SHADE TREE MICRO AVIATION

U-2S DRAGON LADY

STMA

Pilot's Operating Handbook

AIRCRAFT & PLUGIN FEATURES

U-2S, APRIL 2011 for X-Plane V10

Introduction

A Very Short History (Reference – Aerofax Minigraph #28, Lockheed U-2R /TR-1 by Jay Miller and Chris Pocock)

The U-2 was first flown on August 1, 1955 after development by Clarence "Kelly" Johnson's "Skunk Works" team at Palmdale, California. The U-2 has seen many improvements but its longevity is owed to the fact that it is, without question, the ultimate high-altitude subsonic aircraft. The success of the early models led to the conduct of thousands of surveillance missions with the 56 original airframes. Unfortunately, its difficult handling characteristics claimed over 40 airframes and many lives of the volunteers who flew them. The program's mission success increased demand of the capabilities and so, the second generation U-2 was developed. The second generation aircraft was larger by 40%. The fuselage was enlarged which allowed more space for the pilot to wear a full pressure suit and for the bays to carry larger sensor packages. The second generation aircraft was known as the U-2R and alternatively as the TR-1. The latest version, the U-2S has a glass cockpit and clear front windscreen as well as improved engine.

Specifications (Reference - http://www.blackbirds.net/u2/u2specs.html)

- Construction: Conventional aluminum monocoque, with some composites
- Length: 63.1 feet
- Wingspan: 104.8 feet
- Wing Area (gross): 1,000 square feet
- Height: 16.7 feet (at tail)
- Empty Weight: Classified
- Maximum Takeoff Weight: 40,000 lb.
- Maximum Speed: over 430 mph
- Operational Ceiling: over 70,000 feet
- Maximum Unrefueled Range: over 3,000 nautical miles
- Armament: none
- Powerplant Data: U-2S: General Electric F118-GE-101 with 18,300 pounds thrust

STMA's U-2S model is designed to be flown by any X-Plane user. The model replicates U-2 flight as accurately as possible based on descriptions and inputs from experienced operators. The aircraft is a pleasure to fly when the guidelines are followed and a difficult challenge when the flight envelope is exceeded. We have designed the craft to be ready to fly on initialization and there is very little to do before taking to the air. In fact it flies just fine by advancing the throttle and getting airborne.

For the more demanding fliers the cockpit functionality is recreated as much as possible given two very real limitations. First, information about the U-2 is very limited. Second, X-Plane does not allow some of the functionality of the aircraft as designed. The aircraft model was developed for the most part from information in *Aerofax Minigraph #28 – Lockheed U-2R/TR-1* By Jay Miller and Chris Pocock, published by Aerofax, Inc. of Arlington Texas and distributed by Motorbooks International of Osceola, Wisconsin. Additional information was gleaned from *50 Years of the U-2 – The Complete Illustrated History of the "Dragon Lady," by Chris Pocock* and published by Schiffer Publishing of Atglen, Pennsylvania. The cockpit was developed from various pictures available on the internet. We are extremely grateful for the dedicated scale modelers at Hyperscale (*www.**hyperscale**.com)* and the many airshow enthusiasts who have posted their photos on the internet. Without the complete collection of information, this model would have been an insurmountable challenge.

