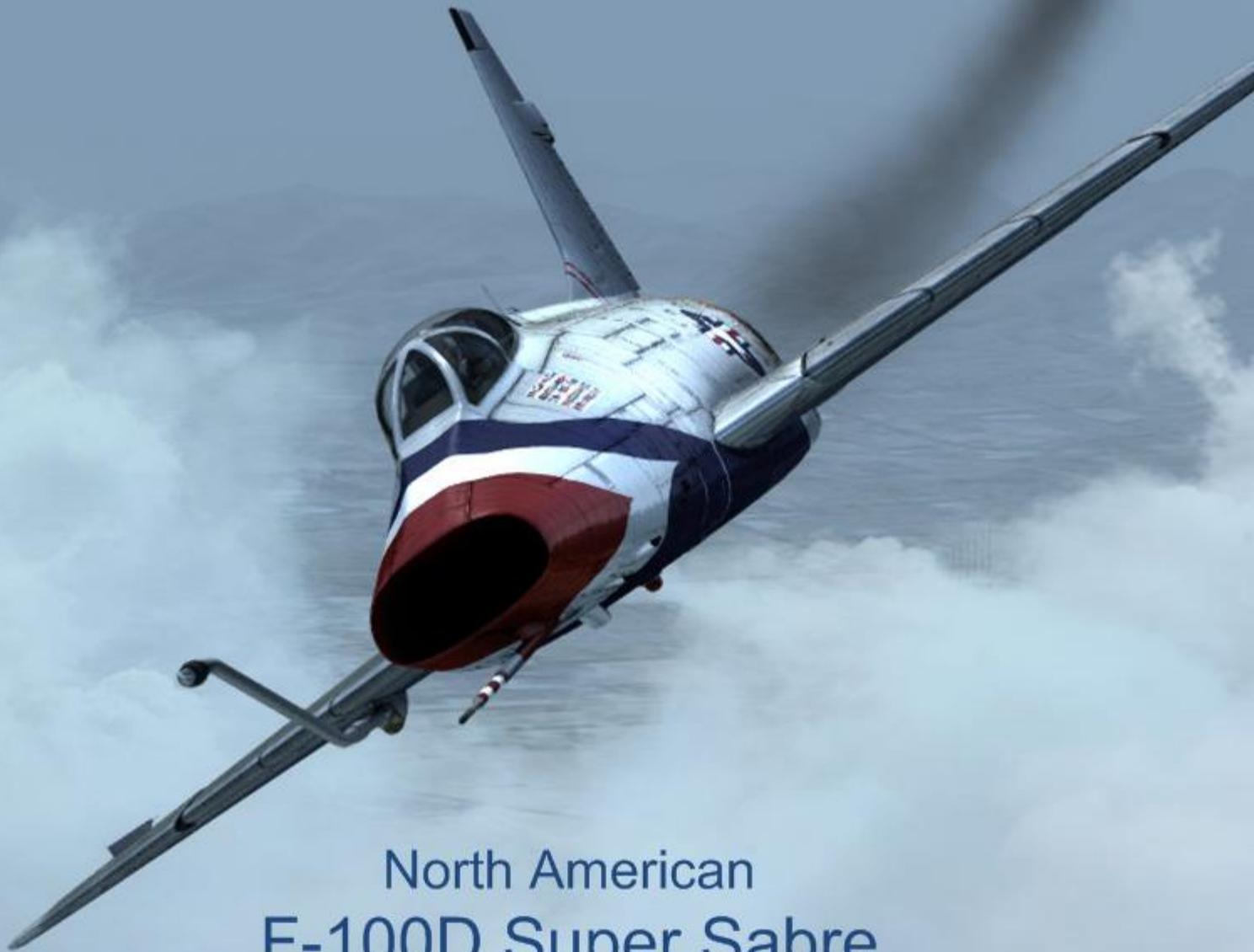


MILVIZ
MILITARY VISUALIZATIONS



North American
F-100D Super Sabre

For FSX and P3D

USER MANUAL

Welcome to the Military Visualizations F-100D Super Sabre User Manual.

As proud as we are of this F-100D simulation, we are also very proud to have you as a pilot/customer and thank you for your purchase!

Simulation Highlights:

- High quality external model using normal, bump and specular maps
- High quality internal model complete with custom 3D gauges
- Realistic (and challenging!) Flight model
- Aircraft configuration Management System
- Realistic (plus easy) Startup scenarios
- Extensive systems modeling
- Weapons modeling including drag and center of gravity consideration
- Sophisticated cockpit lighting
- Drag Chute with custom drag modeling
- Compressor Stall effects
- High AoA buffeting effects
- Ten beautifully detailed liveries (additional liveries available for download)
- High resolution paint kit available for download
- User Manual, Pilot's Flight Manual and Video tutorials

plus: **VRS TacPack enabled**

F-100 Pilot approved! (see credits)

About this Document:

The intention of this document is to highlight aspects of the model that are specific to the simulation environment and MilViz's interpretation of the aircraft operation in the simulator. These would include things such as; PC system requirements, software installation, USB controller setup and aircraft systems basics such as starting the engines, arming and firing the weapons, along with some of the systems and controls limitations. You should find enough information here to get your F-100D in the air. Safely back on the ground? Not so much!

This document does not to provide a complete suite of instructions for operating the F-100D - the USAF has kindly done that for us! Please refer to the accompanying USAF Series F-100D Flight Manual for further details.

Credits:

Developers:

Modelling/Painting: D. Usatyi, C. Pearson, B. Filer, C. Jodry, R. Mackintosh, B. Alexson

Coding: Brian Alexson, Collin Beidenkapp, Jon Bleeker, Chuck Jodry

Flight Dynamics: Brian Alexson (with thanks to Bernt Stolle for getting me rolling)

Sound: Brian Alexson, Mike Maarse (for items borrowed from F-4 soundset)

Installer: Bill Leaming

User Manual: Brian Alexson

Video Tutorials: Ville Keränen

XML Tools: Tom Aguilo

Afterburner Effect components: courtesy of Ted Wolfgang Rampey (AKA TuFun)

Testers:

Toby Wills, Rick Mackintosh, Ville Keränen, Raptor, Storm, Dimus, Axflyboy, Razor6666

With a special thanks to Toby Wills (aka Rhino) for acting as liaison between our Pilot Consultants and the development team!

F-100 Pilot Consultants:

These veteran fighter pilots were keenly interested in helping us bring one of their most-loved jets to life. Their logged hours were in a combination of F-100C, D and F models, with the vast majority in the D. They all went on to fly other higher-performance aircraft in their Air Force careers, but the Hun remains a favorite. They are:

Jerry Stamps, Captain, USAF (Sep)
Flew F-100 1961-63, 475 hrs. in type

Dennis Wills, Captain, USAF (Sep)
1962-63, 135 hrs. in type

Jim Pollak, Captain, USAF (Sep)
1963-68, 1490 hrs. in type (499 of which were combat - his harrowing shoot-down story appears in the book, "Vietnam to Western Airlines.")

Ron Beyers, Colonel, USAF/ANG (Ret)
1963, 1972-79, 1700 hrs. in type

Introduction to the 'Hun'

Being not only the first of America's supersonic fighter, but in fact, the first in the world, the North American F-100 represented a revolution in aircraft design. North American delivered an unsolicited proposal for the Sabre 45 (because of its 45° wing sweep) to the US Air Force in 1951 as an evolution to their highly successful F-86 Sabre. Later that year the new aircraft was accepted as the F-100 and by the end of 1952, the USAF had ordered 275 F-100As.

Seven months ahead of schedule, the first YF-100A flew in May 1953 and reached Mach 1.05 despite being outfitted with a lower-powered XJ57-P-7 engine. The first production model flew in October of that year. The F-100A first entered USAF service in September 1954 with the 479th Fighter Wing at George AFB, California. But by November 1954, the F-100As suffered six major accidents due to flight instability, structural failures, and hydraulic system failures, prompting the air force to ground the entire fleet until February 1955.

First to fly in January, 1956, the F-100D aimed to address the design and offensive shortcomings of previous F-100 variants by being primarily a ground attack aircraft with secondary fighter capabilities. The aircraft was fitted with an autopilot upgraded avionics, and AIM-9 Sidewinder missile capability. To further address the dangerous flight characteristics, the wing span was extended by 26 inches and the vertical tail area was increased by 27%. The "D" model was the definitive version with 1,274 examples eventually produced.

