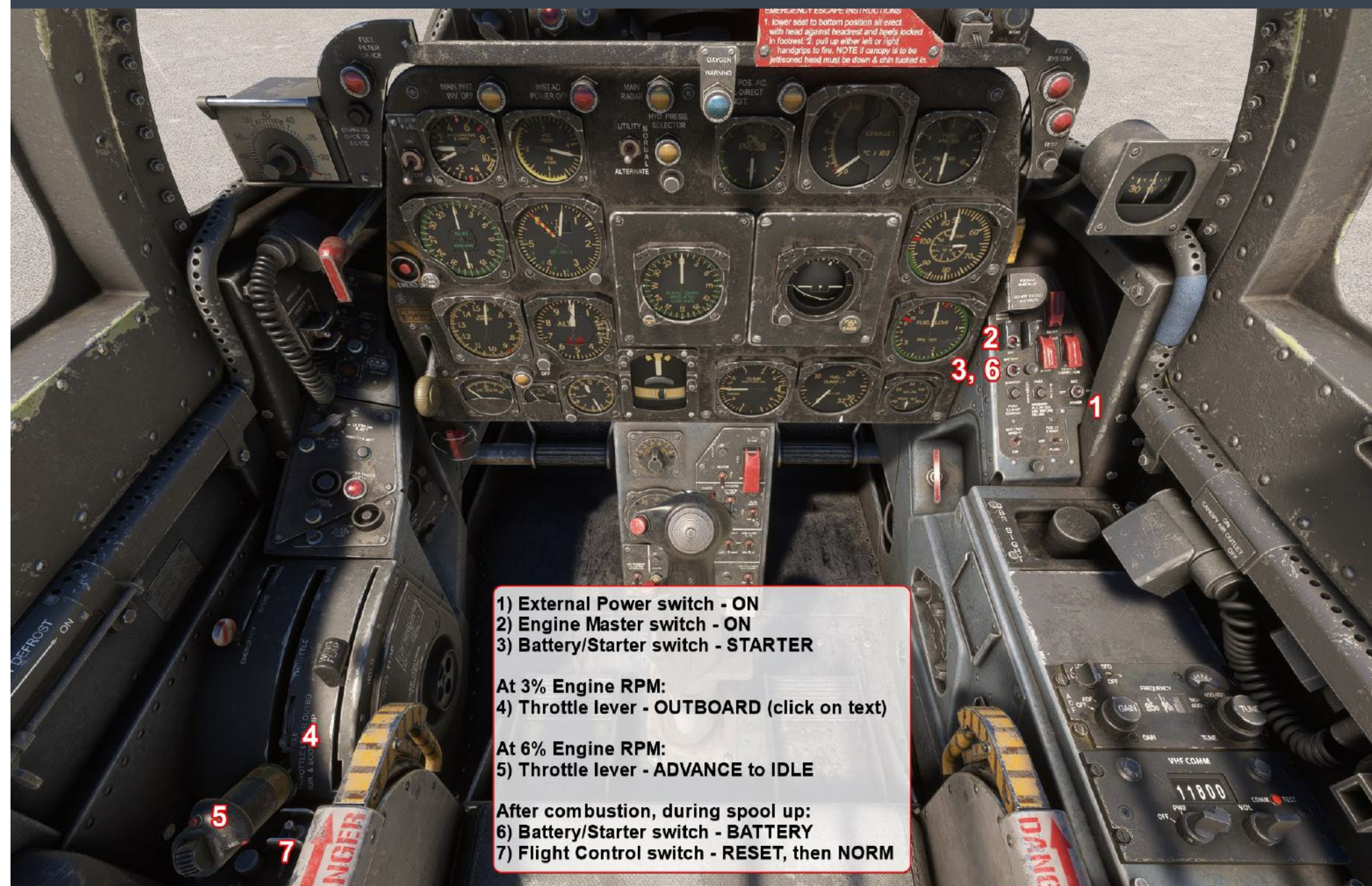
Additional binding provisions are available through the use of exposed lvars for cockpit builders or advanced users. **Note: no support for the use of these variables, nor in the use of third party utilities that may make use of these variables, is provided.**

VARIABLE	VALUE	AIRCRAFT FUNCTION
F86_Switch_EngineMaster	0	Engine Master Switch OFF
"	1	Engine Master Switch ON
F86_Switch_ThrottleOutboard	0	Move throttle INBOARD
"	1	Move throttle OUTBOARD
F86_FlapsLever	0	Retract wing flaps
"	1	Hold wing flaps at current position
"	2	Extend wing flaps
F86_Switch_Speedbrakes	0	Retract speedbrakes

VARIABLE	VALUE	AIRCRAFT FUNCTION
"	1	Hold speedbrakes at current position
"	2	Extend speedbrakes
F86_Switch_NoseWheelSteerDisable	0	Allow nose wheel steering
"	1	Lock nose wheel in forward position
F86_Switch_HydFlightControl	0	Hydraulic flight control switch NORMAL
"	1	Hydraulic flight control switch ALTERNATE
"	2	Hydraulic flight control switch RESET (momentary)
F86_FuelTankJettison_Pressed	1	Jettison external tanks (momentary press)
F86_ExternalJettison_Pressed	1	Jettison bombs/rockets/tanks (momentary press)
F86_BombRocketRelease_Pressed	1	Release bombs/rockets (momentary press)
F86_EmergJettisonHandle	0	Emergency jettison handle safe / guard closed
"	1	Emergency jettison handle guard open
"	2	Emergency jettison handle pulled
F86_GunSafetySwitch_Guard	0	Guns switch guard CLOSED
"	1	Guns switch guard OPEN