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Chapter 1 – Systems

Section 1 - Aircraft Exterior

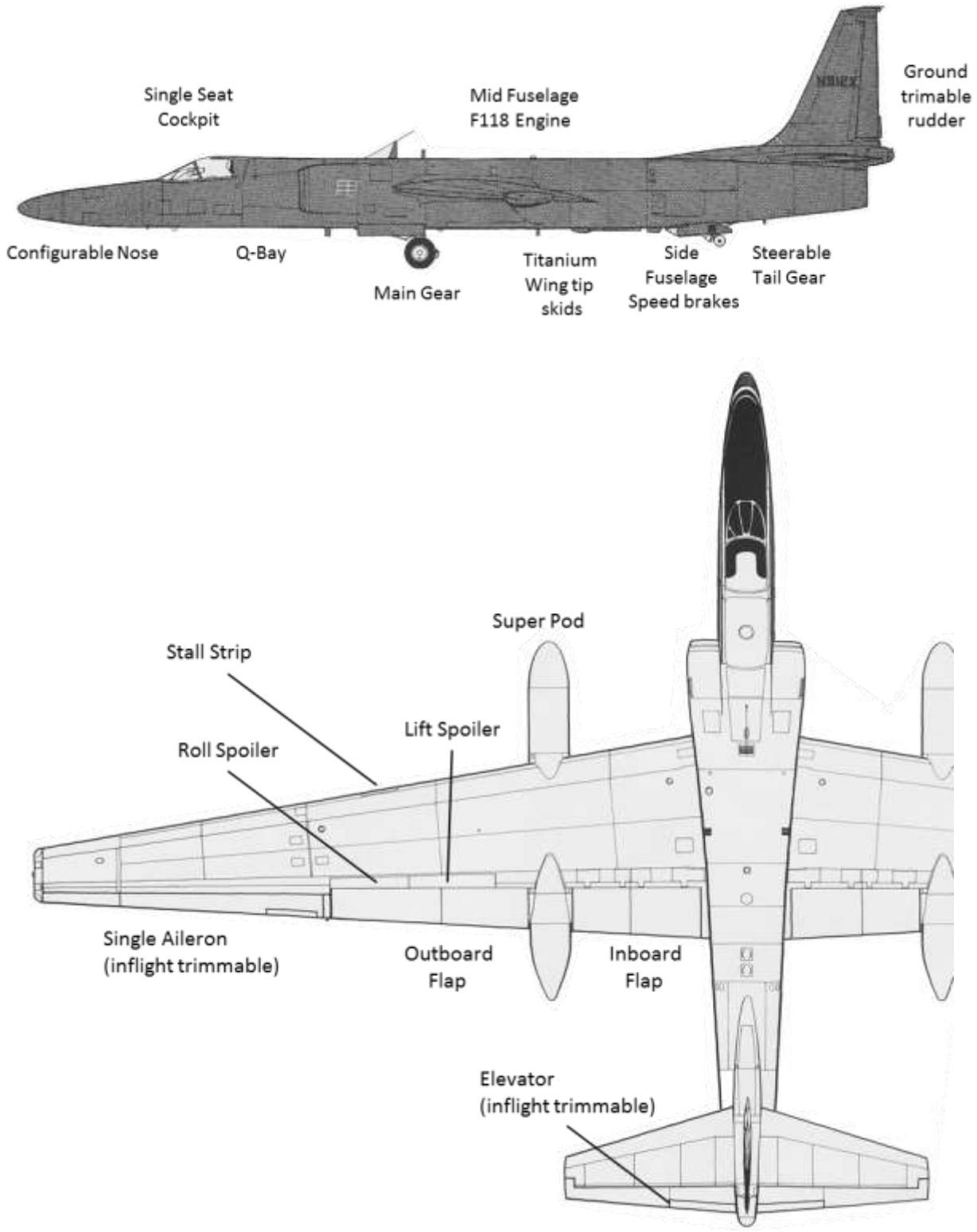


Figure 1. Aircraft External Configuration and Systems

Figure 2. U-2 Temporary Pogo Gear

Before takeoff temporary pogo gear are attached under the wing. Pogo gear are configured to drop off on takeoff at 80 knots. For a realistic landing, the STMA plugin controls gear status to inhibit pogo presence until after the aircraft is on the ground for one minute. This allows you to experience the bicycle tail dragger landing all the way to the full stop. Keep the wings level as long as you can and then a wing tip will settle to the runway.

Figure 3. U-2 Flight Control Surfaces Post Landing (before Pogo installation)

After landing with full flaps, speed brakes deployed, full spoilers out, and resting on the wingtip. This view shows the flight control animations for the main surfaces. Aileron and elevator trim tabs function with trim input. One minute after you land the pogo gear will automatically reinstall for taxi in.

Section 2 – System Operations

The U-2S is powered by a single GE F-118 non-afterburning engine. The engine accessory gearbox drives main and standby electrical generators and the hydraulic system. The electrical system powers mission equipment, flight instruments, trim, and certain systems control functions.

The hydraulic system operates at 2800 psi nominally and provides power for gear extension and retraction, flap operations, and spoiler and speed brake actuation. The primary flight controls are manually operated through cable and pulley systems.

Upon initiation of the aircraft in X-Plane, systems are operating in the before takeoff mode. You can fly immediately and no harm will come to the aircraft due to a misplaced switch. For the more demanding enthusiast, follow checklist procedures in the last chapter of this manual. As in most military checklists, each phase is accomplished around the cockpit from left to right.

The U-2 is designed with a GUST system to reduce wing loading and potential damage in turbulent conditions. The GUST mode has two settings – GUST and Faired. When initialized, the GUST mode is set to GUST. You can verify this by seeing the flaps raised 6 degrees above their streamline position. For takeoff and operations in turbulent conditions, GUST should be used, but will degrade climb performance slightly. For optimum climb in smooth air and anytime above 45,000 feet, GUST mode should be set to FAIRED. This is accomplished by setting the flap setting to the first detent or zero degrees.

Systems operations in the U-2 are mostly automatic and require very little intervention by the pilot. The aircraft's fuel system consists of five tanks – four in the wings and a sump tank in the center that feeds the engine. Fuel is pressurized at 1.5 psi in the wings to cause automatic transfer to the center sump tank. Tank boost pumps and fuel dumping is only required in the event of automatic system failure. Transfer switches in the model are not functional The cabin pressure and Q-bay pressure system is automatically controlled to maintain pressure differential as the aircraft climbs past 7500 feet MSL. The Q-Bay is where your camera rides and it needs pressure and temperature control to work properly.

The autopilot system is essential to U-2 flight operations and modeled as closely as possible to the real Lear autopilot system on the aircraft. Because the U-2 flies in a very broad envelope of the atmosphere, the autopilot is optimized for flight above 50,000 feet MSL. Because of X-Plane autopilot functionality assumptions, the AP does not work correctly for climbs at lower altitudes and like most tactical military aircraft there are no coupled approach capabilities. The AP also reacts poorly to turns at lower altitudes and will overshoot the desired heading several times before settling on course. It is recommended that you fly the aircraft manually below 50,000 feet on climbs, descents, or maneuvering for approach. You can help stop a turn with aileron, but trim disconnects AP. The autopilot uses Speed mode in cruise which causes the aircraft to climb slightly throughout the mission as fuel is consumed. It will settle at about FL680 initially. Set the ALT to FL860 and forget it once you have commanded the climb above FL500. Horizontal navigation is available using the HDG and NAV functions. The AP can be linked to FMS flight plans the same as other X-Plane aircraft.