It made its combat debut during the Vietnam conflict where it was assigned the task of attacking such targets as bridges, river barges, road junctions, and cantonment areas. As a fighter-bomber, armament consisted of four 20-mm cannons mounted in the bottom of the fuselage below the cockpit with provision made for up to 6000 pounds of external ordnance such as bombs and rocket pods. It logged 360,283 combat sorties during its wartime operations.

Over its service life, in addition to the USAF, the F-100 was flown by Turkey, France, Denmark and Taiwan air forces. It became a preferred performance aircraft of the USAF Thunderbirds - the F-100C from 1956 until 1964. After briefly converting to the F-105 Thunderchief, the team flew F-100Ds from July 1964 until November 1968, before eventually converting to the F-4E Phantom II. As its service matured, F-100 was adopted by Air National Guard and it was not until November 1979 that the Air National Guard retired the last of their F-100s.

The F-100 was the first in a line of military aircraft which became known as the "Century Series", which also included the Convair F-102 Delta Dagger, the Lockheed F-104 Starfighter, the Republic F-105 Thunderchief and the F-106 Delta Dart. Nearly all who flew the F-100 loved it and it soon earned the nickname 'Hundert' or affectionately, the "Hun".

F-100D Specifications

General characteristics

- Crew: 1
- Length: 47 ft 1 in (14.35 m) (excluding pitot boom)
- Wingspan: 38 ft 9 in (11.81 m)
- Height: 16 ft 2¾ in (4.95 m)
- Wing area: 400 ft² (37 m²)
- Empty weight: 2,0638 lb (9,361 kg)
- Basic weight: 21,133 lb (9,586 kg)
- Maximum weight: 38,048 lb (17,258 kg)
- Powerplant: 1 × Pratt & Whitney J57-P-21/21A turbojet
- Dry thrust: 10,200 lbf (45 kN)
- Thrust with afterburner: 16,000 lbf (71 kN)
- Zero-lift drag coefficient: 0.0130
- Drag area: 5.0 ft² (0.46 m²)
- Aspect ratio: 3.76

Performance

- Maximum speed: 765 kn (880 mph, 1,417 km/h, Mach 1.3)
- Ferry Range: 1,750 NM (2,014 mi, 3,210 km)
- Combat Radius (internal fuel): 242 NM (278 mi, 448 km)
- Combat Radius (max fuel): 460 NM (529 mi, 852 km)
- Service ceiling: 39,600 ft (12,070 m)
- Combat ceiling: 46,900 ft (14,295 m)
- Rate of climb: 19,000 ft/min (348 m/s)
- Wing loading: 72.1 lb/ft² (352 kg/m²)
- Thrust/weight: 0.55
- Lift-to-drag ratio: 13.9



System Requirements (Minimum):

OS: Windows Vista, Windows 7
(use in all other versions of Windows is unsupported)

.NET 4.5

Available at: <http://www.microsoft.com/en-us/download/details.aspx?id=30653>

Visual C++ 2010 Redistributable x86

Available at: <https://www.microsoft.com/en-us/download/details.aspx?id=40784>

DX10 (June 2010)

Available at: <https://www.microsoft.com/en-us/download/details.aspx?id=8109>

SimConnect (Some P3D users may find required versions have not been installed)

If required, in your P3D folder, go to the `redist\Interface\FSX-SP2-XPACK\retail\lib` and run the `SimConnect.msi`

Care should be taken to ensure these libraries are in place as missing pieces will result in otherwise inexplicable and sometimes subtle missing functionality in the F-100D simulation.

Processor: 2.6 Ghz or higher

Memory: 4 GB RAM

Graphics: DirectX®9 compliant video card or greater, 1024 MB video RAM or higher

Hard Drive: 2 GB available space

FSX Version: FSX:Acceleration or FSX:Steam Edition

The P3D version is designed to be compatible with the most recent P3D release; older versions of P3D may not be supported.

P3Dv2: Latest release, with all hotfixes.

P3Dv3: Latest release, with all hotfixes.

Installation:

System Requirements (REDUX):

Before you begin installation, make sure you have **.NET 4.5** and **Visual C++ 2010 x86 Redistributable** or **Visual C++ 2013 x86 Redistributable** installed on your system. Otherwise, although installation will proceed, you could see a nasty looking and confusing message pop-up during the MilViz Aircraft Management System (MVAMS) initial execution.

Refer to your **PC Control Panel > Programs > Programs and Features** and confirm that the following entries are present:

Microsoft .NET Framework 4.5

Microsoft Visual C++ 2010 x86 Redistributable 10.0.40219 (or higher, recommended)

Anti-virus software has been known to create installer download and execution issues on some systems. It is recommended that you disable them during the download and install process.

Uninstall Previous Version (if any):

It is always recommended that if you have a previous version of the MilViz F100D installed on your system, you first BACK UP any customizations (e.g. aircraft.cfg) and extra liveries you may have installed, then run the INSTALLER USED FOR YOUR EXISTING installation. Confirm the terms and conditions screen, then select the appropriate program version and the 'Uninstall' option. Make sure the destination folder is correctly set for your simulator, then select 'Install' - this will actually Uninstall the product.

Running the Installer:

Run the installer **MilViz F-100D Vx.xxxxxx.exe**. Selecting 'Run As Administrator' with a right mouse click is recommended. Confirm the terms and conditions, then select the appropriate simulation. Make sure the destination folder is correctly set for your simulator. Select 'Install'. The installer will copy the aircraft specific files and folders into your simulator, progress shown in the dialogue window.

Once that is completed, the installer will launch the XMLTools 2.0 Installer (a utility used by the F-100D), complete with it's own dialogue box. Select 'Install', then 'Finish'.

The final item to be installed is the MilViz Aircraft Management System (MVAMS). Once it correctly completes installation, the AMS application automatically launches, allowing you to set up the default configuration for your F-100D and USB controller (i.e. joystick) settings. (Refer to the MVAMS section below for details.) You may create you preferred default settings at this time, or close the MVAMS screen since it may be executed at any time to alter or dynamically update your controller and aircraft configuration.

First Flight:

When you load your F-100D into FSX for the first time, you'll be asked to approve the running of each custom F-100D dll and confirm the saving of this setting. This is normally a one-time event (unless a new version of a dll is installed or the setting is not saved). Unfortunately, the approval process has

been seen to pre-empt the proper execution of the dlls. To avoid potential issues, the **first time you load the aircraft and approve the new gauges, we suggest you immediately quit the session and start a fresh one.**

MilViz Aircraft Management System (MVAMS)

MVAMS offers a framework to select and execute multiple MilViz aircraft specific configuration modules. In this section, we'll discuss the functions offered by the F-100D module. MVAMS provides three separate but related functions in a single tidy window:

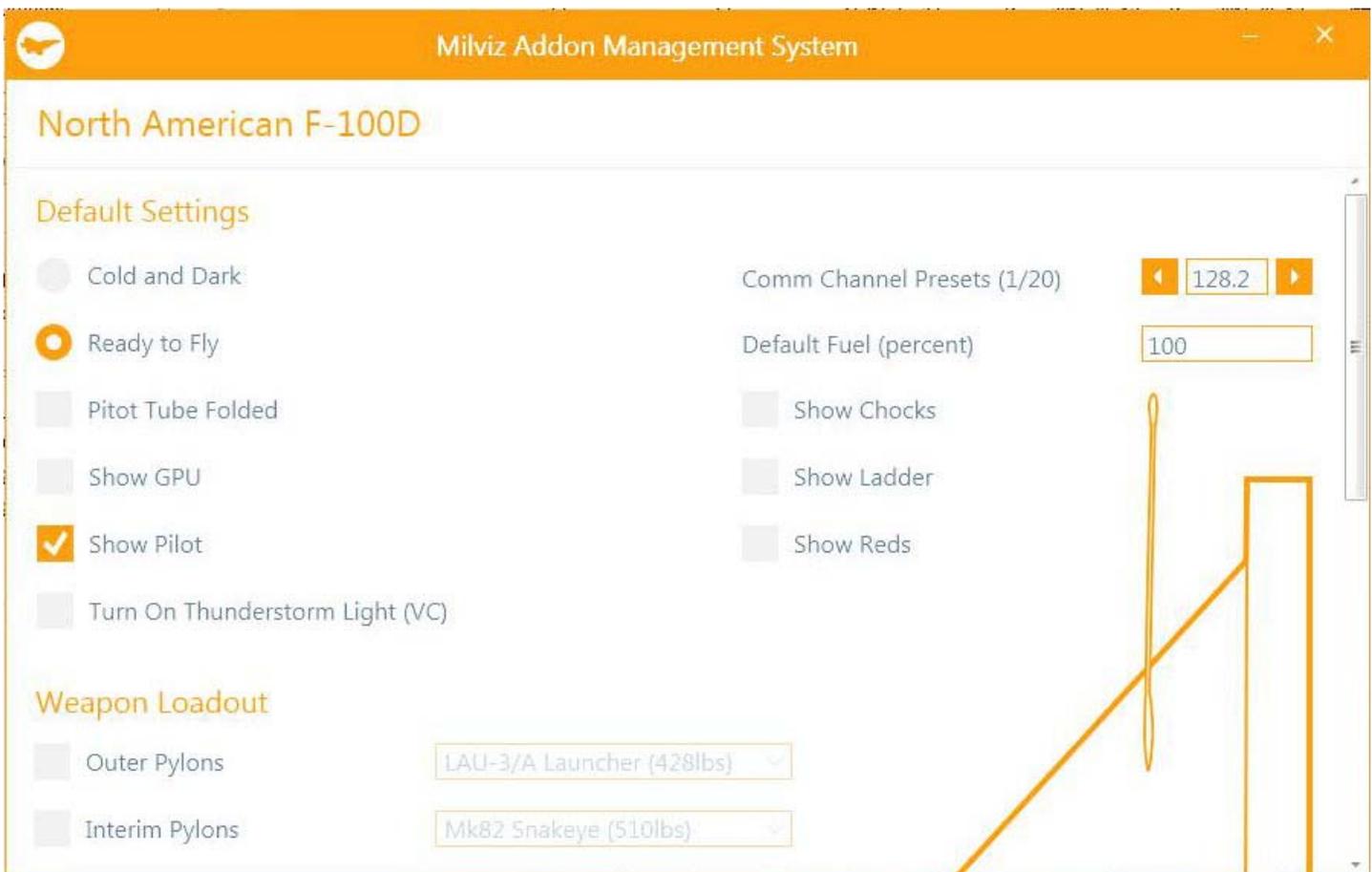
- 1) Setting the default configuration of various F-100D visuals, states, presets and weapons load out.
- 2) Dynamic update of weapons load out during a simulation session
- 3) Setting aircraft specific keyboard and USB controller button mappings

MVAMS.exe is a stand-alone windows application that executes on your Windows desktop. It is installed (typically) under: (C:)Users\\AppData\Local\MVAMS\

A desktop shortcut is created during installation.



Click on the MVAMS.exe application or shortcut to open it. If no other modules are installed, it will directly open the F-100D window (otherwise, select the F100D add-on from the quick access menu icon). You should be presented with the following screen:



Configuration settings are organized into three sections:

Default settings: Desired aircraft settings or conditions asserted when the aircraft is loaded into the simulator.

Weapon Loadout: Settings specific to the F-100D weapons compliment. These are separated from the Default settings because they can be dynamically updated during simulation (using the 'Send Loadout to Sim' button) and further, because they are shared with VRS TacPack (if active in your simulator).

Keyboard Assignments: Mappings for specific key presses (Keyboard input) or game controller buttons (Direct Input) for F-100D specific functions.

It's important to mention that any changes made to your F-100D configuration will not be saved or reflected in your aircraft unless you press the 'Save Defaults' button. Further details are described below.

Here are the settings in Detail:

Default Settings:

These are settings that are asserted when the aircraft is initially loaded into the simulator.

Cold and Dark: Loads the aircraft with all systems and switches in their OFF state. If your default flight is set with engines running, you'll likely hear shut-down sounds when the F100D is loaded.

Ready to Fly: Once the aircraft is loaded, it runs through an automated start-up sequence. Although you can manipulate switches manually during the start-up, it's not recommended to interrupt the engine starting itself.

You may only select one of Cold and Dark or Ready to Fly. Initial setting is 'Ready to fly'.

Pitot Tube Folded: Set this to have the pitot boom visual placed in the folded position. Unchecked, it is straight. This may also be manually toggled for folded or unfolded from within the simulator (see **Changing Default Settings 'In-Sim'** below).

Show GPU: Presents a visual representation of a Ground Power Unit visual and fires it up (Note: GPU will not appear if aircraft is already running). The GPU is required to perform a GPU engine start. The GPU will automatically vanish after 2 minutes or once the engine starts. It may also be manually toggled on and off from within the simulator (see **Changing Default Settings 'In-Sim'** below).

Show Pilot: Enables the pilot in cockpit visual. Initial setting is 'On'. It may also be manually toggled on and off from within the simulator (see **Changing Default Settings 'In-Sim'** below).

Turn On Thunderstorm Light(VC): Turns on thunderstorm light so you can orient yourself in a dark cockpit at night. It may also be manually toggled on and off from within the simulator (see **Changing Default Settings 'In-Sim'** below).

Comm Channel Presets (1/20): The F100D Comm Radio enjoys 20 preset channels. If you wish to use the presets, their frequencies (in MHz) are set in the preset scroll box. The initial values for all preset channels is 128.20 MHz. It is not necessary to assign presets to use the Comm radio.

Default Fuel (Percent): Select the fuel load (by percentage) you wish to have loaded into the aircraft on start-up. Initial value is 100%. This value only applies to internal fuel. Drop tanks, if present, are always loaded full, regardless of the fuel setting.

Show Chocks: Set this to have Chocks visually present at start-up. If on, also asserts the simulator parking brake. To remove the chocks when you're ready to fly (otherwise, you can not turn off parking brake), see **Changing Default Settings 'In-Sim'** below.

Show Ladder: Sets a visual for the pilot's ladder on. It may also be manually toggled on and off from within the simulator (see **Changing Default Settings 'In-Sim'** below).

Show Reds: toggles 'Reds' visual on or off. It may also be manually toggled on and off from within the simulator (see **Changing Default Settings 'In-Sim'** below).

Weapon Loadout:

The loadout that your F-100D gets equipped with is controlled by this area of the MVAMS:



Wing station loads are shown on the right with a visual representation of the current selection. Checkboxes on the left select if a specific pair of pylons is to be configured or not. If configured, the pulldown menu to the right of each pylon indicate what weapon or drop tank (if any) is to be mounted on the pylon (otherwise, it's grayed out).

The 'Guns Loaded' checkbox indicates whether or not to configure ammunition for the M39 cannons.

Once you've selected your desired default loadout, don't forget to press the 'Save Defaults' button at the bottom of your MVAMS screen.

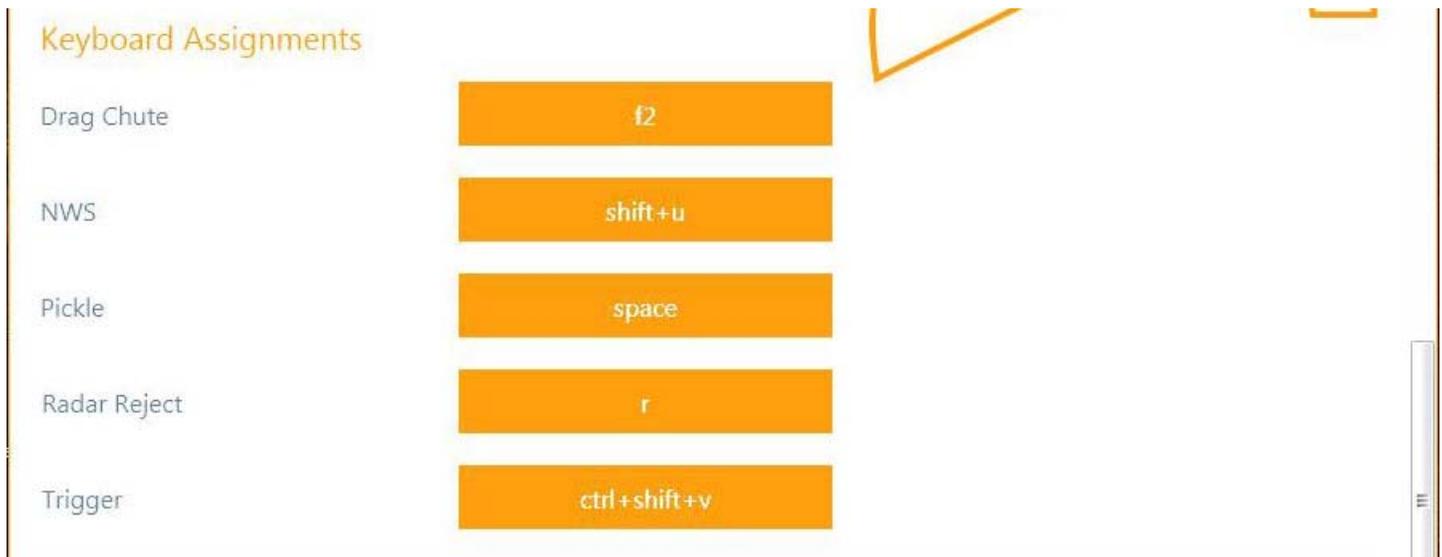
The button labelled 'Send Loadout to Sim' is NOT a save button! It has a different function: This button is used when you wish to alter you loadout ON THE FLY (i.e during a simulation session). Saved defaults are only loaded when the aircraft is loaded/reloaded. However, it's sometimes desirable to alter you loadout during a flight. To perform an update dynamically, it is necessary to suspend (pause) your simulator session, activate the MVAMS screen, set the desired loadout and press the 'Send Loadout to Sim' button. It is convenient (though certainly not necessary) to have the