VARIABLE	VALUE	AIRCRAFT FUNCTION
F86_GunSafetySwitch	0	Guns & sight ON
"	1	Guns & sight OFF
"	2	Guns OFF & sight ON
F86_Switch_LandingLights	0	Landing & taxi lights OFF
"	1	Landing & taxi lights EXTEND & ON
"	2	Landing & taxi lights RETRACT
F86_Switch_PosLights	0	Position & fuselage lights OFF
"	1	Position & fuselage lights STEADY
"	2	Position lights FLASH / fuselage lights STEADY
F86_Switch_ExtLightDim	0	Position & fuselage lights BRIGHT
"	1	Position & fuselage lights DIM
F86_GearWarnAck	1	Silence gear warning tone (momentary press)
F86_Knob_TankSelector	0	External tank selector ALL TANKS OFF
"	1	External tank selector OUTBD ON & JETT
"	3	External tank selector LEFT OUTBD JETT
"	4	External tank selector RIGHT OUTBD JETT

Quick Overview - Engine Start

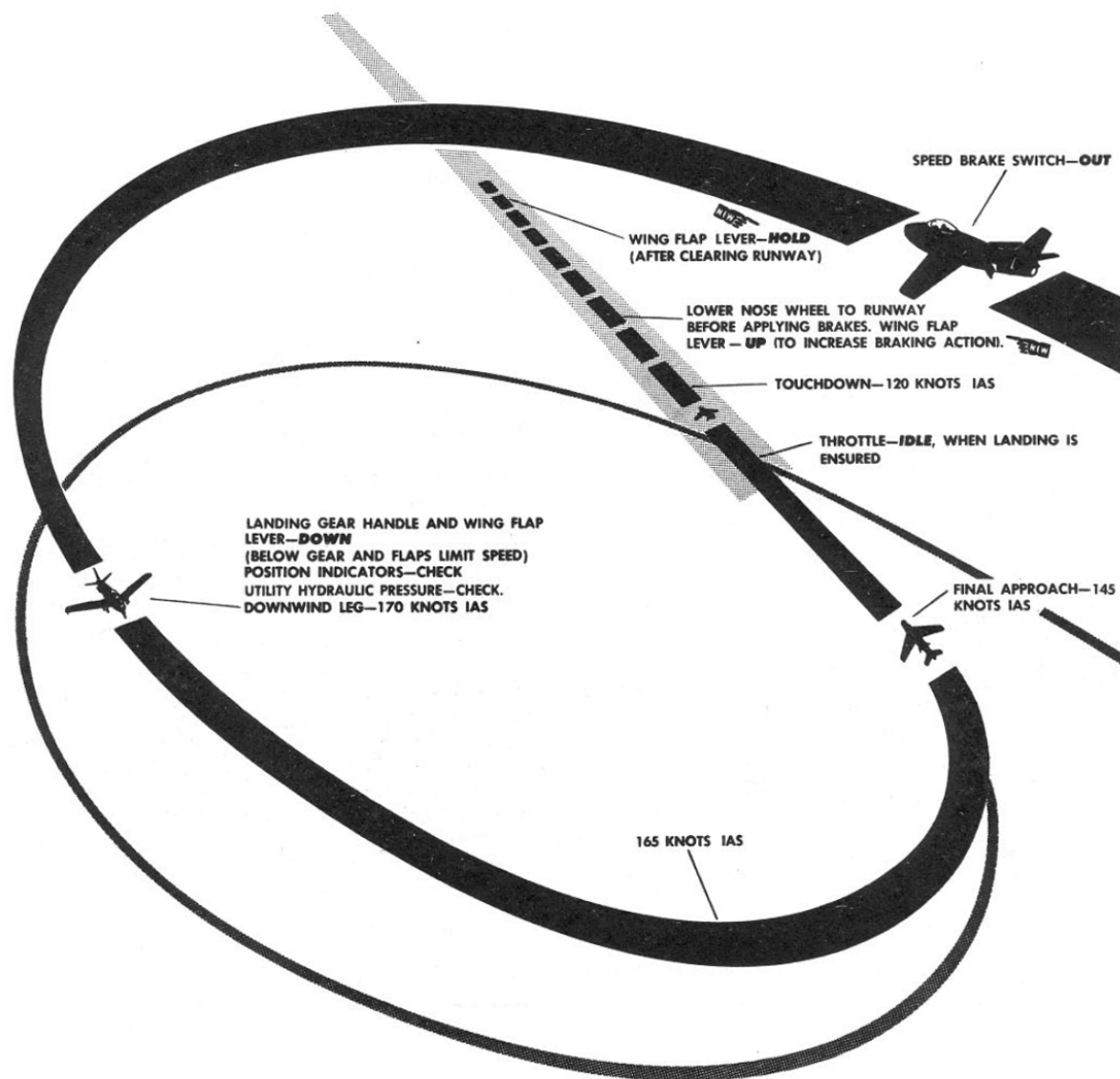


Quick Overview - Landing

TYPICAL landing pattern

AIRPLANES WITHOUT SLATS

NO EXTERNAL LOAD—GROSS WEIGHT 13,800 LB



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