In the first rendition of this model we have prioritized effort on modeling the aircraft flight characteristics and cockpit functionality. The displays lack multipage functionality because there is very little information on MFD functions other than what we have seen in pictures posted by Lockheed, the US Air Force, or other sources available on the internet. More information on cockpit functionality is available in the next section.

Section 3 – Aircraft Interior

Figure 4. U-2S Cockpit Layout

The picture above shows the layout of the U-2S RAMP cockpit and the major subpanels modeled. The left and right circuit breaker (CB) panels are not functional and will not be discussed further. The STMA U-2 initializes to a 3D cockpit . No provision for a 2D cockpit exists. You will need to select 3D and pan down to see the full panel.

The Speed/Altitude Schedule placard is located on the left canopy rail and describes the speed limits in KCAS and MACH related to altitude. The placard also shows GUST and non-GUST airspeed limitations. You will need to be in very high resolution rendering to be able to read the placard.

The AOA indicator at the top of the glare shield is optimized for landing operations and shows recommended approach speed capture by showing the centered green "donut." The AOA optimization occurs at approximately one half fuel load equating to 90-95 knots. The aircraft initializes with three quarters fuel load. Landings are still comfortable using the AOA indicator at this load but approach should favor 95 knots.

A standard landing will touch down about 68-70 knots with the nose high enough to cover the runway. You are in a tail dragger afterall!

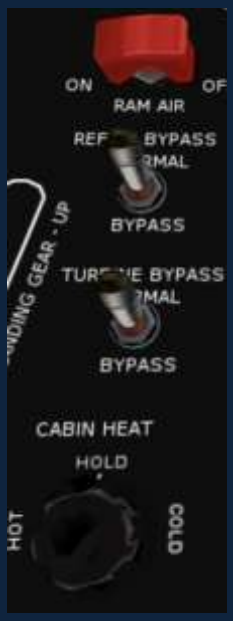
Now let's take a tour around the cockpit in standard USAF fashion – from left to right.

The Engine Control Panel contains the master fuel shutoff valve red-guarded switch, the emergency start system switch, and the engine mode switch. The master fuel shutoff valve closes off all fuel flow to the engine compartment. The emergency start system, when activated provides air start capability when airborne. The Engine mode switch determines X-P FADEC operation and is critically important for U-2 flight operations. The switch will initialize in the PRI (primary) position. This position enables the FADEC. The SEC (secondary) position enables manual engine control. In this position, the aircraft is grossly overpowered at low altitude and routinely compressor stalls, rolls back RPM, or quits completely at high altitude.

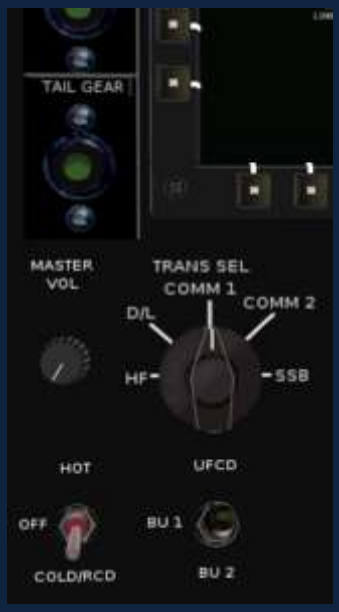
The ***O2 control panel*** is just there for show. If you get hypoxia when flying in X-Plane stop holding your breath!

The COMM Radio panel is located on the lower left console and contains COMM 1 and COMM 2 control heads. These are standard X-P radios and function like any other model. Immediately to the right of the COMM radio set is the transponder (also known as the IFF in military aircraft). The transponder is X-P standard equipment and the comm/nav select panel is also X-P standard.

The Left Side Switch panel is immediately to the right of the left circuit breaker panel. The bottom row and right column of switches are all animated but create no effects in X-Plane. The cluster of four light switches in the upper left of the panel control exterior lighting. The left NAV light controls X-Plane strobes and the right NAV light controls the brightness of the NAV lights. The Anti-collision beacon switch controls the top and bottom rotating beacons. The landing light switch controls the landing lights mounted on the main gear (front). The landing light switch initializes to the OFF position. For tactical missions all lights should be OFF or DIM.



The Environmental Control panel to the right of the gear handle directs ram or bleed air to control cockpit pressure and temperature. The system initializes with the ram air switch in the OFF (guarded) position and the two bypass switches in the BYPASS position. In X-Plane these don't affect operations, but in reality you would want both switches in the NORMAL position for automatic environmental control. Turning RAM air ON will give you a RAM caution light.



The Radio Select panel is animated for checklist completion. COMM audio selection can accomplished here or on the back COMM panel. Immediately above the select panel are the main and aft gear indicators. These indicate dark when the gear are up, light green when the gear are down and locked, and red/white striped when the gear are unsafe. When the STMA plugin sets a realistic POGO configuration in X-Plane, the red/white striped indicator will serve to indicate that the POGOs are inhibited before landing. For more on POGO operation see Normal Flight Operations chapter.

The Interior Lights panel provides control of 3D lighting inside the cockpit. Each of the three infinitely adjustable wafers control the options noted on the labels. Additionally, a functional AOA gauge for cruise flight is available to ensure optimum performance.