MVAMS active during the session if you anticipate altering your loadout during a flight. To alter the loadout, select the MVAMS from toolbar (or start it from you desktop, which may require you to pause the simulator and minimize the window). When you resume your flight, the loadout will be updated. This may sound a bit awkward, but it works nicely in practice.

Note that when you update your weapon loadout, you also refresh (reload) the weapons. However, if you simply wish to reload your weapons without altering the loadout, a more direct method is available. (See **Changing Default Settings 'In-Sim'** below.)

Keyboard Assignments:

The Keyboard Assignments section is used to configure mappings for specific key presses (Keyboard input) or USB game controller buttons (Direct Input) for F-100D specific functions. They are set in this area of the MVAMS:



These settings are examples only. Most simulator recognized Keyboard Shortcuts (eg. KEY (including function keys and some special keys), SHIFT + KEY, CONTROL + SHIFT + KEY) or Direct Input (eg. 'Saitek Joystick Controller Button 1') can be used in MVAMS as a shortcut assigned to the F-100D.

MVAMS uses SIMCONNECT to register the assignments. This has the advantage of overriding and intercepting the simulator Control Settings. This allows you to avoid conflicts if you assign a shortcut normally used by the simulator for some other function, without having to worry about it or changing default simulator assignments. This means that, for example, you could assign the 'b' key for Pickle (bomb button) and as long as you're in the F-100D, the 'b' key will control pickle, not say 'Altimeter (reset)'. If you move to a different aircraft, the 'b' key will revert to controlling 'Altimeter (reset)' (or whatever keyboard assignment may have been set in your simulator). Of course, care must be taken to not override a simulator keyboard shortcut you might already be using to fly your F-100D!

When the MVAMS is first activated, all controller assignments will be set to **[unassigned]**. To make an assignment, click the orange button to the right of the function and this pop-up should appear:



If there's an assignment setting already there, first press 'Clear'. When the string [ENTER KEY...BUTTON] is showing, it's waiting for input. Press the desired keyboard sequence or USB controller button (the controller button itself may have been programmed with a key sequence) to input the assignment. The captured assignment should replace the [ENTER..] string. If it looks good, press 'Save'. Use 'Clear' to try again. Use 'Cancel' to abandon the operation (the last saved assignment is retained). If you enter your input and no assignment occurs, the sequence is invalid (eg. using 'ALT'). Select a different assignment.

If you're a **TacPack user**, it's recommended that in order to keep all the assignments consistent for all your various TacPack enabled aircraft, that the Trigger and Pickle be left [Unassigned] in the MVAMS and instead use the TacPack TRIGGER assignments (see below) to set them. In particular, avoid duplicating these assignments in both MVAMS and TacPack!

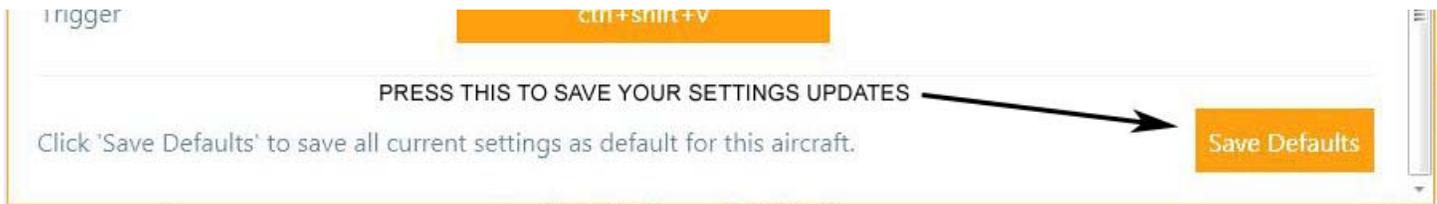
One caution: While it's advantageous to register the assignments with SIMCONNECT, it has one small idiosyncrasy when multiple key press sequence assignments are used - 'SHIFT + b' for example. Oddly, SIMMCONNECT expects the keys to be released in the reverse order that they were pressed. This is important for the TRIGGER and PICKLE since F-100D is concerned with both controller button Press and Release events (for example, to continue firing the guns as long as the trigger is held). Please ensure that if you've programmed a multi-key sequence into your controller, that it releases the keys in the reverse order that they are sent. eg. On button press, controller sends SHIFT + b, and on release, it lifts b, then shift. Some controllers don't do this and require a macro to specifically indicate what happens on button release. So, if you've used a multi-key sequence for your TRIGGER and you find that once you press the trigger, the guns never stop firing, this is probably why.

Propeller Axis -> Manual Radar Ranging

In addition to the MVAMS shortcut keys, the F-100D uses a Simulator Axis directly in the aircraft: Propeller (Pitch) axis is used to control the **Radar Range** when in manual mode. (On the real aircraft, this control is offered by a twist grip on the control stick which is not typically available on a USB joy stick). To take advantage of this capability, please map one of your USB game controller axes or rotary controls to the Propeller Axis. In FSX, for example, this is accessed in FSX -> SETTINGS ->CONTROLS->CONTROL AXES. Select the appropriate Controller type in the pulldown and in the Assignment List event 'Propeller axis', set your Axis assignment.

Saving Your Configuration Settings:

If you make any changes to the aircraft settings in the MVAMS screen, in order to save them (and consequently have them applied to the F-100D when you start a flight), you need to press the 'Save Defaults' key at the bottom right of the MVAMS screen. OTHERWISE, ALL IS LOST! (Note that the 'Save Defaults' button may not be visible unless you scroll down to the bottom of the screen.)



Once you've made your selections, settings are saved (committed to the f100d.ini file in the 'MVAMS\Configurations' folder) by pressing the 'Save Defaults' button. ALL settings (Default settings, Keyboard assignments and Weapon Loadout) are saved. Settings are retained on your computer and are read whenever the aircraft is loaded (or reloaded) into the simulator. If configuration updates made during a flight, they will not be reflected in the current session but will appear the next time the aircraft is loaded.

Changing Default Settings 'In-Sim'

The following 'convenience' functions are accessed via the 'in-flight' simulator **Menu Bar** under **Add-ons > F100-D**

Attach/Disconnect GPU: toggles a Ground Power Unit visual and fires it up (Note: GPU will NOT appear if aircraft is already running and disappears automatically once it is running)

Set/Remove Reds: toggles the exterior view 'Reds' visual on or off

Set/Remove Chocks: toggles the exterior view chocks visual on or off - if on, also asserts the parking brake

Show/Hide Ladder: toggles the exterior view ladder visual on or off

Show/Hide Pilot: toggles the exterior view of the pilot figure in cockpit visual on or off

Fold/Unfold Pitot Tube: toggles the pitot boom visual to be folded or straight.

Toggle Thunderstorm Light: Turns on thunderstorm light. Very useful in at night in a cold and dark cockpit to orient yourself.

Refresh Loadout: Resets all weapons, drop tanks & fuel, ammo and pylons to their state prior to any 'consumption'.

Note: To save valuable machine cycles so they can be used to enhance overall performance, there is minimal checking to validate the 'appropriateness' of a particular visual setting for a particular flight mode. If you want to fly at 300 knots with 'reds' showing, we won't stop you!