The upfront control panel of the U-2 allows the pilot to select COMM and NAV frequencies on all radios, adjust HDG and OBS in macro and fine tuning modes, adjust barometric pressure for the altimeter, and fine adjust AIRSPEED for the autopilot function. The knobs to the left of the UFC provide macro OBS (outer) and macro HDG (inner) adjustments. Each UFC button has clickable left and right functionality for the function shown under the number. The four vertical buttons beside the COMM/NAV frequency display flip the frequencies from adjust (right) to the one in use (left).

The left MFD provides standard X-Plane EFIS functionality. The Mode button selects the display mode by pushing multiple times until the desired display is found. The buttons on the bottom display or inhibit the various navigation, weather, and TCAS modes found in X-Plane. The range scale is changed using the RNG up and down buttons.

Each MFD has individual brightness adjustment through the knob on the upper right bezel. These are mechanized for infinite scale although the label indicates a three position mode.

The center MFD functions as the primary flight display with "standard six" functionality except the turn coordinator. Turn coordination in the U-2 is accomplished by referencing the yaw string that trails back from the canopy bow above your head. Yes, it actually works and you will note that the U-2 requires a lot of rudder to coordinate the roll. Autopilot setting control is available on both left and right sides with the arrow keys. Speed is adjusted on the left and altitude can be adjusted on the right. The inner keys move in increments of 1 kt and 1000 ft. The outer keys (above and below) move in increments of 10 kts and 10,000 ft. Fine tuning in 100 ft increments is available on the ALT button of the upfront control. The altitude setting shown is a good one and that will be explained in more detail in the flight operations section. You can also adjust the heading bug with buttons across the tops and OBS with buttons on the bottom. The inner buttons are 1 degree increments and next outer buttons are 10 degree increments.

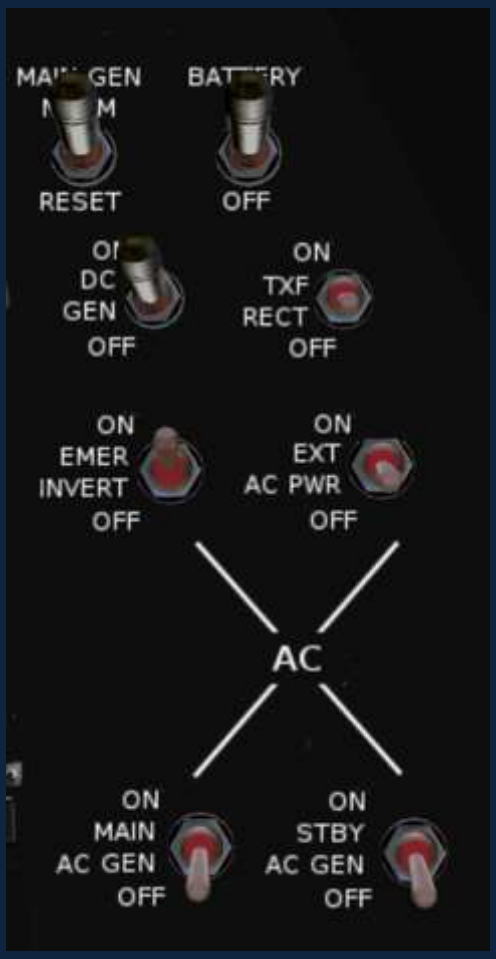
The right MFD functions as the primary systems monitoring display. Engine performance indicators are on the top half. Fuel, cabin pressure, oxygen supply, and cabin temperature displays are on the bottom. The selections across the bottom are currently not used.

The fuel display shows quantity of the engine sump tank on the left tape. The right tape displays total fuel on board. At the bottom of the fuel display the four wing tank quantities are displayed digitally in pounds. On the right side of the fuel panel, several calculations take place continuously. The top calculation is fuel on board expressed in flight time available. The RNG calculation shows how far the aircraft can go at the *current conditions* of groundspeed, fuel flow, and fuel remaining.

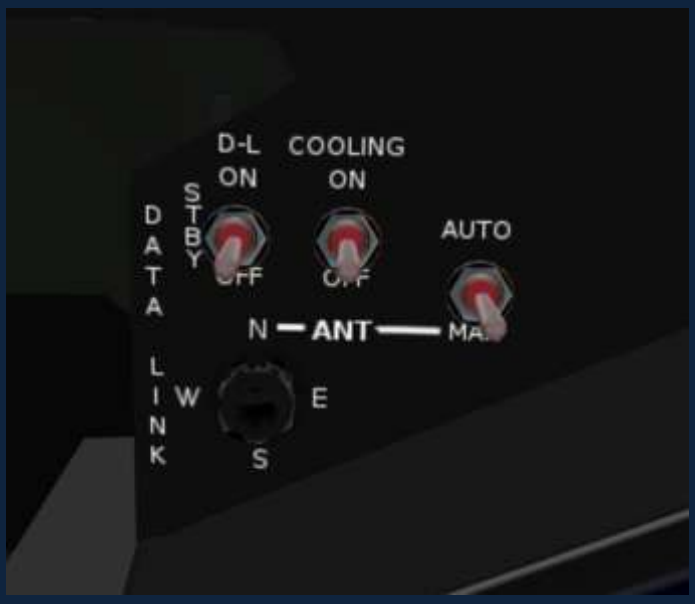
The altitude temperature display shows altitudes in thousands of feet, internal temperatures in degrees F and outside air temperature in degrees C.

The fuel management panel is below the right MFD and provides switches to manage fuel when the automated systems do not function properly. This means that you don't really have to do anything about the fuel in X-Plane except turn the primary and secondary engine boost pumps on before takeoff.

The fuel system feeds fuel from the outboard wing tanks to the inboard tanks and then to the engine sump tank. When flying you will note that the sump and inboard tanks remain full until the outboard tanks are empty. The fuel dump switches dump fuel from individual tanks for emergency balancing. Inboard and outboard cross-feed switches are not functional in the model.



The electrical systems panel provides control of all AC and DC power sources. Upon initiation in X-Plane several switches will need to be moved for checklist accuracy. Remember though, if you just want to fly, X-Plane initializes the U-2 to an operable configuration. The graphic on the panel indicates how to cross-tie sources to the AC buss.



Last but not least on the main instrument panel is the data link control panel. This is located at the lower right corner of the instrument panel. This has no functionality in X-Plane but is fully animated to allow checklist completion for long range communications from the aircraft. All three switches in the UP position provide communications reachback to home base.

The right wall panel is partially animated. The AP gains knobs are not functional and will remain so until we figure out how best to employ them in the U-2. There are only a couple of U-2s with tail hooks and 1071 isn't one of them according to the book we used to build the plane. DON'T WORRY. It will land on the carrier just fine without a hook! We tested that. We decided to add a tail hook switch in the event we add one later. The main switch on this panel that will have an effect on you is the WNSHLD DFG HTR and BLR. This switch preheats the canopy and windscreen for descent from high altitude. Forget it once and you'll find we have fog for you at a point in the descent. Just like in a real aircraft, turning the switch on late will eventually clear the fog, but you'll be in self-inflicted IMC for a while! Apparently your face can get cold in the pressure suit so we have a face heat selector. Pitot heat is on the lower left and fully functional. If you fly in icing conditions you should have this in the ON position.

The right console panel is a mix of animations and standard X-Plane functionality. The FMS is X-Plane standard equipment. The NAV radios are also standard X-Plane equipment.

On the left side of the console are switches and lights for mission equipment. The switches and lights are animated for tactical procedure accuracy. (As far as we know anyway!)

The important part of this panel is the AP and stability augmentation panel in the center. The stab/aug functions are the toggle switches on the top of the panel. Power to all of the stab/aug axes comes from the AFCS switch.

The AP functions are modeled on the bottom of the panel. Power to the AP is provided by the POWER toggle switch on the upper right. Turning the switch to the ON position causes the AP to fly the aircraft. At altitude, the U-2 flies on a SPEED mode, so the typical cruise setup is to select HDG, ALT, and SPD. At cruise altitude (above 60k feet), the aircraft SPD should be adjusted to 103 KTS with an altitude of FL860. The setting of FL860 keeps the aircraft tracking speed with a slight climb. You will not have to worry about altitude again even if you fly for 10 hours straight. The aircraft will climb at up to 20 degrees until reaching maximum capable altitude then will climb slightly as fuel is depleted. Typical for this model after a default fuel takeoff is an initial leveling at 70k feet.

The AP as modeled currently is optimized for high altitude operations. As a result it is not good at low altitude in some functions and particularly in capturing a heading. The aircraft also does not have approach coupling. Welcome to tactical aviation! You have to get yourself home in the bad weather!

Once we get the AP gains figured out on the wall panel we hope to get this dialed in a little better.

Chapter 2 – Normal Flight Operations

Ground Operations

Initialize the aircraft in the engine running condition and on the runway. Run the before takeoff checklist from left to right around the cockpit:

PRE-TAKEOFF CHECKLIST

Left Console

Circuit Breakers - ----------IN
Exterior Lights ---------- AS REQ'D
COMM Radios ---------- SET
Oxygen Panel -- NORM/NORM/ON
Fuel Cutoff ---------- GUARDED
Emer Start System ------ GUARDED
Engine Mode ---------- PRI
IFF/TXPDR ---------- SET/ALT
Canopy Seal ---------- ON

Throttle console

Flaps ---------- FAIRED
Throttle ---------- IDLE
Speed brakes ---------- IN
Spoilers ---------- IN
Aileron Trim ---------- CENTERED
Gear Handle ---- DOWN (two GRN)
Ram Air Supply ---------- OFF
Refrig Bypass ---------- NORMAL
Turbine Bypass ---------- NORMAL
Cabin Heat ---------- AS REQ'D

Instrument Panel

MIC ---------- AS REQ'D
UFC Select ---------- UFCD
Trans Select ---------- COMM 1
Master Volume ---------- AS REQ'D
Gear Indicators ---------- CHECK
UFC ---------- SET
Left MFD ---------- SET (NAV)
Interior Lights ---------- AS REQ'D
Inst/UFC Circuit Breakers -------- IN
Nose Pressure Dump Handle --- IN
Caution & Warning Panel -- CHECK
Center MFD ---- SET (FLIGHT INST)
AP FLT LVL ---------- FL860
Emergency Gear Release ---------IN
Standby ADI ---------- SET
Fire/Oheat Warning --------- CHECK
Trim Indicators ---------- CENTERED
Left MFD ---------- SET (SYSTEMS)
Backup Eng Instruments --- CHECK
Fuel Boost Pumps ---------- ON
Fuel Cross Feeds ---------- OFF
Fuel Dump Switches ---------- OFF
Inbd/Outbd TX Switches ------- ON
Flaps Indicator ---------- FAIRED
(first detent of flaps is FAIRED)
Emer/Norm Shed ---------- OFF
Stall Strip T-handle - STOWED