TacPack Integration

All users have the ability to configure and release bombs, use external drop tanks, fire guns, rockets and AIM-9 missiles, jettison station loads and pylons activate and manually range the A-4 gun sight - all with appropriate effect on aircraft appearance and performance.

TacPack users will enjoy some extended weapons system functionality and weapons visual and audio effects (and the ability to damage the simulated environment!).

Those with VRS TacPack running will also have:

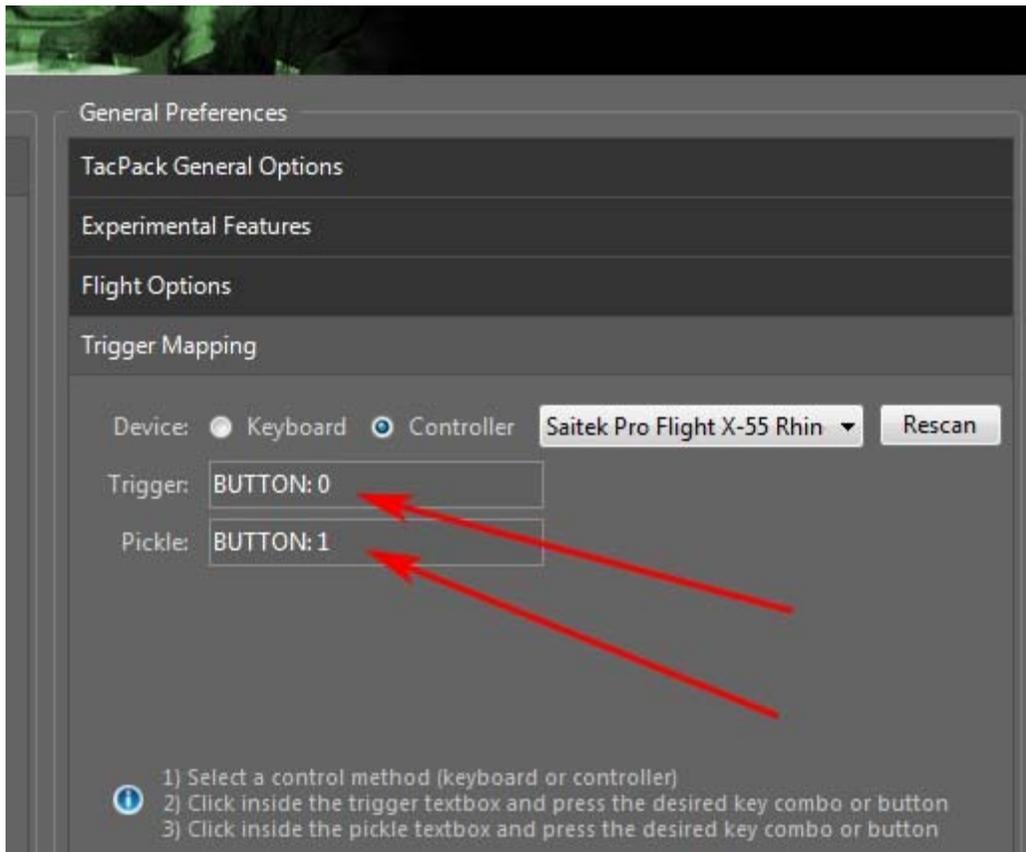
- 1) Ability to inflict damage on other aircraft and ground targets as appropriate to and provided by the TacPack weapons selected (Note that at the time of release, TacPack does not support all the weapons available in the F-100D MVAMS. If the exact weapon is not supported, a reasonably performing alternative has been substituted.)
- 2) Extended A-4 gun sight functionality including Radar target ranging.
- 3) Tanker tracking via TACAN and Air Refuelling.
- 4) Team play Friend/Foe support using the F-100D SIF/IFF system

Please note that our F-100D has been developed with an eye on smooth and efficient operation (FPS) but with the extended weapons fidelity and effects offered with TacPack, heavy use of weapons can seriously tax your system resulting in significant impact on frame rate. Continuous gun fire or rocket barrages are notable culprits. These impacts are transient and usually resolve when impact and explosion effects complete or you've distanced yourself sufficiently from the scene. As in real-life, try to limit yourself to short bursts and you should enjoy good performance.

Configuring for TacPack

The F-100D as installed, is ready to run with or without TacPack. If TacPack is not present, weapons systems will operate with the limitations described above. If it is present, it will detect this and offer the appropriate extended functionality automatically.

However, there is one aspect of configuration that users need to concern themselves with: game controllers. If you intend to operate the F-100D with TacPack, you should set your USB controller buttons or keyboard shortcuts for the Trigger and Pickle (aka Bomb Button) in the TacPack Trigger Mapping configuration screen. For example:



When this is done, TacPack will detect the trigger and pickle button press and release events and in turn, forward this to the F-100D simulation, and all is well.

It is recommended that the Trigger and Pickle assignments in the MVAMS Keyboard Assignments section be set to 'Unassigned' - or at least assigned to something different than those used in TacPack. This is obviously to avoid potential conflicts between TacPack and the MVAMS responding to device events.

While these steps are not essential for operating the F-100D's weapons, we feel that it's advantageous to keep consistent controller configuration for the trigger and pickle for all your TacPack enabled aircraft.

Starting the F-100D

There are several ways to get your F-100D's engine fired up, some easy, some harder (but not that hard!). Here are the basic steps necessary to get your F-100D's engine started:

Easy Start:

- 1) The easiest way to get the F-100D into the air is by selecting the 'Ready To Fly' toggle in MVAMS and save as you default. This way, when the aircraft is loaded into the simulator, it will proceed through the start-up sequence on it's own.
- 2) Almost as easy, if the aircraft is loaded in a 'Cold and Dark' state (or has been shut off after a flight), turn on the unlabeled toggle switch on the left hand console toward the rear (under the red cover). Turning this switch on will initiate the 'easy start' sequence. (But DON'T do it if you're already up and running! Yikes!)

From 'Cold and Dark'

1) GPU Start

- a) If the GPU is not already running, select ' Attach/Disconnect GPU' from the **Menu Bar** under **Add-ons > F100-D**.
- b) Battery switch - ON
- c) Engine Master switch - ON
- d) Wait for engine RPM to exceed 12%
- e) Start Button - PRESS momentarily
- f) Throttle - IDLE (if throttle is OFF, use a right mouse click on the Throttle to advance it to the IDLE position)

2) Cartridge Start

The cartridge system in our F-100D has an endless supply of cartridges, so this method is a reasonable alternative to using a GPU.

- a) Battery switch - ON
- b) Engine Master switch - ON
- c) Throttle - OFF (if throttle is IDLE, use a left mouse click on the Throttle to move it to the OFF position)
- d) Start Button - PRESS momentarily
- e) Throttle - IDLE (if throttle is OFF, use a right mouse click on the Throttle to advance it to the IDLE position)

Engine should start - as indicated by a rise in exhaust temperature, fuel flow and RPM. For flight instruments and systems to fully operate, the DC Bus and AC Bus switches should be set to ON (AC generator must be reset after engine is running to engage it.) Don't forget to set flaps, take-off trim and anti-skid brakes before take-off!

Air Start

A flameout (negative G flameouts can occur surprisingly quickly - in as little as 1.5 seconds at low altitude with afterburner) or pilot error might leave your aircraft hurtling through the skies without engine combustion.

If you're quick enough (you have about 10 seconds after the loss of combustion before the engine becomes too cool for this), an Immediate re-Start attempt is the way to go:

- a) Fuel Regulator switch - EMER
- b) Air Start switch - ON

It's a crap-shoot. Conditions have to be right and even then, it doesn't always work. But if it does, turn off each of the above switches, reset your AC Generator and continue on your way.

If the Immediate Start doesn't work, all is not lost. A regular Air Start attempt can still be made.

- a) Fuel Regulator switch - NORM (if you set it to EMER due to an immediate restart attempt)
- b) Air Start switch - ON
- c) Throttle - IDLE (if throttle is OFF, use a mouse click on the Throttle to advance it to the IDLE position)

This is also a percentages game, requiring appropriate conditions (altitude, airspeed) to optimize your chances. It may catch immediately, or may take upwards of 30 seconds for ignition to occur. (A tip if it doesn't catch after a suitable wait - advancing the throttle and bringing it back to idle will give you another roll dice).

If this doesn't work, and you still have time, you can always try a cartridge start, since they're unlimited in our simulation.

If you are unsuccessful at an Air start and you're getting too close to the ground, look for a nearby strip and brace for a hard landing!

Takeoff and Landing

Proper takeoff and landing technique is described in detail USAF Flight Manual, but here's a couple of tips: The F-100 takeoff is typical done with after burners, use of which is maintained until the aircraft reaches the desired cruising altitude and speed. The aircraft is designed to achieve high speed (capable of mach flight above 15000 ft), but those goals mean the low speed performance is sluggish and twitchy. Watch your air speed - particularly on landing approach! Charts for recommended take-off and approach/landing speeds for various aircraft weights are included in the reference material at the end of this manual.

Weaponry and Station Loads

The F-100D was truly a 'weapons delivery platform' with a wide array of weapons available to it during it's career. If you're feeling aggressive, we've included the following selection of simulated weapons and tank options for your enjoyment:

4 M39 20mm Cannon

Inboard Wing Stations:

Pylon
AIM-9B x 2, plus rack
200 Gallon Drop Tank
Blu-1/B 750 lb. Firebomb
Mk82 500 lb. general purpose bomb
Mk82SE 500 lb. Snakeye bomb
M117 750 lb. general purpose bomb

Middle Wing Stations:

Pylon
335 Gallon Drop Tank
Blu-1/B 750 lb. Firebomb
Mk82 500 lb. general purpose bomb
Mk82SE 500 lb. Snakeye bomb
M117 750 lb. general purpose bomb

Outboard Wing Stations:

Pylon
Blu-1/B 750 lb. Firebomb
LAU-32/A Rocket Launcher
LAU-3/A Rocket Launcher
Mk82 500 lb. general purpose bomb
Mk82SE 500 lb. Snakeye bomb
M117 750 lb. general purpose bomb



Using Weapons (A quick tour)

In this section, we'll summarize how to use the weapons and related systems. For details on weapons operation, please consult the accompanying USAF Series F-100D Flight Manual. Some features are only available to TacPack users, but weapons are enabled in the same manner whether or not you're using TacPack.

Configure weapons in MVAMS

In order to fire a weapon, your aircraft must be loaded with it. Make sure you have the necessary weapons and ammunition on board! Refer to the MVAMS section (above) for weapons loadout configuration. If necessary, you may reload your weapons with the 'in-flight' simulator **Menu Bar** under **Add-ons > F100-D 'Refresh Loadout'** button. (Use of this may function be limited by TacPack team player restrictions).

M39 20mm Cannon

Very simple! As with all the weapons, your F-100D needs to be in the air and have electrical bus power for the guns to fire. To enable guns, set the trigger safety switch (top center of the main instrument panel, under a red cover) to the upper 'Guns-Camera' position. Pull the trigger on your HOTAS. This fires four M39 cannon simultaneously for loads of fun and destructive power! Firing will continue until you release the trigger (or you're out of ammo).

Of course, to hit anything, you'll want to be aiming with the A-4 Gun Sight. See below for how basic operation.



AIM-9B 'Sidewinder' Missiles

The AIM-9B is an early incarnation of this ubiquitous heat seeking air-to-air missile. Setting up and using it is a little more involved than cannon, and as you'll see below, is somewhat unreliable.



To use this weapon, locate the AIM-9B 'MISSILE CONTROL' panel (left, rear console) and set 'MISSILE MASTER' knob to 'Ready'. Put your trigger safety switch into the 'Guns-Missiles' position. At this point, if there's a AIM-9B queued up and ready to fire, you see the AIM missile status light (right hand side above main instrument panel) illuminate with the selected missile indicated. TacPack users will also hear the infamous AIM missile seeker 'growl' (a low growl tone if there's no target lock, a high tone if there is a lock). Pull the trigger on your HOTAS to fire the missile. It will fire regardless of a seeker lock, so don't waste it! The next missile in the sequence (if there is one) will be automatically queued up for firing.



Early AIM-9s must have been frustrating for pilots - as you'll find the simulated AIM-9Bs to be! Seekers can be easily fooled by the sun and be blocked by clouds. And even if you're in the optimum firing position (suitable range selection will come with practice), the odds of taking down a target are only about one in four, due to the following limitations:

- Seeker works at a maximum of 10 degrees off tail of target
- Launch G must be less than 2G
- Probability of motor failure: 28%

- Probability of guidance failure: 60%
- Probability of fuze failure: 20%

Rockets

Originally intended for air-to-air encounters, their inaccuracy made hitting a precise target difficult even at close range. However, they proved to be useful air-to-ground weapon... and fun to use!



To configure your rockets, locate the bomb panel (left console mid-rear) and set the 'ARMAMENT SELECTOR' knob to the 'ROCKET - FIRE' position. Turn the attack 'MODE SEL' knob to the 'MANUAL' position. Finally locate the 'RKT SET' toggle switch just above it and switch it from OFF to either 'ALL' or 'SINGLES'.



To fire rockets, press the Pickle (Bomb Button) on your HOTAS. If the rocket set switch is set for SINGLES, one rocket will fire. If it is set for ALL, rockets will be fired continuously, on a timed release (at about 1/10 of a second intervals) for as long as the Pickle button is held (or you're out of rockets).

Bombs and Fire Bombs (Napalm)

Our F-100D can be equipped with Mk82 general purpose 'dumb' bombs, Mk82SE 'Snakeye' bombs or the larger M117 general purpose bomb. Regardless of which type is configured, the setup and release controls work the same. To set up for bombs release, locate the bomb panel (left console mid-rear) and set the 'ARMAMENT SELECTOR' knob to one of 'BOMB SINGLES', 'PAIRS' or 'SALVO' as desired.

We're can also be equipped with Napalm. To set up for Napalm release, set the 'ARMAMENT SELECTOR' knob to NAPLAM REL & TANK JETT OUTBD, INTERM or INBD depending on which station pair you wish to released.



Turn the attack 'MODE SEL' knob to the 'MANUAL' position. Your bombs can now be dropped. However, if you want them to explode on impact rather than simply falling to the earth, locate the 'BOMB ARM' toggle switch and move it from SAFE to either 'NOSE & TAIL' or 'TAIL ONLY'.



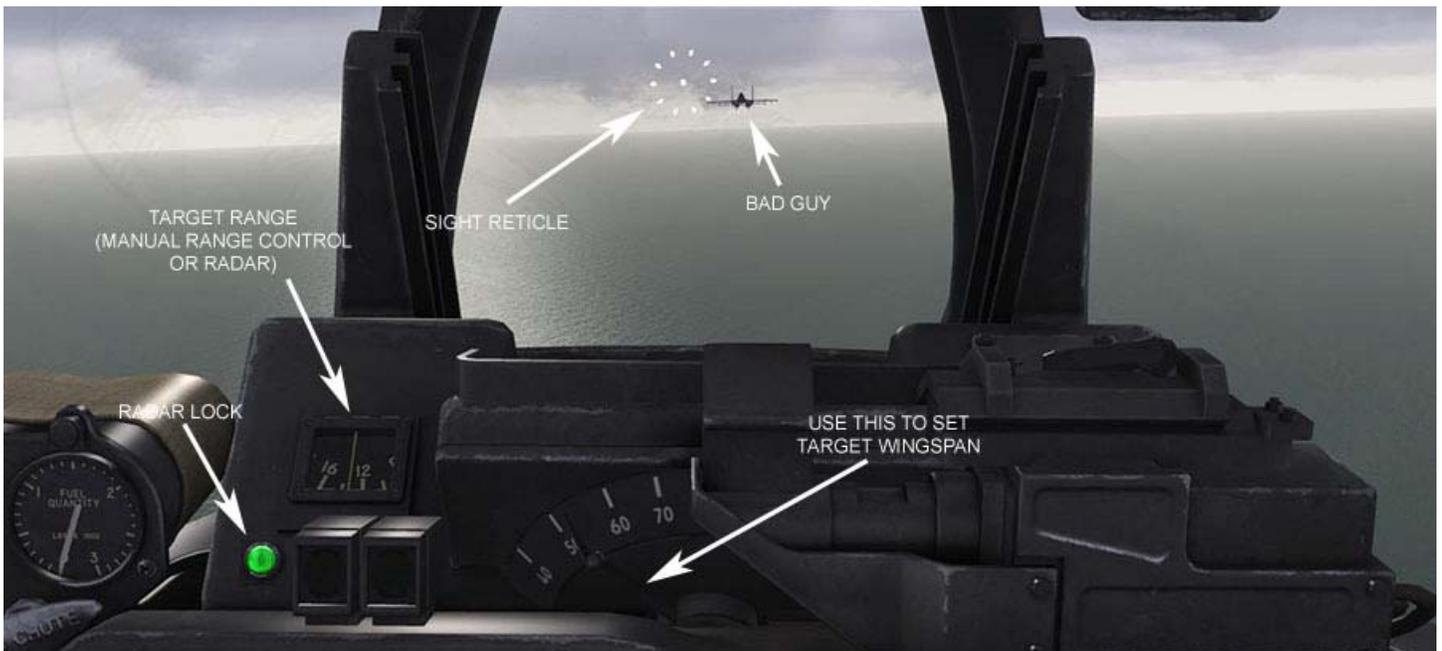
To release a bomb(s) or a the selected pair of fire bombs, press the Pickle (Bomb Button) on your HOTAS.