Electrical/Data Link Panel

Main Gen ---------- NORM
Battery ---------- ON
DC Gen ---------- ON
TXFR Rect ---------- ON
Emergency Inverter ---------- ON
Ext Power ---------- OFF
Main AC Gen ---------- ON
Stby AC Gen ---------- ON
Datalink ---------- OFF
DL Cooling ---------- OFF
DL Directional Antenna ------ AUTO

Right Console

System X Control Panel - AS REQ'D
FMS ---------- SET AS REQ'D
Recorder ---------- OFF
PWR-A ---------- OFF
Stability Augment Switches -- ON
Autopilot ---------- TEST
NAV Radios ---------- SET
Tail hook Switch ----------GUARDED
Autopilot Gains ---------- Position 1
Pitch Trim ---------- AUTO
STBY Attitude Source --- AIRCRAFT
Tracker Heat ---------- OFF
Windshield Defog ---------- OFF
Face Heat ---------- AS REQ'D
Pitot Heat ---------- AS REQ'D
Right Circuit Breakers ---------- IN
Mission materials/food - STOWED

TAKEOFF

Throttle - Full
Yoke - Establish 1/3 back travel
(CAUTION - less back pressure will make the aircraft porpoise on the nose gear and damage it)
Directional control - MAINTAIN
Liftoff - 70-95 KIAS (depending on fuel state) (default fuel liftoff occurs at 95-100 kts depending on yoke position

CAUTION

Reduction of aft pressure on the yoke prior to liftoff will cause the aircraft to porpoise on the main gear. Ensure the yoke is pulled aft at least 1/3 of the available back travel of your joystick and the aircraft lifts off cleanly before reducing back pressure.

After liftoff release back pressure to accelerate aircraft to 110 KIAS then pull gently to hold 130 KIAS for the initial climb. This happens quickly so don't let it get away from you. At default fuel the climb angle is 28 degrees at sea level. Half fuel climb attitude is 34 degrees. You will be on the ADI for the climb so get ready for it.

5000' CHECK

Gear - UP (check lights out)

10,000' CHECK

Cabin Altitude - CHECK
Suit Pressure - CHECK
Q-Bay Altitude - CHECK
(if any pressure system fail, abort the mission and return to base)
Face heat - AS REQ'D
Center MFD/UFC - HDG SET
Autopilot - ENGAGE HDG/MACH
Autopilot speed – set to 160 kts
Continue to monitor AP performance throughout climb.
Adjust speed setting to maintain limits shown on speed schedule placard on left canopy rail.
(lower the nose to accelerate to 160 knots and select GUST flaps if turbulence is forecast)

10k (continued)

Pitch - REDUCE
Climb - 160 KIAS (climb attitude will decrease continuously through the climb)

60,000' / Tactical CHECK

DL Cooling – ON
DL Power – ON
DL Antenna - AUTO
Exterior Lights - OFF

LEVEL OFF CHECK

Cabin Pressure - CHECK
Suit Pressure - CHECK
Suit Ventilation - AS REQ'D
Q-Bay Pressure - Check
Mission - CONTINUE

DESCENT CHECK

Windshield Defog - HTR and BLWR
Cabin Heat - FULL HOT (temporarily)
Pitot Heat - ON
Power - REDUCE
Speed Brakes – EXTEND FULLY
Landing Gear - EXTEND (do not exceed 160 KIAS or M 0.65)
(Extending landing gear and speed brakes are the only high altitude drag devices available. DO NOT EXTEND FLAPS)
Airspeed - 160 KIAS

10,000 DESCENT CHECK

GEAR and SPEEDBRAKES - AS REQ'D
Flaps - GUST (optimum reduction of lift)
Airspeed - 150 to 200 KIAS (200 KIAS max w/ GUST)
External Lights - AS REQ'D
Landing Light - ON

BEFORE LANDING CHECK

(Remember – the STMA U-2S plugin inhibits pogo gear until after you have been on the ground for one minute. This is automatically set for you to experience the bicycle landing that makes the U-2 the most cantankerous tail dragger there is!)

Gear - DOWN (red/white stripes = POGOs suspended otherwise - green)
Airspeed - BELOW 150 KIAS
Flaps - 35 DEG
Approach - AS REQ'D

(slips with full flaps provide additional drag. Watch your yaw string as you slip to verify side slip. Feel free to use full rudder authority – you won't bend anything!)

ON FINAL

Airspeed – below 110kts
FLAPS - 50 Degrees
Stall Strips - Deploy (gray T-handle on Right Inst panel)
Speed brakes – As Required
Power - AS REQ'D (maintain 90-95 KIAS)
(Descent on final with full flaps, speed brakes, gear, and idle power is 5 degrees at 93 KTS (625 fpm) standard day)

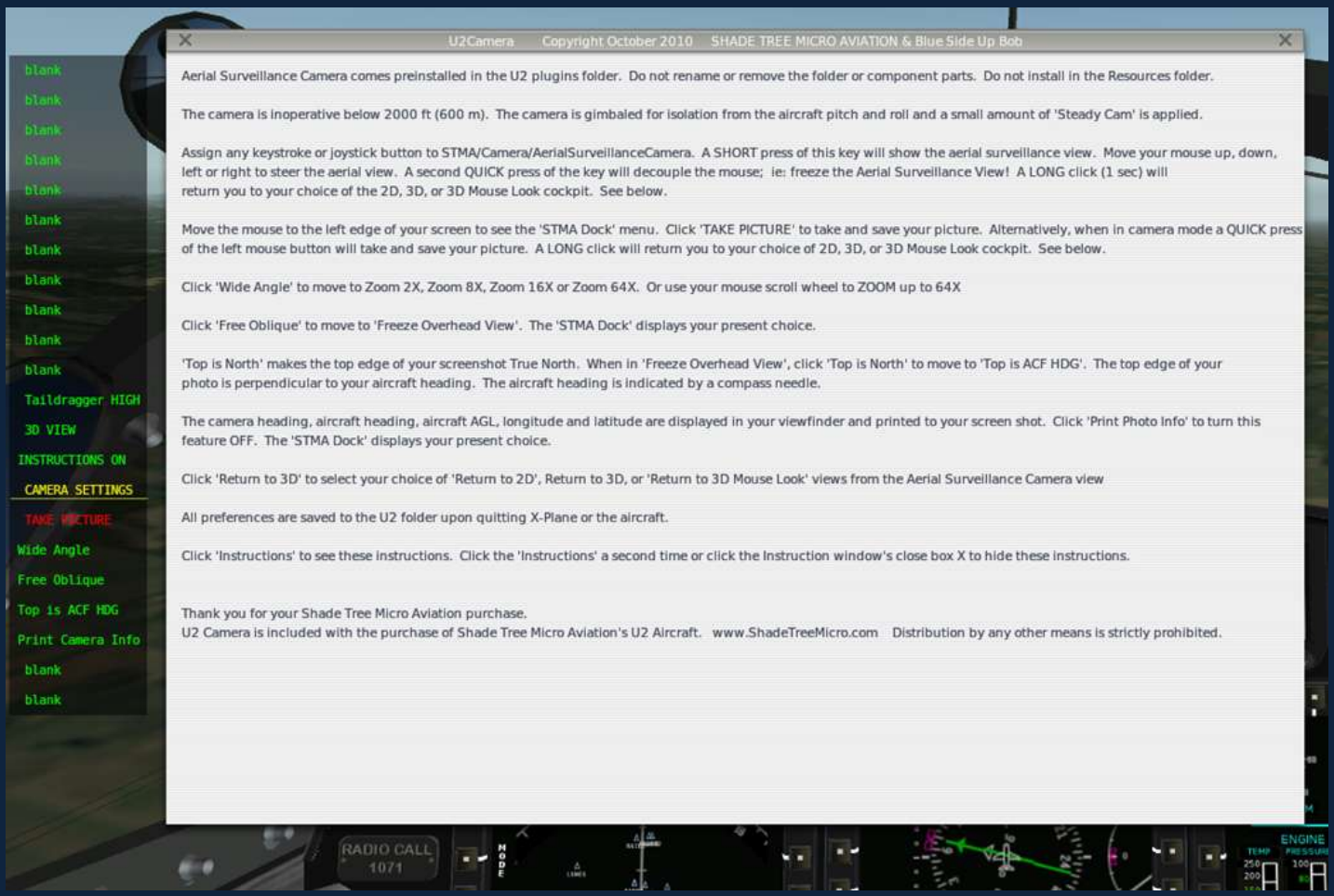
LANDING CHECK

(Landings are possible with up to a 20 KIAS crosswind; however, you will drag the upwind wingtip if you add required aileron into the wind to maintain rudder effectiveness OR lose rudder effectiveness if you try to keep the wings level. The development and flight test of the X-Plane model was conducted by a very experienced conventional gear pilot. Start with 5 KIAS XW and work your way up! One more thing - If you don't have rudders on your control set up then avoid XWs completely with this aircraft. We'll call the "demonstrated XW component 15 KIAS at Sea Level)

50 Feet - SLOW DESCENT (ROUNDOUT)
10 Feet - ESTABLISH LANDING ATTITUDE (GEAR LEVEL)
Touchdown - TAIL GEAR SLIGHTLY BEFORE MAIN
(The sight picture for the default pilot view point is to hold the top of the AOA gauge slightly above the horizon just before touchdown. You will be able to establish this at approximately 85 kts and hold it with increasing back pressure until touchdown.
Wings Level - MAINTAIN until 15 KIAS
(with good fuel balance and a little practice you can turn off at 4000' and come to a stop before the wing tip touches the ground)
Upwind Wing Tip - SET DOWN (if fuel balance allows)
RUNWAY - CLEAR (if conditions permit)
Give the STMA "crew" (plugin) 60 seconds to refit your pogo gear and level the aircraft. You can then clean up and taxi to the hangar! If you are in a hurry you can replace them from the STMA dock.

Chapter 3 – Mission Camera Operations

The U-2 is equipped with a mission camera to simulate the high altitude imagery capability the aircraft has. The camera operates through a plug-in developed by Blue Side Up Bob and is offered exclusively as a capability in the STMA U-2S. All the instructions for adapting the camera to your controls can be found by calling up the dock on the left side of the X-Plane screen as shown below. Go to and select INSTRUCTIONS – ON. You will see the camera guide and set-up instructions in the center of the screen. We recommend autopilot – ON for camera ops!