If you're dropping bombs (not fire bombs), one or more bombs will be released as per your Armament Selector setting. Note that outboard bombs, if configured, are released first and in pairs, even if the selector is set to Bomb Single. Release order is selected automatically. Consecutive Pickle button presses will release the next single or bomb pair until all bombs are dropped.

A-4 Gun Sight

The F-100D is equipped with the A-4 gyro Gun Sight. This sophisticated piece of kit accepts inputs from various controls and sources to put the target right in your bead: Simulated gyros provide Azimuth and Elevation offsets to correct for aircraft motion, Radar or the Manual range control is used to set target range, target speed and weapon type are set through control inputs.

Operation, briefly: Use the lever on the gun sight to set the target wingspan (in feet - assuming you know what sort of target you'll likely encounter). This sets the diameter of the gun reticle so that it matches the target size for a specific range. This serves two purposes - 1) when manual ranging, you'll know you have the correct range set when the target wingspan matches the reticle diameter. 2) when using radar ranging, you'll have a sense of whether the radar is locked on to the target you think it is, or some other target you're not aware of (such as the ground).



The A-4 operates in 2 modes that are selected with the 'MODE SELECT' knob on the weapons panel (see photo on the previous page). The A-4 is off with the mode select in the 'OFF' position. In the 'SIGHT & RADAR' setting, radar ranging is engaged. In 'MANUAL' position, manual ranging is engaged. These settings imply that Radar Ranging is intended to use primarily with Guns, while rockets and bombs (and guns too when radar ranging is compromised) would use manual ranging.

The gun sight target range dial is located on the left side of the sight and indicates the range (in 100's of feet) that the gun sight is using. When the mode select knob is set to 'MANUAL', the range is manually input using the Propeller Axis control you set up on your controller when you installed the F-100D (right!?) Manual setting is limited to a maximum of 2700 feet. When manually ranging, you'll notice that the reticle diameter changes as you alter the target range (within the constraints of the display). This is where correctly selecting a target wingspan is important - when the target just fits in the reticle, you know you're in range.

Below the target range dial is the Radar Lock indicator. It is lit when a target is detected by the radar system. The radar system can detect targets at distances of between 700 feet and 9000 feet, subject

to the constraints of range sweep and radar reject described below. Note that radar ranging is inoperative for non-Tackpack.



These controls, located on the left hand console near the bomb panel, also influence the gun sight. Set the SIGHT SELECTOR as desired (default position is 'GUNS'). Set the TARGET SPEED as follows: If your target is another aircraft going about the same speed as you, set it to 'HI'. If it's considerably slower or stationary, set it to 'LO', if it's somewhere in between, use 'TR'. Default position is 'TR'.

Set the SIGHT DIMMER as desired for a suitable reticle brightness. Note that when you have a Radar Lock, the reticle will go to maximum brightness regardless of this setting.

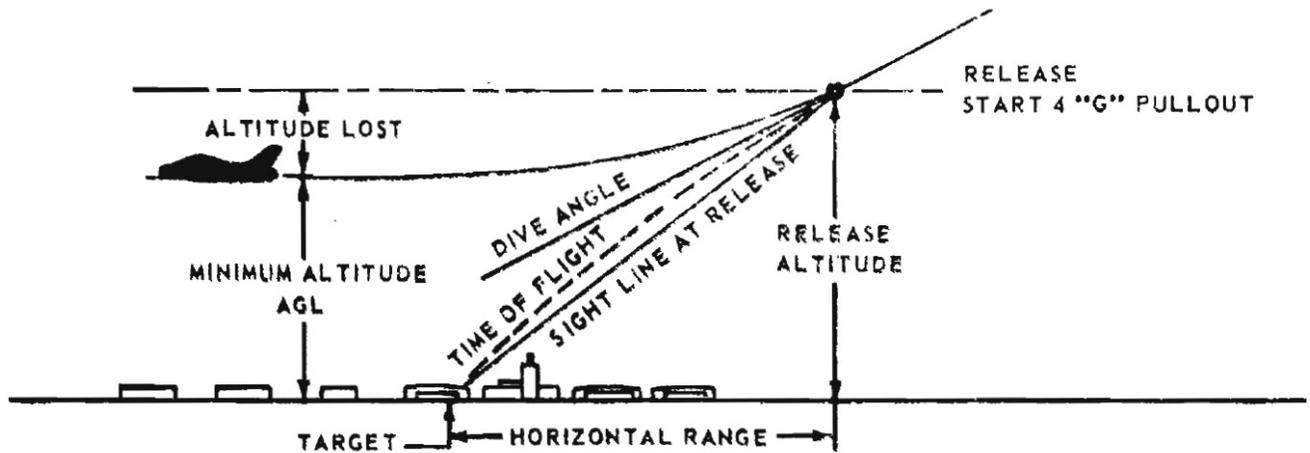
The radar range control can be very important. The F-100D radar system is rudimentary - it has a wide aperture and is **highly susceptible to ground clutter**. The 'RANGE SWEEP' control allows the radar's range to be limited from it's maximum range of 9000 feet down to about 2700 feet. Lower settings are used for lower altitude encounters to remove ground clutter. Below about 3000 feet, manual ranging should be used.

The RADAR REJECT button (this function enabled through your HOTAS when mapped via MVAMS, not available in the VC), is analogous to the radar range, but instead limits the minimum range of the radar system. The radar will always report on the closest target it encounters. In some situations, you may not be interested in that target. Say your wingman is going after one of a pair of bandits, and you're interested in another who's a little further out. When you're locked onto the target you wish to reject, a button press will set the minimum range to just beyond that target, allowing you to get a lock on the further target. You can continue to 'reject' targets until there are none in range, then the reject range will reset on the next press. Note that if you've rejected a target, but it's pulling away from you, it may repeatedly be reacquired as it exceeds the minimum rejection range you have set.

Bombing Targets using the A-4 Sight

In modern times, bomb sights typically automatically compute a bombing solution for the selected ordinance and target. Not so with the F-100D's rudimentary system. Missions were flown using predetermined profiles with pre-calculated bomb targeting solutions. Based on the loadout, release altitude above ground level, dive angle and speed, the pilot sets up the altimeter and the sight depression angle (the difference in the dive angle and the sight line, measured in milli-radians) so that when his piper is on the target, he'll get a hit.

Bombing is divided into two categories - level flight and dive delivery. Mastering the technique is challenging. A steady flight path and precise release timing is key to success.



Ground Attack – Bomb Delivery

Typical steps for the F-100 pilot in setting up for a bombing mission are as follows:

1. Zero the altimeter for the target altitude
2. Select the desired Armament as per the loadout
3. Set Sight mode select knob set to 'MANUAL'
4. Set Sight Selector to Bomb
5. Consult the Bombing solutions charts (see reference material - pre-computed Bombing Solutions) and based on the desired mission profile (Speed, Dive angle, Release Altitude AGL) set the sight Rocket Depression Angle.
6. Arm Bomb!

Fly the mission as prescribed and when the target is in your sight, press the Bomb Button on your stick to release the Kracken.

Our ASAF military pilots tell us a VERY typical dive bombing profile was to approach the target area at 10,000 feet. Dive to 30 degrees and release the ordinance at 500 knots IAS, 3000 ft AGL. Two seconds after release, a 4G pullout should ensure a minimum altitude of 1500 feet.

So as an example, you wish to use MK-82 500 lb. bombs on your target using the aforementioned mission profile. Refer to the Bombing Solutions **MK-82** chart at the end of this manual. Locate the line which reads:

IAS	Dive Angle	Release Alt AGL	Depression Angle-mil
500	30	3000	140

Set the Rocket Depression Angle dial to 140. This lowers the sight reticle 140 milli-radians, or about 9 degrees, from the center line and is calculated so that the release of MK-82 at the prescribed conditions will place it on the target.

High speed, low altitude level bombing runs are also great fun, so solutions for various speeds at zero dive angle have also been included.

Multi Player Team Identification

The SIF/IFF panels (about mid-way down the right hand console) function has been slightly modified in the simulated F-100D so they can be used for TacPack team playing in conjunction with the IFF caution light (Front right panel). To use this capability, set your ID on the SIF panel rotary dials as follows:

- Outer Left Dial - Most significant digit determines team membership
- Inner Left Dial - Determines MODE4 Datalink sub-team membership
- Outer Right Dial - Determines package/flight membership
- Inner Right Dial - Determines specific ID inside of a package/flight



For example, if a participant code is set to 7362 (selected digits are at the TOP of the dial - the dial is set to 0000 in the photo), they are on team 7, sub-team 3, package/flight 6, and ID 2. To set this, click or roll the mouse wheel on the outer left-hand ring until the 7 is at the top, set the left hand inner ring to 3 and so on.

To activate the system, set the IFF panel 'MASTER' knob to any of the 'LOW', 'NORMAL' or 'EMERGENCY' positions.

Once activated, this system works in conjunction with the Radar system to indicate if a potential radar target is a Friend (not IFF Caution Light) or a POSSIBLE Foe (IFF Caution).

Air Refuelling

Simulated air refuelling is both fun and challenging. TacPack users enjoy the ability to track an airborne refuelling tanker with the TACAN system and simulate taking on fuel.



To take on fuel with TacPack, you need navigate your F-100D such that your refuelling probe is in the vicinity of the tanker boom/drogue basket. (How close this needs to be is configured in TacPack Tanker configuration). The aircraft will continue to take on fuel as long as you are 'connected' to the tanker (i.e. remain within the distance configured for the tanker) until the tanks are full. There is no indication that you're taking on fuel other than rising fuel level on your fuel gauges. If you have 350 gallon drop tanks, you must also turn on the 'AIR REFUEL' switch (forward, left console) or they will not fill! Internal tanks will fill regardless of the switch position, as in the real aircraft. Note that the rate our simulated F-100D takes on fuel is slightly accelerated. Once completed, turn off the Air Refuel switch and carry on.

Non-TacPack users can refuel in the air, but using a simplified method. You may replenish your tanks at any time by turning on the AIR REFUEL switch. When you've reached the desired fuel level, turn off the Air Refuel switch and carry on.

Alternative Flight Model

While most pilots grew to love this aircraft, the F-100D was a challenging aircraft to fly - sluggish response at low speed and some nasty characteristics, such as a wicked adverse yaw. We've tried to recreate these behaviors in our simulation to make flying it both fun and challenging. But some pilots may find it too challenging and maybe not so much fun. To accommodate this, we've included a more relaxed flight model with reduced adverse yaw tendency. It's still challenging and gives you a sense of the idiosyncrasies of the F-100D, so no shame!

To use the relaxed model requires a bit of manual editing of the aircraft.cfg to substitute the relaxed flight model airfile for the default one:

- 1) Navigate to the **Milviz F-100D** folder your SimObjects\Airplanes\ folder.
- 2) Open the **aircraft.cfg** with a text editor (such as notepad). You may wish to make a backup copy first!
- 3) For EACH F-100D aircraft instance (i.e. [fltsim.0], [fltsim.1] ...) that you wish to alter, uncomment (delete the leading '/') the relaxed airfile reference (sim=) and comment out the default version:

[fltsim.xx]		[fltsim.xx]
title = North American F-100D FW-796		title = North American F-100D FW-796
sim=F100D_1v1	=>	//sim=F100D_1v1
//sim=F100D_relaxed	=>	sim=F100D_relaxed
model=		model=
panel= ... etc		panel= ... etc

Save the file with your changes and restart the simulator.

Note that for TacPack Multi Player, the aircraft is signed using the standard airfile. The Relaxed version will not pass TacPack verification and may result in you being ineligible for multi-player combat with the relaxed configuration.

Cockpit Controls Status

The MilViz F-100D simulation, while extensive, does not offer full functionality for every single control, gauge or system that occurs on the real-world aircraft. In almost all cases, the controls move or behave in the expected manner. However, with some, there's little functionality behind it due to practical limitations in the simulation environment, exceptional difficulty or lack of utility in providing it, or simple because our aircraft configuration options simply don't require it.



This section is intended to identify items that are non-operative in the simulation at this time. This way, you won't be left wondering why flicking a switch or pushing a button appears to do nothing more than click or move.

Inoperative Controls/Systems (from left-rear console to right rear console):

- Camera Controls
- Pylons Loading Selector Switches
- LABS and LADD bombing modes (on MODE SEL knob)
- Reset Rocket Interval switch
- CHEM & SUU position selector knob (weapons not available)
- Throttle friction control
- AGM-12B Missile Controls (weapons not available)
- Rudder Hydraulic system test switch
- Special Stores Emergency Release Button (no special stores)
- LABS Yaw/Roll Gyro Check (LABS system not implemented)
- Special Stores Emergency Release handle (no special stores)
- DCU-9/A special stores controls (no special stores)
- LABS and Release Timer knobs
- Foot Warmer
- Control stick buttons
- LABS release light
- LABS ROLL/CLIMB indicator
- ADF Ant/Loop controls
- IFF Mode and Mic controls (panel customize for TacPack team player use)
- Position lights Dim/Bright switch
- Gyro Compass panel
- Face mask anti-frost
- Cockpit Temperature Control (TBD)

For details on instrument, controls and aircraft operation, please consult the accompanying USAF Series F-100D Flight Manual.

Reference Material

F-100D Takeoff and Landing Speeds:

TAKE-OFF SPEEDS

GROSS WEIGHT— 1000 POUNDS	NOSE ROTATION SPEED—KNOTS IAS		TAKE-OFF SPEED— KNOTS IAS
	FLAPS UP	INTMED FLAPS	
26	135	135	150
27	135	135	150
28	138	135	153
29	140	135	155
30	143	135	158
31	145	135	160
32	148	138	163
M 33	150	P 140	Q 165
34	152	142	167
35	155	145	170
36	157	147	172
37	160	150	175
38	162	152	177
39	165	155	180
40	165	155	180

LANDING SPEEDS

GROSS WEIGHT — 1000 POUNDS	FINAL APPROACH SPEEDS — KNOTS IAS	TOUCHDOWN SPEED — KNOTS IAS	MINIMUM CONTROL SPEED (POWER OFF) — KNOTS IAS
22	158	135	128
23	161	138	131
24	163	141	133
25	166	143	136
26 P	169 Q	146 R	138 S
27	172	148	140
28	174	151	143
29	176	153	146
30	179	156	148
31	181	158	150
32	184	160	152
33	186	163	154
34	188	165	156
35	191	167	158
36	193	169	160

Bombing Solutions:

MK-82

IAS	Dive Angle	Rel Alt AGL	Dep Angle-mil
350	0	200	165
400	0	400	175
450	0	400	155
500	0	500	150
500	0	700	170
550	0	1000	175
600	0	1000	160
500	10	1500	165
500	20	2000	145
500	30	3000	140
500	40	3000	110
500	45	3000	100
500	45	5000	95

MK-117

IAS	Dive Angle	Rel Alt AGL	Dep Angle-mil
350	0	200	165
400	0	400	175
450	0	400	155
500	0	500	150
500	0	700	170
550	0	1000	175
600	0	1000	165
500	10	1500	165
500	20	2000	145
500	30	3000	140
500	40	3000	110
500	45	3000	100
500	45	5000	100

MK-82SE

IAS	Dive Angle	Rel Alt AGL	Dep Angle-mil
350	0	200	175
400	0	300	155
450	0	300	145
500	0	300	135
500	0	400	150
550	0	500	155
600	0	500	140
600	0	600	155
500	10	1000	160
500	20	2000	160
500	30	3000	160
500	40	3000	140
500	45	3000	120
500	45	5000	145

BLU-1/B

IAS	Dive Angle	Rel Alt AGL	Dep Angle-mil
350	0	200	165
400	0	400	175
450	0	400	155
500	0	500	150
500	0	700	170
550	0	1000	175
600	0	1000	165
500	10	1500	165
500	20	2000	145
500	30	3000	140
500	40	3000	110
500	45	3000	100
500	45	5000	100



Solution not recommended due to proximity to detonation or pullout safety margin