Once you have the camera enabled, it is important to understand that LOD settings of various scenery will affect how much of the features on the ground you see. Most scenery packages have LOD limits that do not allow the U-2 above 60,000 feet to see the full scenery set. The function works very well if you have scenery draping of real ortho photos or G2XPL terrain overlays.

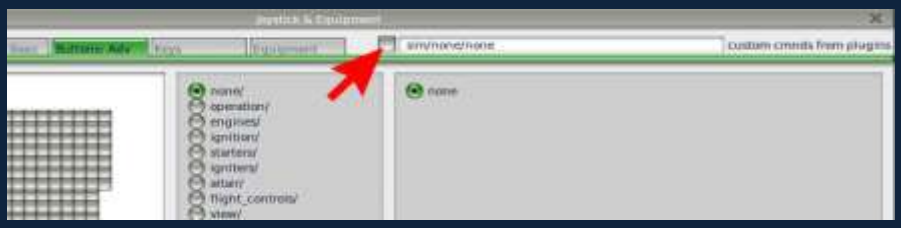
The camera is inhibited below 2000 feet and will indicate that on the left dock if you attempt to call it up.

The camera angle is operated using your mouse. A left click captures the image and files it in your X-Plane folder for later viewing. If you have a wheel on your mouse it zooms the view in and out.

Appendix A SETTING A JOYSTICK BUTTON TO THE CUSTOM COMMAND STMA/Camera/AerialSurveillanceCamera

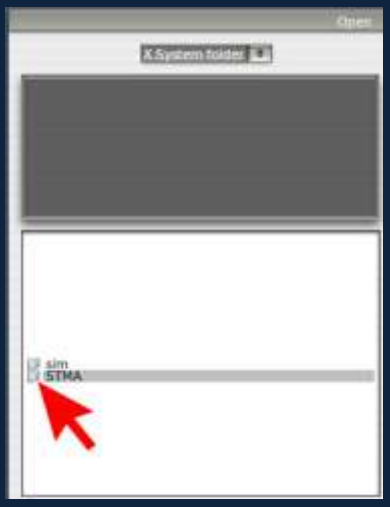
The Camera function can be assigned to any button using the command STMA/Camera/AerialSurveillanceCamera. To do this, go to the X-Plane > Settings > Joystick and Equipment menu and click the 'Buttons Adv' tab.

1) Press the button on your joystick you want to program. Then check mark the "custom commands from plugins" box.

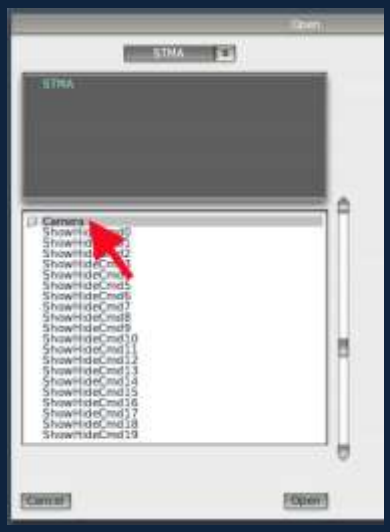


2) Select the X System folder.

3) Open the STMA folder by double clicking.



4) Click Camera



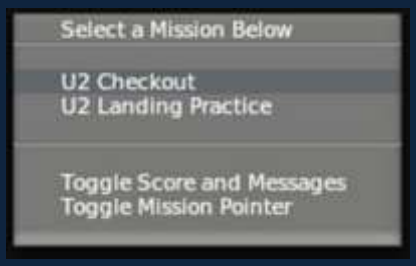
5) Click AerialSurveillanceCamera

Appendix B Loading and flying the U-2 X-Adventure

The U-2S X-Adventure is designed to get you acquainted with the U-2 flight and landing characteristics along with an imagery gathering mission. After downloading the setup file, simply open it and follow the instructions to load it into your X-Plane folder.

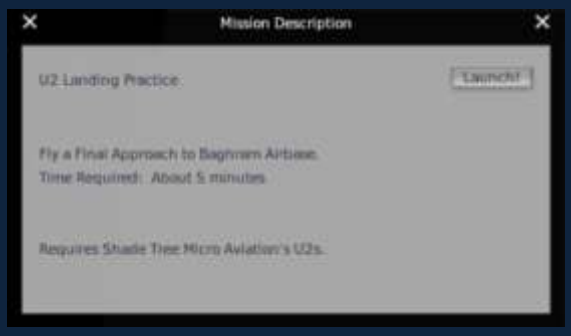
When the setup process is complete you should see an X-Adventures plug-in listed in the plug-in drop down menu like this:

Select the plugin line and the X-Adventure applet will appear:



You can show or hide the message box and pointer at any time in the flight . It is a good idea the leave them on and move the message box to the upper right corner of the screen

Once you have selected the mission you want, X-Adventure will display a launch message. Upon launch, the system will take you to the adventure airfield and set up the mission. In landing practice you will be placed on 3 mile final. In the photo mission you will start in the hangar and taxi out.



The missions are better on faster machines with 8 or more AI aircraft but you can reduce the number at any time to retrieve frame rate.

Once started, you only need to follow the voice and written instructions. It is a good idea to acquaint yourself with the checklist first and take the plane around the pattern a few times before doing these adventures.

Mission Pointer

Msg Window